

Deregulation of Public Utilities: Current Issues and Perspectives

Edited by Megan Richardson

Centre for Corporate Law and Securities Regulation

**DEREGULATION OF PUBLIC
UTILITIES:
CURRENT ISSUES AND PERSPECTIVES**

Editor

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Foreword

In June 1996 a public lecture and panel discussion on deregulation of public utilities was held at The University of Melbourne. The public lecture was hosted by the Centre for Corporate Law and Securities Regulation and The University of Melbourne Law School. Sponsorship from the University's Committee for Public Affairs Programs and the Australia New Zealand Foundation enabled participants to include Michael Trebilcock, Professor of Law and Director of the Law and Economics Programme at The University of Toronto, and David Goddard, a partner in the New Zealand law firm, Chapman Tripp Sheffield Young and a World Bank consultant on deregulation issues. Other participants were Jim Holmes, Executive Manager Business Development at Powernet, Victoria, and previously Director-Regulatory and Corporate Secretary of Telecom Australia, Philip Williams, Professor of Law and Economics at the Melbourne Business School, and John Perham, Deputy Secretary and Director Privatisations and Industries Reform Division, Victorian Treasury.

This book contains the proceedings of the public lecture and panel discussion in chapter 2. In addition four further chapters have been included. The first chapter, which is an introduction to the book, is by Frances Hanks, Senior Lecturer in Law at The University of Melbourne. Her chapter sets out the competition law framework of deregulation in Australia and raises the issues which are discussed in more detail in the chapters which follow. The third chapter is by Philip Williams on the deregulation of Victoria's electricity industry and is an updated version of the inaugural Professorial address given by Professor Williams at the Melbourne Business School in June 1995. The fourth chapter is by Dr Stephen King of the Research School of Social Sciences, The Australian National University, and is a study, supported by the Australian Competition and Consumer Commission, regarding the appropriate basis for asset pricing and access under the new Part IIIA of the *Trade Practices Act 1974* (Cth). The fifth chapter is by Professor Henry Ergas of The University of Auckland on telecommunications across the Tasman and compares the experience of the different approaches adopted to deregulation in Australia and New Zealand.

A uniting theme of all the chapters is that a close examination of the economic principles underlying deregulation is essential to an understanding of, not only the benefits to be gained from deregulation, but also the appropriate structure for deregulated industries and approach to be adopted to their regulation (or "reregulation" as Jim Holmes aptly terms it). Nevertheless, as Frances Hanks points out in her introductory chapter, there remains scope for debate as to the precise economic principles to be applied. It is hoped that by contributing to that debate this book will also contribute to the resolution of some of the difficult current issues regarding deregulation of public utilities.

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Part I

The Competition Law Framework

Chapter 1

The Competition Law Framework for Deregulation of Public Utilities in Australia

Frances Hanks¹

Introduction

Moves to enhance competition in specific sectors of the Australian economy have been under way for more than a decade. Some moves have involved simply a retreat from regulation or a change in government policy; examples are the Commonwealth's abandonment of its two airline policy and its admission of foreign banks. Other industries, such as telecommunications and petroleum in Western Australia, have been the object of industry-specific regulatory schemes.²

The chapters which follow direct attention to the significant issues that attend the opening up of new areas of the economy to competition:

- (i) the structure chosen for the industry (if it has been a government monopoly);
- (ii) the design of the regulation that affects the industry;
- (iii) the way in which economies that arise from combining vertically integrated activities are to be handled; and
- (iv) the terms on which access is to be granted to those aspects of the deregulated activity that cannot effectively be duplicated.

The last two issues have direct relevance in the application of the competition law in place in Australia today. Apart from the industry-specific legislation mentioned above, there are two laws of general application by which new entrants can gain access to the products or services they need in order to compete. They are section 46 of the *Trade Practices Act 1974* (Cth) and Part IIIA of the same Act which was inserted into the Act after the recommendations of the Hilmer Committee.³ Under each law there are two questions. Should the owner of the property be compelled to deal with others? If so, on what terms?

The first of the issues above (What structure?) is a matter for governments rather than law. However the decision a government takes on structure must be affected by the legal regime that will apply to the deregulated structure. Issues of regulatory design, while clearly issues of concern to the law, appear at first glance to have been settled once

1 Senior Lecturer, Faculty of Law, The University of Melbourne.

2 *Telecommunications Act 1991* (Cth) and *Petroleum Pipelines Act 1969* (WA).

3 *National Competition Policy*, Report by the Independent Committee of Inquiry, AGPS, August 1993 ("Hilmer Committee").

the law is put in place. In the case of the legislated access regime in Part IIIA, the first glance should not be the last. The comments by Jim Holmes on the chapter by Michael Trebilcock and Michal Gal include insights that should inform the way the regulator goes about its business even if they have been overlooked by the legislature.

This chapter focuses on the legal regimes for access under section 46 and Part IIIA of the *Trade Practices Act*.

Section 46 *Trade Practices Act*

Section 46 regulates anticompetitive conduct. To establish a breach of section 46 an applicant must satisfy the three elements of the section. It must establish that the respondent had a substantial degree of power in a market, that it took advantage of that power, and that it acted for anticompetitive purposes. The sanctions for contravention include penalties up to \$10 million, injunctions and a range of compensatory orders.

Traders whose business opportunities have been curtailed by the refusal of another to trade with them have often sought to invoke section 46.⁴ Such a case came before the High Court of Australia in the *Queensland Wire* case.⁵ In a landmark judgment the Court clarified the meaning of the phrase “take advantage”: a corporation takes advantage of its market power whenever it acts in a way that would not be commercially possible if it faced competition. The result in *Queensland Wire* was a referral back to the trial judge to determine the order — the terms on which BHP was to supply its Y-bar to Queensland Wire Industries. The trial judge was spared this task because the parties settled.

Where a firm seeks access to another firm’s products or facility in order to compete with the other firm the element of anti-competitive purpose is not helpful in distinguishing between a refusal that is part of the ordinary competitive conduct that Part IV (which includes section 46) seeks to foster and a refusal that is anticompetitive and so caught by section 46. As the High Court observed in *Queensland Wire*, competition by its very nature is deliberate and ruthless.⁶ This means that once the market power of a firm denying access is established, the only real issue under the section is whether its refusal is contingent on that power.

When is a refusal to deal, or a constructive refusal by offering to deal only at some high price, contingent on the market power? It has been argued elsewhere that a refusal is not explained by the power if there are economies of scope that can be realised by combining the activity in which the firm has power, and to which the aspiring competitor seeks access, with the activity in which the aspirant seeks to engage.⁷ This is because in a competitive market firms would not split a process where the consequence would be to fail to realise attainable economies.

4 Complaints about the respondent’s refusal to deal with the applicant account for a large part of the litigation under section 46: see cases listed in Russell V Miller, *Annotated Trade Practices Act* (17th ed, LBC Information Services, 1996) at 181-183.

5 *Queensland Wire Industries Pty Ltd v The Broken Hill Pty Co Ltd* (1989) ATPR 40-925.

6 Ibid at 50,010 per Mason CJ and Wilson J.

7 Frances Hanks and Philip L Williams, “Implications of the Decision of the High Court in *Queensland Wire*” (1990) 17 *Melbourne University Law Review* 437.

The risk that structural reform might be achieved at the cost of the loss of economies that derive from vertical integration is addressed in Trebilcock and Gal's chapter, is down-played in respect of publicly owned utilities in Holmes' comment, and is the point on which Williams queries Trebilcock and Gal in his comment. If the analysis of section 46 in the last paragraph is accepted by the courts (and not all courts have seen it that way)⁸ vertical integration that is justified by economies is immune from incursion by means of proceedings under the section.

That section 46 operates to allow access only where entry would be efficient is consistent with the view taken by the Privy Council of the equivalent provision in the New Zealand *Commerce Act 1986* in the *Clear* case.⁹ The issue was what fee Telecom (the privatised successor to the former state monopoly) was entitled to charge Clear for access to its network. The Privy Council ruled that if Telecom charged its competitors a price that compensated it for the revenue foregone because those competitors would be serving its former customers in the contestable part of the activity, that pricing conduct would not infringe the provision. The pricing formula became known during the course of the proceedings as the Baumol-Willig rule after the economists who proposed it.

The Privy Council acknowledged that under this formula any monopoly profits (in the form of high prices or inefficient behaviour) that Telecom was currently taking would be reflected in the price it could charge for access. It considered that the role of the provision was simply to compel the dominant firm to grant access on terms that would permit a firm as efficient as itself to compete. The elimination of monopoly profits was a matter for direct pricing regulation, not for the provision prohibiting a misuse of market power. The Privy Council had the comfort of a little-used part of the *Commerce Act* which permits the New Zealand government to regulate prices. In Australia, the oversight of prices, formerly the province of the Prices Surveillance Authority and now of the Australian Competition and Consumer Commission ("ACCC"), falls short of the power to stipulate the price at which a firm may sell.

As part of the Hilmer reforms which are discussed below, the application of section 46, along with all the other competition provisions of Part IV of the *Act*, has been extended to all Australian governments.¹⁰

Hilmer Recommendations and their Implementation

General policies to address the introduction of competition across all sectors of the Australian economy proceed from the recommendations of the Hilmer Committee¹¹ in 1993. The Committee was established by the Prime Minister who had secured the

8 *Union Shipping NZ Ltd v Port Nelson Ltd* [1990] 2 NZLR 662 (proceedings under section 36 *Commerce Act 1986* (NZ)).

9 *Telecom Corporation of New Zealand Limited v Clear Communications Limited* [1995] 1 NZLR 385.

10 With the proviso that the governments are not liable to a penalty: sections 2A and 2B. Section 2B, extending the operation of Part IV to the Crown in the right of each of the States and the Territories, came into effect on 21 July 1996.

11 *National Competition Policy*, Report by the Independent Committee of Inquiry (August 1993, Australian Government Publishing Service).

agreement of the States and Territories to the principle that universal rules of market conduct should apply to all market participants.¹²

The Committee went beyond its brief. It reported that more than the removal of existing regulatory restrictions that protected some business conduct from exposure to the rules of Part IV of the Trade Practices Act was required if effective competition was to be fostered across the economy. In particular, the introduction of open competition into the sectors of the economy currently dominated by public monopolies required positive steps.

The Committee was silent on the issue of public versus private ownership, with the qualification that government businesses should not enjoy any competitive advantage because of their public sector ownership.¹³ Further, the Committee recommended that where governments privatise an existing government monopoly or introduce competition to a sector that has been supplied by a public monopoly that step should be preceded by a review of the industry structure with a presumption in favour of the separation of any natural monopoly element from activities that are potentially competitive.¹⁴

Neither of these recommendations would affect a government's prerogative to retain its existing public monopolies in their present form.¹⁵ However that prerogative is affected directly by the Committee's recommendation on access to essential facilities. The Committee recommended that the Commonwealth establish a legislated regime to permit competitors to gain access to facilities that cannot be duplicated economically.¹⁶ It envisaged that many of the facilities potentially subject to this access regime would be government-owned or be found in industries in which governments have traditionally been involved as owners.¹⁷

The implementation of the reforms proposed by Hilmer was an exercise that, in a spirit of euphemism, might be called co-operative federalism. The co-operation of the States and Territories was obtained by a mixture of financial inducements,¹⁸ conceding the States and Territories a role in the appointment of the key administrative bodies,¹⁹ and permitting the States and Territories to set up their own regimes for access to essential facilities as an alternative to the Commonwealth scheme.²⁰

12 Ibid at xviii–xix.

13 Ibid Ch 13.

14 Ibid Ch 10.

15 However the Report recommends that government businesses should be subject to a mechanism for the oversight of prices, with surveillance being imposed at a national level on State and Territory Governments whose failure to undertake the task themselves has an impact on interstate or overseas trade: *ibid* 291.

16 Ibid Ch 11.

17 Ibid at 251 and 260.

18 Under the *Agreement to Implement the National Competition Policy and Related Reforms*, executed by all Australian Governments on 11 April 1995, the Commonwealth undertook to provide financial assistance to the States and Territories in return for their continued progress in implementing the policy — the assistance to range from \$200 million in the 1997–98 financial year to \$600 million in 2001–02.

19 The Australian Competition and Consumer Commission and the National Competition Council: *Trade Practices Act 1974* s.6A and 29C.

20 *Trade Practices Act* sections 44G(2)(e) and (3), 44H(4)(e) and (5), and 44M–44Q.

There is a stick behind these carrots. First, a State is entitled to participate in the appointments to the regulatory bodies, or to have the comfort of a ruling in advance of an application for access that its own access regimes qualify as an alternative to the Commonwealth process, only if it is a full participant in the package of legislative reforms that flow from the Hilmer Report.²¹ Second, a State's entitlement to a share of the Commonwealth money grant is made conditional on the State's implementation of initiatives for micro-economic reform that go beyond the legislative changes recommended by Hilmer. These initiatives include commitments to competitive neutrality and to review industry structure whenever government businesses are privatised or competition is introduced²² — matters on which the Hilmer Committee recommended that the governments agree to abide by a set of principles. Further, the inter-governmental agreement makes payment to the States conditional on their implementation of micro-economic reforms in particular industries that have been the subject of inter-governmental agreement.²³

Part IIIA Access Regime

The Hilmer Committee saw section 46 as inadequate as a mechanism to facilitate access to facilities owned by vertically integrated monopolies.²⁴ Deficiencies of the section were said to include the reluctance of the courts to impose terms of dealing on the parties and the delays associated with litigation. The other problem identified in the report shows that the Hilmer Committee did not fully understand section 46.

In describing the difficulties of proof that face an applicant under the section the Committee singled out the difficulty of demonstrating that the owner of the facility has an anticompetitive purpose when it refuses access. On the other hand, the Committee assumed that the "take advantage" element of the section will easily be established because, it said simply, in the absence of market power access will be available. The Committee did not understand the nature of the inquiry required by the test of taking advantage adopted by the High Court in *Queensland Wire*. It was not alert to the factors that determine whether dealing will occur under competitive conditions.

Hilmer recommended a legislated regime that would apply to facilities to which

21 The package goes well beyond the matters dealt with here. For instance, States and Territories were required to introduce legislation that would expose unincorporated businesses (notably the professions) to the discipline of the competition provisions of Part IV of the *Trade Practices Act*.

22 *Agreement to Implement the National Competition Policy and Related Reforms*, Condition (i); and Competition Principles Agreement, Clauses 3 & 4.

23 For instance, the *Agreement to Implement the National Competition Policy and Related Reforms* conditions the payment in 1999–2000 on "effective implementation of all Council of Australian Governments agreements on:

- the establishment of a competitive electricity market,
- the national framework for free and fair trade in gas,
- the strategic framework for the efficient and sustainable reform of the Australian water industry" and "effective observance of road transport reforms".

24 Supra note 11 at 243–245.

access was essential to permit effective competition in an upstream or downstream activity in an industry that was significant to the national economy. The Committee envisaged a two-step process. The first step would entail declaration of the service. Declaration was to be made by the Commonwealth Minister but only after the recommendation of an independent body (the to-be-established National Competition Council). When declaring a facility the Minister was to specify the principles to be applied in determining the price of access. If the parties could not reach agreement, the second step would be arbitration by the ACCC.

While adhering to its two-step process, the legislated scheme in Part IIIA departs significantly from the Hilmer Committee's recommendation in the following respects:

- (i) the States have been included in the process of the declaration of their own facilities²⁵ and have been permitted to set up their own access regimes;²⁶
- (ii) the declaration of the service by the Minister is at large, not accompanied by a statement of the policy issues to be taken into account by the ACCC in determining the terms of access;
- (iii) both the Minister's decision on whether to accept a recommendation to declare a service and the ACCC's arbitration of the terms of access are subject to review by the Australian Competition Tribunal;²⁷ and
- (iv) the ACCC's role is considerably expanded by provision for it to accept undertakings from service providers²⁸ which, once accepted, by-pass the declaration process. The appropriateness of an undertaking is not a matter on which the ACCC's judgment is subject to review by the Tribunal.

Scope of the legislated regime

Under Part IIIA access is available to a "service" which is defined in section 44B to mean:

... a service provided by means of a facility and includes:

- (a) the use of an infrastructure facility such as a road or railway line;
- (b) handling or transporting things such as goods or people;
- (c) a communications service or similar service;

but does not include:

- (d) the supply of goods; or
- (e) the use of intellectual property; or
- (f) the use of a production process;

except to the extent that it is an integral but subsidiary part of the service.

This definition serves to narrow the range of possible activities that can be subject to an access regime and to target the kinds of network services that have traditionally been the business of government. The exclusion of the supply of goods serves to distinguish

25 By section 44F(2) the Council is to make its recommendation to the "designated Minister", defined in section 44D(2) in respect of any State or Territory as the responsible Minister of that State or Territory.

26 Sections 44G(3) and 44H(5) discussed below.

27 Sections 44K, 44L and 44ZP.

28 Section 44ZZA.

between the electricity grid on the one hand and electricity on the other. Access to electricity, like the access that Queensland Wire Industries sought to BHP's Y-bar, remains the exclusive province of section 46.

Criteria for declaration

The criteria for declaration of a service are set out in sections 44G(2) and 44H(4). The Council is not to recommend declaration of a service and the Minister is not to declare the service unless they are satisfied:

- (a) that access (or increased access) to the service would promote competition in at least one market (whether or not in Australia), other than the market for the service;
- (b) that it would be uneconomical for anyone to develop another facility to provide the service;
- (c) that the facility is of national significance, having regard to:
 - (i) the size of the facility;
 - (ii) the importance of the facility to [interstate or overseas] trade or commerce; or
 - (iii) the importance of the facility to the national economy;
- (d) that access to the service can be provided without undue risk to human health or safety;
- (e) that access to the service is not already the subject of an effective access regime;
- (f) that access (or increased access) to the service would not be contrary to the public interest.

In determining whether declaration is precluded by the existence of an "effective access regime" in paragraph (e), the Council under section 44G(3), and the Minister under section 44H(5), are directed to take into account only the principles in the Competition Principles Agreement. That agreement provides that the Commonwealth scheme will not apply to a facility that is situated in one of the States or Territories where there is in place an access regime which covers the facility and conforms to principles set out in the agreement. The principles set out in the agreement are modelled on Part IIIA.

The requirement in paragraph (a) that access will promote competition in some market other than the market for the service raises questions about how much competition is to be promoted, and with what objective. Goddard, in his comment on Trebilcock and Gal in Chapter 2, points out that the objectives in introducing competition may range from a desire to see a lot of "rivalrous behaviour" in contestable sectors to a variety of short term and long term efficiency goals.

Paragraph (f), which precludes declaration where access would be contrary to the public interest, indicates a concern that a service not be declared where entry will be inefficient. The phrase "the public interest" calls to mind the "public benefit" test for authorisation of anticompetitive conduct under Part VII of the Act. In the *QCMA* case²⁹ the Tribunal said that it saw public benefit as:

... anything of value to the community generally, any contribution to the aims pursued by

²⁹ *Re QCMA and Defiance Holdings Ltd* (1976) ATPR 40-012.

society including as one of its principal elements . . . the achievement of the economic goals of efficiency and progress.³⁰

In its restatement in *Re 7-Eleven Stores*,³¹ the Tribunal sweeps “progress” into the concept of efficiency which, it says, encompasses allocative efficiency, production efficiency and dynamic efficiency. None of this is controversial.

There are two problems with efficiency as a criterion for declaration. The first problem is that, with its three aspects, efficiency is not a unitary goal. In an industry with a great potential for technological change access might be justified on grounds that entry will enhance dynamic efficiency. However facilitating access in the interest of dynamic efficiency might entail the sacrifice of some economies of scale and scope, and so be bought at the expense of production efficiency, at least in the short term. Trebilcock and Gal refer to the trade-off between economies of scope and enhanced competition that might accompany structural separation of existing network monopolies. Williams responds in his comment. While both are discussing industry structure, the same issue arises on the declaration of a service under Part IIIA.

It could be said that the multi-dimensional nature of efficiency should not matter because the declaring bodies can take a view of the industry. They can decide on balance which type of efficiency weighs most heavily in the industry’s role in achieving society’s goal in allocating its resources efficiently. However whether one or more of the goals of efficiency will be served by access to a service may well depend on the terms on which access is granted. This raises the second problem of the declaration process under Part IIIA as a means of achieving an efficient outcome.

If the terms on which access is granted use the occasion of access to eliminate monopoly rents then the outcome should be allocatively efficient (because it results in costs to consumers that approximate the costs of production).³² If considerations of dynamic efficiency are predominant, logic may require that new entrants be given access at a price that is less than the provider’s cost of maintaining its service. In telecommunications, the terms on which the Commonwealth Government granted Optus interconnection to Telstra have been interpreted as a recognition that the possibilities for change in this industry weigh more heavily than any static efficiency concerns.³³ Finally, concern for production efficiency may point towards granting access on the Baumol-Willig terms applied in *Clear*, terms that preserve all monopoly profits of the uncontestable part of the industry and require of the monopolist no more than that it does not discriminate between itself and new entrants in the contestable sector.

Hilmer’s recommendation was that the setting of principles as to the price on which access was to be granted should be part of the declaration that exposed a service to the

30 Ibid at 17,242.

31 *Re 7-Eleven Stores* (1994) ATPR 41–357 at 42,677.

32 G A Hay, “Reflections on *Clear*” (1996) 3 *Competition & Consumer Law Journal* 231, at 237.

33 David Lindsay and Philip Williams, “The Trade-Off between Competition and Efficiency in Telecommunications: The Australian Experience” in Megan Richardson and Philip Williams (eds) *The Law and The Market* (Federation Press, 1995).

access regime. The reasons were that it was proper that the policy issues be dealt with by an elected representative rather than a regulator and that the establishment of pricing principles at the outset gave parties a framework within which to negotiate.³⁴

The legislation has gone along a different path. First, the process of declaration is less overtly political than the process envisaged by Hilmer. Once the Council recommends declaration, it is the Tribunal on a review of the Minister's decision that has the final voice. Second, the declaring bodies have not been given the capacity to project forward into the pricing process the rationale upon which their declaration is based.

Access prices

If the parties cannot agree on the terms on which access is to be granted to a service that has been declared, then the ACCC and (on review) the Tribunal may "arbitrate". The basis on which the ACCC must determine the access prices is set out in section 44X. The ACCC must take into account:

- (a) the legitimate business interests of the provider, and the provider's investment in the facility;
- (b) the public interest, including the public interest in having competition in markets (whether or not in Australia);
- (c) the interests of all persons who have rights to use the service;
- (d) the direct costs of providing access to the service;
- (e) the value to the provider of extensions whose cost is borne by others;
- (f) the operational and technical requirements necessary for the safe and reliable operation of the facility;
- (g) the economically efficient operation of the facility.

The ACCC may take into account any other matters that it thinks are relevant.

This open-ended shopping list of factors confers a broad discretion on the regulator. The legislation does not establish principles by reference to which prices are to be calculated.

What guidance does the legislation give? Paragraph (a), in requiring attention to be paid to the provider's investment in the facility may suggest that parliament did not envisage an access price being set as low as the direct incremental cost of providing the access. The Explanatory Memorandum that accompanied the Bill explains the references to "legitimate" business interests of the provider and to the "direct" costs of providing access as intended to preclude arguments that the provider should be reimbursed for "consequential costs which the provider may incur as a result of increased competition in an upstream or downstream market."³⁵ Perhaps this is an indication that those who drafted the provision did not intend an access price based on the Baumol-Willig rule which permits the provider to recoup the opportunity cost it

³⁴ Supra note 11 at 255.

³⁵ *Explanatory Memorandum to Competition Policy Reform Bill 1995* clause 233. The comments in the Memorandum are drawn from clause 6(4)(i)(ii) of the *Competition Principles Agreement* which sets out the principles which must be followed by a state access regime if it is to be effective to oust Part IIIA.

incurs through granting access. Paragraph (g) referring to the economically efficient operation of the facility is consistent with an intention that regulated prices should be similar to those that would be charged in a competitive market.

These speculations serve only to demonstrate that if parliament had clear policy objectives it has not made those objectives manifest in the instructions it has given to the regulator. The Holmes and Goddard commentaries on the chapter by Trebilcock and Gal are apposite in this respect.

Trebilcock and Gal and also Williams, in his comment on bottleneck pricing, proceed from the assumption that the objective of the reform of utilities is to achieve an efficient allocation of resources. Under this assumption, they say, the proper role of the regulator is to mimic competitive market forces, and so require the regulated enterprise to deal on the terms that would pertain under competition. The immediate focus of Trebilcock, Gal and Williams is the structural reform of public utilities. Part IIIA has a broader application. It applies to public and private investments alike. Whether these commentators would prescribe the same pricing principle for access to a facility that was privately developed is not clear.³⁶

The requirement that the ACCC take into account the provider's investment in the facility raises questions of how that asset is to be valued. Stephen King in Chapter 4 canvasses six theoretical approaches to valuation. They range from valuation based on the value of the economic benefits that the facility can deliver to its owner, on the one hand, to scrap value, on the other. A significant issue raised in King's chapter is whether the valuation of an asset for the purposes of a regulatory regime is to be undertaken in the light of the regulatory environment.

Conclusion

Its federal structure sets the Australian experience apart from unitary structures such as New Zealand. In the last chapter in this book, Henry Ergas looks across the Tasman and compares the economic outcomes of "light handed" regulation in New Zealand and elaborate regulation in Australia in the telecommunications industry. Ergas concludes that the New Zealand experiment of deregulating the industry and leaving issues of access to be determined by recourse to the general principles of competition law has produced better performance outcomes.

Telecommunications is an industry in which federalism is not an issue in Australia because telecommunications has been a Commonwealth monopoly and it is the national government that has been at the forefront of economic reform. However it is obvious from the Australian experience that the system of government has a significant effect on how structural reform can be achieved. Unitary systems have all their public monopolies under the one control and so have the capacity to deregulate or divest fast. They have also the capacity to legislate to rein in outcomes of deregulation that were not

36 Compare the Hilmer report which envisaged a range of possible pricing regimes to operate on access (*supra* note 11 at 254) and did not envisage the proposed access regime as a general mechanism to cope with monopoly pricing by owners of essential facilities (*ibid* at 240–241).

contemplated. That is not a luxury possessed by the governments in a federal system.

The Australian regimes for access to facilities that are essential for entry into the competitive process would fail most tests of good regulatory design. Under the *Trade Practices Act* the owner of an essential facility is exposed concurrently to section 46 and Part IIIA.³⁷ Within Part IIIA, undertakings to the ACCC are set up as an alternative to the declaration process, and the consequence of the ACCC accepting an undertaking is to remove the possibility of review. The possible plethora of State regimes adds to the confusion. The divorcement of the declaration process from the specification of principles on which access is to be granted, and the failure of the legislation to fill this vacuum by providing principles, make for incoherence at the declaration stage and uncertainty and an undesirable degree of regulator discretion thereafter. Given that the policy considerations that will shape the operation of the legislated regime in Part IIIA are not contained within the legislation, it is clear even at this stage that those considerations will have to be imported from outside.

37 The Hilmer Committee was of the hopeful view that once a facility had been declared, the legislated access regime would operate to the exclusion of section 46 on matters of access.

Part II

Issues and Perspectives

Chapter 2

Deregulation of Public Utilities: Experience of the Ontario Natural Gas and Electricity Industries

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Introduction: The Move Towards Deregulation

In recent years there has been a worldwide trend towards the deregulation and de-integration of network industries traditionally regarded as natural monopolies. Most first world countries are shifting towards regulatory systems³ organised, to the extent possible, around competition.⁴ It is now widely believed that appropriately structured market forces can operate effectively to address a variety of regulatory concerns as well as yield dramatic improvements in customer welfare. Nonetheless, where market forces are not a sufficient discipline, regulation is required, the nature and extent of which are at the centre of current debates.

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3 The term "regulation" will be used throughout this paper in its generic sense, to cover all methods of regulation, including competition (anti-trust) laws and sector-specific regulatory regimes.

4 This regulatory trend has been extensively discussed in the literature. See, for example, C. D. Foster, *Privatization, Public Ownership and the Regulation of Natural Monopoly*, (Oxford: Blackwell, 1992); W. Kip Viscusi, John M. Vernon, Joseph E. Harrington, Jr., *Economics of Regulation and Anti-Trust* (Toronto: D.C. Heath and Company, 1992); Michael Waterson, *Regulation of the Firm and Natural Monopoly* (Oxford: Basil Blackwell, 1988); Michael A. Crew and Paul R. Kleindorfer, *The Economics of Public Utility Regulation* (Cambridge, Mass.: The MIT Press, 1986); Kenneth E. Train, *Optimal Regulation- The Economic Theory of Natural Monopoly* (Cambridge, Mass.: The MIT press, 1991); Walter J. Primeaux, Jr., *Direct Electric Utility Competition- The Natural Monopoly Myth* (Westport: Praeger, 1986); Mark Armstrong, Simon Cowan and John Vickers, *Regulatory Reform: Economic Analysis and British Experience*, (Cambridge, MA: MIT Press, 1994); John Vickers and George Yarrow, *Privatization — An Economic Analysis* (Cambridge, Mass.: The MIT Press, 1988).

This belief in the enhanced scope for competition has received support from practical experience with economic regulation as well as from the teachings of economics. In particular, in the past twenty five years, traditional theories of regulation have been fundamentally challenged, yielding radically different approaches to utility regulation. The other factor propelling the trend towards deregulation has been technological changes which have undermined economies of scale in the production segments of many network industries, thus allowing competition to evolve.

The current challenge for public policy in the network industries is to deregulate the largely competitive activities of the production segments of the network industries while maintaining adequate regulatory safeguards special regulatory frameworks or general framework competition laws over remaining natural monopoly facilities, such as natural gas pipelines, and electric transmission lines. This challenge spawns a need for a new, more market-oriented regulatory framework. In order for market governance to function effectively, the regulatory system must be designed to address potential market failures and to ensure that competition operates effectively to increase welfare. Issues that required little regulatory attention under the previous market structure have become increasingly important. The focus has shifted from primary concern with prices to the interfaces of competitive forces with the remaining natural monopoly segments where competition alone cannot provide adequate discipline. The new regulatory regime must deal with issues such as access to the natural monopoly “bottleneck” facilities and the degree of industry de-integration (the “separation issue”). For the benefits of competition to materialise under the new industry structure the development of new and innovative regulatory tools is required.

This deregulatory trend is strongly evident in the Canadian network industries. Canada has long initiated a deregulation program in its natural gas and oil industries. Major steps have also been taken towards the deregulation of the telecommunications industry. In addition, the Ontario electricity industry is at a critical juncture in its history — the era of monopoly appears to be over, and fundamental structural and regulatory changes seem imminent. Although vertically integrated structures still dominate the electricity industry, Ontario is currently debating the steps that should be taken towards its deregulation. This chapter will focus on two of the energy network industries, namely the natural gas and electricity industries. While the former industry has already undergone major structural and regulatory changes, and can serve as an example of a deregulated network industry, the latter provides us with insights into the on-going debate regarding its efficient deregulation. Although the technical and structural features of each of these network industries raise unique issues they, nonetheless, share many common features. As we will show, the path of both energy industries towards achieving economic efficiency is similar in many respects.

This chapter argues that in order to increase consumer welfare in Ontario, competition in both industries needs to advance further and regulation, where it is still justified, needs to adapt to new market forces. Clearly, such adaptation must reflect the industries’ unique characteristics in the Ontario setting. For example, given the fact that large-scale nuclear plants currently produce approximately 60% of the province’s

electricity, the privatization of the Ontario electricity production segment must deal with difficult problems regarding market dominance which may affect competition.

While this chapter focuses mainly on the natural gas and electricity industries, the issues of regulatory design, especially in regard to the interface between the natural monopoly and the competitive segments of an industry, are common to a wide range of network industries in developed and developing countries in which deregulation is being implemented.

The chapter emphasises how the inter-play between regulatory policy and industry structure promotes more efficient performance of these industries. While industry structure influences its conduct, and thus the need for regulatory overview, the regulatory framework also influences the industry's structure. Thus, the choice of the regulatory instrument necessitates the creation of a delicate balance between industry structure and regulatory regime. We will argue that in the Ontario context structural changes, whenever possible, should be preferred to regulation. The chapter is organised as follows. The next section identifies the general characteristics and issues common to both the natural gas and electricity industries. Then follows a description of the evolution of regulation in the natural gas industry and its current structure. We analyse the inefficiencies associated with the status quo, and propose future steps that should be taken in order to address these inefficiencies. The following section describes the Ontario electricity industry and presents several models that might be invoked in order to render it more competitive. These two parts demonstrate how further deregulation can enhance consumer welfare. The final section summarises and concludes the chapter.

Ontario's Electricity and Natural Gas Industries — a General Overview

In creating an effective regulatory regime for the natural gas and electricity industries, it is critical to understand how the physical flow of gas or electrons can be integrated with financial transactions. Accordingly, understanding an industry's basic conditions is vital to determining the potential for deregulation as well as its effectiveness. Such basic conditions include both "objective" characteristics such as underlying technology, as well as "historical" factors, such as past policy actions and managerial decisions which have shaped the structure and conduct of the industry in the past. This section focuses on the "objective" characteristics of the two industries, while the following sections explore the "historical" factors. While a broad-brush survey of the "objective" characteristics of the two industries runs the risk of over-simplification, such survey is, as noted above, necessary for our analysis. The basic models for deregulation will also be presented. We start by presenting the motivations for deregulation.

Motivations for the Deregulation of Ontario's Electricity and Natural Gas Industries

The network owners' ability to control access to transportation resulted, traditionally, in a reliance on bundled service. However, traditional regulation under the

natural monopoly model entailed various inefficiencies, including lack of effective constraints on prices and costs. Deregulation and de-integration of the network industries have been introduced or proposed to remedy some of these economic inefficiencies and to enhance social welfare. However, in the Ontario natural gas and electricity industries this is not the only motivation for deregulation.

An additional motivation for the deregulation of the natural gas and electricity industries involves their competitive viability in the North American energy markets. If the Ontario energy industries are to play a role in the North American energy market, then it is crucial that they be as efficiently organised as their counterparts across the Ontario border, whether in other Canadian provinces or in the U.S. The ability of the Ontario energy industries to be competitive in an open North American market depends, *inter alia*, on their structure and regulatory regime.

A further factor involves the importance of parallel deregulation of both energy industries for achieving economic efficiency. Since the Ontario natural gas and oil industries have been deregulated, it is vital that the electricity industry be deregulated as well. The reason is twofold. First, electricity and gas are substitutes or potential substitutes in many end uses. Where natural gas and electricity compete for end-users of energy ("competition to the meter"), price signals which do not reflect the true relative cost of each kind of energy lead to allocative inefficiency.⁵ It would be inefficient in that consumers in paying prices that exceed marginal cost may, over the long-run, make inefficient and wasteful substitution decisions in favour of other energy sources. These substitution effects can be substantial over time (and very costly), as witness waves in the recent past of conversion of oil to gas or electricity, especially in the home-heating market.⁶ Vertical de-integration of the Ontario natural gas industry, and a much enhanced role for competition, can take a large part of the credit for the enhanced performance of the natural gas industry in recent years, which has now become the major source of threat to the Ontario electricity industry. Wasteful consumer bypasses are minimised by ensuring that alternative energy sources are priced as closely as possible to their real resource cost, as recent deregulatory policy moves towards competitive pricing appear designed to promote. If every energy source is priced so as to reflect the real resource cost of supplying it, real resource savings will be realised by industrial fuel end-users in producing their output with lower-priced inputs, and society will be better off to the extent that productive efficiency has been enhanced and resources have been released for deployment elsewhere in the economy. Avoiding economic bypass also limits the scope for stranding socially valuable assets.

Second, if convergence and inter-industry competition is what the future holds for

5 For example, the high price of electricity and lower price of natural gas have caused a growing number of energy switchable customers to switch from electricity to natural gas.

6 Such uneconomic bypass may also result from regulatory intervention, for example, where regulators enforce high access charges as a source of revenues for cross-subsidies to residential consumers. See, for example, William J. Baumol and J. Gregory Sidak, *Towards Competition in Local Telephony* (Washington, D.C.: The MIT Press and the American Enterprise Institute for Public Policy Research, 1994).

the natural gas and electricity industries,⁷ their regulatory policies should also reflect convergence.⁸ For example, large gas producers are likely to enter the gas-electricity manufacturing function and operate merchant plants.⁹ In addition, gas turbine plants are likely to improve efficiencies by reducing costs in electricity generation. A later stage of convergence is related to the development of consumer choice driving the development of new technologies for end use applications. Fuel-operated appliances could be developed into more cross-overs. Gas technologies and electrotechnologies would then compete for customer loyalty and purchasing appeal. It is predicted that in time the gas and electricity business sectors will have more closely entwined roles in future supply and the boundaries of the two industries will blur into one energy sector. For each of these stages to realise economic efficiencies it is crucial that the prices of both electricity and natural gas yield accurate signals to the market and that the structure of the industries as well as their regulatory regime allow for such convergence.

Basic Conditions

Although the natural gas and electricity industries differ in some of their technical features, they are, nonetheless, similar in many respects. As a general matter, both industries consist of the same market segments: production/generation, transmission, and distribution. In both industries production is actually or potentially competitive while the downstream transmission and distribution facilities, on the other hand, will retain their natural monopoly characteristics. The source of such monopoly power over the network is generally assumed to be a result of subadditivity in the technology underlying the network, which implies that a single supplier is able to operate more efficiently than several suppliers. These transportation segments are also bottleneck facilities, i.e. their access is vital to the linkage of otherwise isolated buyers and sellers. The flow of both natural gas and electricity in the transportation facilities necessitates coordinated operations and is managed through a sophisticated system with operating centres that dispatch the generation/storage to match varying demands. Coordination is required to manage the dispatch of generation and transmission facilities for the purpose of instantaneously matching supply and demand and ensuring the integrity of the inter-

7 Ontario Hydro, *Finding New Paths to the Customer* (Ontario Hydro Management's Submission to the Advisory Committee on Competition in Ontario's Electricity System, January 25, 1996) (hereinafter: "Ontario Hydro's Report"), p. 23-5.

8 This is not to say that mergers between electricity and natural gas companies will be efficient where they eliminate competition between the two industries and thus reduce the incentive of the combination company to minimise rates. See, for example, Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions* (New York: John Wiley and Sons, Inc., 2nd ed., 1983) p. 276. Some empirical studies find no evidence that integrated gas-electric utilities achieve lower unit costs. See Vernon L. Smith, "Regulatory Reform in the Electric Power Industry", (1996) 1 *Regulation*, 33 at p. 34.

9 Competitive gas companies such as Westcoast and TransCanada Pipelines are already present in electricity generation in Ontario and in the U.S. market. Also, since natural gas can add value to an energy utility because it can be stored to fuel electricity generators to meet peak loads, Hydro Quebec has entered into strategic alliances with several gas distributors. Ontario Hydro's Report, *supra*, note 7, pp. 4 and 25.

connected system. Also, electricity and natural gas are both homogenous commodities; electricity or gas injected at any point in the grid is indistinguishable from any other. In both industries, many if not most end-users take energy as they need it.¹⁰

As to the dissimilarities between the two industries, electricity unlike natural gas, cannot be economically restored. In the electricity industry demand variability can be met only by load variability from extra production, whereas in the natural gas industry gas storage can be used to meet variability in demand. Consequently, reliability of supply is a more demanding task in the electricity industry. A second difference between the two industries involves the location of the source of commodity supply. Whereas natural gas is produced mainly in Alberta and is transmitted from one main supply pool, electricity in Ontario is produced in several different locations. Consequently, competition in the production segment of natural gas does not change the technical direction of the flow of natural gas in the transportation system, while flows of electricity on the transportation system might change. Moreover, electricity cannot practically be directed or switched like other commodities, such as natural gas.

The essential characteristic distinguishing network industries from other competitive markets derives from the nature of the underlying technology of the transmission and distribution networks. As indicated above, production is potentially competitive. However, it has traditionally been “tied” or “bundled” with the network, which is not competitive. The fact that transmission and distribution “bottleneck” facilities operate on a monopoly basis not only creates economic incentives to charge monopoly prices but also threatens the competitiveness of the production markets. To the extent that monopoly over the networks continues to exist and is not eroded or bypassed by the emergence of new technologies, the viability of competition in production is hostage to the need to connect to the network.

The essential threat to the sustainability of competition in the production segment is created by the combination of a monopoly in the transmission and distribution segments and a complementarity between all the segments of the industry resulting in *upstream market foreclosure*, i.e. commercial practices that reduce a buyer’s access to a supplier. Under the bundled industry structure the natural monopolist has economic incentives to exploit opportunities resulting from its market power, in particular to use its power and profits from the natural monopoly segments of the industry to extend this monopoly power to, and exploit it in, the competitive segments of the industry. The monopolist might impede competition in the competitive segment either by *cross-subsidising* its own facilities in the competitive segments, or by conferring on these facilities *interconnection benefits* over potential rivals. Since the natural monopoly segments are “bottleneck” facilities, where the control over the natural monopoly segment is in the hands of one of the competitors, it has the ability to restrict access of potential rivals in the competitive segments of the industry by using either pricing tactics or non-price

10 See, for example, Alfred E. Kahn, *supra* note 8; Thomas P. Lyon and Steven C. Hackett, “Bottlenecks and Governance Structures: Open Access and Long-Term Contracting in Natural Gas”, (1993) 9 *Journal of Law, Economics, and Organization* 380.

forms of discrimination. Such foreclosure creates allocative and productive inefficiencies.¹¹

In both regulated and unregulated industries, the economic incentives for foreclosure involve driving out a competitor, with a view to recouping any lost revenues resulting from such foreclosure by charging higher prices after the rival's exit from the market (predatory conduct in its broad sense). However, predatory pricing is a contested notion in economics. Some economists argue that it is almost never profitable, and a predator can rarely recoup his losses resulting from pricing below cost. However, even these economists agree that predation can be profitable if the monopolist is prevented by regulation from extracting full monopoly profits from its downstream facilities. In that case, it can extract supra-competitive profits by cross-subsidising its competitive facilities and driving its rivals out of the market.¹² If the bottleneck is regulated, backwards integration may allow for cost inflation upstream and the collection of rents through an unregulated upstream affiliate. If a vertically integrated monopolist's prices (but not its quantities) are regulated, it might restrict output in order to increase profits in upstream markets.

Accordingly, a "non-discrimination" principle governing access to the networks is vital to the preservation of competitive parity. This non discrimination requirement extends beyond price and includes other factors such as quality and service flexibility. It is also vital that no cross-subsidisation between the monopoly and competitive segments be allowed. However, given that the contestability that free entry provides will not be sufficient to regulate the natural monopoly, a regulatory solution must be provided. Generation competition is unlikely to survive under an open competition regime without some form of regulatory intervention sufficient to restrict or dissuade network monopolists from foreclosing the upstream market.

Moreover, even where the network operator does not compete in the upstream market, pure private ordering solutions to the issue of interconnection may fail to achieve efficient results. Given significant market power over the networks and the complementarity between the market segments, voluntary solutions will be ineffective, or, at best, problematic. Regulation is necessary to prevent the monopolist from using its market power to raise access prices above competitive levels. It should replicate as closely as possible competitive levels of service and prices, provided that doing so is consistent with the economic viability of the firm.¹³

Another essential feature of network industries created by the complementarity between production and transportation is *vertical economies of scope*. Vertical economies are created when it is cheaper to coordinate upstream and downstream production in a single firm than through arms-length contracts and markets, due to high

11 See, for example, Kip Viscusi et al., *supra* note 4, p. 233; Jean Tirole, *The Theory of Industrial Organization*, (Cambridge, MA: MIT Press, 1990), section 4.6.2.

12 For an overview see Viscusi et al, *supra*, note 4, chapter 8, p. 220.

13 Baumol and Sidak, *supra* note 6, p. 11.

transaction costs.¹⁴ Such economies are traded off against the benefits resulting from competition when the industry is de-integrated.

This trade-off between economies of vertical integration and the benefits of competition, has long been recognised in the economic literature on the theory of the firm. Ronald Coase's pioneering analysis focused on the transaction costs inherent in organising an activity through either a market or the firm.¹⁵ Where a transaction is organised through the market, information on available prices and quality must be obtained. As well, contracts must be negotiated, monitored, and enforced for each desired purchase. Each of these steps is costly. On the other hand, internalising production is also costly because information on the value and scarcity of inputs — which would otherwise be provided by the market — is replaced by less accurate internal proxies.¹⁶ Also internalising production may not exploit the comparative advantage possessed by other firms in some activities.

Subsequent theorists have stressed the relative costs of different forms of opportunism under contracting out and internal production regimes.¹⁷ In the case of contracting out, there are incentives for the outside contractor to engage in pecuniary forms of opportunism by chiselling on features of the contract that are difficult to specify, monitor or enforce. On the other hand, where production is moved in-house using contracted employees, there are incentives to engage in nonpecuniary forms of opportunism, such as consumption or slacking on the job, given that remuneration is typically not closely tied to output. All arrangements for the supply of inputs entail contractual arrangements of one form or another, although the incentive structures differ. Indeed, it is now common to view a firm as simply a "nexus of contracts" of various kinds with various stakeholders.¹⁸

This literature suggests that market provision of needed inputs may well be more efficient when needs can be easily specified and are relatively constant; when compliance with contractual terms is easily monitored; when negotiation of contracts is relatively inexpensive; and when there are highly differentiated inputs with few economies of scale and scope but large returns to specialisation. On the other hand,

14 For example, a study conducted by Kaserman and Mayo estimates that arms-length contracting between electricity generators and distributors raises costs by 11.95 percent relative to vertically integrated production. See David L. Kaserman and John W. Mayo, "The Measurement of Vertical Economies and the Efficient Structure of the Electricity Utility Business", (1991) 39 *Journal of Industrial Economics* 483, 499.

15 Ronald Coase, "The Nature of the Firm", (1937) 4 *Economica* 386.

16 See, for example, Oliver Williamson, "Hierarchical Control and Optimal Firm Size" (1964) 75 *Journal of Political Economy* 123.

17 See, for example, Armen Alchian and Harold Demsetz, "Production, Information Cost, and Economic Organization", (1972) 62 *American Economic Review* 777 (1972): 777; John McManus, "The Costs of Alternative Economic Organization", (1975) 8 *Canadian Journal of Economics* 334; Oliver Williamson, *Markets and Hierarchies* (New York: Pres Press, 1975); idem, "Transaction Cost Economics: The Governance of Contractual Relations", (1979) 22 *Journal of Law and Economics* 3.

18 See Frank Easterbrook and Daniel Fischel, *Economic Structure*; "Symposium, Contractual Freedom in Contract Law", (1988/89) *Columbia Law Review* 1395.

production with the firm may be more efficient when needs are difficult to specify or are in a state of continuous evolution; when compliance with contractual terms becomes more difficult to monitor and hence there is an increased risk of chiselling by contractors; and when contract renegotiations become more complicated and expensive due to the advantages of incumbency.¹⁹

The relevance of the theory of the firm for the choice of organisational arrangements for the natural gas and electricity industries is obvious. Economies which exist in and between the generation, transmission and distribution segments of the industries, which rest upon the existence of technological interdependencies between the activities of these segments have provided the traditional economic rationale for vertical coordination by ownership. The breaking-up of the industry into unbundled segments, entails vertical coordination by contract rather than ownership and new forms of transaction costs. The vertical economies that may be lost by "contracting out" pertain to long-run investment decisions as well as short-run supply management. The first involve decisions concerning the construction and location of new generating power stations and (to a lesser extent) gas production facilities. Such decisions are necessarily affected by the likely evolution of the transmission and distribution systems, and vice versa. Of course, such coordination may be feasible via market transactions between independent companies. Nevertheless, some studies suggest that the possible benefits of vertical integration by ownership cannot be entirely discounted.²⁰ Short-run vertical economies of coordination pertain to decisions necessary in order to match supply and demand on an ongoing basis. An electricity equilibrium must be maintained at all times. Also, unlike most markets, a company generating electricity cannot direct its output to a designated point of demand. Hence, the performances of the various generating firms are, in a very direct and obvious way, interdependent.²¹ Such vertical economies are particularly important in the electricity industry because electricity cannot be stored.²² In order to maintain reliability of supply and assure deliverability on a consistent basis, the system should match production/transmission from storage to consumption and should maintain system-wide pressure. Lyon and Hackett further note that "[o]ne important vertical economy results from the internalisation of network externalities. Such externalities occur when the actions of individual buyers and sellers impose external congestion or reliability costs on others."²³ The high standard of reliability

19 See Michael J. Trebilcock and J.R.S. Prichard, "Crown Corporations in Canada: The Calculus of Instrument Choice", in J.R.S. Prichard, ed., *Crown Corporations in Canada* (Toronto: Butterworth, 1983). For an overview of the theory of the firm see, for example, Michael J. Trebilcock, *The Prospects for Reinventing Government* (Toronto, Ont.: C.D. Howe Institute, 1994), p. 12-14.

20 Vickers and Yarrow, *supra* note 4, p. 308.

21 *Ibid.*, p. 291.

22 Lyon and Hackett, *supra* note 10, p. 381.

23 Network externalities occur when the actions of individual buyers and sellers impose external congestion or reliability costs on others. For example, if markets for wellhead gas supply and transportation are separated, individual wellhead producers lack incentives to maintain the system-wide pressure required to provide reliable service to downstream customers. Similarly, a franchise has an incentive to use substandard inputs when the reputational costs are shared throughout the chain, *ibid.* p. 382-3.

required in the electricity industry and in the residential market for natural gas magnifies these vertical economies. Reliability is especially important since with most consumers, supply should meet demand on an instantaneous basis. Consumers use as much electricity or gas as they need without giving advance warning. Consequently, when the network provides bundled service, its rights to control operation of the system are more complete than under decentralised contracting in an unbundled environment.²⁴

In addition, breaking-up of a national power network can potentially reduce *horizontal economies of scale* which exist in the generation segment, which, according to a study conducted by Joskow and Schmalensee, include the following:²⁵

- (i) increased reliability of supply via the consolidation of uncertain loads and uncertain plant performance characteristics;
- (ii) efficient production achieved by coordinating the operations of plants with different marginal costs of supply;
- (iii) lower total capacity requirements resulting from the aggregation of demand with differing load characteristics;
- (iv) economies from the coordination of maintenance schedules;
- (v) economies in responding to emergencies such as plant failures.

In practice, it has proved difficult to handle these network dependencies in an efficient manner through the use of a fully decentralised set of contractual relationships. Thus, there is a need for a centralised “planning authority” that makes allocative decisions on a command basis. As Vickers and Yarrow point out:

The technology of electricity supply creates a policy dilemma — the benefits of coordination among firms have to be balanced against the benefits of competition — and the question of how this trade-off should be resolved is one of the most important issues in electricity [and other network] economics.²⁶

Basic Models for Deregulation

Assuming that a judgment is justified that the enhancement of consumer welfare from increased competition exceeds any economies associated with vertical integration by ownership, problems arising from the “bottleneck” problem of the network industries need to be addressed. Several general approaches are available. First, the regulator can seek to increase the competitiveness of the networks by *stimulating entry*

24 The argument that vertical integration entails economic benefits to society was raised in the 1984 antitrust action by the U.S. Department of Justice against AT&T regarding the vertical integration between Western Electric and the Bell System operating companies. Western Electric manufactured most of the telephone switching equipment and trunks used by the operating companies. It was argued that since they were all part of one company (AT&T) Western could coordinate orders from the operating companies and plan its production scheduling so as to minimise cost. Some of these planning economies may be lost because of uncertainties resulting from the divestiture of Western from other segments of AT&T. See, for example, Viscusi, *supra* note 4, at p. 222.

25 P.L. Joskow and R.M. Schmalensee, *Markets for Power: An Analysis of Electric Utility Deregulation* (Cambridge, MA: MIT Press, 1983).

26 Vickers and Yarrow, *supra* note 4, p. 291.

or by fostering bypass technologies as has occurred in the telecommunications industry (e.g. cellular, PCS or cable telephone). However, in the natural gas and electricity industries the technical features of the networks still make competition in the network segments infeasible. These networks are conventionally and traditionally characterised by significant subadditivity and economies of scale, so that competition is unsustainable.

The second general solution is for regulators to *mandate some form of managed interconnection regime*. Under such regime, the regulator would specify terms under which competitors could gain access to the network and through it to the market. The main difficulty with this approach is determining the appropriate terms of interconnection. This is especially troublesome due to the absence of any competitive bench-mark price. The regulator must therefore construct an interconnection price based primarily on economic theory.

The third general solution is *structural separation*, which was a component of regulatory reform of network industries undertaken in many countries, including the U.S. (telecommunications) and the U.K. (in electricity but not natural gas).²⁷ Under this approach, network operators are required to establish some form of segregation between industry segments. Separation addresses the market foreclosure problem by prohibiting the monopolist from undertaking activities in the competitive segments. Separation can potentially take many forms, which range from accounting separation to complete divestiture. Incomplete division solutions generally seem ineffective, since this separation fails to eliminate the underlying incentives for network operators to benefit the entire organization at the expense of competitors. On the other hand, complete divestiture risks sacrificing benefits, such as vertical economies of scope, which might result from integration of market segments within one firm. As Joskow observes:

Decisions about the vertical or horizontal scope of regulated firms are affected both by traditional transaction cost considerations involving the comparative analysis of the properties of alternative organisational arrangements to govern trade *and* the effects of alternative organisational structures on the ability of regulators to ensure that the firms subject to their jurisdiction are in fact supplying services consistent with regulatory objectives.²⁸

Kahn emphasises the major problem inherent in policies directed to maintaining competition as follows:

Effective competition calls for a balancing-off of considerations of efficiency on the one hand and purity of rivalry on the other. In the presence of economies of integration (as of scale), the

27 A recent decision of the British Secretary of State rejected a recommendation by the British Monopolies and Mergers Commission to approve the consolidation and vertical integration of the electricity industry through two large electricity mergers, despite strong opposition from the industry's regulator. Had these mergers been approved, they would have allowed Britain's two major generating companies to take-over Britain's second and third largest regional electricity companies, and would have constituted a step back from one of the key features of the British privatization, namely separation of electricity generation from distribution and supply. See *The Economist*, April 13th 1996, p. 47.

28 Paul L. Joskow, "The Role of Transaction Cost Economics in Antitrust and Public Utility Regulatory Policies", (1991) 7 *Journal of Law, Economics, and Organization*, 53 at 67.

balancing has to be between permitting firms large and integrated enough to enjoy these economies and firms numerous enough and with sufficient opportunity for effective rivalry. In the presence of potential economies of interfirm coordination, the balancing is one of cooperation on the one hand and independence of action on the other.²⁹

All three solutions noted above may be used as complements rather than substitutes. An interconnection regime is necessary even under a completely unbundled industry structure; fostering of bypass technologies can be undertaken in parallel to the other two solutions, i.e. a mandated interconnection regime or structural separation.

In the deregulation of the natural gas and electricity industries, we generally prefer structural separation, since, as noted above, stimulation of bypass technologies is unlikely to increase efficiency in most cases. Nonetheless, structural changes should be complemented by regulation. To the extent that competitive structures can be promoted in various segments of the industry, the case for extensive regulation, or in some cases any regulation at all, is obviated. Canada's competition (or anti-trust) laws, administered by the Federal Competition Policy Bureau and enforced primarily by the Competition Tribunal, should complement competition in the competitive segments by discouraging collusive, exclusionary or predatory practices, discouraging anti-competitive mergers, and preventing abuse of dominant position. The major role of regulation should be to complement the role of competition by ensuring a level playing field, particularly where the competitive and the natural monopoly elements of the industry interface. With respect to those elements of the industry where competition is both unlikely and inefficient, regulation serves the function of a substitute for competition by attempting to ensure that the performance of the industry in terms of prices, costs, output, reliability, and innovation does not deviate substantially from appropriate competitive performance benchmarks. Thus, the choice of the regulatory instrument necessitates the creation of a delicate balance between industry structure and the role of regulation.

Nonetheless, it is important that economies in vertical coordination should not be unnecessarily endangered. Rather, careful attention should be given to economies of scale and coordination between what are technologically intimately interrelated segments of the industry that could be forfeited without such attention. Here, we emphasise the importance of devising institutional mechanisms that will ensure effective coordination of the industry's complementary segments if these currently integrated segments are unbundled from one another.

As the next Part will show, in the Ontario natural gas industry the current regulatory regime has adopted structural separation between production and transmission while adopting a managed interconnection regime between the retail and distribution functions. We will argue that the current industry structure perpetuates significant economic inefficiencies, and that further structural changes are needed in order to maximise social welfare.

29 Kahn, *supra* note 10, vol. II, p. 255.

Ontario's Natural Gas Industry

The Current Structure of Ontario's Natural Gas Industry

Since the mid-1980s the natural gas industry in Canada has moved strongly towards enhanced competition in the wellhead market and greater access to pipeline transportation.³⁰ For a decade prior to deregulation, a government-administered Alberta border gas price was maintained, which provincial utilities commissions took as a given in determining natural gas rates for all end users. Virtually every stage of the industry was subject to extensive federal or provincial oversight. In 1985, the first major deregulation step was initiated. In that year the gas producing provinces and the federal government entered into two agreements which deregulated upstream gas prices ("the agreements").³¹ One of the objectives of the agreements was to enable new market participants to enter the marketplace and to provide end-users and gas producers with greater flexibility and new alternatives under which to buy and sell gas. In response to these agreements, the National Energy Board ("NEB"), a federal regulatory agency, implemented several measures designed to assure new market participants, including end-users, producers, and marketers, non-discriminatory access to federally regulated pipelines. For example, the NEB amended inter-provincial pipeline tariffs to ensure non-discriminatory access to firm and interruptible pipeline capacity and unbundled transportation and gas charges. These changes, both structural and regulatory, created a dramatic increase in the demand for "unbundled" services (i.e. parties elected to contract separately for gas supply and transportation services). The changes also encouraged the entry into retailing of natural gas of independent agents, brokers, and marketers ("ABM's") which compete with the Local Distribution Companies ("LDCs").³² They also placed greater responsibility on the LDCs for the reliability of gas supply to their customers.

30 For the history of the Canadian natural gas industry prior to deregulation, see Energy, Mines and Resources Ministry Canada, *Energy in Canada — A Background Paper* (Nov. 1987).

31 In the Western Accord of March 28 1985, the governments of Canada, Alberta, British Columbia and Saskatchewan agreed to modify the then-existing regime of energy pricing and taxation. The four governments adopted the view that market-sensitive pricing for both oil and gas, and profit-sensitive taxation, would stimulate investment and job creation in the energy sector while promoting energy security for Canadians. The Western Accord was followed by the October 31, 1985 Agreement on Natural Gas Markets and Prices between the same parties to the Western Accord (the so-called "Halloween Agreement"). This agreement was intended to promote an orderly transition to market sensitive pricing, creating an environment in which gas prices and other terms of gas transactions could be freely negotiated between buyers and sellers. See Senate of Canada, *Proceedings of the Standing Senate Committee on Energy and Natural Resources, Twelfth Report of the Committee* (September 7, 1988) (hereinafter: "Report of Senate Committee"), p. 19–20. See also Industrial Gas Users Association, "Ten Year Market Review- Where We Are" (December 18, 1995) (hereinafter: "IGUA Report").

32 National Energy Board, *Natural Gas Management Assessment-Long-Term Canadian Natural Gas Contracts* (Alberta, CA: National Energy Board, August 1992) (hereinafter: "NEB's Long-Term Contract Assessment").

The Canadian natural gas industry is made up of thousands of natural gas wells, hundreds of gas processing plants and an extensive network of gas gathering, transmission and distribution systems. The "upstream" production segment of the industry is located primarily in Western Canada, mostly in Alberta.³³ Gas is produced by independent companies, subject to the regulatory authority of the NEB regarding the environmental and natural resources aspects of its production (as distinguished from its price).

The sale and transportation of natural gas from the wellhead to the point of use ("burner tip") are typically arranged through a series of contractual arrangements between buyers and sellers, often including agents and corporate affiliates. Natural gas producers sell gas to downstream parties who may either be LDCs or large volume marketers like TransCanada Gas Service and Direct Energy (large agents/brokers/marketers or large ABMs). While LDCs buy directly some of the gas they need to service their end-user requirements, the supply chain starting from the large ABMs may be more complex. Large ABMs service one or all of the following constituencies: 1) directly supply large industrial and commercial end-users; 2) supply LDCs; or 3) supply small brokers who aggregate customers in the residential market.³⁴ The role of the large ABMs as suppliers to other downstream intermediaries is substantial. For example, approximately 50%–60% of the gas requirements of the LDCs is now sourced from the large ABMs. These large ABMs, therefore, not only act as brokers for end-users, but also as a large supply bank for other downstream intermediaries in Ontario. Accordingly, they perform an important twofold role:

- (i) coordination between natural gas producers who may not have the administrative and marketing capacity and also the production scale to maintain ongoing relationships with buyers, on the one hand, and buyers of gas for whom it is uneconomical to search among, and transact with, a large set of natural gas producers, on the other. Accordingly, deregulation has enabled new ABMs to enter the market and hence increased competition;
- (ii) provide hedges against unforeseen supply shocks.

However, the buy/sell mechanism that has evolved is not without its costs. It is an administratively cumbersome process. Under this mechanism, an ABM purchases the gas directly from a gas producer, usually at the inlet to the TransCanada pipeline in western Canada. The ABM may resell the gas to an LDC either at the same point (i.e., a western buy/sell), or at the LDC's city gate in Ontario (i.e., an Ontario buy/sell). This resale is made at a regulated price, dependent upon the weighted average cost of gas ("WACOG"). The LDC then sells the gas to the customer at the WACOG price plus a

33 Of the estimated 1,876 billion cubic meters of natural gas remaining in Canada by the end of 1993, 1541 billion cubic meters were located in Alberta. Much smaller quantities of natural gas are located in British Columbia (241 billion cubic meters), Saskatchewan (80 billion cubic meters), and Northwest Territories and South Yukon Territory (5 billion cubic meters). Almost all of the natural gas consumed in Canada (98%) is produced in Canada. In 1994 Canadian firms, located mainly in Alberta, exported 70.8 billion cubic meters to the U.S. NEB, *1994 Annual Report, Thirty-Fifth Year* (Alberta, CA: National Energy Board, 1994) (hereinafter: "NEB's 1994 Annual Report").

34 Report of Senate Committee, *supra* note 31, pp. 8–10.

regulated charge for fixed charges and transportation. In other words, under the current regulatory regime the LDCs are required to sell gas to their customers at a regulated price. Also, if they purchase gas from an ABM they are required to pay for the gas at a regulated price, based on the WACOG. If the ABM has been successful in buying low-cost gas from a gas producer, it passes on to the consumer an agreed upon portion of the difference between the WACOG and the purchase price of the gas.³⁵

The process of transporting gas to the end user is less competitive. It constitutes a multistep process of gathering, transmission and distribution. The first step entails transporting the gas to a transmission pipeline through collecting or gathering pipelines. Gas is transported from the wellhead in Alberta, via a processing plant, to an aggregation point on the Alberta border by such pipelines. At this point, the gas is bought from the supplier and transported to Ontario via the high-pressure TransCanada Pipeline, operated by an investor-owned company. This capital-intensive bottleneck facility has natural monopoly features and as such has little head-to-head competition with other companies (although there is indirect competition from other sources of energy, such as oil and electricity). Consequently, the TransCanada pipeline is regulated by the NEB.

The NEB's regulatory powers under the *NEB Act* include, *inter alia*, the granting of authorisation for the construction and operation of interprovincial and international gas pipelines. NEB approval is required before any interprovincial or international pipeline can be built or operated. Such approval is given in the form of a Certificate of Public Convenience and Necessity, or, for pipelines not exceeding 40 kilometers, including system upgrades and additions, by an Order. Certificates require the approval of the Governor in Council. In granting a certificate or an Order authorising the construction of pipeline facilities, the NEB must be satisfied that the requested facilities are, and will continue to be, required to satisfy public convenience and necessity. Upon granting approval, the NEB monitors TransCanada's pipeline construction and operation to ensure compliance with safety regulations and any specific conditions set by it.

In addition, the NEB is empowered to financially regulate the pipelines. The goal of such regulation is to ensure that tolls and tariffs are just and reasonable and that pipeline services are provided without unjust discrimination and in a cost-efficient manner approaching the costs that would prevail in a competitive market. The financial and operating performances of the major gas pipeline companies are closely monitored by the NEB. Tolls of other pipeline companies are generally reviewed upon receipt of a complaint.³⁶ Until February 1996 transmission tolls were determined so as to recover operational costs fully on a straight fixed/variable tariff with the fixed toll covering approximately 98% of the total costs and with a small commodity toll to cover compression and some other incidental costs. Given the seasonality of consumption and the maximum capacity of the pipeline, the transmission fixed toll made it expensive to meet seasonal demand through fluctuating throughput. This is because the fixed capacity demand charges have to be met even in the summer periods, when poor loads

35 IGUA Report, *supra* note 31, p. 4-5.

36 See NEB's 1994 Annual Report, *supra* note 33, p. 3-4.

mean that little gas actually needs to be shipped. The result has been a dramatic increase in the development of downstream storage services. Consequently, seasonal and peak demand are handled, to some extent, by downstream gas-storage facilities located in Ontario.³⁷ In February 1996, the NEB approved a four-year negotiated settlement between TransCanada and its stakeholders. Under the settlement, TransCanada's costs are split into two parts: an incentive cost envelope and a flow-through cost envelope. The net effect of the mechanisms is an enhancement to the traditional cost-of-service approach. TransCanada will have incentives to achieve cost efficiencies. However, with annual rebasing of the incentive cost envelope, the risk and the reward are limited.³⁸

The LDCs hold long-term transportation contracts for most of the capacity on the TransCanada pipeline required to transport gas to their franchisees. The gas contracted under short-term arrangements by commercial and industrial buyers is transported on TransCanada either under direct agreements between TransCanada and the buyers or their suppliers or indirectly through the LDCs' firm capacity under *buy/sell arrangements*.³⁹ In buy/sell arrangements the shipper holding capacity rights on an interstate pipeline or over produced gas transfers those rights to another party through a purchase and resale transaction.

The last link in the transportation chain—distribution of the natural gas to customers in Ontario—is performed by investor-owned LDCs (Centra Gas Ontario, Union Gas Limited and Consumers' Gas Company), which take delivery in their franchise areas and distribute the gas to the burner tip. These LDCs also interconnect with some U.S. pipelines and also to storage facilities located in southwestern Ontario. These legally authorised local monopolies exhibit features of natural monopoly and bottleneck facilities for the distribution of natural gas. Consequently, they are regulated by the Ontario Energy Board ("OEB") which, *inter alia*, regulates their distribution charges and allows them to earn a specified rate of return on an approved rate base.

In addition to their distribution function, the LDCs act as merchant brokers of gas. In the latter market the LDCs compete with numerous independent ABMs which operate in the retail market for gas. Ontario customers may, therefore, purchase gas from an LDC or from an independent ABM. If customers purchase gas from an LDC, both the distribution function and the gas commodity are supplied by the LDC. Such customers are termed "system gas customers". The LDC charges system gas customers a single price ("bundled rate") which accounts for both the gas as well as the transportation cost. The LDCs' gas cost is calculated, according to an OEB directive, as the WACOG. Alternatively, customers may purchase gas from independent ABMs. Such purchases, which are termed "direct purchases", comprise two main purchase mechanisms:

37 Laurence Booth and Paul Halpern, "Regulation of Transmission and Distribution Activities of Ontario Hydro" in Ronald J. Daniels (ed.), *Ontario Hydro at the Millennium: Has Monopoly's Moment Passed?* (Montreal and Kingston: McGill-Queen's University Press, 1996), at 72.

38 Kenneth W. Vollman, "Toward Incentive Regulation of Canadian Pipelines" (discussion paper prepared for the fifth Annual DOE-NARVC Natural Gas Conference, St. Louis, Missouri, April 28–May 1, 1996).

39 Report of Senate Committee, *supra*, note 31, p. 12.

- (i) **T-Service:** Under this mechanism, the ABM purchases transportation services from the LDC. These include distribution service on the LDC's network to the end-user. Under the unbundled option, gas is transported by TransCanada pipeline to a point in Ontario where the LDC's network begins and the LDC delivers the gas through its network to the customer's location. Such delivery service can be bundled with other services. These may include load balancing facilities or transportation services on the TransCanada pipeline through the LDC's contracted capacity on such pipeline.
- (ii) **Buy/Sell Arrangements** (explained above).

However, to date only large customers have benefited from the simpler T-service mechanism. Administrative barriers, such as LDC billing procedures, have prevented ABMs from offering T-service arrangements to smaller consumers. Given the fact that an LDC has a monopoly right over metering and billing, residential consumers who buy gas from ABMs using only buy/sell arrangements are billed for both gas and transportation by the LDC, although they may receive a rebate from an ABM. As noted above, the price of gas which appears on the bill sent to the consumer by the LDC is based on the regulated price of gas, (the WACOG).

The natural gas consumer market is comprised of an industrial segment, a commercial segment and a residential, or a core, segment. The residential and the industrial segments are by volume almost equal in size. Direct purchases through the ABMs (of both types of arrangements described above), account for about 67% of total gas purchases in Ontario. However, while direct purchases through ABMs are a high percentage in the industrial sector, the LDCs have retained a strong presence in the residential sector. The LDCs sell system gas to almost 75% of the two million residential consumers in Ontario. In terms of gas consumption volume, approximately 70% of the residential consumption is supplied by LDCs within their respective franchise areas.⁴⁰

Deregulation of the natural gas industry has resulted not only in the introduction of new market players but also in a change in the transactional relationships between such players. Prior to deregulation practically all western Canadian natural gas was sold to the Trans-Canada pipeline under long-term contracts. These contracts were the foundation for much of the financing required to build the Canadian natural gas industry. Deregulation increased tremendously the proportion of the market served by short-term and spot sales of natural gas. This trend is especially pronounced in markets where buyers and sellers have access to existing pipeline capacity. Most long-term contracts negotiated since deregulation exhibit increased flexibility for both buyer and seller, enabling the parties to respond more readily to changing demand and supply conditions. Many long-term contracts today provide the contracting parties with much the same flexibility as short-term contracts while still giving the seller a secure long-term outlet for its gas supply and providing the buyer with a reliable and stable source of gas. Flexible contract pricing terms track competitive market conditions, reducing the

40 *Natural Gas Trends 1994*, Market Research Sub-Committee, Ontario Natural Gas Association, September 1995.

risk for both parties of contract prices that are "off-market" for extended periods. Other changes include reduced contract volumes as smaller end-users and smaller producers/marketers enter the market and as larger buyers and sellers diversify their portfolios and market outlets.⁴¹

The deregulation of the Ontario natural gas industry has experienced some difficulties in its early stages. As a Canadian Senate committee report indicates, the first steps toward natural gas deregulation were not intended to abrogate long-term contracts which had been signed by producers and the pipelines. Rather, the new policy was meant to broaden the scope of market transactions, which could be used by those buyers whose needs were in excess of existing contracted supplies, or those who might not have been party to a long-term contract. This group was envisaged to consist mainly of industrial users who typically have shorter-term fuel contracts and greater fuel-switching capability. However, since the original Agreements did not preclude other types of consumers from entering into direct purchase transactions, consumers tied to system-gas contracts endeavoured to replace their system gas requirements with direct purchases in order to realise savings. The direct purchase provisions served consumers well, by giving flexibility where it did not previously exist and by realising transactions at lower than existing contract prices. Such direct transactions also served to address the financial position of many producers, who were short on cash flow, since the new arrangements offered a means of augmenting their income by selling gas that otherwise would not be sold. Nonetheless, such introduction of competition was not without difficulties. Since lower prices for gas meant lower price-based royalty revenues to the resource owner, i.e. the provincial government in Alberta, it took the position that the demand and revenue base represented by the pre-deregulation long-term contract arrangements must not be eroded, except for a weakening in actual natural gas demand. To this end, it moved to block direct short-term sales to residential, commercial and small industrial consumers, known as the "core market".⁴² Also, in 1989 the Ontario Energy Board, in its review of contracts between Western Gas Marketing Limited ("WGML"), the TCPL marketing agent, and the Ontario distributors found a number of constraints on the development of a competitive market for natural gas. These included the fact that WGML was effectively the only possible source of supply since the volumes available from other independent producers were insufficient to meet the needs of the Ontario distributors and all major producers were under contracts to WGML and were not prepared to bid on a direct sale to Ontario distributors. Other factors contributing to the OEB's conclusion included the fact that the LDCs were under pressure to ensure reliability of supply; that transportation capacity from the wellhead to the delivery points in Ontario had become almost fully utilised, which reduced flexibility for direct purchase; and the fact that distributors were prevented from self-displacing volumes supplied under long-term contracts that were in force on October

41 NEB's Long-Term Contract Assessment, *supra* note 32; National Energy Board, *Natural Gas Management Assessment 1989-91*, Oct. 1989 (hereinafter: "NEB's Assessment 1989-91").

42 Report of Senate Committee, *supra* note 31, p. 7-8.

31, 1985. Nonetheless, the OEB found that the contracts contained significant changes which appeared to be the result of aggressive negotiations between the parties.⁴³

It is noteworthy that most of these difficulties could have been avoided had the deregulation process been designed, from the outset, to achieve complete retail competition, as is now the goal. For example, the Alberta policy regarding sales of gas to the retail market could have been avoided with a restructuring of the royalty rate to the resource owner.

Economic Inefficiencies Created by the Current Regulatory Arrangements⁴⁴

The deregulation of the Ontario natural gas market has not completely achieved the goal of maximising social welfare. The current regulatory regime generates a number of economic distortions which carry the potential for anti-competitive abuse and economic inefficiencies. Most of these inefficiencies, which are related to the industry's dual nature, monopolistic and competitive, should inspire a rethinking of the industry's regulatory regime.

Some of the current inefficiencies in the natural gas industry are a result of the historical conditions of the market. For example, since deregulation did not abrogate existing long-term contracts, market conditions in the productive segment are still not fully competitive. However, as the expiration of these contracts occurs, this segment has become more contestable, as reflected, *inter alia*, in reductions in natural gas costs.⁴⁵ In the transmission segment, problems related to the efficiency of the cost-of-service regulatory regime have been mitigated by the adoption of more incentive-oriented forms of rate regulation. However, discrimination issues (i.e. cross subsidisation of its competitive facilities or giving interconnection benefits to these facilities) might arise from the limited separation of TCPL from its brokerage arm (WMGL). Most of the industry's current inefficiencies arise in the retail market which is currently comprised of the distribution and the merchant functions. The distortions can be organised into four categories, namely price distortions, transaction cost distortions, information distortions, and barriers to entry. An additional, non-efficiency concern relates to the distributional consequences of the current regulatory framework. These distortions are described in detail below.

1. Price Distortions

Allocative efficiency, which requires that resources be efficiently allocated between alternative uses, necessitates that price equal the cost of supply. Generally, economic theory suggests that prices higher than cost of supply deny or reduce access to customers who would have been willing to purchase the product at the incremental cost of

43 See NEB's Assessment 1989-91, *supra* note 41, p. 9-10.

44 This section draws on Frank Mathewson and Michael Trebilcock, *Promoting the Efficient Retailing of Natural Gas* (Toronto: Economics and Law Associates, January 26, 1996). See also IGUA Report, *supra* note 31.

45 In 1994-5 natural gas prices trended downwards. This was the outcome of increased production and deliverability (pipeline capacity) coupled with large volumes of natural gas in storage. As a result, gas storage has almost been used to its full capacity and gas prices have increasingly declined. *Globe and Mail*, January 1996.

providing the additional product to them. The current Ontario regulatory regime for the natural gas retail segment permits the price of natural gas to deviate from the unit cost of natural gas, thus distorting the price signals to consumers. This may lead to inefficient switching between different gas retailers or even between different types of energy (e.g. oil, electricity, etc.). Such switching entail wasteful switching costs as well as allocative inefficiency. Three main price distortions can be identified:

- (a) *WACOG gives inaccurate price signals.* Both retail systems available to residential consumers—gas purchases from the LDCs or buy/sell arrangements with ABMs—lead to *ex post* adjustments in the price of gas, which do not enable the consumer to obtain the information he or she needs in order to make *ex ante* efficient choices between gas retailers. As noted above, an LDC pays a forecasted weighted average of gas prices to the large ABMs when it purchases gas from them. WACOG is also paid by system gas customers for the gas purchased from the LDCs. In a world with changing gas prices, a forecasted weighted average price will not measure accurately the “real” price of gas. At best, WACOG is a pseudo-market price, which holds the potential for error. To correct deviations in actual from forecast gas prices, the LDCs have a reserve in the form of a purchase gas variance account. However, this account does not solve the false price signal problem. First, it influences the price of gas for system users only subsequent to the decision point. Further, the LDCs were given a residual right of clearance over the account. End users are also exposed to the risks and costs associated with the utilities’ efforts to manage price volatility. With regard to direct purchase agreements, the consumer does not always realise the savings upfront. If gas is traded through a buy/sell agreement, the price paid by the customer which is reported on his invoice is the WACOG price. The savings are distributed among participants in the purchasing consortium periodically after the gas is actually used, so that the correct share of savings can be ascribed to each participant.⁴⁶ Thus, only at some later point in time, may the customer receive a rebate, based upon:
 - (i) the success of the ABM in bargaining with the gas supplier over the price paid for his gas, and
 - (ii) the type of contract signed by the customer. Also, buy/sell customers assess their natural gas prices against the WACOG price rather than comparing it to the market price. This economic inefficiency is exemplified in large shifts of customers back and forth between system gas suppliers and direct purchases. These shifts have not occurred as a result of consumers responding to market or price signals reflecting real changes in the market place, but rather changes in the artificial relationship between market prices and the LDCs’ WACOG benchmark.⁴⁷

46 Report of Senate Committee, *supra* note 31, p. 9.

47 IGUA Report, *supra* note 31, p. 9–10.

- (b) *Regulated costs of the LDCs.* Under the current regulatory regime, the LDCs are allowed to earn a specified rate of return on a rate base approved by the OEB. Since LDCs are allowed to engage in some competitive activities (retailing of gas as well as some non-core business such as heating, ventilation and air-conditioning sales, rentals, and repairs) they have strong economic incentives to behave strategically with respect to cost allocation. By transferring costs that are in fact incurred to underwrite commercial activities into the rate base of its regulated activity, an LDC has the ability to distort the price of both its regulated and its competitive activities. This could result in it earning a supra-competitive surplus from its regulated activity as well as cross-subsidising its competitive activities. It also holds the potential for pursuing anti-competitive policies, such as predatory pricing, should it wish to do so. Experience suggests that such cost manipulations are both costly and difficult (perhaps impossible) for any outside regulatory authority to monitor.
- (c) *Menu restrictions of the LDCs.* The current regulatory arrangements restrict the ability of the LDCs to offer a menu of contracts. This inhibits their ability to offer contract options which consumers value as evidenced by the success of the ABMs in offering different types of contracts, for example, contracts varying in length.

2. Transaction Costs

- (a) *Buy/Sell agreements increase transaction costs.* The buy/sell agreements between large ABMs and LDCs raise the costs of market participants by adding an administratively complex link to the retail chain. Accordingly, T-service arrangements should be utilised, whenever possible.
- (b) *Private and public costs of regulatory hearings.* When only one market segment holds the potential for market failure, the bundling together of all the market segments might increase the costs of regulatory oversight, especially where the interconnection between industry segments carries the potential for market distortions. In the gas industry, the bundling of the retail and the distribution functions of the LDCs increases the compliance and hearing costs of the LDCs as well as the public resources associated with the hearing process.⁴⁸

3. Information Costs

- (a) *Information asymmetries between different classes of customers.* Under the current system, information asymmetries exist between different classes of

⁴⁸ The NEB has taken several steps in recent years to improve its regulatory process. See, for example, NEB, *Improving The Regulatory Process, Current Position and Submitter's Suggestions* (NEB. Sept. 1988).

customers, especially between residential and large industrial customers. Given the high search costs for low gas prices and the cost of information regarding price fluctuations compared to their cost of gas, residential and small commercial and industrial consumers have little incentive to invest in costly search activities for better deals proposed by ABMs. Since it is prohibitively expensive for individual residential users and smaller industrial or commercial users to negotiate direct purchase contracts, it is impossible for them to make any credible threat to do so. These captive end-users who lack practical supply alternatives may make inefficient and wasteful substitution decisions in favour of other energy sources. At the same time, large industrial consumers have strong incentives to buy gas from ABMs, since the fixed search costs are spread over larger volumes of gas purchases. Consequently, these customers are better informed than most residential customers about gas price fluctuations.

- (b) *Inflated information costs for ABM customers.* The ABM market has greater flexibility than the LDCs in the type of supply options offered to the consumer (e.g. length of contract, price stability, etc.). Clearly, a better dissemination of information regarding these options will benefit both the ABMs and the customers. However, due to information problems, many residential customers are uncertain about their designated supplier and many believe that it is still the LDC even when it is not.
- (c) *Bundling of transport and gas prices on the invoice.* One corollary associated with the price distortions involves the reporting to consumers on their invoice of a single charge for their gas consumption. This does not permit the consumer to break-out the transport and the gas charges and results in a lack of transparency which leads to inaccurate information regarding the merchant function.

4. Barriers to Entry

- (a) *Access to the distribution network.* Monopoly privileges accorded to the LDCs include an exclusive right over the distribution pipelines and load management which are considered a natural monopoly. Consequently, as observed above, the LDCs have strong incentives to foreclose the downstream bottleneck facilities to their competitors in the retail segment. This can be done either through discriminatory access to the network or by cross-subsidising the competitive segment using monopoly profits from the monopoly segment.⁴⁹

⁴⁹ Recently, the U.S. FERC found evidence that pipelines were discriminating in the quality of service they provided to end users that had migrated to transportation. To avoid such discrimination, pipelines were required to separate gas sales from transportation. Frank P. Darr, "A State Regulatory Strategy for the Transitional Phase of Gas Regulation", (1995) 12 *The Yale Journal on Regulation*, p. 79.

- (b) *Strategic benefits of the LDCs conferred by the monopoly over metering/billing.* Under the current arrangement, the LDCs' monopoly privileges extend to the metering and billing activities associated with sale and consumer use of gas. Consequently, the LDCs have strategic benefits relative to the ABMs: 1) since the LDCs' name appears on the invoice, it is easy for customers to impute a monopoly privilege to the LDC over the merchant function. This problem is mistakenly exacerbated when consumer search costs for another gas merchant are high; 2) The LDCs have access to the ABMs' customer list and their customers' demand for gas. By using this knowledge, the LDCs possesses a strategic competitive advantage in marketing and pricing over the ABMs.
- (c) *Asymmetric costs of investment in reputational capital.* The extension of the LDCs' monopoly distribution privilege to metering/billing functions and the structure of the current buy/sell arrangements increase the cost of brand name investment for the ABMs relative to the LDCs, and thus creates an asymmetry of advertising costs between merchant competitors. This is especially true in the small volume residential market, where the size of informational costs relative to the pay-offs from such information reduce customers' incentives to separate the delivery and commodity functions. Moreover, since the LDCs are the "fall-back" option and their name appears on all gas bills, ABMs face higher costs of brand name recognition. Not only does this artificially alter the relative costs of advertising across the competitors, but it enhances the ABMs' costs of correcting any consumer misperceptions of relative quality induced by the LDC's advertising.⁵⁰
- (d) *Transaction costs and complexities associated with direct purchase arrangements.* There are some transaction costs entailed in customers leaving the LDCs and contracting separately for gas supplies and transportation. Moreover, direct purchase arrangements are intimidating in that they entail signing complex legal documents for a commodity whose annual cost for most "core" consumers is relatively low.
- (e) *Scale and scope economies.* Scale and scope economies imply that the equalisation of unbundled and bundled service charges is impossible to reconcile with economic efficiency.⁵¹ In other words, a firm which operates in more than one vertical segment of the industry can take advantage of scale and scope economies not available to a firm which operates in only one segment of the industry. Thus, the LDCs, which serve both the merchant and the distribution functions, have a "built-in" cost advantage over the ABMs.

50 For example, the warning by LDCs to residential consumers that offers of gas prices lower than system prices do not represent offers from the LDC has a negative tone that may overstate the relative reliability of gas purchased from LDCs and not from an ABM.

51 David J. Teece, "The Uneasy Case for Mandatory Contract Carriage in the Natural Gas Industry", in Jerry Ellig and Joseph P. Kalt (eds.), *New Horizons in Natural Gas Deregulation*, (Westport, Connecticut: Praeger, 1996), 43 at 61-6.

A final non-efficiency concern with the current regulatory regime relates to its distributional consequences- the decline in the retail price of gas for large customers relative to small customers (residential and certain commercial customers) resulting from the above economic inefficiencies. Such price discrimination, if not cost justified, is usually a result of a measure of market power which system producers possess vis-a-vis end-users without ready alternative supply options. Discrimination in prices between residential and industrial customers means that competition has not yet been effectively realised in the residential segment of the industry and makes it difficult to contemplate simple and immediate de-regulation of retail natural gas prices. Consequently, there is a legitimate concern that small retail customers, relative to other gas customers, may have received too few of the benefits from the recent reforms in the natural gas industry. The dispersion of benefits across gas customer groups will necessitate a more broadly competitive retail gas market than that which currently exists. As a policy matter, regulators should pay more attention to expanding market opportunities for small retail customers.⁵²

The Next Step: De-integration of the Merchant and Distribution Functions

Given the above economic inefficiencies associated with the current structure of the natural gas industry, we believe that de-integration of the merchant and transportation functions is inevitable. This structural change can take one of two forms. The first option involves a complete unbundling of the merchant and transportation functions by excluding LDCs from the merchant function. The second option is more modest and requires the LDCs to completely separate these functions, although some form of common ownership may be permitted (e.g. through a common holding company). The goal of the proposed changes is to facilitate contracting between wellhead suppliers and end-users so that artificial distinctions between retail suppliers evaporate and end-users have the maximum provider choice.

In general, the complete unbundling option removes most of the distortions noted above. Absent a commercial presence in the merchant function, the strategic incentives facing the LDCs to favour their own merchant function are absent by definition. With easy entry into the brokerage business, it is very likely that the ABMs could survive and compete in the market. The trade-offs in this proposal involve the elimination of significant competitors from the market (the LDCs) and loss of economies of scope which served as the economic foundation for the current structure. As a result, the transaction costs of customers, mainly small customers, will increase.

The more modest proposal, which permits a separate merchant subsidiary owned by the parent LDC, or a holding company of the LDC and the merchant subsidiary, while not eliminating significant competitors from the market, remedies some of the

52 See Kenneth W. Costello and Daniel J. Duann, "Turning up the Heat in the Natural Gas Industry", (1996) *Regulation* 52 at 54 writing about the U.S. natural gas industry.

economic distortions outlined above.⁵³ The potential for strategic behaviour remains when the LDCs continue to operate both merchant and transportation functions. This requires, at minimum, a clear separation of the assets and operating functions of the two functions which would render intra-corporate cost allocations more transparent. Accordingly, there is a clear role for the regulatory authority to regulate the terms of access to the network in a fashion that will not be discriminatory. Although the proposed unbundling increases transparency, the regulatory task is still not an easy one. Transaction costs associated with public and private costs of regulatory hearings, are not eliminated. Information costs could be eliminated if informational neutrality can be achieved through the structural changes. Such neutrality is achieved if consumers do not impute any of the historically conferred brand name recognition to the merchant subsidiary of the LDC. A level playing field can be achieved through informational brochures to system customers outlining the different options consumers have for contracting with competing merchants. Barriers to entry would also be reduced. Nonetheless, some regulatory oversight would be required to monitor potential strategic abuse that favours the LDCs' merchant function. However, if the merchant function is performed by a completely separate subsidiary of the LDCs, there may be little or no economic benefit to ownership of these subsidiaries by the LDCs. Rather, it may be more efficient to sell them off as proposed in the more radical option.

As noted above, from an economic perspective, the two options involve a trade-off between economies of scope that flow from network coordination and enhanced competition in the competitive segments of the industry. Mandatory unbundling entails non-trivial transaction costs that should be taken into account.⁵⁴ The provision of a reliable supply in a fully unbundled marketplace will involve the coordination of many individual transactions; the use of many contingent contracts between suppliers, buyers, and the network; extensive monitoring of supply quality; a considerable amount of command-and-control authority on the part of the pipeline; and higher costs of internalising externalities. Thus, unbundling and open access are not, *prima facie*, unequivocally efficient.

53 The U.S. natural gas industry has recently undergone a structural change which unbundled gas retailing and transportation. The Federal Regulatory Commission's Order No. 636 eliminated the responsibility of interstate pipelines for moving their own gas from the field to the city gate. The Federal Energy Regulatory Commission ("FERC") has ordered the pipelines to unbundle and reprice their services so that as their customers can package their gas service to include the best-priced combination of gas commodity and transportation. The reasoning behind the implementation of the Order was twofold. Open access to the grid failed to create an efficient market place in gas. The Federal Power Commission concluded that the pipelines' ability to control access to transportation and its quality resulted in an inefficient reliance on traditional bundled service. Also it found evidence that pipelines were discriminating in the quality of service they provided to end users that had migrated to transportation. To rectify the inefficiency created by pipelines' control of transportation, the Commission ordered that pipelines unbundle sales and transportation of gas. Although an LDC could purchase both gas and transportation service from a pipeline, gas would be sold separately from transportation service. See, for example, Darr, *supra* note 49, p. 69; Douglas M. Canter, "Buy/Sell Transactions in the Natural Gas Industry: What's Prohibited and What Isn't?" (1994) 15 *Energy Law Journal* 427.

54 Lyon and Hackett, *supra* note 10; Joskow, *supra* note 28, p. 53.

Hence, in the efforts to create a level playing field, integration economies should not be ignored. Rather unbundling should be coupled with mechanisms that would allow market players to reduce transaction costs, such as long-term contracts⁵⁵ and pricing systems that would create the correct economic incentives needed in order to maintain system reliability. One such option involves the fine-tuning of the pipelines' (both interprovincial and local) toll-making methodology in order to enhance efficiency. Pipelines' price menus for different levels of service could help optimise capacity utilisation by setting different prices for different priorities of service on a pipeline system, so that shoppers would be able to trade-off price and level of service, and use more efficiently other market mechanisms such as storage facilities.

Both outlined structural changes, while remedying some or all of the above outlined distortions, still necessitate some form of regulatory oversight. In both proposals the transportation function, being a natural monopoly, will continue to be regulated. The production and merchant markets, being competitive, should be regulated like all other competitive markets in Canada, by the *Competition Act*, including vertical mergers between market players from different segments of the industry. In the limiting case, horizontal mergers between distribution companies (LDCs) that result in only one LDC in a jurisdiction may raise issues of yardstick competition. While mergers between distribution companies can potentially create economies of scope (e.g. construction or maintenance economies), given the small number of existing LDCs in Ontario (three — two of which have a common parent company) such mergers reduce yardstick competition (i.e. competition created by pressures of local consumers to achieve similar results in different distribution areas) and also preclude the regulator from relying on readily available cost benchmarks. Perhaps this problem is not a significant one if benchmarks are readily available from neighbouring jurisdiction. Nonetheless, given that neighbouring jurisdictions may be regulated in a different manner and may have different features, comparisons with other jurisdictions may not very useful. However, the choice of regulatory body that should regulate such mergers raises an intriguing policy question. Given the expertise of the Bureau of Competition and the Competition Tribunal, these agencies should be empowered to regulate such mergers. However, it seems that such regulation may necessitate a change in legislation. Under the existing merger provisions of the *Competition Act*, one of the main conditions necessary to prevent a merger is that the proposed merger "prevents or lessens competition

55 The Standing Canadian Senate Committee on Energy and Natural Resources suggested that "long-term supply commitments secured by contracts should be the basis for protecting the interests of all participants in the natural gas industry." It also recommended that "the core market of gas consumers who lack fuel switching capability or access to other readily available energy supplies be protected by supply contracts no less than 10 years in length; that these supplies be evergreen and contain equitable price adjustments and price arbitration provisions" (p. 3). "Producers would be assured of the cash flow to continue exploring for and developing new reserves of natural gas that will maintain security of supply. These new reserves may also necessitate expansion of the gas transmission system, which requires secure contracts to obtain long-term financing . . . Consumers with limited or no fuel-switching capability should be protected by long-term supply arrangements" (p. 5). See Report of Senate Committee, *supra* note 31, p. 3-5.

substantially".⁵⁶ Since distribution companies, being natural monopolies, do not compete in their distribution functions in the ordinary sense of the word—which arguably does not include yardstick competition—the Act's merger provisions would not be sufficient to prevent mergers between distribution companies. Alternatively, a sector-specific regulatory body (e.g. the OEB) could be given authority to prevent such mergers. However, the latter option would then entail setting a clear set of *ex ante* rules for mergers between distribution companies.

Clearly, the implementation of each of these options requires some transitional steps, such as reallocation of consumers to ABMs and co-ordinated action informing customers of their options. A default mechanism to provide for consumers who fail to indicate any preference across the menu of merchants should also be created. These transitional steps should also be implemented with careful attention to vertical economies.

In sum, over the past decade the natural gas industry has taken major steps towards becoming more competitive, customer responsive, and economically efficient. This trend needs to be extended to the retail sector and requires the unbundling of the merchant and the transportation functions of the LDCs. Regulators will play a crucial role in sanctioning anti-competitive behaviour as well as designing and implementing new pricing and planning rules for promoting efficient operation of the natural monopoly facilities.

Ontario's Electricity Industry⁵⁷

The Current Regulatory Regime

Like the natural gas industry, the electricity industry is comprised of three complementary components: production, transmission, and distribution, which exhibit vertical economies of scope. Similarly, the transportation and distribution segments exhibit classic elements of natural monopoly and are "bottleneck" facilities. However, while production is potentially competitive, some of the electricity production technologies, such as nuclear or hydroelectric plants, exhibit large economies of scale. These industry characteristics have led Ontario to regulate its electricity industry premised on the traditional natural monopoly model. The electricity industry of Ontario is still characterised by one integrated firm, Ontario Hydro, which has monopoly power over the production and transmission but not the distribution segments of the industry.⁵⁸

⁵⁶ *Competition Act* ss 91–100.

⁵⁷ This section draws heavily on Ronald J. Daniels and Michael J. Trebilcock, "The Future of Ontario Hydro: A Review of Structural and Regulatory Options", In Ronald J. Daniels (ed.) *Ontario Hydro at the Millennium: Has Monopoly's Moment Passed?* (Montreal and Kingston: McGill-Queen's University Press, 1996) 1; published in a shorter version in (1995) 6:4 *Utilities Law Review*, 152 at p. 161.

⁵⁸ For histories of Ontario Hydro, see, for example, Merrill Dennison, *The People's Power: The History of Ontario Hydro* (Toronto: McClelland & Stewart, 1960); William R. Plewman, *Adam Beck and the Ontario Hydro* (Toronto: Ryerson Press, 1947); Neil Freeman, *The Politics of Power: Ontario Hydro and Its Government 1906-1995* (University of Toronto Press, 1996).

Ontario Hydro is a corporation without share capital, whose Board of Directors is appointed by the provincial government. Ontario Hydro generates about 90 percent of the electric power sold in the province. It owns and operates 79 generating facilities: 68 hydraulic, 5 nuclear, and 6 fossil fuel. Nuclear represents 62 percent of the total electricity supplied in the province; hydro electric 24 percent; fossil 10 percent; non-utility generation 3.7 percent; and it purchases 0.3 percent.⁵⁹

The province-wide transmission grid owned and operated by Ontario Hydro delivers about 70 percent of the total power generated in the province to 309 municipal electrical utilities ("MEUs"), which own and operate the local distribution systems, with the balance being split evenly between direct delivery by Ontario Hydro to about 95,000 rural retail customers outside the jurisdiction of any of the MEUs and direct sales by Ontario Hydro to about 100 large industrial customers.

Under the terms of the *Power Corporation Act*, the provincial government, through the Minister of Energy, can issue a Policy Directive, after consultation with the Board of Directors of Ontario Hydro, with which the Corporation must comply. In addition, the Act provides for a Memorandum of Understanding between the Corporation and the Minister which must be reviewed at least once every three years and sets out the accountability and reporting requirements governing the Corporation's relationship with the Minister and the government, and matters of government policy that the Corporation will respect in the conduct of its affairs. The external regulation of Ontario Hydro is *sui generis*, and does not follow conventional modes of regulation in electricity or other utilities. Ontario Hydro sets its own rates for those customers that it serves directly, sets wholesale rates for the supply of electricity to the MEUs, and regulates retail rates that may be charged by the MEUs. These rates are subject to review by the Ontario Energy Board, but the OEB's powers are limited to making recommendations to the Corporation and the Minister of Energy, and are not binding on the Corporation, at least without Ministerial directive. Capital expenditure plans have been subjected to various *ad hoc* forms of review by Select Committees of the Ontario Legislature, Task Forces, Royal Commissions and the Environmental Assessment Board.

In sum, the Ontario electricity industry comports with the traditional natural monopoly model. Almost the entire electricity system in Ontario is publicly owned (generation, transmission and local distribution). However, the industry is not fully vertically integrated in that local distribution companies are separately (municipally) owned from the vertically integrated transmission and generation segments.

The Current Trend towards Deregulation of the Ontario Electricity Industry

A number of factors have conspired to render contestable a number of the assumptions upon which the present structure and regulation of the electricity industry in Ontario are based. These were thrown into recent political relief when Ontario Hydro's customers faced large rate increases (almost 30 percent) from 1991–1993, at a

⁵⁹ Ontario Hydro's Report, *supra* note 7, p. 19.

time of severe recession in the province. In the face of public outcries provoked by these rate increases, Ontario Hydro has committed itself for the rest of the decade to holding rate increases to no more than increases in CPI. In 1993, the corporation incurred a net loss after restructuring charges of over \$3.6 billion- the largest corporate loss in Canadian history. Ontario Hydro's debt to equity ratio in 1995 was about 92 percent. Its debt of approximately \$35 billion, which is guaranteed by the provincial government, constitutes about 30% of the provincial debt. It also possesses substantial excess capacity.⁶⁰

Most of Ontario Hydro's immediate difficulties can be attributed to the following factors:

- (i) over-estimation of future demand;
- (ii) over-expansion and related borrowing with respect to its nuclear facilities in the 1970s and 1980s;
- (iii) substantial cost over-runs and disappointing operating performance of a number of these nuclear facilities, in part itself a function of a federal-provincial industrial strategy designed to promote the atomic reactor industry in Canada;
- (iv) wide-spread adoption of energy conservation measures on the demand side;
- (v) the severe recession of the early 1990s;
- (vi) a changing longer-term industrial structure for the Ontario economy, with less dependence on heavy manufacturing which is energy intensive;
- (vii) declining prices for substitute sources of energy, particularly natural gas; and
- (viii) an anachronistic regulatory structure characterised by dispersed and fragmented authority that has at times subverted public transparency and fostered government micro-management.

These factors, in themselves, might not justify a fundamental rethinking of the organization and accountability of the electricity industry in Ontario. After all, some of them can be regarded as simply reflecting one-time misjudgments of demand and supply requirements; others can be regarded as reflecting temporary conditions in the broader provincial economy; yet others could be redressed with targeted legal and institutional changes alone. However, in addition, technological innovations on the supply side are undermining traditional assumptions about minimum efficient levels of scale in electricity generation. For example, combined cycle gas turbines technology (CCGT) not only facilitates competitive entry by relatively small scale plants, but, further, the implementation of these plants can be achieved much more quickly than alternative generators given short construction times and the generally less obtrusive level of regulatory review given the lower levels of environmental risk. In addition, more localised power generation technology is rapidly evolving. Much of this new technology

60 Ontario Hydro's reserve margin between installed capacity and maximum peak demand has risen sharply from 28.1 percent in 1989 to 64.8 percent in 1993. This margin compares with the Canadian average of 38 percent and 19 percent for selected U.S. utilities in 1993. See RBC Dominion Securities Report, "Ontario Hydro: Moving to a Higher Voltage" (August 24, 1994) (hereinafter: "RBC Dominion Securities Report"), p. 29.

can be installed by end-users to serve their own power needs and in some cases also to supply power to other end-users through the local distribution system (so-called distributed generation or retail wheeling).⁶¹ The effect of these technological changes is that a competitive generating sector characterised by significant levels of risk assumed by private investors is immediately feasible. Current industrial rates, although lower than rates charged by MEUs, are higher than the cost of electric power produced using the new technologies. These costs and hence price differentials raise the prospect of large industrial customers and larger MEUs embarking upon policies of self-generation or purchase from local non-utility generators and exiting the present integrated electricity system in Ontario, casting an increasing proportion of the burden of recovery of sunk investment costs onto remaining customers, who are likely to be disproportionately urban residents and rural customers. These customers, in turn, are likely to substitute away from electricity and towards other energy sources, where feasible, thus setting in motion an unravelling of the existing integrated system, or as it is sometimes put more dramatically, a "death spiral". An additional factor driving in the same direction is the amount of excess capacity possessed by many existing electric utilities in North America, which makes it profitable for them to sell power outside their traditional jurisdictions at any price above short-run marginal cost.⁶² Moreover, innovative demand-side management systems which allow the measurement of the amount of electricity used by the consumer and the availability of sources and prices on a continuous basis, vest consumption and planning decisions in the hands of the consumers.⁶³ The key implication of these technologies is that the need to place singular reliance on the decisions of large, vertically integrated utilities to achieve environmental goals is attenuated.⁶⁴

These factors led to the appointment by the new Ontario Conservative government in late 1995 of the Advisory Committee on Competition in Ontario's Electricity System ("the Macdonald Committee") to provide recommendations regarding the structure of Ontario's electricity system and its regulatory regime to the Ontario government. The Macdonald Committee's recommendations are reviewed below. Ontario Hydro, as well as numerous businesses and consumer groups affected by the current structure and regulatory regime of the electricity industry, submitted various proposals to the Committee for restructuring the industry. Although these submissions differ in detail, there seems to be near-unanimity that the era of monopoly supply is over and that fundamental change is inevitable. Most stakeholders believe that a more competitive structure should be adopted. Also, there is wide-spread agreement that it is essential that

61 See Christopher Flaven and Nicholas Lenssen, *Reshaping the Power Industry* (Washington D.C.: World Watch Institute, October 28, 1993).

62 Report of Financial Restructuring Group, *Ontario Hydro and the Electric Power Industry: Challenges and Choices*, Ontario Hydro (June 27, 1994) (hereinafter: "Report of Financial Restructuring Group"), p. 16.

63 See, for example, Michael R. Niggli and Walter W. Nixon, III, "A Serendipitous Synergy: Why Electric Utilities Should Install the Information Superhighway" (1994) 7 *Electricity Journal* 25.

64 See Douglas Houston, "Can Energy Markets Drive DSM?" (1994) 7 *Electricity Journal* 46.

the regulatory rules of the game be clearly established at the outset of the deregulation process so that market players can condition their activities (such as bids for Ontario Hydro's assets) on a relatively accurate understanding of the future policy environment.

It is also widely believed that the primary objective of deregulation/privatization policies is to achieve economic efficiency. This single benchmark diverges markedly from the traditional goals of regulation, when regulation was used to serve diverse and often conflicting goals, only one of which was economic efficiency. One such goal was universal service, making electricity available to everyone, with no groups excluded because of the costliness of serving its members. Subsidies were extracted from urban customers and from customers using large volumes of electricity with low marginal costs attributable to scale economies. This made possible the supply of service at low prices to sparsely settled areas. However, once competition is introduced, such subsidies will be eroded because entrants will initially specialise in supplying service to customers served in high-density routes that are overpriced. Distributional goals, if they are to be maintained, will have to be addressed in different ways.

The Basic Reform Options

Reforms and reform proposals in other jurisdictions suggest three basic reform models (each with a range of structural and regulatory sub-options) with regard to the unbundling of the electricity industry. The first model—*competitive access to a power pool*—entails electricity generators competing on a merit-order basis for access to a power-pool that operates a spot-market, provides access to the transmission system, and dispatches pool members' power plants on a least-cost basis to the grid. The second model—*wholesale competition*—involves competition among generators for wholesale customers, entailing bilateral contracting between generators and local distribution companies and large industrial companies, supported, or supplemented, by a pool or exchange operating a spot-market. The third model—*retail competition*—entails competition among generators for retail customers, where industrial, commercial, and residential customers, through various kinds or intermediaries, would contract with generators for the supply of electricity, probably again supported or supplemented by a spot market, and paying regulated transmission and local distribution charges for use of the grid and local wire system on a common-carrier basis.

One feature that these models share in common is some measure of de-integration of the vertically integrated natural monopoly model of the electricity industry so that competition can be introduced into the production segment. All three options entail similar issues regarding the degree of de-integration of the industry's segments from each other as well as issues regarding the appropriate methods of regulation or deregulation of each of these segments. These issues, introduced in the following section which analyses the benefits and trade-offs of Model 1, are also relevant to Models 2 and 3, analysed in the succeeding sections. As in the natural gas industry, structural and regulatory solutions are interdependent, serving as complements or substitutes.

1. *Model 1: Competition in Generation for Access to the Grid*

A minimum institutional requirement to operationalise this model is the creation of a power pool or exchange into which competing generators can bid their power with bids being chosen on a least-cost, merit-order basis, with downstream distribution companies and customers simply buying their power from the grid. In the absence of any structural changes, the immediate problems raised by this model pertain to serious potential conflicts of interests between Ontario Hydro as grid owner and Ontario Hydro as owner of 90 percent of the generating capacity in the province.

Thus, the introduction of competition necessitates some form of de-integration of the industry's segments, which is necessary both to create effective competition in generation and to constrain the economic incentives of the natural monopolist to engage in self-dealing in favour of its own generators.⁶⁵ A number of solutions short of de-integration of existing vertically integrated utilities have been proposed to deal with the self-dealing temptation. For instance, by segregating the generation and transmission activities of existing utilities into two separate functional divisions or perhaps even separate Crown corporations with different boards of directors, it is claimed that the potential for self-dealing could be mitigated. However, as in the case of other industries where these governance devices have been utilised, the results are equivocal. In this vein, it has been argued that it is highly doubtful that any external agency can devise regulatory counter-incentives powerful enough to overcome this natural incentive, and that any method of creating a competitive market for electricity that leaves intact the present vertically integrated industry structure will be plagued by disputes raised by allegations of self-dealing.⁶⁶ The basic problem is that the complexities of transmission pricing and access, particularly system requirements for out-of-merit-order access that are responsive to congestion externalities, vest considerable discretion in the transmission grid which is difficult to observe and to evaluate from afar.⁶⁷

A radical privatization option in the Ontario setting that would be responsive to the self-dealing temptation would entail Ontario Hydro selling off all its generating facilities in perhaps four or five bundles of assets, with appropriate mixes of base load and peak load power plants, which, along with independent power producers and inter-provincial and U.S. utilities, would compete to supply the grid.⁶⁸

65 See Richard Pierce, "The State of the Transition to Competitive Markets in Natural Gas and Electricity" (1994) 15 *Energy Law Journal* 323, 344; Richard Pierce, "The Advantage of De-integrating the Electricity Industry" (1994) 7 *Electricity Journal* 16.

66 Richard Pierce, "The Advantage of De-Integrating the Electricity Industry", *ibid*.

67 The complexities of efficient transmission pricing using spot market nodal prices are discussed in F.C. Schweppe, M.C. Caramanis, R.D. Taboors and R.E. Bohn, *Spot Market Pricing of Electricity* (Kluwer Academic Publishers, 1988). See also William W. Hogan, "Electric Transmission: A New Model for Old Principles" (1993) 6 *Electricity Journal* 18.

68 The importance of disaggregating Ontario Hydro's existing generating assets into more than two or three generators (as in the U.K.) is underscored by the market power problems experienced following privatization in the U.K. See: Richard J. Green and David M. Newberry, "Competition in the British Electricity Spot Market" (1992) 100 *Journal of Political Economy* 929.

However, in Ontario, there are serious questions as whether this option is feasible in light of the large proportion of Ontario Hydro's generating capacity accounted for by nuclear generation (approximately 60%). As the British experience reflects,⁶⁹ privatising nuclear generation facilities is likely to prove extremely difficult, at least without detailed government commitments regarding the recovery of high average total costs, limiting future liabilities, and sharing the costs of decommissioning and fuel reprocessing likely to be entailed when the useful life of these plants is exhausted. Moreover, there may be substantial public concerns over privatising nuclear generating assets focused on whether private owners will have the same incentives as state actors in adhering to appropriate safety standards in the operation and maintenance of these facilities, especially in a setting of government-imposed limitations on liability for tortious conduct. For instance, under private ownership, there may be stronger incentives for owners or managers of private generating facilities to chisel on needed investments in asset maintenance, particularly as the remaining useful life of the assets declines. There may also be serious final period problems, where a facility would simply be closed and its owners shield behind limited liability or bankruptcy laws in order to avoid decommissioning costs. However, to the extent that the propensity to shirk on investments in asset maintenance can (and will need to be) curtailed through detailed and obtrusive levels of regulatory oversight of plant operations, the efficiency gains associated with private ownership will be diminished through such micro-management. In addition, as demonstrated by the recent performance of the British Government's state owned nuclear generating company, Nuclear Electric, it is entirely conceivable that marked improvements in plant operations could be realised without transferring ownership to the private sector⁷⁰ (although it is not clear whether even better results could be achieved if it were privatised). Finally, were the state to retain ownership, it could change the policy environment respecting nuclear assets to respond to public sentiment but without appearing to act opportunistically against private owners. Under this option, Ontario Hydro's existing nuclear generating facilities should be transferred to a new Crown Corporation (Genco).

However, if the government decides to privatise the nuclear facilities, this should be done in such a manner so as to minimise risks of market dominance by the private owners.⁷¹ Ontario's nuclear facilities should be sold-off in at least three bundles,

69 Armstrong et al, *supra* note 4; J. Hewlett, "Lessons from the Attempted Privatization of Nuclear Power in the United Kingdom" (1994) 16 *Energy Sources* 17.

70 See STM, 14 May 1995, Andrew Lorentz, "Nuclear: The Ultimate Privatization". Arguably, much of the benefit from improved operational efficiency can be traced to competition with privatised firms. See J. Trebilcock, *supra* note 19.

71 Recently, the British Government has announced plans to merge Nuclear Electric (which holds the nuclear remnants of Central Electricity Generating Board in England) with Scottish Nuclear, and the subsequent privatization of the merged entity (amounting to 22% of the British electricity market). However, some of the oldest reactors will remain in public ownership (8% of the British electricity market). INS, 14 May 1995, "All you need to know about the nuclear sell-off: What will be sold? — Why now? — Will anyone want to buy it? — Will it be more dangerous?". The argument in favour of privatization now is that the issue of future liabilities for plant decommissioning and fuel reprocessing

comprised of the three main existing clusters of nuclear plants (i.e. Pickering, Darlington and Bruce). The privatization of the plants should also be contingent on a decommissioning performance bond being obtained from the private owners or the creation of a non-accessible sinking fund to which mandatory on-going contributions are made by the private owners. Such a bond or fund should be made accessible to the Ontario government, contingent on some objective review such as a court order, in the event that the plant owner goes bankrupt and does not meet its legal responsibilities.

If we assume that the nuclear facilities cannot be privatised but only the hydro and coal-fired generators, the British experience suggests potentially serious problems in engendering a sufficient degree of competition among generators in bidding to supply the grid. To meet this concern, it would be necessary to privatise the non-nuclear generating facilities into at least four firms if this would not forfeit significant economies of scale or scope in their operation. Here, there may be some political objection to the sale of Ontario Hydro's hydraulic generators on the basis that the net effect of these sales to the private sector would be to increase the cost of electricity to Ontario consumers because consumers would be forced to pay twice for the capital costs of the plant and equipment of these generators (variable costs are relatively trivial), once to the state when the plant was originally constructed and a second time to the private operator who will have to recover its up-front capital investments in these assets. However, this objection fails to account for the likely use of these funds to retire some of Ontario Hydro's current outstanding debt associated with nuclear assets (the market value of which is far below book value) which will result in reduced revenue requirements for servicing debts on these assets. Another political objection to the sale of the hydro generators relates to the symbolism inherent in selling the province's perceived birth right in water power to private interests. Yet it is questionable whether these preferences should command the sympathies of policy-makers given the wide range of other privately-owned natural resource industries that implicate similar (perhaps more intense) concerns over resource exploitation given their non-renewable status. Moreover, this issue can be over-come by charging the private company the market value of the rights for water-power usage. Nonetheless, given that the variable costs of generation for these plants are tied to water rental charges, the province would be required to enter into long-term contracts with private investors at the time of privatization so as to permit accurate assessment of future revenues and to guard against post-purchase governmental opportunism through rental increases.

Moreover, if competition is to be feasible and if allocative efficiency is to be achieved, the financial benefits conferred on Genco by its status as a public enterprise, which confers advantages in the form of exemption from corporate income taxes and lower costs of capital in virtue of the provincial guarantee of its debts, should be eliminated, or at least limited.

With regard to the grid, the empirical evidence suggests that the economic performance of publicly-owned monopolies and incentive-based regulated private

costs has been resolved and the operating efficiency of the plants, particularly those under the ownership of Nuclear Electric, has been dramatically improved over the past five years.

monopolies is sharply different. Empirical evidence on the welfare effects of privatization on state-owned enterprises, with very few exceptions, is strikingly positive, even in monopolistic industries where incentive-based regulation has been introduced. One recent study of the performance of 61 companies from 18 countries and 32 industries that experienced full or partial privatization during the period 1961 to 1990 found that privatised firms increase real sales, become more profitable, increase their capital investment spending, improve their operating efficiency, lower their debt levels, increase dividend payout, and increase their work forces.⁷² Accordingly, we believe that the grid should be privately owned, as is the case in the natural gas industry⁷³ and should probably be privatised through a public offering. This would also resolve issues of self-dealing with residual upstream state-owned generating facilities.

Like the transmission facilities, local distribution facilities exhibit characteristics of natural monopoly.⁷⁴ Nonetheless, it has been persuasively argued that there are far too many MEUs to realise fully economies of scale or scope. Of the present MEUs, 131 have fewer than 1,000 customers.⁷⁵ Ontario Hydro's proposals seek to consolidate the MEUs and Ontario Hydro in one company ("Wiresco"). This could be done by way of legislation, without compensation to the municipalities or through purchase of the MEUs in exchange for, or financed by, leveraged capital (bonds) of Ontario Hydro. Wiresco would be responsible for the planning, acquisition, maintenance and directed operations of all transportation facilities as well as for upgrades, capital additions, or changes to transportation facilities based on foreseen needs of suppliers or customers. This suggestion is appealing in that it realises some economies of scope. A single entity would have the benefits of providing a single accountability for connection to the network, reliability, power quality and pricing of delivery; providing simplified and non-discriminatory access to delivery services; and improving efficiency by improving system coordination, creating economies of scale, and reducing duplication and overlap.⁷⁶ Nonetheless, it implies substantial market power in one market player and reduces the possibility for yardstick competition in the distribution segment and hence reduces the ability of captive consumers to compare easily the price and quality dimensions of service they are receiving from their local supplier.

72 William Megginson, Robert Nash and Matthias Van Randenborgh, "The Financial and Operating Performance of Newly Privatised Firms: An International Empirical Analysis" (1994) 49 *Journal of Finance* 403. For a different view see, for example, John Vickers and George Yarrow, "Economic Perspectives on Privatization" (1991) 5 *Journal of Economic Perspectives* 111.

73 However, if the grid is not privatised and on the assumption that Ontario's non-nuclear generating facilities can be effectively and efficiently privatised, Ontario Hydro's existing nuclear facilities and its transmission facilities should be unbundled and separated into two distinct Corporations- Genco and Gridco, with independent governance structures. This should reduce incentives for the grid to distort investment decisions and grid enhancement in favour of its own generating facilities and to disadvantage the non-Hydro generating sources. It would also reduce the complexities associated with grid regulation.

74 For a different view see Smith, *supra* note 8, p. 34-5.

75 One study apparently suggests that if all the MEUs in the Greater Toronto area were merged, operating expenses could be reduced by roughly 25 percent. See Report of the Financial Restructuring Group, *supra* note 62, p. 27.

76 Ontario Hydro's Report, *supra* note 7, p. 48.

We believe that MEUs should be privatised and that market forces regulated by the general framework of the *Competition Act* should determine the scope of economies of scale between different franchise areas. Rationalisation may occur through mergers of smaller distribution companies who may choose to aggregate smaller companies on a regional basis to realise economies of scale and scope, or through the formation of cooperatives or buying groups.

As in the natural gas industry, the issue of allowing these distribution companies (whether privatised or not) to operate the merchant function involves trade-offs between vertical economies of scope and anti-competitive incentives. However, given the experience of the natural gas industry, we believe that structural changes entailing some substantial measure of separation will be necessary.

Once the industry segments are unbundled, a fully independent pool or exchange would be set up with a governance structure comprising representatives of the generators, the LDCs, independent power producers, inter-provincial and U.S. power producers and large industrial customers. The independent exchange would be set up under legislation that mandated it to purchase power on a least-cost basis from any of these sources and to perform the dispatch function. This power pool would manage Ontario's financial exchange for electricity, as well as system dispatch and security. Alternatively, these functions could be performed by the grid, subject to regulatory oversight, assuming self-dealing problems have been resolved through complete vertical de-integration.

In order to achieve allocative efficiency, electricity prices should signify the cost of electricity production. Hence, prices should reflect the different transmission costs from plants located in different areas. One way to achieve this goal is to charge LDCs different transmission prices, according to their relative costs. Another is to provide that local distributors and large customers pay the same rate for transmission out of the pool, regardless of how far they are from the sources of generation, while to supply power into the pool, generators and importers would pay charges or receive credits based on location of supply in order to create incentives for suppliers to locate new facilities so as to maximise the efficiency of the grid system.

With these broad structural features in place, it is then important to identify the indispensable regulatory elements implied by this structure. The generation segment, being competitive, should be regulated like all other competitive markets in Canada by the *Competition Act*. Canada's competition laws should complement competition in this competitive segment by discouraging collusive, exclusionary or predatory practices, discouraging anti-competitive mergers, and preventing abuse of dominant position. Nonetheless, given concerns in the early stages of deregulation that nuclear generating facilities will dominate the market, if retained in public ownership, they will require some form of regulation. Daniels and Trebilcock suggest two ways to minimise the need for such regulation. First, Genco would be constrained from investing in any new generating facilities, thus allowing staged but certain withdrawal of public sector decision-making respecting incremental generating capacity in the electricity domain.⁷⁷

77 Data provided by Ontario Hydro indicates that the average remaining life of existing nuclear generators is 29 years. See RBC Dominion Securities Report, *supra* note 60, p. 26.

Critical to the willingness of private investors to put their risk capital into the electricity industry in Ontario will be the provision of credible commitments by the state that it will exit the industry and will refrain from undertaking heroic measures aimed at prolonging the remaining life of the nuclear assets. Second, to the extent that Genco as a dominant firm in the generating segment of the industry may raise dangers of monopoly pricing, predation, or explicit or tacit collusion by the competitive fringe simply pricing up to Genco's monopoly pricing umbrella, collusion and predatory behaviour by Genco designed to foreclose entry by more efficient generators could be regulated by the enforcement authorities under the Canadian *Competition Act*. The effect of greater access to the grid by out-of-province suppliers and in-province non-utility generators would substantially lessen the prospects for collusive behaviour, thereby enhancing the prospects for competition to supplant the need for direct regulation.⁷⁸

Given the natural monopoly characteristics of the grid, it should be subject to ongoing regulation, at least to some degree.⁷⁹ Grid regulation should include access to the grid, including *inter alia* access terms and pricing as well as grid capacity. For example, the grid should be subject to regulatory obligations to proceed quickly with negotiations over grid enhancement with inter-provincial utilities in other provinces as well as utilities in the northeastern U.S. states so that a significant portion of the Ontario electricity market is rendered contestable by extra-provincial generators. It is also important that access pricing to the grid be transparent.

Traditionally, the grid's monopoly pricing problem has been dealt with via administered rate-of-return regulation which permits a return on investment calibrated to the actual costs of providing service. Since external review is beset by serious and persistent information problems (typically the regulated firm has much greater information than the regulator), considerable resources need to be spent in extensive regulatory proceedings designed to elicit and then to certify the accuracy of information produced by the regulated firm. Compounding these problems are the relatively weak incentives that rate-of-return regulation provides for firms to introduce cost saving innovations or to keep production costs down generally. It may also introduce incentives for over-capitalisation.

To mitigate the problems inherent in rate-of-return regulation, several mechanisms have merit. First, regulatory lags that permit shareholders to reap temporary excess returns from operating inefficiencies can be adopted. However, due to the unpredictability of the duration of such lags, incentives to engage in productive improvements are attenuated. Nonetheless, this problem can be partly overcome if the regulator credibly sets the duration of such lags beforehand. Alternatively, price-cap regulation can be used. Under the RPI-X formula used to regulate utility prices in Britain, regulated firms are assured of receiving price increases equivalent to the rate of

78 Nonetheless, such contestable forces are limited by transmission costs and regulatory barriers, as well as technical barriers, such as inter-provincial or inter-state grid capacity.

79 The purpose of such regulation is to redress the opportunism problems deriving from the natural monopoly properties of the transmission grid: significant economies of scale and low short run marginal costs (given high fixed capital costs, the variable costs of production are relatively low, requiring second order pricing for suppliers to recover total costs.)

inflation during the period minus stipulated productivity increases. However, experience with such regulation suggests that it differs only in degree, and not in kind, from rate-of-return regulation in terms of the information requirements for effective external regulation.⁸⁰

The adoption of either form of incentive-based regulation (lagged rate-of-return or price caps) would raise certain difficulties. First, neither form of regulation would be feasible without prior valuation of the transmission grid's assets and an estimation of operating expenses. Second, given agency costs associated with public sector operation, it is not clear how responsive transmission managers will be to incentive-based regulation. While these problems could be constrained by the adoption of nuanced performance based compensation arrangements, political concerns over excessive compensation may limit their adoption. For these and other reasons noted above, we favour privatization of the grid.

In addition, new generators, large industrial customers, and local distribution companies may need to be provided with a legal right to challenge refusals by the grid to extend or enhance the grid before a third party regulator in order to minimise the risk of the grid owners favouring some generation facilities over others. This problem would be particularly acute if both the grid and the nuclear generating facilities remain in public ownership. Privatization of both would substantially mitigate these problems.

The regulatory regime over the distribution system should also change. At present, Ontario Hydro sets the retail rates for the MEUs. Daniels and Trebilcock suggest that as long as the local distribution companies remain owned by municipalities, there is only limited value in price regulation, viewing local electricity prices as analogous to local property taxes, where local forms of political voice and accountability reinforced by threats of exit should be adequate in ensuring that the prices charged are not excessive. Moreover, yardstick competition from other MEUs may play a disciplinary role. Although the MEUs operate in distinct franchise areas and thus do not compete with one another in their distribution function, achievements of one MEU may result in pressure on other MEUs by their local customers to achieve similar results.⁸¹ However, should local distribution companies become investor-owned, price regulation of the distribution function would then need to be contemplated. Again, it seems likely that incentive-based regulation would achieve the best results for this market segment. In addition, horizontal mergers between MEUs, while not posing significant problems as in the case of mergers between the much smaller number of natural gas LDCs, should be nonetheless be subject to regulatory review.

Assuming that the regulatory regime for both transmission and distribution facilities is cost-based, this would, likely, involve different prices for rural users. To the

80 See Deiter Helm, "British Utility Regulation: Theory, Practice, and Reform" 10 *Oxford Review of Economic Policy* 17; Baumol and Sidak, *supra* note 6.

81 Yardstick competition has also a strong appeal where price-cap regulation is adopted. Yardstick comparisons of efficiency from other comparable utilities offers a possibility for setting revised price caps. See, for example, Thomas G. Weyman-Jones, "Regulating the Privatised Electricity Utilities in the U.K." in Thomas Clarke and Christos Pietelis (eds.), *The Political Economy of Privatization* (London: Routledge, 1993) 93 at 106.

extent that the cost of transmitting electric power to rural customers is higher than transmission and distribution costs to urban consumers,⁸² the changes proposed will undermine existing cross-subsidies and thus will result in higher prices for rural consumers. If a substantial reduction in the magnitude of the cross-subsidies generates legitimate distributional concerns, it is open to the government to provide supplementary assistance (direct or targeted subsidies), arguably conditioned on income, for rural customers.

Three remaining potential problems need to be addressed. First, the stranded asset problem has led U.S. regulators to contemplate the imposition of non-avoidable demand charges following deregulation.⁸³ However, in the Ontario context, this problem is not of central importance. A recent study conducted by Ontario Hydro concluded that the overall market value of the Corporation's assets is at least equal to book value.⁸⁴ Moreover, whether stranded assets are paid for by customers or tax-payers matters little, given the substantial identity between the two in the publicly owned Ontario electricity system.

A second potential source of complexity relates to the pricing levels that are likely to emerge in a competitive power pool. Some commentators⁸⁵ suggest that if competition to supply the pool is fully effective, all prices will be bid down to short run marginal cost. If this were so, this would entail no allocative inefficiencies with respect to incumbent generators, whose fixed costs are sunk, but it would presumably deter entry by new generators who would not find it rational to make new capital investments unless they were assured that prices would cover average total costs. Reflecting these concerns, the British electricity regime has until recently provided for payment of "capacity adders" to generators on top of system power prices generated through bidding to supply the pool. However, these capacity adders have apparently been subject to serious manipulation by generators.⁸⁶ Moreover, evidence does not suggest that all prices will necessarily be bid down to short-run marginal cost.⁸⁷ Thus, in the Ontario setting, the case for imposition of capacity adders charges does not seem powerful.

82 It has been estimated that transmission costs constitute only 15% of the total final cost of electricity, with the remaining 85% divided between generation (70%) and distribution (15%). If so, the impact of location-specific transmission pricing on final electricity prices is unlikely to be severe even if it were to be permitted.

83 William Baumol, Paul Joskow and Alfred Kahn, "The Challenge for Federal and State Regulators: Transition from Regulation to Efficient Competition in Electric power" (9 Dec. 1994); Scott Hempling, Kenneth Rose and Robert Burns Report to the National Association of Regulatory Utility Commissioners, "The Regulatory Treatment of Embedded Costs Exceeding Market Prices: Transition to the Competitive Electric Generation Market" (Washington, D.C.: November 7, 1994) at p. 57.

84 Report of Financial Restructuring Group, *supra* note 62, p. 22. While the nuclear facilities would entail a mark-down in their book-value, the non-nuclear facilities would entail a mark-up in their book value. For a more extensive discussion of this point see Daniels and Trebilcock, *supra* note 57.

85 Baumol, Joskow and Kahn, *supra* note 83.

86 See Stephen Littlechild, "Competition and Regulation in the U.K. Electricity Industry", presentation to the University of Toronto Electric Power Project, April 7, 1995.

87 Armstrong, Cowan and Vickers, *supra* note 4, chap. 9 at p. 303; *The Economist*, *supra* note 27, p. 48.

The third related concern also relates to the dominant position of the nuclear facilities, which may mean that prices may not be bid down to marginal cost. Rather tacit collusion between generators could emerge. British experience has shown that the fact that National Power and PowerGen control 90% of the crucial swing capacity enables them to set the pool price most of the time (approximately 85% of the time). They have little incentive to undercut each other. In the Ontario setting, this problem may be even more acute, since the "baseload" power stations which run continuously (nuclear or hydro plants) account for most of the provincial demand, thus holding a large price-setting capacity. This problem can be partly overcome, by the introduction of inter-provincial or international competition and also by the break-up of the production segment into five or six entities. Privatising the nuclear facilities into three competing generating companies seems more responsive to these concerns than transferring these facilities to a Crown Corporation.

2. *Model 2: Competition for Wholesale Customers*

This model assumes that instead of, or more plausibly in addition to, competition for access to a power pool, generators can compete for direct wholesale business with local distribution companies and large industrial users through bilateral contracts. Bilateral contracting would operate alongside the power pool and would entail contracts for differences- in effect hedging contracts relative to pool prices. Local distribution companies would then pay transmission prices to the grid, as would the industrial customers utilising the grid. To the extent that the latter utilise the local distribution network they would also pay a local distribution charge. At the same time, any constraints on self-generation by municipalities would be removed, as would constraints on retail wheeling through the local distribution system or grid by self-generators with excess capacity. The exchange would continue to perform a dispatch function both for sales to the pool and generation under contract.

There are at least three advantages to Model 2 over Model 1:

- (i) the pool is likely to become supplemental to bilateral contracts which would be struck for whatever length is mutually acceptable to the parties, presumably ensuring that the power prices paid under such contracts are likely to cover average total costs. In effect, the electricity market will become less vulnerable to non-trivial, system-wide mistakes made by a centralised actor;
- (ii) the availability of the bilateral contracting option is likely to keep the exchange honest, thereby reducing the need for costly regulatory intervention. Also experimental/empirical evidence shows that two-sided markets are more competitive and provide better discipline of market power than one-sided auction markets;⁸⁸
- (iii) By permitting competition amongst generators for wholesale buyers, this

88 Smith, *supra* note 8, p. 44-5.

will create an immediate incentive for MEUs to rationalise themselves into economically efficient units in order to make bilateral contracting feasible.⁸⁹

In terms of regulatory requirements implied by Model 2, these differ from those of Model 1 mainly at the distribution or retail level, where there may be a more complex potential interplay between structural and regulatory reform. MEUs might be effectively disciplined by local political voice and inter-jurisdictional competition. However, under some rationalisation scenarios, e.g. where MEUs are sold off to private investors, they would cease to be accountable to local political constituencies, thus strengthening the case for some form of price regulation of the distribution and retailing functions.

Model 2 may also raise distributional concerns. For example, large industrial users may be able to negotiate bulk discounts that lower their per unit power charges substantially below those payable by "captive" residential customers. We discount this concern, since MEUs also have strong incentives to negotiate the best deals possible for their local customers. If local distribution is privatised, local distribution companies will similarly have incentives to minimise input prices (while distribution and commodity prices would be regulated). Nonetheless, as noted above, to the extent that the cost of transmitting electric power to rural customers is higher than transmission costs to urban consumers⁹⁰, it is open to the government to provide supplementary assistance to rural customers.

3. *Model 3: Competition for Retail Customers*

Under this Model, generators would be free to compete directly for retail customers, facilitated by various kinds of energy intermediaries (ABMs), as is the case in the natural gas industry. The retail monopoly presently held by the MEUs would be terminated, creating additional incentives beyond those implied by Model 2, for spontaneous rationalisation of this sector. Local distribution companies would retain a natural monopoly over the local wire network, but not over the retailing of electricity or other energy related services, such as metering, etc. The adoption of Model 3 therefore can be viewed as a way of promoting much greater competition in the demand side management segment of the industry. It can also be viewed as a market corrective for the lack of citizen mobility in response to electricity rates that has been alleged to impair

89 On the incentives for municipalisation in fully vertically integrated U.S. electricity systems created by the potential for bilateral contracting, see Pierce, "The State of Transition to Competitive Markets in Natural Gas and Electricity", *supra* note 65, p. 34. The nature and level of economies of scale in distribution is discussed in J. Stephen Henderson, "Cost Estimation for Vertically Integrated Firms: The Case of Electricity" in Michael A. Crew (ed.) *Analysing the Impact of Regulatory Change in Public Utilities* (Lexington, Mass: D.C. Heath and Company, 1985), chapter 6.

90 It has been estimated that transmission costs constitute only 15% of the total final cost of electricity, with the remaining 85% divided between generation (70%) and distribution (15%). If so, the impact of location-specific transmission pricing on final electricity prices is unlikely to be severe even if it were to be permitted.

voice at the municipal level.⁹¹ If industrial and residential consumers are dissatisfied with the level of commodity pricing being offered by LDCs they will no doubt press for entry of alternative suppliers or perhaps even attempt to establish local buying groups that will vie for the local franchise.

As in Model 2, if local distribution companies become investor-owned they will have incentives to charge monopoly prices for distribution services. In addition, if distribution and retail functions are not unbundled, there is a further risk that local distribution companies may charge independent customers or energy retailers discriminatory rates for use of the local distribution network relative to rates they charge their own customers. Thus, there is a need for enhanced regulation at this level. Under this regime, distribution charges would ideally be levied on an unbundled basis and would be subject to some form of incentive-based regulation to mitigate the dual problems of potential monopoly pricing and potential discrimination between LDCs' own customers and other customers. Alternatively, distribution should be fully unbundled from the retail function through structural separation (as we have proposed in the natural gas industry), thus limiting the intensity of regulation required in preventing discriminatory pricing of distribution services and fostering effective competition in the retailing function.

Given the above analysis, we believe that the Ontario electricity industry should aspire, over the medium term, to the progressive adoption of Model 3, by in the short term adopting Model 2- accompanied by an announced phase-in of retail competition. It is important to emphasise that once Model 3 is accepted as a logical endpoint of reform, Model 2 is unlikely to persist as a stable equilibrium. If industrial and residential consumers are dissatisfied with the level of service being offered by monopoly distributing companies, they will, as was the case in the natural gas industry, press for the entry of alternative suppliers or perhaps even attempt to establish local buying groups that will vie for the local franchise. We also note that, unlike the U.S., the issue of retail and wholesale competition is less vexing because it does not implicate issues of federal distribution of power- the provinces' power over both wholesale and retail distribution appears to be well established.⁹²

These proposals attempt to keep regulatory involvement in the industry to a minimum and to utilise incentive-based regulation where regulation is necessary. Where regulation is required, we strongly favour reposing all industry-specific regulatory responsibilities in one external agency in order to more sharply focus the oversight process and to enhance institutional stability, continuity, memory and an integrated

91 Tiebout's model of inter-jurisdictional competition is beset by bundling or tied sales properties, i.e. citizens may find that their electricity rates are only a small portion of their total costs of carrying on a business or forming a household in a given jurisdiction and may therefore induce only muted voice in disciplining municipal politicians. See C. M. Tiebout, "A Pure Theory of Public Expenditures" (1956) 64 *Journal of Political Economics* 416. Indeed, for most Ontario industrials, electricity rates constitute only 2% of total production costs (unpublished data from Ontario Hydro).

92 In the United States, the Energy Policy Act of 1992 makes it clear that the FERC only has power over wholesale not retail markets, which is remitted to the states. In the Canadian natural gas industry, the province of Alberta prevented retail sales to the core market.

industry perspective that is forward-looking. It would also position the industry to compete internationally, by allowing generators and retailers the pricing flexibility needed in order to meet extra-provincial competition.

Nonetheless, given the experience with the deregulation of the Ontario natural gas industry, it is vital that the goals and stages of privatization and deregulation be designed and proclaimed clearly before the process is initiated. Moreover, elementary considerations of fairness and economic efficiency dictate that, at a minimum, former monopoly suppliers of electricity, as well as their new rivals, should be aware of the potential legal (and collateral economic) consequences of different forms of conduct in the new competitive environment.

The Macdonald Committee Report

The Macdonald Committee Report,⁹³ which was released in June 1996 follows some but not all of the guidelines proposed in this paper. The government of Ontario has not yet announced its reactions to the report.

The report recommends a phased process leading to a competitive electricity system. The first stage would be wholesale competition where electricity generators compete to supply power to electricity distributors and other large customers that demand 5 MW of power or more at one site. After a competitive wholesale power market is established and reliability is ensured, the report recommends moving to retail competition where electricity suppliers compete to supply power to all customers, including residential users.

In order to achieve a competitive marketplace, the report recommends structural separation of the three main segments of the electricity industry: generation, transmission and distribution. The report recommends that the current transmission assets of Ontario Hydro be owned by a Transmission Grid Company under the Ontario *Business Corporations Act*, which would apparently be initially state-owned and which would be responsible for maintaining and managing Ontario's high voltage transmission grid. The report emphasises the importance of open, non-discriminatory access to the transmission system by both suppliers and potential customers inside and outside Ontario. This condition will be enforced by a System Operator. The report notes that the natural monopoly represented by the transmission lines does not have to be owned by a single entity. It is feasible to have multiple owners of the transmission system, since the overall management of the system will be in the hands of the System Operator, and this body will be independent from any owners of transmission facilities. As for tariffs, the report supports a constraint-related charge being levied on generators to reflect the costs of transmitting electricity from a specific generation location to demand locations. However, these "location signals" should affect generators, not customers. It also recommends incentive-based regulation of transmission tariffs.

As for electricity generation, the report recommends that Ontario Hydro's

93 The report of the Advisory Committee on Competition in Ontario's Electricity system to the Ontario Minister of Environment and Energy, "A Framework for Competition" (May 1996).

monopoly in generation be dissolved and competition be introduced into the generation sector as soon as possible. The hydroelectric facilities should be grouped by river system and sold off to private investors. Private equity should also be introduced into the fossil fuel generation assets which would be separated into distinct operating entities. The report does not specify the exact division of these generation facilities into separate companies. However, it recommends that dispersion of ownership be implemented so as to prevent any one company from being able to exercise undue market power. However, public ownership over the hydroelectric generation assets on the Niagara River as well as over the nuclear generation plants would remain. In order to introduce more competition, the nuclear generating facilities would be divided into four different entities (two at each of the Bruce and Darlington sites, and one at the Pickering site). This division, the report argues, will "advance the competitive spirit". However, due to planning and maintenance economies, the division should enable continued coordination between the nuclear generation entities and thus it is recommended that they be retained under a single (state) owner. We are quite sceptical about the "competitive spirit" that might develop as a result of the proposed structure. Rather, the single ownership and the coordination of activities would make it easier for the "separate entities" to coordinate their conduct. Also we do not believe that "public sentiments" should justify leaving the Niagara River hydroelectric plants in public ownership. As recommended above, public ownership over the water power can be translated into economical rates for water rental instead of the operation of the plants themselves.

The report also recommends creating a "level playing field" for electricity generators in Ontario. This necessitates equal treatment of all participants by applying a consistent set of rules, especially where both publicly-owned and privately-owned generators are competing for customers. This entails, *inter alia*, that publicly-owned generating entities operate in a commercial manner and should be required to make payments that reflect the same fiscal conditions under which private companies are obliged to operate. For example, they must be required to pay grants equivalent to provincial and federal income taxes; capital and large corporation provincial taxes; grants equivalent to property taxes; borrow at commercial rates, with interest paid as though they were private companies; etc.

As for the distribution system, the report recommends that existing MEUs should rationalise themselves not only to reduce their numbers, but also to expand their territories to ensure that service is provided to all Ontarians. Ontario Hydro's distribution and retail function should be absorbed into the local distribution systems which, although in public ownership, would be given all powers of corporate bodies under the *Business Corporations Act*. Under wholesale competition, the local distribution companies will continue to have a monopoly over the retail function. However, under retail competition, they will be required to provide open and non-discriminatory access to all independent retailers. In order to achieve this goal, the report recommends that distributors should be directed to keep separate their competitive and non-competitive activities by using accounting measures. As noted

above, we are sceptical about the efficacy of such "accounting separation" in preventing cross-subsidies and anti-competitive behaviour. Rather, we believe that more drastic separation of the retail and distribution functions is necessary. As for distribution tariffs, the report recommends the introduction of incentive-based regulation.

In order to operate the marketplace for electricity, the report recommends that an independent agency, the System Operator, be established. The System Operator would dispatch electricity over the transmission system, oversee the delivery and coordination of electricity supplies in the province, and ensure security of supply. This Operator would be an independent non-profit agency, with the ability to recover justifiable costs incurred in the course of its business. In addition, an Electricity Exchange would be established. Members would include all those entities — generators, energy service companies, specified purchasers, ABMs — that wish to supply or purchase electricity through the Ontario transmission system. Like the System Operator, it would also be a non-profit entity, with the ability to recover justifiable costs incurred in the course of its business.

As for the regulatory framework for the electricity industry, the report recommends new legislation setting out the framework for Ontario's electricity system, which would be of a policy nature only. Such legislation would formalise the legal de-integration of Ontario Hydro, create a new regulatory system, and set in motion the competitive process for the electricity system. However, such legislation should allow for flexible, responsive supervision of the emerging competitive electricity market and the ability to make rapid corrections.

The report recommends that during the transition to competition restructuring will require some degree of regulatory oversight of all market activities from generation to transmission to distribution. Once the transition period comes to an end, the regulator will require legislative authority to regulate in a number of areas, including the monopoly elements of electricity transmission and distribution. It will also require a residual power to receive and resolve complaints that any provider of electricity or electricity services is doing, or failing to do, anything that is prohibited or required by law, regulatory policy or practice. As suggested by the report, "The mere fact that these powers exist could deter much of the anti-competitive conduct."⁹⁴ It recommends that the Ontario Energy Board, which has regulated to date aspects of the electricity and natural gas industries, be given the responsibility for regulating the electricity industry in Ontario, according to powers vested in it by amendments to the *Ontario Energy Board Act*. The recommendations regarding the functioning of the OEB as the regulatory body would enhance future possibilities of "converging technologies" and would be a step towards consistent treatment of the two industries. The report recommends that the federal *Competition Act* be applied parallel to regulatory oversight of generation prices, which would ensure that the participants do not exercise market power. Ultimately, when "Ontario has a vigorous, effective and fully functional competitive market in electricity generation"⁹⁵ there will be no need for the regulator to

94 Ibid p. 99.

95 Ibid p. 104.

oversee generation prices. Accordingly, "the Province should not rely exclusively on competition law and federal enforcement in introducing competition into Ontario's electricity system. In our opinion, the federal competition law should be complementary to, and not an alternative to, appropriate provincial regulation."⁹⁶ We are not persuaded by these last recommendations and believe that in the generation segment the *Competition Act* should be applied exclusively from the outset. We believe that the recommended "two layers" of regulation will be problematic. First, such regulation would create a duplication of resources. Such duplication, apart from creating inefficiencies, might raise concerns regarding the fairness of being subject to two independent proceedings. Second, the competition authorities' expertise suggests that they are better suited to regulate potentially competitive markets. Third, such "two-layered" regulation creates a lack of clarity which is an essential condition for a swift and efficient transition. For example, investors may be disinclined to invest in generating facilities if it is not clear which set of rules will apply to their conduct. In contrast, vesting of oversight responsibilities within a single agency will serve to eliminate inconsistencies that might otherwise arise from the possible application of different criteria by the two regulatory bodies. Instead, other mechanisms that would allow the province to take an active role in ensuring that the emerging competitive market in electricity generation does materialise should be implemented. For example, the provincial government might be given a right of access to the Competition Tribunal.

Conclusions

The course of evolution in the natural gas industry has almost precisely followed the path outlined above for the electricity industry. Natural gas producers now compete among themselves to supply under contract both local distribution companies and retail customers or intermediaries acting on the latter's behalf. The investor-owned interprovincial pipelines operate as common carriers, subject to rate regulation, and the local distribution companies (local investor-owned gas utilities) compete with other natural gas retailers for final customers' business, with distribution charges for use of the local network being subject to regulation to preclude the imposition of either monopolistic or discriminatory charges. The next step is to de-integrate (separate) the retail and distribution functions of the LDCs. The electricity industry in Ontario should evolve generally in a similar direction, and over a time frame not radically different from that which has obtained in the natural gas industry. Nonetheless, some of the difficulties encountered in the course of natural gas deregulation can, and should, be anticipated and addressed. For example, de-integration of the distribution and retailing functions should be provided for from the outset.

As we have emphasised throughout this chapter, no single regulatory or market regime for network industries is optimal. Rather each regime has its own set of costs and benefits. Vertical integration and free competition are in large measure alternatives to one another. The first, by eliminating most of the obstacles to realising vertical

96 Ibid.

economies (financial, coordination or informational) offers the possibility of important efficiency gains. On the other hand, where associated with market power, it seriously weakens competitive vigour by creating obstacles to the rivalry of outside parties. Competition enhances efficiency by supplying powerful stimuli to dynamic improvements, while however forfeiting some vertical economies. Also, some horizontal economies may be forfeited when production plants operated by similar technologies are owned by different market players; regulatory costs are also increased where sector-specific regulation is implemented.

The key to efficient regulation lies in finding the right balance between these competing considerations. The solution lies in a combination of regulatory and structural changes. Under our proposals, structural separation (de-integration) should be used extensively. Production should be separated from transportation, and distribution should be separated from retailing. De-integration would eliminate the incentives for self-dealing in vertically integrated firms which distort competition and are almost impossible to control. Nonetheless, other regulatory tools—such as long-term flexible contracts—should be used to minimise transaction costs resulting from loss of vertical economies.

We have also attempted to keep regulatory involvement in these industries to a minimum. Whenever competition becomes sufficiently powerful to protect the legitimate interests of both customers and related firms, the potentially competitive industry segment should be granted full freedom from regulation, subject only to surveillance by the general competition authorities to ensure that market forces are operating as intended.⁹⁷ Accordingly, the production and retailing functions, being potentially competitive, should principally be regulated, like all other competitive markets in Canada, by the *Competition Act*.

In the non-competitive segments of the electricity and natural gas, the proper role for regulation is that of a substitute for competitive market forces. The regulator's task then becomes a two-part undertaking: first, to determine the rules of behaviour that the regulated firm could have been expected to follow if it had operated free of regulation in a market with fully effective competitive forces; second, to constrain the regulated firm to behave as it would in such a competitive market, and to circumscribe its behaviour no less and no more than this. The regulator should restrict its decisions to such behaviour. A regulated firm should be left free to pursue any course of action that effective market forces would have permitted, had they been present. We have also emphasised the need for assuring that market-type incentives drive the industry to operate efficiently and minimise transaction costs resulting from the break-up of vertical economies. As we suggested above, grid regulation should involve access to the grid, including *inter alia* access terms and pricing as well as grid capacity and maintenance. Such regulation should ensure that access terms are non-discriminatory and are likely to enhance efficient use of the grid. The grid should also be subject to regulatory oversight regarding its interconnection with other pipelines or transmission lines or, in the case of natural gas, with storage facilities, especially where such interconnection might erode

⁹⁷ For a similar conclusion in telecommunications see Baumol and Sidak, *supra* note 6, p. 4–5.

the natural monopoly's monopoly power. It is also important that access pricing to the network be transparent. We also suggest that a specialised regulator oversee the operation of the electricity power pool.⁹⁸

The principal focus of the competition authorities is likely to be on the following issues. First, horizontal mergers in the production segment of the electricity industry will likely be an on going concern, given the high levels of concentration likely to exist in this segment. However, such mergers will be of less concern in the natural gas industry's production segment which is highly dispersed. Second, horizontal mergers between retail companies may raise competition issues. Such mergers are more likely to raise competition concerns if functional separation of the retail and distribution functions is implemented (as in our more modest proposal for the deregulation of the natural gas industry) than if complete separation through divestiture of the two functions is implemented (the more radical proposal), since barriers to entry into the retail function will be higher under functional separation than under complete separation. Third, horizontal mergers between distribution companies are likely to raise minor concerns, especially in the electricity industry given the need for major rationalisation in this sector. On the other hand, mergers between the three existing LDCs which operate in the distribution segment of the Ontario natural gas industry (two of which are owned by the same parent company) may reduce yardstick competition and may prevent the regulator from relying on readily available cost benchmarks if such benchmarks are unavailable from other distribution companies operating in other jurisdictions (e.g. given differences in the regulatory regimes or differences in other features of these jurisdictions). However, it is questionable whether the current powers of the competition authorities enable them to prevent such mergers on yardstick competition grounds.

Fourth, vertical mergers are also likely to raise serious competition issues. While vertical mergers have generally attracted little concern from competition authorities in other contexts, vertical integration in the natural gas and electricity industries runs the risk of re-creating the non-competitive, vertically integrated industry structure that has

98 In Britain, the transmission and distribution charges are subject to regulation by the sector-specific regulatory bodies (in electricity the Director General of Electricity Supply and the Office of Electricity Regulation (OFFER); and in the gas industry the Director-General of Gas Supply and the Office of Gas Supply (OFGAS)). In addition, these sector-specific regulatory bodies may establish price controls in markets where competition is weak. See, for example, Vickers and Yarrow, *supra* note 2, chapter 9. Where a license condition is to be changed or there is a fair-trading offence, there is a right of appeal to the Monopolies and Mergers Commission ("MMC"). This arrangement implies that an appeal lies from one discretionary regulatory body to another. Foster argues that because the MMC is not a court and is comparatively informal in its procedures this should avoid excessive legalism in this area. C.D. Foster, "Privatization, Public Ownership and the Regulation of Natural Monopoly" (Oxford, UK: Blackwell, 1992), p.281-287. For example, the MMC succeeded in forcing British Gas to abandon its practice of price discrimination in access charges. Foster, p.132; Trefor Jones, "Privatization and Market Structure in the U.K. Gas Industry", in Thomas Clarke and Christos Pitelis (eds.), *The Political Economy of Privatization* (London: Routledge, 1993), p. 108. The biggest disadvantage of this arrangement lies in the fact that the competition authorities do not possess any comparative advantage in issues regarding the efficient setting of interconnection terms.

represented the traditional status quo. While vertical mergers may create economies of scale or scope, most vertical mergers nonetheless suffer from the economic trade-offs inherent in the integrated industry structure, mainly market foreclosure. Perhaps industry-specific regulatory policies prohibiting vertical mergers from the outset would reduce uncertainties in this respect, although at least in the natural gas industry these seem likely to be a matter of federal jurisdiction while in the electricity industry they are arguably a matter of provincial legislation. In the absence of such rules, an on-going concern of the competition authorities is likely to involve vertical mergers between generators and local distribution companies. Such mergers may reduce competition, as exemplified by recent British experience where the Monopolies and Mergers Commission approved acquisitions by the two major privatised generators of regional distribution companies, but was overruled by the Secretary of State. Had these mergers been approved, they would have allowed Britain's two major generating companies to take-over Britain's second and third largest regional electricity companies, and would have constituted a step backward from one of the key features of the British privatization, namely separation of electricity generation from distribution and supply which was designed to ensure that generators had to compete to find buyers for their electricity. As the British regulator who opposed these merger pointed out, such vertical mergers would have allowed the generators to secure captive outlets for their electricity and would thus have reduced competition in both generation and supply. In addition, such mergers would have served to discourage new entrants into the domestic market and would have increased the generators' incentive to control prices in the electricity pool. Also license conditions designed to prevent cross-subsidies and price discrimination would have been difficult to enforce if contracts previously negotiated on a commercial basis between separately owned companies were replaced by internal arrangements within a single company.⁹⁹

A fifth and related issue likely to confront the competition authorities involves vertical mergers between the grid and generation companies. Problems of foreclosure and self-dealing are likely to arise if the privatised transmission grid were to attempt to acquire upstream generators. Vertical mergers between the grid and distribution companies, on the other hand, are unlikely to raise serious competitive issues if retailing and distribution functions are completely separated. On the other hand, if only functional separation between the retailing and distribution functions is implemented, such mergers should be closely regulated, since problems of foreclosure and self-dealing are again likely to arise. In the natural gas industry regulatory oversight is also necessary of mergers between companies who own storage facilities and companies operating in other segments of the industry (especially the retailing function). Competitive concerns with such mergers arise mainly because of the current structure of the grid's access pricing. As noted above, the fixed capacity demand charges of the grid have to be paid even when low loads mean that little gas actually needs to be shipped. Thus, seasonal and peak fluctuations are better handled by downstream gas-storage facilities located in Ontario. Mergers between retailing and storage companies may

99 *The Economist*, supra note 27.

foreclose the use of the storage facilities by other retailers and thus reduce competition.

Sixth, as technological developments allow for convergence between the electricity and natural gas industries, the competition authorities may also have to contend with mergers between firms operating in the electricity industry and firms operating in the natural gas industry, especially with respect to distribution and retailing functions. Without complete separation of these functions, market power in the retailing function with respect to gas and electricity could arise through such mergers, viewing these two commodities as substitutes.

Seventh, potential tacit or explicit collusion between market participants in the electricity and/or in the natural gas industry is likely to raise yet another set of competition issues (especially in electricity generation, given the inherently concentrated nature of this market and an undifferentiated product).

Finally, allegations of predatory pricing or abuse of dominance by dominant firms in the production and retailing segments of the industries may raise yet another set of competition issues. If nuclear facilities are left in public ownership, market dominance may attract allegations of predatory pricing from competing generators especially if the nuclear generators price their power down to its short-run marginal costs, treating their fixed costs as sunk. Whether this should be viewed as predatory is not obvious if one assumes that the nuclear assets should not be replaced at the end of their useful life, although such a pricing strategy is likely to deter new "greenfield" entrants whose average total costs exceed the short-run marginal costs of the nuclear facilities (whose variable costs are a trivial proportion of average total costs). Such a pricing strategy seems to fall into the "grey zone" of the Areeda-Turner predatory-pricing test¹⁰⁰ and the Bureau of Competition's predatory-pricing test in its Predatory Pricing Enforcement Guidelines¹⁰¹, since prices will likely be set above marginal cost but below average total cost. This issue can be resolved if the decision regarding the write-off of the nuclear facilities' debts is made at the time of deregulation of the industry, making clear that recovery of all fixed costs is not contemplated. Predatory pricing allegations may also arise in the retail segment, especially if the distribution companies continue to possess market power in the retailing function (as is currently the case in natural gas). Cross-subsidies between the distribution and retailing functions may lead to claims by ABMs of predation by the local distribution-retailing companies. If predatory pricing is made possible by such cross-subsidies, such allegations are best dealt with by sector-specific regulatory bodies which regulate the natural monopoly segments of the industry. To the extent that allegations of predation in the retailing function are not predicated on cross-subsidies, such allegations should be reviewed by the federal competition authorities.

100 P. Areeda and D.F. Turner, "Predatory Pricing and Related Practices under Section 2 of the Sherman Act" (1974-5) 88 *Harvard Law Review* 697. Their predatory pricing test initially exempts as non-predatory, *inter alia*, prices greater than or equal to reasonably anticipated marginal cost.

101 *Predatory Pricing Enforcement Guidelines*, Director of Investigation and Research (1992). According to the Guidelines, "a price set at or above the average total cost of the alleged predator will not be regarded as 'unreasonably low' by the Director . . . A price set below the average variable cost of the alleged predator is likely to be regarded as 'unreasonably low' by the Director, unless there is a clear justification such as the need to sell off perishable inventory", p. 10.

It should be pointed out that some commentators would assign an even more ambitious role for the *Competition Act* in regulating network industries¹⁰² and, in particular, the interface between the competitive and natural monopoly segments of the industry (i.e. terms of access to bottleneck facilities). We reject this view. The *Competition Act* is not designed to regulate the conduct of the natural monopoly segments of the network industries. Access charges and other terms of access require specialised on-going regulatory supervision (and price regulation) of a kind that general competition authorities are not well-equipped to play either in terms of their legal powers or their personnel.¹⁰³

The theory underlying competition laws involves a model of workable competition which assumes that where the conditions which allow for competition are present (e.g. several existing or potential competitors, low barriers to entry etc.), there is little need for government intervention in the market place. Competition laws seek to create and maintain market environments that enhance the competitive process.¹⁰⁴ Accordingly, the primary task of the *Competition Act* is to prevent the development or exercise of market power that might threaten the competitive functioning of markets.¹⁰⁵ As such, its domain is intrinsically limited. Market forces are, by definition, ineffective in controlling natural monopolies.¹⁰⁶

Further, even if the language of the Act could be interpreted as applying to natural monopolies, the remedies that may be issued by the Competition Tribunal are ill-adapted to achieve efficient outcomes, in particular, preventing a natural monopoly from abusing its monopoly power by charging supra-competitive access rates. Given the economic theory on which the Act is based, it is not surprising that it does not contain any specific provision that prohibits abuse of monopoly power by way of extracting monopoly rents. Sections 78 and 79 of the Act deal with abuse of dominant position.¹⁰⁷ Although the statutory list of anti-competitive practices does not include charging monopoly prices, it can be argued that since the list is non-exhaustive¹⁰⁸ such conduct comes within their scope to the extent that excessive access charges may have exclusionary effects. However, even assuming that the sections apply, the remedies that

102 Lawson A, W. Hunter, Susan M. Hutton, Mirko Bibic, Jonathan Daniels, Mirelle Tabib and Nina Norregaard, "All We Are Saying, Is Give Competition A Chance — The Role of Competition Policy in Industries in Transition from Regulation to Competition" (given in a conference The Competition Act Ten Years On: A Stock-Taking, University of Toronto Law School, December, 1995) p. 63.

103 Iain C. Scott, "Allocating Regulatory Jurisdiction in the Canadian Telecommunications Industry" (Competition Law and Deregulation in Network Industries, Conference, University of Toronto Law School, June 14, 1996).

104 Phillip Areeda and Louis Kaplow, *Antitrust Analysis, Problems, Text, Cases* (Boston: Little, Brown and Company, 1988, 4th ed.), p. 13.

105 Viscusi et al, *supra* note 4, p. vii.

106 Areeda and Kaplow, *supra* note 104, p. 10–11.

107 The refusal to deal provision (s 75 of the *Competition Act*) might also be invoked. However, its suitability to regulate the rates charged by the natural monopolist is even more questionable than the suitability of s 78 and 79 of the Act. For example, it is not clear what the term "usual trade terms" on which the supplier can be mandated to supply his product mean in the natural monopoly context.

108 *Director of Investigation and Research v. Nutrasweet Co* (1990) 62 C.P.R.(3d).

can be ordered by the Competition Tribunal are not well adapted to preventing the natural monopolist from charging monopoly prices on an on-going basis. The Act deals with abuse of dominance situations either by preventing growth of firms into monopolies or by breaking-up existing monopolies when this is necessary in order to prevent them from abusing their monopoly power. Remedies may relate to industry structure, as well as to conduct. Structural remedies are not appropriate in the case of natural monopolies, where the existing industry structure is already the most efficient possible. Any structural changes would only reduce economic efficiency. Although the Tribunal is empowered to issue conduct-related orders, these can effectively be used only in one-episode conduct rather than on-going behaviour. In this case, on-going extensive industry-specific conduct regulation is needed. In contrast to the *Competition Act*, economic regulation generally recognises that market concentration is not only inevitable, but in many cases is a superior market structure for the particular market. The intent is then to place limits on the conduct of the firms in the market so as to limit the exercise of market power. The rules are, necessarily, sector-specific, since such regulation is based on the specific performance of the regulated firm, usually without any competitive benchmark.

We cannot conclude our paper without referring, albeit briefly, to the New Zealand and Australian experience in regulating another network industry: the telecommunications industry which is similar, in many respects, to the electricity and natural gas industries. In New Zealand, the Government introduced a "light-handed" regulatory regime, coupled with privatization, while in Australia a sector-specific regulatory regime was adopted. The New Zealand Government decided against creating an industry-specific regulatory body. Nevertheless, some sector-specific constraints were retained. The most important of these (the Telecommunications (Disclosure) Regulations 1990/120) requires Telecom New Zealand ("TCNZ") to retrospectively disclose discounts granted from its standard tariffs. At the same time, in privatising TCNZ, the Government wrote into the new company's Articles of Association provisions aimed at ensuring that ordinary residential telephone service would continue to be made as widely available as before privatization, and that rentals not be increased in real terms, provided that this did not "unreasonably impair" TCNZ's profitability. These "pledges" were to be enforced by the Minister of Finance, acting on behalf of the Crown, as the designated holder of a "Kiwi Share" empowered to veto changes in the Corporation's Articles.

The industry-specific regulations did not, however, extend to the terms on which TCNZ was to provide competitors with access to its network or to the manner in which it could price its services in response to competition. Rather, in the "light-handed" approach adopted, the industry was to be treated like any other and made fully subject to the provisions of the *Commerce Act 1986* (the framework competition statute). The Government's view was that these provisions would be sufficient to achieve the objectives of deregulation; if matters proved otherwise, it retained the option of imposing more direct controls.

In contrast, in Australia most of the telecommunications market was not opened to

competition. Moreover, Telecom Australia was allowed to participate in both the monopoly and the competitive segments of the industry. As a result, the scope for abuse of market power required more direct and pro-active supervision than could be exercised under the Australian Competition Law — the *Trade Practices Act*. The result was a relatively complex piece of sector-specific legislation, along with a sector-specific agency — AUSTEL — responsible for implementing the regulatory aspects of the new regime.

Chapter 5 of this book, a study by Ergas shows that while costs of regulation were much higher in Australia than in New Zealand, TCNZ has performed much better than the Australian industry on various surveyed indicators: productivity, consumer prices, service universability, profits and the state of competition.¹⁰⁹ However, several cautionary points must be made regarding the implications of the study, especially with regard to the suitability of competition laws to regulate all aspects of network industries:

- (i) The study focuses on the telecommunications industry. While many of the characteristics and conditions present in the natural gas and electricity industries are also present in the telecommunications industry, some differences between these industries are of crucial importance. The most important difference regards the extent to which technological innovations have succeeded in eroding the natural monopoly elements of the industry. While the transmission and distribution segments of the electricity and natural gas industry cannot be economically duplicated, in the telecommunications industry competition can be introduced even in the local loops, which were considered the “last resort” of natural monopoly in the telecommunications industry.¹¹⁰
- (ii) The study compares the New Zealand approach to the Australian approach which is, according to the author of the study, inherently flawed. For example, the absence of structural separation of the monopoly and competitive segments of the industry created a need for direct and pro-active supervision. It does not, however, contain any “objective” performance indicators.
- (iii) The New Zealand *Commerce Act* includes a number of important provisions which are not present in the Canadian *Competition Act*. For example, Part IV of the *Commerce Act* enables goods or services to be placed under direct price control by the Commerce Commission where the Minister determines that there is limited competition in the market and it is necessary or desirable for prices to be controlled in the interests of users, consumers or suppliers. Although this provision has never been used, it can be viewed as a threat which may constrain the pricing behaviour of dominant firms.

109 See further *infra* Comments by David Goddard.

110 See, for example, the papers in Steven Globerman, W. T. Stanbury, and Thomas A. Wilson (eds.), *The Future of Telecommunications Policy in Canada* (Bureau of Applied Research, Faculty of Commerce and Business Administration, University of British Columbia and Institute of Policy Analysis, University of Toronto, April 1995).

- (iv) The "Kiwi Share" Arrangement ensures some degree of universality of service.
- (v) The current New Zealand regulatory regime has led to extensive litigation between TCNZ and its competitors, which reached the Privy Council, regarding access costs to the network.¹¹¹ Such litigation was very time and resource intensive. This approach towards "defining the rules of the game" is very problematic, *inter alia* because the Privy Council, which resolved the issue, has limited institutional expertise on issues of access pricing. Also the Privy Council decision noted that Clear had not established that TCNZ's charges would be so high that Clear would be prevented from entering the market at all. This approach towards anti-competitive behaviour is not necessarily the appropriate approach where a natural monopoly is involved. Some commentators have also pointed out that the New Zealand regime has created uncertainty about legal limits on behaviour.
- (vi) It is noteworthy that Australia has recently taken some steps towards changing its regulatory regime. The new Part IIIA of the *Trade Practices Act* 1974 (Cth) had adopted a regulatory regime for third-party access to facilities which a competitor could not reasonably replicate in circumstances where such access would significantly increase competition. Accordingly, mandatory access may be required if and only if the following conditions are met: (a) access (or increased access) to the service would promote competition in at least one market other than the market for the service; (b) that it would be uneconomical for anyone to develop another facility to provide the service; (c) that the facility is of national significance, due to its size, importance to trade or commerce or to the national economy; (d) that access to the service can be provided without undue risk to human health or safety; (e) that access to the service is not already the subject of an effective access regime; (f) that access to the service would not be contrary to the public interest.¹¹² The Australian Consumer and Competition Commission can regulate access prices if the Minister directs it to do so. This provision which resembles in its conditions the American essential facilities doctrine,¹¹³ has not yet been invoked.

111 *Telecom Corporation of New Zealand Ltd. v. Clear Communications Ltd.* [1995] 1 NZLR 385 (PC); *Clear Communications Ltd. v. Telecom Corporation of New Zealand Ltd.* (1993) 3 NZBLC 99-321 (CA); *Clear Communications Ltd. v. Telecom Corporation of New Zealand Ltd.* (1992) 5 TCLR 166 (HC).

112 *Trade Practices Act* s 44G.

113 See, for example, Gregory Werden, "The Law and Economics of the Essential Facilities Doctrine" (1987) 32 *St. Louis University Law Journal* 433; William E. Kovacic, "The Antitrust Law and Economics of Essential Facilities in Public Utility Regulation" in Michael A. Crew (ed.) *Economic Innovations in Public Utility Regulation* (1992). The essential elements of the doctrine, as established in *MCI Communications Corp. v. AT&T* (708 F.2d 1081 (7th Cir.) (1983)) are as follows: (1) control of an essential facility by a monopolist; (2) a competitor's inability practically or reasonably to duplicate the

In sum, deregulation is vital for both the electricity and the natural gas industries in Ontario. Although major steps towards deregulation have been taken in the natural gas industry, further deregulation of the retail and distribution functions of the industry is necessary. Past experience and present difficulties in this industry should be used as guides in the privatization and deregulation of the electricity industry. In both industries, sector-specific regulatory bodies are required to regulate the natural monopoly segments of the industry and the interface between the competitive and natural monopoly segments of the industry, while general framework competition laws should address competitive conditions in the potentially competitive segments of these industries. As these two industries converge technologically and structurally, a consistent framework of regulatory and competition policies needs to be applied to them, given that gas and electricity as commodities are both close substitutes and also often complements. In electricity a leap of faith is required in assuming that the benefits of competition in generation and retailing will outweigh the loss of vertical economies of integration by ownership. The example of the de-integrated natural gas industry and its strong performance over recent years provides some confidence that this is not — literally or metaphorically — a leap in the dark.

essential facility; (3) the denial of the use of the facility to a competitor; and (4) the feasibility of providing the facility. In case these elements are established, the court may mandate that access to the essential facility be allowed to competitors on a non-discriminatory basis.

Comments on “Deregulation of Public Utilities: Experience of the Ontario Natural Gas and Electricity Industries”

Jim Holmes¹

Introduction

Australia now has substantial experience of public utility deregulation. The comments set out below have been drawn from the fields of telecommunications and electricity.

What is Deregulation?

Deregulation is the process of opening up an industry to competition, and allowing market forces to achieve outcomes — such as productive and allocative efficiency, technological advancement, service quality and product innovation — outcomes previously sought through other means such as public ownership and regulation. The process is widely confused with other processes, such as:

- privatisation
- liberalisation
- industry restructuring
- corporatisation of public enterprises

The confusion is not unexpected since these other processes may be put in place at the same time as deregulation as part of the overall policy mix.

The 1940s Model of Regulating Utilities

In Australia what I have called the 1940s model of utility regulation was widespread. It involved regulation through public ownership and Ministerial oversight of a vertically integrated enterprise in an infrastructural industry.² Public ownership and the political process were the means of ensuring such enterprises addressed the broad

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2 It is not by chance that such regulation might be regarded as the 1940s model, because this approach was perfected by the governments of the United Kingdom and related dominions as part of the great wave of post-War nationalisation and infrastructural expansion. In Australia, for example, the Commonwealth Government established the Overseas Telecommunications Commission as a publicly owned enterprise in 1946, and the Snowy Mountains Hydro-Electricity Authority in 1949. Both were good examples of regulation on the public ownership/vertical integration/Ministerial oversight model.

range of stakeholder interests and expectations — ranging from equitable, affordable and ubiquitous access to meeting a long list of corporate good citizenship goals such as employment conditions and local industry development.³ Such regulation typically lacks transparency, predictability and efficiency of outcomes, and accountability. From the description in the chapter by Trebilcock and Gal, Ontario Hydro sounds like a classic case of this form of anachronistic regulation. So was the State Electricity Commission of Victoria until 1993, and Telecom Australia until 1989.

Motivations for Deregulation

The motivations for deregulation of public utilities are various. In Australia they typically have arisen after a degree of maturity has been achieved in basic service provision. Such motivations include:

- (i) increased efficiencies: that is, removing the waste associated with loosely regulated public enterprises and lowering service costs to users;⁴
- (ii) improved service quality and diversity: that is, ensuring sustainable improvement through contestability;⁵
- (iii) private investment: that is, permitting private capital to displace public investment, or to take new investment risk that should not or cannot be borne by government;⁶
- (iv) ideological preference for competitive market models; and
- (v) monopoly failure.⁷

All of these factors were present to varying degrees in the case of telecommunications and Victorian electricity deregulation.

3 Entities conforming to this model of regulation and attempting to meet a seemingly unending and ever changing list of stakeholder expectations are characterised by a high degree of administrative discretion. It would be counter-productive for such entities to be subject to well articulated and finite lists of community service obligations which are dealt with in a transparent manner conducive to ready external scrutiny.

4 Among the General Objectives of the *Telecommunications Act 1991* (Cth), for example, are “ensuring that the standard telephone service is supplied as efficiently and economically as practicable” (s. 3(a)(i)) and “maximising the efficiency of the carriers” (s. 3(b)).

5 “Promoting the introduction of new and diverse telecommunications services”: *Telecommunications Act*, s. 3(f).

6 This was certainly part of the motivation for the precise way in which the deregulation of telecommunications carriage took place, with the second carrier licence going to a consortium that was prepared to pay a licence fee sufficient to enable discharge of the Commonwealth’s large and growing debt in relation to Aussat. Substantial State debt also governed in detail the arrangements accompanying the deregulation of the SECV.

7 Monopoly failure can take many forms. One form involves the inability of the monopoly enterprise to successfully meet the demand for service and service diversity that has been created, thereby requiring others to enter the industry to do so. Good examples of this may be found in Australian telecommunications in the 1980s when Telecom permitted increasing private participation in terminal equipment supply to meet the growing demands for diversity that it could not meet, particularly in the data communications and PABX markets. In the electricity supply industry capital constraints have forced the opening of generation to private investment in most States.

New Regulation (Re-regulation)

The opening of public utility industries to competition is and must be accompanied by new forms of regulation — or re-regulation — leading to the superficial irony that deregulation and re-regulation go hand in hand in the case of public utilities. Re-regulation at the very least involves the externalisation from Government of processes that were previously discharged within the utility organisation or as part of the political process involving the utility Minister concerned.

The opening up of utility industries to competition expands the range of players and stakeholders. Collectively they require that regulation becomes:

- independent of the players
- transparent
- articulated
- predictable and substantially rule-based.

AUSTEL and the Office of the Regulator-General generally meet these requirements in telecommunications and electricity, respectively.

Regulatory Design

In most deregulating utilities the former monopoly incumbents or their successors continue to have substantial market power. It will usually be insufficient for regulation to be in the hands of a general competition regulator — such as the ACCC — at least while competition is developing and fragile. Industry specific regulatory agencies are usually required so that close oversight can be given to the balances that need to be struck and made viable. This occurred in telecommunications with the formation of AUSTEL, and in electricity with the Office of the Regulator-General in Victoria.

Australian deregulation has been prepared to recognise the special circumstances of the early stages of competition in utility industries, and not to rely only on the forces of competition to work their way through with guidance only from general competition statutes, or the threat of litigation. The New Zealand model therefore — which eschews industry-specific regulation and regulatory agencies — has found little favour here. Australian deregulation has been prepared to use both specific regulatory agencies and a degree of structural reform to achieve sustainable competition.⁸

Regulatory design encompasses the rules to be applied by the regulatory agency and the scope, powers and processes to be exercised by that agency. Regulatory design in the

8 It may be argued that, in the case of telecommunications, the decision to enable Telecom to continue as a global carrier rather than to separate out competitive from monopoly operations (such as the local loop) shows that structural means of achieving industry reform were not preferred. On the other hand, the option adopted recognised that two general carriers would be able to generate early and viable competition across the full range of telecommunications markets. At that time, 1990/91, it was also recognised that to maximise arrangements for competition at the national level could well result in depleting the ability of Australian licensed carriers to compete in the rapidly developing telecommunications markets at a global level.

newly deregulated utilities cannot be determined in a vacuum. Regard must be had to a whole host of factors such as:

- (i) **Market Design and Structure.** New utility markets need to be structured to maximise the delivery of outcomes through competitive rivalry, rather than through the intervention of a regulator. In addition, legislative arrangements may be needed to ensure specific outcomes. In Australian telecommunications, the key interim arrangement was to limit carrier competition to enable one licensed competitor to Telecom to establish itself. The design choice was therefore to underwrite longer term competitive viability through limited initial deregulation rather than through allowing open entry at the outset. The result was that the regulator's tasks included the protection and promotion of competition through, inter alia, upholding carrier rights against third party intrusion.
- (ii) **Historical Burdens.** Deregulation, by definition, does not operate on a blank page. Long term debt, past investment and prior contracts, for example, continue to demand accommodation under the new regime. These elements were clearly present in deregulation of both the Victorian electricity industry and Australian telecommunications.
- (iii) **Community Service Obligations (CSOs).** The new industry and regulatory order must address CSOs. The cross subsidies that underpin most CSOs cannot survive without assistance in the new competitive order, where prices are driven closer to cost. The most obvious policy of on-budget compensation is seldom adopted. A telecommunications carrier contribution scheme based on local market share has been established by legislation to support the universal service CSO and the cross-subsidies that obligation entails in rural areas.⁹ In the case of the Victorian electricity industry, transmission charges have been confined within predetermined ranges to underpin the continued supply of electricity to rural and remote points at affordable prices.¹⁰
- (iv) **Agency Discretion.** Current Australian practice is for Governments to determine policy and for policy to be administered by relatively independent agencies in newly deregulated utility industries. Regulatory agencies have limited discretion, in theory, to extend or shape policy, unlike many of their American equivalents. In practice there are areas of apparently large regulatory discretion that are troublesome. For example, the ability of AUSTEL under the *Telecommunications Act 1994* (Cth) to develop and impose a Decision Making Framework for determining whether Telecom remained dominant in any particular market, and to do so in a way that diverged significantly from the well understood conceptual frameworks of Trade Practices Law, was a dangerous discretionary excess. Another

9 Assessment, Collection and Distribution of Universal Service Levy — *Telecommunications Act*, Part 13. This scheme has been hailed as a world model, but is heavy on administrative time and costs.

10 See the Tariff Order, 20 July, 1995.

example, present in virtually all legislative schemes is that the balance of priorities amongst competing industry objectives is left substantially with the regulatory agency without material guidance or supervision on the trade-offs that are needed.

- (v) **Regulatory Accountability.** How are agencies made responsible or held accountable? Invariably some, albeit limited, appeal mechanisms exist. At the least, judicial review can curb activity beyond power. On the other hand, few regulatory designers wish to encourage judicial review of the merits of regulatory decisions and to thereby destabilise the regulatory scheme as a whole through interstitial intervention by the courts. The dilemma for regulatory design is to make regulatory agencies accountable without increasing cost, uncertainty and gaming through ready appeal to other tribunals or to the courts.
- (vi) **Industry Needs.** Regulatory design should value certainty, and to recognise that predictability will reduce regulatory risk and associated cost, and will aid the process of sensible investment.

Lessons from Australian Telecommunications and Electricity Deregulation

The following lessons can be drawn from the Australian experience of deregulation in the telecommunications and electricity industries, so far:

- (i) In all infrastructural industries the major contest that must be quickly settled by regulatory means will be over the price and other terms of access to essential (bottleneck) facilities — specifically, for example, to local telecommunications networks and to electricity transmission and distribution networks. Part IIIA of the *Trade Practices Act*, dealing with Access to Services, has yet to be tested, however.
- (ii) Regulatory style is very important. Regulators have clear tendencies to amass whatever powers they can, and to plead for the discretion and the flexibility they regard as necessary to address the task they have been given. The notion of light-handed regulation is something of a myth, unless the regulatory agency is constrained by the procedures in enabling legislation to limit intervention. The threat of intervention by suitably armed regulators usually has the effect of ensuring a degree of compliance, and it is this threatening posture, without formal exercise of powers, that usually passes for light-handed regulation.
- (iii) Economies of scope in vertically integrated public utilities are invariably not fully realised, and the prospect of their loss through the restructuring of deregulation should be at least partly discounted. This observation would suggest that more use should be made of structural mechanisms to effect utility deregulation, provided other public benefits are not thereby sacrificed.¹¹

11 As in the case of telecommunications deregulation — see *supra* note 8.

- (iv) Large users expect to be able to negotiate good deals at the expense of users in general and can be relied upon to oppose regulatory prescription on prices and well-defined non-discrimination rules.¹² On the other hand price inflexibility and averaging can lead to uneconomic bypass, and the start of a 'death spiral'.
- (v) Regulatory agendas are too easily defocused as regulators pursue immediate issues, particularly those of media interest and subject to referral to the agency by the responsible Minister. It is important not to over burden economic regulators with case work associated with individual consumer protection cases.¹³
- (vi) Legislators must get better at setting in enabling statutes appropriate regulatory agendas and trade-offs to guide regulatory agencies in balancing regulatory goals and setting priorities for the attention of their finite resources. The envelopes of regulatory authority and discretion need to be better defined in the process.
- (vii) Industry restructuring and market mechanisms should be maximised as means of achieving preferred market outcomes, rather than reliance on regulatory intervention. On the other hand, the value of industry-specific regulation and regulatory agencies in the early period of deregulation, has been recognised.

12 As in the case of the opposition by the Business Council of Australia, representing very large electricity users in industry, to the level of prescription in Chapter 6, on transmission pricing and regulatory price setting, of the Draft National Electricity Code released for public comment on 1 March, 1996, by the National Grid Management Council.

13 A good example of this need is the excessive attention that AUSTEL gave to individual access CSO cases in the first years of its operation, before the creation of a separate Telecommunications Industry Ombudsman.¹² As in the case of the opposition by the Business Council of Australia, representing very large electricity users in industry, to the level of prescription in Chapter 6, on transmission pricing and regulatory price setting, of the Draft National Electricity Code released for public comment on 1 March, 1996, by the National Grid Management Council.

Comments on “Deregulation of Public Utilities: Experience of the Ontario Natural Gas and Electricity Industries”

Philip Williams¹

The Bottleneck Problem and Access Pricing

These remarks will address only one aspect of the Trebilcock and Gal chapter: the so-called bottleneck problem. The problem arises in many deregulated public utilities. In essence, it can be characterised as follows: An enterprise has monopoly control over one section of a production process. This section of monopoly control is called the bottleneck. The enterprise also has operations downstream (or upstream) from the bottleneck section. But, in contrast to the bottleneck, the enterprise faces competition in these downstream (or upstream) operations. The problem is that the downstream competitor is forced to purchase input goods or services from the enterprise that controls the bottleneck process. If the competition is in the upstream process, the competitor is forced to sell its output to its competitor — who controls the bottleneck.

One solution to this bottleneck problem is to control the price that the controller of the bottleneck charges for access to the service that is provided by the bottleneck facility. This is the solution proposed by the regime of the new Part IIIA of the *Trade Practices Act*.² It attempts to deal with the problem of the upstream bottleneck which supplies competitive enterprises downstream. (Of course it does not deal with the problem of competitive enterprises upstream which have to supply a bottleneck purchaser).

The bottleneck problem arises in deregulated public utilities because of real or perceived natural monopolies.³ In particular, the local distribution networks in water, gas, electricity and telecommunications are often thought to be natural monopolies. Because, by definition, the natural monopoly is most-efficiently supplied by one enterprise, this enterprise controls the bottleneck in a production process.

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2 This approach, however, raises the big problem of what capital costs to include. See further the chapter by Stephen King, “Asset Valuation and Access to Essential Industries Under Part IIIA of the Trade Practices Act 1974 (Cth)” (prepared for the ACCC, 1996).

3 A natural monopoly may be defined as market whose output can be most cheaply produced by only one enterprise. See W W Sharkey, *The Theory of Natural Monopoly* (Cambridge University Press, 1982) at 2.

Structural Separation

As Trebilcock and Gal show in their chapter, regulation of pricing is only one possible solution to the bottleneck problem. Another solution is quantitative constraints — as when the U.S. Federal Communications Commission mandates that telecommunications carriers sell a certain proportion of their capacity to their downstream competitors. Yet another solution is structural separation.

The classic example of structural separation is the U.S. telecommunications industry following the Modification of Final Judgment in *U.S. v A.T.&T.* (1982) that led to competition on trunk services and local monopolies in the local loops. The local monopolists are not allowed to compete in the provision of trunk services, so the trunk providers do not have to deal with their competitors when they negotiate with the local loops to complete the trunk calls.

The point of this comment is that structural separation is a more-appealing solution to the bottleneck problem than is suggested by Trebilcock and Gal. The great advantage of structural separation is that it avoids the insuperable problems posed by attempts to regulate the prices that should be charged (or paid) by the controller of the bottleneck.

The Alleged Cost of Structural Separation

The Trebilcock and Gal chapter argues that structural separation yields costs in terms of forgone vertical economies of scope. Economies of scale are cost reductions from combining operations that are similar. Economies of scope are cost reductions from combining operations that are different. Economies of scale or scope that are large compared with total demand for the services produce natural monopolies.

The proposition that structural separation may impose costs in terms of forgone economies of scale or scope is based on a mistake of logic. Although this mistake is common, it is to be found in the chapter by Trebilcock and Gal. The mistake can be seen by writing the argument baldly in the form of three propositions:

- (i) some production processes involve stages that are naturally monopolistic and other stages where multiple providers are possible;
- (ii) structural separation involves prohibiting those who control the natural monopoly bottlenecks from operating in the segments that are not natural monopolies; and
- (iii) the cost of structural separation is that one forgoes access to vertical economies of scope.

The logical error can be seen by contrasting propositions (i) and (iii). If the vertical stages are linked by significant economies of scope — as is supposed by proposition (iii) — then the two stages constitute a single natural monopoly. And if the two stages involve a single natural monopoly then, according to propositions (i) and (iii), they should not be separated. In brief, providing the natural monopolies are not divided among enterprises, forgone economies of scope cannot be a cost of structural separation.

Bottlenecks in Local Distribution

Trebilcock and Gal discuss the problem caused by enterprises which control local distribution networks (LDCs) also competing in retailing (the merchant function). This is a problem that bedevils deregulated electricity industries in Australia. The electricity retailers are forced to deal with local distribution companies — who are also competing in the retailing market.

This is an example of a bottleneck problem that Australia could have avoided by imposing structural separation when the deregulated model was established. Let us hope that the same mistake is not repeated when we decide upon models for our deregulated gas industry. Local gas distribution almost certainly involves significant economies of scale and scope. This means that competition in local distribution in, for example, the Melbourne metropolitan area is impossible. The optimal structure may be to have a, regulated, monopoly distribution company. This does not mean that gas merchants (retailing) should be under monopoly control. Indeed, to avoid the bottleneck problem, the monopoly distribution company should be prevented from competing in retailing. The monopoly distribution company should be regulated to charge the competitive retail segment prices which do not discriminate among the retailers.

Comments on “Deregulation of Public Utilities: Experience of the Ontario Natural Gas and Electricity Industries”

John Perham¹

Introduction

Trebilcock and Gal have commented on the structure of the gas and electricity industries in Ontario and the restructuring which has taken place within the gas industry. There is a very close analogy between the restructuring of the gas industry in Ontario and the restructuring of the electricity industry that has taken place in Victoria. However, to our advantage, Victoria has no nuclear power generation and has significantly better debt-equity ratios in all segments of the electricity industry. In addition, Victoria has experienced very little real labour unrest through the extensive restructuring that has taken place from the vertically integrated monopoly (the State Electricity Corporation of Victoria) to the completely disaggregated industry as it exists today.

Restructuring of the Victorian Electricity Industry

The restructuring of the electricity industry in Victoria took place in three distinct phases. In the first place the vertically integrated monopoly (SECV) was separated into three entities, Generation Victoria (Gen Vic); Distco (a business which consisted of the aggregation of all of the distribution elements of the industry) and Transco (a business which consisted of the high voltage transmission grid and associated switching equipment).

In phase 2, Distco took over the distribution elements of the industry which were still within the control of various local Government instrumentalities and then disaggregated the entire distribution business into five separately constituted businesses of approximately equal value but with largely different distribution and investment characteristics. Transco was then separated out into PowerNet Victoria (ie the State's high voltage grid) and a new company which was set up to establish the market in wholesale electricity (Victorian Power Exchange, VPX).

In phase 3, Gen Vic was separated into five generating entities, three brown coal-fired generating units, one gas-fired generating unit consisting of two separate operating elements and the hydro-electric generation capacity. The five distribution businesses were corporatised with well-developed business plans and as much historical

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information as could reasonably be ascribed to them from the integrated historical data available from SECV. Each distribution business was then prepared for privatisation. VPX, in turn, rapidly developed a wholesale market between the generating business and the distributors.

Benefits of Restructuring

The benefits which the State Government of Victoria sought to achieve through this restructuring process were:

- improved efficiency and cost reductions
- better price signals
- improved investment decisions
- lower prices for consumers
- independent regulation
- reduced Government risk

In addition, the distribution businesses were required to separate out their “wires business” from their electricity retail business so that these could be separately monitored by the independent regulator (the Office of the Regulator-General). This meant that the monopoly element of the distribution business was separated out from the contestable element and provided the opportunity for new retailers to enter a clearly contestable market.

The Victorian Gas Industry

Victoria still has a monopoly supplier in the gas business operating as a traditional monopoly utility. There are no significant interstate gas connections to a national grid network (although there is some limited connection between Victoria and New South Wales at Albury). Nevertheless, the Government is committed to restructuring of the gas industry and, unless a more effective model is developed, it is likely that the electricity model will be the basis for that restructuring. Therefore, the objectives will be to:

- (i) optimise competitive pressures and gain efficiencies at all levels;
- (ii) produce an environment which has the lowest long term sustainable prices.

On this basis, Victoria will need to have:

- (i) multiple suppliers;
- (ii) access to an integrated transmission network;
- (iii) direct access for large customers to suppliers;
- (iv) efficient distribution and expanded retail competition.

Commenting specifically on the ability to regulate the activity of distribution businesses with both monopoly and contestable functions, I am not yet convinced that accounting separation alone will provide an adequate environment for the elimination of cross subsidies between these two business activities and I would favour full legal separation (and ownership) as the more effective (and long term) solution for this particular problem area.

Finally, on the issue about privatisation of the high-voltage grid, I would be cautious in proceeding on this matter. The situation in Victoria is certainly different from that which prevailed in the UK prior to the national grid being privatised. In that instance, the UK REC's each had approximately 15 per cent of the national grid ownership allocated to them. This asset on their balance sheet was difficult to manage and it made some sense for all of them to recommend some form of disposal on a basis that a new monopoly could not be created.

In Victoria, ownership of the grid (ie PNV) remains with the Government at present. If it is to be privatised, I would favour a privatisation process which gave very wide distribution of ownership and a maximum holding per shareholder being enshrined in the articles for the first significant period of the companies life (ie for, say, ten years).

Comments on “Deregulation of Public Utilities: Experience of the Ontario Natural Gas and Electricity Industries”

David Goddard¹

Introduction: Taking Regulation Skeptically

The chapter by Professor Michael Trebilcock and Michael Gal on “Current issues in the Deregulation of the Ontario Electricity and Natural Gas Industries” contains many challenging and stimulating ideas. The chapter identifies the current challenge for public policy in the network industries as deregulation of competitive activities of the production segments of the network industries, while maintaining adequate regulatory safeguards over remaining natural monopoly facilities. Those safeguards, the chapter suggests, may take the form of:

- structural changes;
- special regulatory frameworks;
- general framework competition laws.

In this brief commentary, it is not possible to attempt to respond to all the material traversed, or even to engage in a detailed analysis of the principal thrust of the chapter.² I confine myself to a broad discussion at a level of principle of the second of these safeguards: special regulatory frameworks. My scepticism about the usefulness of such frameworks, and in particular of industry — specific regulators, may be seen by some as a parochial defence of New Zealand’s “light-handed regulation” approach to these issues. But there is little or no empirical evidence that industry regulators, above and beyond general framework competition law, advance the cause of economic efficiency. The chapter by Professor Henry Ergas³ referred to by Trebilcock and Gal compares regulatory regimes and outcomes in telecommunications in Australia, where there is an industry regulator, and in New Zealand, where there is not. The chapter concludes that the cost of regulation (including litigation) in New Zealand has been less than a fifth of that in Australia, yet measured against a range of indicators there has been a greater improvement in the New Zealand telecommunications industry in terms both of relative

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2 Or, for that matter, to address the significance and appropriateness of referring to utilities as “public” — in itself a somewhat loaded and controversial turn of phrase, at least in this part of the world.

3 Chapter 5, Henry Ergas, “Telecommunications Across the Tasman: A Comparison of Regulatory Approaches and Economic Outcomes in Australia and New Zealand (prepared for the International Institute of Communication, 15 May 1996).

change and of absolute performance levels. If the conclusions reached in that chapter are correct, they provide some empirical basis for the more abstract doubts set out below.

I take as my starting points:

- (i) the principle that the owner of a business should be free to run the business and use its assets free of State intervention, absent a clear public policy justification for that intervention; and
- (ii) the existence of general framework competition laws such as those found in the *Commerce Act 1986* (NZ) and the *Trade Practices Act 1974* (Cth).

It seems to me that those who advocate further regulation, and in particular the establishment of an industry-specific regulator, need to answer four questions:

- (i) What is the problem they want to solve?
- (ii) Will the proposed regime solve the problem, at least as a matter of theory?
- (iii) Will the proposed regime work in practice — ie will sufficient human and financial resources be available to implement the regime. Are there other practical reasons why the theory is unlikely to be realised in the real world?
- (iv) Is there a reasonable expectation, founded in something more than wishful thinking or dogma, that the benefits from the intervention will outweigh the costs?

What is the Problem?

There is a tendency to blur different types of concern about natural monopolies when advocating the merits of regulation. Economists tend to focus on efficiency issues, while politicians often have distributional concerns at heart. There is a real tension between these two strands of thought. Efficiency goals often require a rebalancing of tariffs which for many years have incorporated considerable cross-subsidies from large business users to domestic users. An element of cross subsidy from urban users to rural users of utility services is also common, since costs of reticulation and service delivery in rural areas are high, but charges have often been the same.

Politicians, on the other hand, do not like to see their constituents facing higher bills for telephones, gas, electricity and other services. One of the political objectives of industry regulation is often to slow down or prevent the very process of rebalancing which is likely to be most efficient.⁴

Another source of tension in the focus of regulation can be the need to allocate (efficiently? equitably?) the significant fixed costs which characterise network industries. As vertical integration is eroded and retailing is increasingly contestable, it can become more difficult to maintain the extensive price discrimination that has often characterised network industries. The ability to price discriminate depends on a firm

4 An example from New Zealand is the "Kiwi share" in Telecom's corporate constitution, which effectively precludes real price increases to residential customers, and requires free local calling to continue to be available to such customers.

having an appreciable degree of market power.⁵ In the presence of high fixed costs, price discrimination can be extremely efficient. Yet it is often seen as inherently undesirable, and something which regulators should attempt to eradicate.

Governments responsible for deregulation which also own the utilities in question face another set of conflicts: their interest in revenues from operation (and possible sale) of the utility is unlikely to coincide with wider efficiency goals.

My purpose here is not to identify the objective which I think a regulator ought to have, but simply to ask that those who advocate the establishment of industry-specific regulation specify clearly whether they are pursuing efficiency goals, distributional goals, or some mix of these; and identify in some detail the "evil" they seek to prevent. If a number of goals are to be pursued, some method of reconciling or prioritising them is also required.

Will the Proposed Regime Solve the Problem as a Matter of Theory?

Depending on the nature of the problem sought to be resolved, different regulatory regimes may be created. If the concern is price increases to consumers, it is relatively simply to design a regime which will prevent or limit such increases. But while price control or rate of return regulation is good at holding down prices in the short to medium term, it is not so good at deterring inefficient investment and promoting efficient investment, or more generally encouraging dynamic efficiencies which produce longer term gains. Some incentives for natural monopolies to achieve efficiency gains can be created by well designed price control regimes, where a price is fixed for a considerable period of time (say five years) and there is an assurance of no further intervention, so that efficiency gains are, during that period, captured by the network industry in question. However few regulatory bodies are capable of the restraint necessary to implement a regime of this kind.

If, on the other hand, the goal is a high level of "rivalrous behaviour" in the contestable sectors of the industry, a regulatory regime may focus on access issues and may establish favourable charging regimes for new entrants. But economic theory suggests that access regimes which are designed to encourage or shelter new entrants may have the undesirable effect of encouraging inefficient entry, resulting in distortions in charging regimes and a risk of higher costs to consumers.⁶

5 See for example Carlton and Perloff, *Modern Industrial Organisation* (2nd ed, Harper Collins, New York) at pages 434-435. Other conditions are knowledge of the consumers' willingness to pay, ie the ability to identify inframarginal consumers, and an ability to prevent or limit resales by customers who pay the lower price to those who pay the higher price.

6 See *Telecom Corporation of New Zealand Limited v Clear Communications Limited* [1995] 1 NZLR 385 (PC); WJ Baumol & JG Sidak, "The Pricing of Inputs Sold to Competitors" (1994) 11 *Yale Journal on Regulation* 171; AE Kahn & WX Taylor, "The Pricing of Inputs Sold to Competitors: A Comment", (1994) 11 *Yale Journal on Regulation* 225; WB Tye, "The Pricing of Inputs Sold to Competitors: A Response" (1994) 11 *Yale J on Reg* 203; WJ Baumol & JG Sidak, "The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue" (1995) 12 *Yale J on Regulation* 177.

Probably the hardest regime to design, even in theory, is a regime that will encourage efficiency. The level of debate about which industry structure and which sort of regime is most efficient leaves ample room for scepticism about any particular regulatory solution.

Will it Work in Practice?

In every country in which I have worked, including relatively wealthy countries such as Australia and New Zealand, regulators have limited resources in terms of funding and personnel. It is rare for the most able industry experts, economists and lawyers to be found in a regulatory agency — and from a social perspective, it is almost certainly undesirable that that is where they should be! But this has a real bearing on the ability of any regulatory agency to perform its (often difficult and poorly specified) task. To this must be added the problem of imperfect information: regulatory/competition issues in network industries are typically extremely complex, and even with the best resources available it is not going to be possible to obtain more than an impressionistic overview of the current state of play, let alone of likely future developments.

It is equally true that regulators tend to find something to do all the time, if they exist all the time. Industry regulators tend to increase their involvement in the day to day operation of the industry over time. Conversely, there is the risk of “capture” of the regulator by the natural monopoly firm, on which there is an extensive literature. There is a real danger that a permanent regulatory body will do a lot more than is needed, and do it in such a way that the costs are greater than they should be in theory, and the benefits are less than the theory might suggest.

In many countries concern about these issues has led to a rejection of active industry regulation. New Zealand is one obvious example.

Costs and Benefits

Even if there is a well specified regime with clear goals, which should work in theory and is sufficiently well resourced to work in practice, a critical question is whether the cost of the intervention is justified by the expected benefits. Certainly the history of industry regulation inspires little confidence. The chapter by Professor Ergas mentioned above suggests that the New Zealand telecommunication sector has performed better than the Australian telecommunication sector when measured against efficiency, productivity and access/equity criteria. These results provide some empirical support for scepticism about the existence of any benefits at all, even from modern industry regulation. The case that benefits exceed costs is still harder to make out — yet this is the burden that the proponents of industry regulation need to discharge.

I am not saying that it is possible to reach a general conclusion that the costs of regulation cannot be outweighed by the benefits. What I do believe is that this issue must be thought through rigorously in relation to any particular proposed regime, before leaping into implementation of that regime. Untested optimism is a poor basis for pressing ahead with regulatory intervention.

Summary

Deregulation is occurring world-wide at present. There are a number of ways in which those engaged in deregulation can learn from the practical experience of other jurisdictions, and the considerable body of literature on the subject. One form of “learning” which is sometimes seen is the uncritical adoption of a regime used in another country, on the assumption that if it has been done elsewhere it must be the right way to do things. And there are fashions in regulation, as in most other human pastimes. But in this area the significant theoretical advances in our understanding of the relevant issues, and the rather mixed practical experience of regulation in various countries, strongly suggest that a cautious and principled approach to deciding whether to have regulation, and to design of a regulatory regime, is essential.

My final plea, then, is that deregulators think through these issues rigorously, and abstain from intervention unless a proper case has been made out. It is often harder politically to refrain from regulating than it is to be seen to be “doing something”. And yet populism in this area may well be inimical to the long term interests of the community. Some of the points I have made may seem obvious, or even trivial. But the questions posed are deceptively simple, as any rigorous attempt to answer them in a particular case will show. Failure to ask them is likely to lead to regulation which is at best unnecessary, and which may be positively harmful.

The Trebilcock and Gal chapter addresses the first of my questions, and identifies significant efficiency concerns in natural monopoly segments of the industries it considers. This is not a controversial result. But the chapter appears to move from this answer to a firm view that “access charges and other terms of access require specialised on-going regulatory supervision and price regulation, without addressing — or reserving for subsequent consideration — the second, third and fourth questions raised above. What would be the regulator’s task prescription — would it solve the concerns identified, at least in theory? Is it likely to work in practice? Will the benefits outweigh the costs? These are not details to be sorted later: they are central issues which must be addressed by those who seek to make out a case for industry regulation.

Chapter 3

What Prices Should Public Utilities Charge? The Case of Victoria's Electricity Reforms

Philip Williams¹

Introduction

Recent public debate over the reform of Victoria's electricity industry has been notable for both the passion and the ignorance of many of the participants. The usual jibe about generating more heat than light is particularly apposite.

The role of economists in this debate has hardly been a source of satisfaction. No economist can be an expert in every area of economics — and, in particular, I claim no expertise in the economics of electricity. Nevertheless, there are certain propositions in economics that have not been seriously challenged for decades — or even since John Stuart Mill's *Principles of Political Economy* was first published in 1848 or since David Hume was writing the century before. Those who claim professional expertise in economics cannot be excused their ignorance of these fundamental propositions.

This chapter attempts to show how these fundamental propositions can throw light on debates over efficient pricing in public utilities and, in particular, on the public debate over the reform of Victoria's electricity industry.

Efficient Prices

Economics is concerned principally with how resources are allocated and whether the systems of allocation are efficient. However, efficiency can only be assessed with reference to an objective standard. The standard used in economics is what may be called the dollar votes of consumers. We may imagine that each participant in the economy has a pile of dollar notes. Each dollar note counts for one vote in determining how the resources of the economy ought to be allocated. If a person spends some votes in purchasing brown leather sandals, that expenditure will encourage resources to flow into the production of brown leather sandals. By voting in the marketplace with dollar notes, the consumer has been able to influence the allocation of resources.

An efficient allocation is one that maximises the dollar votes of consumers; consumers would be prepared to pay more for the resulting allocation than for any alternative allocation. Efficiency is enhanced when resources are reallocated so that

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consumers are prepared to pay more dollars for the new allocation than they were for the old.

This standard implicitly embodies Hume's law: that a dollar is a dollar. Hume's law means that if two persons are bidding at an auction for a seaside cottage and a poor homeless family is outbid by a wealthy family wishing to own a seaside weekender, the result of the bidding is efficient. The house has been placed in the hands of those who offer the more dollar votes.

The effect of Hume's law is to divorce consideration of the allocation of resources from consideration of the distribution of wealth (or income). This separation is undertaken so that one can match instruments with objectives. We may wish government policy to pursue multiple objectives — including an efficient allocation of resources and a fair distribution of wealth. Instruments such as competition and pricing policy have a relatively big effect on efficiency and a relatively small effect on the distribution of wealth. Other policy instruments such as income taxes and unemployment relief have a relatively large effect on the distribution of wealth and a relatively small effect on efficiency. It is a fundamental proposition in economics that we should match instruments with objectives so that instruments that have a relatively large impact on an objective should be targeted to that objective.

For this reason competition and pricing policy should be directed to economic efficiency and not to the securing of a good distribution of wealth. The reforms of Victoria's electricity industry should be judged against this yardstick: are they likely to enhance the efficiency with which resources are allocated? The implication is that if one does not like the market's allocation of the seaside cottage to the wealthy family, one should look to measures that improve the wealth of poorer families. One should not override the market's ability to allocate resources efficiently.

Competition and pricing policy affect two principal types of efficiency: **production** efficiency and **allocation** efficiency. Production efficiency assessed the costs incurred during the process of production. If production is undertaken without each enterprise minimising its costs per unit of output, and without taking advantage of all available economies of large-scale production, then resources are wasted. More resources are used in the process of production than are needed. These wasted resources have an alternative use; they could be used to produce other goods that consumers would value. Accordingly production efficiency is necessary if the economy is to allocate resources efficiently.

The second form of efficiency is allocative efficiency; resources must be allocated to produce those goods or services for which consumers are prepared to pay most. If buyers are willing to pay to cover the cost of the extra resources needed to produce more brown shoes, then these should be produced. Conversely, if buyers are not willing to pay enough to cover the costs of the marginal producer of black shoes, then that producer should not be using the nation's valuable resources to produce black shoes.

If, as economically-literate persons, we accept the proposition that electricity reforms should be judged against the standard of efficiency, where do we start in our analysis? We start from the proposition that a highly-competitive economy will produce

an efficient allocation of resources — both in the sense of production efficiency and allocation efficiency. This is not to say that the State cannot readily produce an electricity industry that is highly competitive and therefore, efficient. But it suggests: (i) if competition is possible, competitive constraints on enterprises can be relied upon to secure efficient prices; and (ii) if competition is not possible, regulation should be introduced to ensure that prices charged by monopolistic industries are similar to those that would be charged by a competitive industry.

All this is quite uncontroversial. The more-difficult questions are whether electricity can be competitive and, if not, how should it be regulated?

Competition and Public Utilities

Economists have known of natural monopolies since the publication of John Stuart Mill's *Principles of Political Economy* in 1848. In Book I, Chapter IX, Mill presents what Stigler has taught us to call the survivor principle: that the number of firms in any free-competitive industry will tend towards industry output divided by that scale of production at which long-run average cost is minimised. Following his presentation of the survivor principle, Mill notes that in certain industries — such as gas supply, water supply and the provision of railways — economies of scale accrue over such a large range of scales that only one firm could survive the rigours of free competition.

It is obvious, for example, how great an economy of labour would be obtained if London were supplied by a single gas or water company instead of the existing plurality. While there are even as many as two, this implies double establishments of all sorts, when one only, with a small increase, could probably perform the whole operation equally well; double sets of machinery and works, when the whole of the gas or water required could generally be produced by one set only; even double sets of pipes, if the companies did not prevent this needless expense by agreeing upon a division of the territory.²

Mill obliges further by providing a label for this class of industry: the natural monopoly.

All the natural monopolies (meaning thereby those which are created by circumstances, and not by law) which produce or aggravate the disparities in the remuneration of different kinds of labour, operate similarly between different kinds of labour, operate similarly between different employments of capital. If a business can only be advantageously carried on by a large capital, this in most countries limits so narrowly the class of persons who can enter the employment, that they are enabled to keep their rate of profit above the general level.³

Mill's analysis of natural monopoly was utilised by American professional economists when they came to analyse the trust movement of the 1880s. Economists such as J B Clark argued that cost pressures were behind the forces of consolidation that they observed. American economists, such as Ely, also observed attempts at entry into natural monopolies — where these attempts yielded nothing in terms of economic efficiency: they were attempts by the entrant merely to share in the rents that would otherwise accrue to the incumbent:

2 J.S. Mill, *Principles of Political Economy*, ed by W J Ashley (Longmans Green, 9th ed, 1909) at 143.

3 Ibid at 410.

Most apparent attempts at competition (in such industries) are simply raids on a company which has a good business; and the end in view is a division of the business and a participation in the spoils. A test is easy. When a new gas company is formed in the interests of the "dear people", in order to give them, as it is usually said, the benefits of competition, let the confident citizen take the managers at their word and ask them to make a contract to supply gas at the current low rate for a number of years, and he will find that they refuse. Rates go down and a bitter struggle ensues; but it is not competition. It is a fight for mastery. The only question at issue is, under what terms shall we combine or in what manner shall territory be divided.⁴

Or as Edmund James explained this dead-weight loss:

But if the old (i.e. established) company is really making the enormous profit which may undoubtedly be under such circumstances, it is perfectly possible for a new company to force them to divide profits by entering the field . . . It is possible that the investor has lost something but the consumer has gained nothing at all.⁵

This work found a later echo in the contestability literature of the early 1980s — which proved theoretically what has been observed in practice one century before: that natural monopoly is no barrier to inefficient entry. As Kenneth Boulding has remarked: if it exists, it must be possible!

In summary, natural monopoly characteristics create barriers to competition in certain public utilities. They do this because sustainable competition among incumbents is impossible because the largest incumbent will always have a cost advantage over smaller competitors. Secondly, competition for the market by potential entrants is not only unlikely; but, if it occurs, it may well be more rent-seeking activity that has detrimental effects on efficiency.

The Modification of Final Judgment (MFJ) in *U.S. v A.T.&T.* 1982 that led to the dissolution of A.T.&T. was a landmark in contemporary policy towards public utilities. Prior to the MFJ many public utility enterprises (whether owned privately or by the State) had been vertically integrated. The rationale for the vertically integrated monopoly was somewhat shaky because only parts of its activity were natural monopolies.

The MFJ proved to be seminal in policy towards public utilities because it attempted to introduce competition into those parts of telecommunications where competition is possible (inter-city calls) but to retain monopoly controls where it appears that costs suggested a natural monopoly (the local-exchange networks). Since 1982 reform of public utility regulations in many countries has followed this pattern. The Victorian State Government's reforms of electricity are one example of this trend.

Competitive Prices

Victoria's reforms of its electricity industry follow to a large extent the recommendations of the Industry Commission Report on *Energy Generation and Distribution*, No. 11, 17 May 1991. The Report found that the publicly-owned,

4 R.T. Ely, *Problems of Today* (Thomas Crowell, 3rd ed, 1890) at 122.

5 E.J. James, "The Relation of the Modern Municipality to the Gas Supply" (1886) 1 *American Economic Association Publications* at 31–2.

vertically integrated model had been highly inefficient. Over-investment in the 1980s produced capacity in excess of utilisation of around 40 — 70 per cent; there was massive over-staffing; prices did not reflect costs; and there were cross-subsidies between different classes of users.

The Report was critical of prices for two reasons: they did not reflect costs; and there were significant cross-subsidies. One has to be very careful in interpreting these criticisms because of the importance of common costs in the provision of electricity.

From the eighteenth century economists have recognised that if costs were common to multiple products, the prices of those products would not be determined by their costs. Rather the aggregate revenue from the group of products should be offset against the aggregate costs. For example, Hamilton wrote:

When we import a cargo of different kinds of goods which could not well be separated, such as iron and deals; of which the one is necessary for ballast, the other to complete the lading, it is proper to join them in one account, and compute the profit or loss on the whole together. Here we open an account of goods from Gottenburgh, and distinguish the iron and deals in inner columns, which is better than to open one account for iron, and another for deals. Perhaps there might be gain on the one and loss on the other; but as we were obliged to import both together, it is the success of the whole that we should inquire into.⁶

In the nineteenth century, John Stuart Mill's *Principles of Political Economy* noted that when products have costs in common their prices will not be determined by their costs but will reflect the urgency of demand.

It sometimes happens that two different commodities have what may be termed a joint cost of production. They are both products of the same operation, or set of operations, and the outlay is incurred for the sake of both together, not part of one and part for the other . . . Since cost of production here fails us, we must revert to a law of value anterior to cost of production, and more fundamental, the law of demand and supply.⁷

Twentieth-century economics developed the proposition that economic efficiency is served when price equals marginal cost. This is also the outcome for a single-product firm under perfect competition. However, the equating of price and marginal cost is not possible for an enterprise producing multiple products with common costs. If prices are set at marginal costs the enterprise could not recover its common costs and so would not be viable. Prices must contain a mark-up over marginal cost so that common costs are recovered.

Consider the classic example of a sheep farmer. Nurture of the sheep produces two products: wool and mutton. Suppose that each sheep produces one fleece of wool before it is slaughtered for its meat. Suppose that the cost of producing the sheep is \$100, whereas the additional cost of shearing the sheep is \$10 and the additional cost of killing the sheep is also \$10. This makes the marginal cost of a fleece of wool equal to \$10 and the marginal cost of a carcase also \$10; but the farmer will only graze a sheep if the revenue from the wool and the mutton together sums at least to \$120. This means that

6 R. Hamilton, *Introduction to Merchandize* (1797) at 414.

7 See Mill, *supra* note 2 at 569–70.

price must exceed marginal cost for the wool and the mutton so that the \$100 of common costs are recovered.

In perfectly competitive markets, like those for wool and mutton, prices are determined by supply and demand. Electricity is not sold in perfectly-competitive markets. Nevertheless, economic efficiency is served when prices are set at competitive levels. This involves marking up price on marginal cost in accordance with demand. Economic efficiency is best served by a mark-up on marginal cost that is said to be Ramsey-optimal. The theory derives from Ramsey⁸ and Boiteux;⁹ but the modern application to the problem of common costs of the theory was developed by Baumol and Bradford.¹⁰

Ramsey-optimal prices allow each service to have a mark-up on marginal cost where the mark-up is determined by demand. If consumers of a particular service are very unresponsive to a large mark-up of price on marginal cost (i.e. if the price elasticity of demand is low) the mark-up should be large — because this large mark-up will not cause too much of a restriction on the flow of resources to the provision of the service. Alternatively, if consumers of another service are very sensitive to price, that service will have only a small mark-up of price on marginal cost. The sum of the surpluses over marginal costs should be only just sufficient to give the company that rate of return on its shareholders' funds that could be obtained in a competitive market.

The calculation of a set of Ramsey-optimal prices utilises a great deal of judgment and gives much room for controversy. The millions of services on offer have first to be grouped so that the company has a manageable number of prices to charge. Then the marginal cost and price elasticity of demand must be estimated for each product, or group of products. These procedures are far from straightforward.

This simple review of competitive pricing in a multi-product enterprise suggests that the Industry Commission was too hasty in its condemnation of price discrimination by the state-owned electricity companies. Price discrimination is common in markets which are generally regarded as highly competitive — as anyone who has bought an international aeroplane ticket would know.

It is interesting to reflect why professional economists are so concerned with price discrimination. The answer probably lies in the poor training they received in their under-graduate degrees. That training in price theory nearly always assumes a single-product firm with only one category of consumer. The sheep farmer problem of Mill or the problems of public-utility pricing are just not discussed.

Victoria's Reforms

The electricity industry may be considered to consist of five vertical levels: generation; high-voltage grid; low-voltage distribution; retail; and customers. The high-

8 F.P. Ramsey, "A Contribution to the Theory of Taxation" (1927) 37 *Economic Journal*.

9 M. Boiteux, "Sur la gestion des monopoles publics astreints à l'équilibre budgétaire" (1956) 24 *Econometrica*; translated as "On the Management of Public Monopolies Subject to Budgetary Constraints" (1971) 3 *Journal of Economic Theory*.

10 W.J. Baumol and D Bradford, "Optimal Departures for Marginal Cost Pricing" (1970) 60 *American Economic Review*.

voltage grid and low-voltage distribution are natural monopolies; and their margins will continue to be regulated. (The regulator will be the Office of the Regulator General). Competition will be introduced at two levels: generation and retail. It is expected to operate in the following manner.

The structure of tariffs that has been inherited from the past will continue fairly much as it has been until the year 2000. Domestic (Residential) customers pay the maximum uniform tariff which will increase with the CPI minus one percentage point. The one percentage point is to allow for improvements in productivity.

During the period up to the year 2000 the freedom for parties to contract with competitive generators will be gradually liberalised. The larger customers have been the first to have this freedom. This can be seen from Table 1 below:

Table One
Class of a Non-Franchise Customer as at Particular Date

<i>Size of Purchase</i>	<i>Date of Franchise</i>	<i>Number in Victoria</i>
> 5MW	December 1994	47
<5MU;> 1MW	July 1995	330
<1MW;> 250 KW	July 1996	1500
<250 KW;> 50 KW	July 1998	5000
< 50 KW	December 2000	

Table One distinguishes franchise from non-franchise customers. A non-franchise customer is one who is not compelled to purchase from their local distribution business (DB). There are five such DBs — three metropolitan and two in the country. Each of these undertakes two functions: low-voltage distribution and retail. Non-franchise customers are free to purchase direct from a generation company or from any DB they wish.

The activity of generation has been allocated among five licensed operators. These can compete for the business of the DBs and of the non-franchise customers. However, the effects of this competition on the profits of the generation companies will be severely constrained for the next five years.

The most obvious constraint on competition is that the DBs will be able to contract with the generation companies until the year 2000 at a fixed price so as to cover their obligations to their franchised customers. These contracts are known as vesting contracts.

A second constraint on competition is that the price received by the generators will not be allowed to fall to competitive levels. The massive excess capacity that was identified in the 1991 Industry Commission Report would force prices down if the prices were determined competitively. In fact, competitive prices would almost certainly be below long-run incremental cost. Apart from vesting contracts and the old tariff H customers, the reforms have established a free-market, wholesale spot price for

ex-generator power. If all power were traded at this price (or even at freely negotiated long-term contracts) the value of the generator companies would be decreased significantly.

If the free-market wholesale price were introduced at the same time as retail prices were maintained, there would be a windfall gain to the DBs. To safeguard the value of the generation companies, the government will tax the DBs. This tax will provide funds to keep the prices paid to the generation companies at their above-competition levels so as to safeguard the value of their assets. In effect, customers will continue to pay above-competitive retail prices so as to safeguard the artificially-inflated value of the generators.

The final constraint on competition among the generation companies is the structure of the market. At the moment, only five companies are licensed to provide power to the grid. This will increase in February 1997 when the national grid (linking New South Wales and South Australia to Victoria) is planned to come on line.¹¹ But the ability of inter-state generators to constrain the monopoly power of local generators will be limited by the limited capacity of inter-state transmission. At present, capacity constraints limit the amount of NSW power that could be brought into Victoria to some five per cent of Victorian capacity. This can only be increased by incurring significant capital expenditure. This expenditure is obviously critical to the emergence of a truly-competitive generation market.

The Five Distribution Businesses will also be able to compete for the business of the non-franchised customers. Much of the discussion about the reforms suggests that retail margins might be really squeezed as customers increasingly are free to contract. Given the highly-concentrated structure of the distribution businesses and the obvious barriers to entry, this form of concentration may seem rather remote. However, the retail businesses of the DBs will be able to compete in other ways that may turn out to be quite significant. The DBs will be able to purchase power through long-term contracts or through spot purchasing. Their skill in forecasting demand and their skill in structuring wholesale purchasing contracts to cater for demand may lead to significant differences in the performance of the DBs — and these differences may be strong incentive to good performance.

Conclusions

Competition provides efficient prices. Even where competition is not possible, as in a natural monopoly, competition provides a standard for regulated prices. The reforms to Victoria's electricity industry are a response to a highly-unsuccessful experiment with a vertically-integrated, state-owned monopoly. The reforms have attempted to introduce competition into generation and into retailing. The effects of competition in generation will emerge only slowly — and then, to a large extent, they will be largely contingent upon the amount of investment in interstate transmission links. Competition among retails may largely take the form of forecasting demand and matching this to orders.

¹¹ This date which has already been postponed from July 1996 is to be confirmed in September 1996.

Chapter 4

Asset Valuation and Access to Essential Facilities Under Part IIIA of the Trade Practices Act 1974 (Cth)

Stephen King¹

Introduction: Asset Valuation and Access

The new access regime which forms Part IIIA of the *Trade Practices Act 1974* (Cth), establishes alternative procedures for parties to access the services of 'essential' infrastructure facilities. Access is achieved either through a process of declaration, negotiation and arbitration or by the infrastructure owner voluntarily submitting an access undertaking to the Australian Competition and Consumer Commission (ACCC). A facility owner may also avoid having his or her infrastructure service(s) declared if an effective access regime is already in place. For example, the facility may be covered by an effective state access regime.

To evaluate an undertaking, determine the effectiveness of an access regime, or make a determination on an access dispute, the relevant regulator will need to consider the economic effects of access. Many facilities that will be subject to access involve increasing returns to scale technology and sunk capital. The facilities have few if any alternative uses other than their present function and their scrap value is well below the initial construction cost. Simple uniform pricing which maximises static economic welfare will not allow the infrastructure owner to receive a reasonable return on his or her capital investment. Access based on uniform pricing that is efficient in the short term will fail to elicit new infrastructure investment and will be detrimental to long term social welfare. While more sophisticated non-linear pricing schemes may overcome this problem, the regulator will often be called on to decide (either directly or indirectly) the amount of revenue that the infrastructure owner is allowed to earn from access pricing in order to gain a reasonable return on his or her investment.

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

1 Competition and Regulatory Policy Program, Centre for Economic Policy Research, Research School for Social Sciences, Australian National University. I would like to thank Henry Ergas, Rod Maddock, David Chapman, John Tamblyn and seminar participants at the ACCC, and the 1996 Industry Economic Conference for their suggestions. This work has been supported by the ACCC. However, both the views and any errors are the author's.

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 order to generate his or her allowed revenue.

This chapter concentrates on the first of these steps — the appropriate foundations for determining the rate base. I do not intend to provide a comprehensive coverage of the multitude of issues that may arise in any situation.² Rather, this chapter will consider the underlying methodology for rate base determination. What rules should be used to judge the value of new or existing infrastructure in the rate base? There are a variety of alternative procedures which can be used by the regulator, including historic cost, replacement cost and deprival value. This chapter compares and contrasts these alternatives and considers circumstances when one or another of these rules may be more applicable. In particular, I consider whether some rules are more likely to provide better economic incentives for current and potential infrastructure owners and investors.

Evaluation of the rate base, however, cannot be considered in isolation. As I note below, the choice of rate base and allowed rate-of-return are entwined. The choice of rate base may also influence the pricing rules set by the regulator — for example whether and to what degree the infrastructure owner can price discriminate between customers. The rules for optimal pricing suggest that the infrastructure owner should be encouraged to set non-linear tariffs, with the marginal price to customers close to the (congestion adjusted) short run marginal cost of access.³ If the revenues collected from such prices fall short of the allowed revenues, the owner should recover the difference through up-front fees or charges that only affect inframarginal prices. It may also be desirable to use the revenue constraint as a ‘cap’. If the infrastructure owner is able to decrease his or her operating costs, he would be allowed to retain some of the extra revenues generated from these savings, at least until the next rate review. This form of incentive regulation may aid innovation and avoid undesirable cost-padding by the infrastructure owner.⁴

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.⁵

2 A good starting point for anyone interested in a comprehensive manual on regulatory procedures is J. Bonbright, A. Danielsen and D. Kamerschen, *Principles of Public Utility Pricing* (2nd. ed., Public Utility Reports Inc. Virginia, 1988).

3 See S. King “Access Pricing”, *Research Paper No. 3* (Government Pricing Tribunal of New South Wales, Sydney, 1995).

4 In the U.S., this form of incentive regulation is called performance based regulation. See P. Navarro (1995) “The ABCs of PBR”, *Public Utilities Fortnightly* (July 15), 16–20, for a discussion.

5 This conclusion runs counter to the methods of rate base valuation, for example, used to monitor the performance of government business enterprises (GBEs) in Australia. This is partly because valuation for performance monitoring involves different objectives to regulatory rate base determination. GBE asset valuation has recently been carried out in Australia in order to monitor managerial performance

Different methods of asset valuation

I begin by briefly describing the most common valuation methods used to calculate the rate base for a regulated firm. The list of alternatives is not exhaustive and does not include industry specific variants, such as the asset components model of valuation that has been developed for the water industry.⁶

Each of the methods has both practical and theoretical limitations. For example, Bonbright *et. al.* list six practical problems for original cost valuation that are of "special theoretical interest".⁷ These problems include the treatment of working capital, the issue of acquisition costs for a firm buying regulated assets and allowances for depreciation. Similar problems arise under all alternative valuation procedures. While some of these issues will be addressed below, I will concentrate on the theoretical and practical differences between valuation procedures.

1. Historic/Original Cost

Historic or original cost represents the simplest rate base. The value of the relevant asset is set at its depreciated original cost of purchase. The rate base is given "by summation of the actual legitimate costs of plant and equipment devoted to the public service (including or plus allowances for funds used during construction), with appropriate deductions for accumulated depreciation and with reasonable allowance for working capital".⁸ As Weiss notes public utility commissions in the US have tended to favour the use of original cost rates.⁹ Much of this support is based on its transparency and administrative efficiency.

In the context of managerial performance monitoring, historic cost valuations have been criticised as understating asset values and overstating profits and returns, particularly in times of rising prices.¹⁰ For performance monitoring and comparisons between enterprises, these criticisms have some weight. As will be seen below, however, the choice of valuation rule will depend on its use and I will consider if and when these criticisms remain valid in the context of an access regime.

across a range of broadly comparable enterprises. While managerial performance may be an important objective, and will be considered below, this is not the central issue that needs to be addressed by valuation for access. Rather, incentives for efficient investment need to dominate the choice of an infrastructure rate base for access, and in this situation a valuation method based on historic or original cost usually combines both adequate incentive properties with administrative simplicity.

6 See E. Neal, *et. al.*, *Report of the expert group on asset valuation methods and cost-recovery definitions for the Australian water industry* (Canberra, 1995).

7 *Supra* note 2, p. 238.

8 *Ibid.*, p. 237.

9 L. Weiss *Case Studies in American Industry*, (2nd. ed., John Wiley & Sons, New York, 1971) p. 108.

10 Steering Committee on National Performance Monitoring of Government Trading Enterprises *Overview: Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises* (Industry Commission, Melbourne, 1994). See also S. Temple-Heald "The importance of asset valuation and implications for performance monitoring of GTEs" (*Research Unit Discussion Paper No. 1*, Industry Commission, Canberra, 1991).

2. Fair value

Fair value rules were introduced to the U.S. by the Supreme Court in the case of *Smyth v Ames*. To calculate fair value, the regulator was required to take into account “the original cost of construction, the amount expended in permanent improvements, the amount or market value of its stocks and bonds, the present as compared with the original cost of construction, the probable earning capacity of the property . . . and the sum required to meet operating expenses”.¹¹

Fair value calculations involve circular reasoning. Fair value includes reference to the market value of the firm. But the fair value is used to set the prices which will determine the market value of the firm.¹² By 1944 the US Supreme Court had formally recognised this problem noting “that ‘fair value’ is the end product of the process of rate-making not the starting point . . . The heart of the matter is that rates cannot be made to depend upon ‘fair value’ when the value of the going enterprise depends on earnings under whatever rates may be anticipated”.¹³

Fair value calculations are still used by some state regulators in the US. However, “[o]ver time fair value has evolved into an average of original and reproduction cost, with the weights assigned to each component varying from case to case”.¹⁴ The indeterminacy of the weights given to components in fair value calculations make this method both contentious and potentially litigious. Christy, however, argues in favour of the fair value system stating that its indeterminacy is also its greatest strength. “With neither rate base nor accompanying rate of return tightly constrained by rules or mathematical algorithms, commissions in fair value states have elbow room for the exercise of judgment”.¹⁵

3. Replacement Cost

Replacement cost valuation considers the current cost of replacing the services embodied in a particular asset, with alternative assets. “Replacement costs are the costs of replacing the facility with another facility that would provide comparable services, but would not necessarily be the same plant. That is, it measures what it would cost today to provide the same capacity”.¹⁶ There is a close relationship between replacement cost and the deprival value method which will be discussed below.¹⁷

Temple-Heald argues in favour of depreciated current replacement cost valuation for performance monitoring of government trading enterprises. Such “current cost

11 *Smyth v Ames* 169 U.S. 466 (1898).

12 *Supra* note 2, p. 216.

13 *Federal Power Commission et. al. v Hope Natural Gas Company* 320 U.S. 344 (1944).

14 R. Nelson and W. Primeaux “Rate Base Valuation and the Behavior of Regulated Firms” (1984) 24 *Quarterly Review of Economics and Business*, 72–81 at p. 73. See also Weiss, *supra* note 7, p. 110.

15 G. Christy “Original Cost and Fair Value: Pseudo-Science Versus Judgement” in J. Foster, G. Hall, S. Holmberg, C. Phillips and R. Wallace (eds) *Regulatory Reform, the State of the Regulatory Art* (Institute for Study of Regulation, Washington, 1984) p. 166.

16 Bonbright et al, *supra* note 2, p. 239.

17 See Neal et al, *supra* note 6, p. 19.

valuation systems are widely regarded as providing more relevant measures of costs for the purposes of decision making than do historic cost systems".¹⁸ While I will consider this claim in more detail below, it is worthwhile noting that any procedure involving replacement value is likely to present significant practical difficulties and is potentially highly litigious. Replacement value depends on the how a facility is analysed. For example, the individual replacement values for a railway line and for the railway rolling stock will probably differ from the replacement cost for the entire system. The latter may include a completely different form of production while the former considers replacement value one part at a time. Measuring replacement value will often involve significant guess-work and will often be a matter of opinion. As Bonbright, *et. al.* note, "[r]eplacement costs are vague, requiring a guesstimate of the hypothetical best option currently available".¹⁹

4. *Reproduction Cost*

Because of the subjective nature of replacement cost, it is likely that such a valuation scheme would evolve into reproduction cost in practice. "Reproduction costs are those costs required to reproduce the existing plant in substantially its present form, at current prices which may be calculated by appraisal, by estimates of new facilities minus the appropriate depreciation, or by original costs trended up or down by the appropriate price index".²⁰ These different interpretations of reproduction cost have different economic meanings. For example, there seems to be little or no economic justification for basing value on "the cost of reproducing the *same* plant at current prices even if the plant was out of date and no one would think of actually reproducing it".²¹ In contrast, using original cost adjusted for changes in a general price index may provide certain advantages in times of inflation over an unadjusted original cost base. I consider this further below.²²

5. *Deprival Value*

Bonbright *et. al.* contrast the difference between current cost and current value methodologies:

The cost-based rationale is that the original costs have lost significance *because they no longer reflect*, in terms of dollars of current purchasing power, *the net financial sacrifice* for which investors are still entitled to fair compensation under a cost-of-service principal of rate control.

... The value-based rationale is that the original costs have lost significance *because they no longer reflect the current values of assets* devoted to the public service and hence an allowed annual return on the original cost would not even crudely measure annual service value of the assets to the consuming public.²³

18 Supra note 10, p. 4.

19 Supra note 2, p. 231.

20 Ibid, p. 230.

21 Weiss, supra note 9, p. 110.

22 See also Temple-Heald, supra note 10, p. 10-11.

23 Supra note 2, p. 216, italics in original.

Deprival value tries to integrate these two concepts by measuring value as the minimum of replacement cost and foregone revenues:

Deprival value of an asset is the value to the entity of the future economic benefits that the entity would forego if deprived of the asset. Under this approach assets are valued at an amount that represents the loss that might be expected to be incurred by an entity if that entity was deprived of the service potential or future economic benefits of these assets at the reporting date. Thus, the value to the entity in most cases will be measured by the replacement cost of the services or benefits currently embodied in the asset . . . Where an entity would not replace an asset if deprived of it, the asset would be measured at the greater of its *market value* and the *present value* of future net cash inflows expected from continued use of the asset.²⁴

Supporters of deprival value claim that it provides relevant current information. The relevance of any information, however, will depend on the purpose of the valuation regime.

There are two problems when using deprival value to set allowed revenues. First, it contains the same circularity as methods based on market value or net present value. The replacement test in deprival valuation is based on whether “the net cash inflows generated by the asset are less than the replacement cost of the asset”.²⁵ But these net cash flows can only be determined by considering the allowed returns for the asset. Unless the present value of future net cash flows is based on an artificial construct outside the regulatory environment, for example a measure of the maximum potential revenues that the asset could generate from consumers if unregulated, they cannot be used as an input to the valuation process.

Secondly, deprival value is likely to present significant practical difficulties. “[I]n actual practice, the application of a value standard would be hopelessly unfeasible”.²⁶ Deprival value, if properly implemented, would escalate the highly subjective and litigious aspects of replacement value.

6. Scrap Value

The value of the relevant asset in its next best alternative use, provides a lower bound to regulatory valuation. If this lower bound is violated, then the owner will find it profitable to transfer the asset to the alternative use, even if it is socially more desirable for the asset to remain in its current function. I refer to this lower bound as the scrap value of the asset.

Scrap value reflects the opportunity cost to the facility owner of retaining the asset in the regulated regime. This value may vary widely between assets and need not be trivial. For example, the scrap value of a block of land is the market value of the block. If the contribution of the land to the owner’s rate base falls below this market value then it will pay the owner to sell the land even if it is economically more valuable in its current use. The land is not a sunk asset and can readily be moved to alternative uses, so

24 Steering Committee, *supra* note 10, p. 9–10 (italics in original).

25 *Ibid* p. 10–11.

26 Bonbright et al, *supra* note 2, p. 220.

its valuation in the rate base must include these real opportunities. In contrast, for an asset that is sunk and has no alternative use outside its current function, the scrap value will be close to zero.²⁷

General Issues in Asset Value

Depreciation

The allowed depreciation schedule for capital assets will affect the change in the asset base over time and consequently the stream of allowed revenues. A faster rate of depreciation will enable the facility owner to claim higher costs in the short run resulting in higher regulated revenues, but lower costs and revenues in the longer run as the value of the asset falls. The reverse will occur if the allowed rate of depreciation is slow.

Does the depreciation schedule approved by the regulator have any incentive effects? As will be discussed further below, for most assets the relevant incentives relate to initial investment, not to the ongoing relative use of the asset over time. In this situation, the actual depreciation schedule is irrelevant so long as it does not give the owner incentives to scrap the asset before it is past its useful life. Changing the depreciation schedule simply alters the flow of funds to the asset owner, but does not alter the present value of the investment project.²⁸

It can be argued that depreciation schedules need to be tied to current replacement costs to ensure that:

- (i) there are sufficient funds available to replace the asset at the end of its useful life; and
- (ii) there are minimal 'price shocks' to consumers.

The first of these arguments is clearly fallacious. The purpose of depreciation is not to allow the asset owner to raise capital internally for future investment projects. This is the function of the capital markets. When the current asset has finished its useful life, it will either be an economically sensible investment to replace the asset at that point in time or not. The existence of a pile of accumulated funds is irrelevant when considering the investment. If the investment will not be able to yield an equivalent return to the next best option, then it should not be carried out using either existing or new funds. If the investment is profitable, then the money can be sourced from the capital market and internal funds are not required.

27 Valuing an asset below scrap will lead to its removal from its current regulatory function. This need not be undesirable. If the asset has a value in an alternative use which exceeds the social value of its current use then there seems little point in artificially retaining it in that current use. However, the valuation scheme must try to avoid creating undesirable incentives to dispose of assets.

28 Altering the flow of allowed revenues will however alter the allowed prices over time and may have a significant effect on final good consumers. See T. Brennan "Depreciation, Investor Compensation, and Welfare under Rate-of-Return Regulation", (1991) 6 *Review of Industrial Organization*, 73–87, for a discussion. This issue, considered from the perspective of the effects of inflation on the rate base, will be considered further below.

The second argument has more merit. As Temple-Heald states “[w]hen replacement of existing assets is required, insufficient provision for depreciation may result in operators having to significantly raise prices to current users in order to compensate for past failures to fully recover the economic costs of service delivery”.²⁹ This argument clearly assumes that the cost of replacing the existing asset will rise over time. This assumption is not obvious, particularly in infrastructure industries such as telecommunications.

If replacement costs are rising, the new investment will cause a shock to the capital base and raise both the allowed revenue and consumer prices. It may be possible to avoid some of this shock by only allowing the asset owner low levels of depreciation early in the asset life and higher depreciation rates as the asset reaches the end of its useful life. Such a scheme would however, require the regulator to be able to accurately guess the life of the asset when setting the initial depreciation schedule or would require adjustment to the allowed depreciation schedule at the end of each regulatory period. The regulator would have to be careful that he did not depreciate the asset too quickly, in which case there will either be incentives for the owner to replace the asset before its useful life has expired, or the price shock will be reintroduced as the owner “runs out” of depreciable value before he replaces the asset. If the regulator depreciates the asset too slowly, however, then the consumer will not be protected from a price shock when the asset is replaced and the investor will also have to be compensated for the “unused” portion of the depreciation schedule.

In practice, the issue of rate-base shock is likely to be relatively unimportant. Investment in infrastructure tends to be ongoing so that the base will continually be adjusted for new capital assets. However, there will always be numerous practical issues that need to be dealt with when applying a depreciation schedule for regulatory purposes. Bonbright, *et. al*, considers many of these issues in detail.³⁰

Depreciation will be limited by the requirement that the rate base not violate a lower bound set by the asset owner’s opportunity cost of retaining the asset. If the asset is depreciated below scrap value then the owner will remove the asset from its current function even if its useful life is not complete.

Optimisation and Revaluation

Any valuation scheme will need to include procedures to evaluate current assets and determine if they are in excess for current requirements. Such procedures are needed to adjust the base for fluctuations or over-estimates of demand and to overcome the possibility of deliberate overcapitalisation caused by choosing an allowed rate-of-return that exceeds the investor’s true cost of capital. This latter possibility is referred to as the Averch-Johnson effect.³¹

29 Supra note 10, p. 2.

30 Supra note 2, chapter 13.

31 H. Averch and L. Johnson “Behavior of the Firm under Regulatory Constraint”, (1962) 52 *American Economic Review*, 1052–69.

In the U.S. regulators often apply a “used and useful” test to infrastructure assets under their control.³² A similar optimisation test will be required in Australia.

Tests for the reasonableness of the existing asset base and for any additions to that asset base are likely to be contentious. The asset owner will have an incentive to always claim that an asset which has not been depreciated to its scrap value should be included in the asset base. While the regulator must guard against excessive inclusion, it is also necessary not to create incentives which work against efficient investment.

For example, if demand for the end product of the infrastructure facility is growing, then it will often be economically desirable to overbuild the facility from the perspective of current demand. It is usually cheaper to build a bigger facility today than to build a smaller facility in the short term and try to enlarge it as demand grows in the longer term. Evaluation of the rate base must encourage efficient infrastructure development without creating incentives for overcapitalisation. This may be achieved, for example, by only allowing the infrastructure owner to include currently used capacity in the current rate base, but to carry excess capacity forward. When this capacity is eventually used, it can be added to the rate base at, say, inflation adjusted historic value.

The ability to carry forward current excess capacity will be closely tied to the issue of discount pricing. Given the existence of capacity which would not generate the allowed level of revenue today but may be required in the future, it is economically efficient to allow facility owners to sell this capacity at a discount to current consumers. However, care must be taken not to penalise infrastructure owners for such efficient sales by reducing their allowed future returns by more than their current revenue. If owners were penalised in this fashion then they would withdraw the discounts, preferring to wait until demand grows and they can meet their revenue limits.

The issue is also closely connected to allocation of risk for demand fluctuations. These fluctuations may be passed onto consumers by holding the rate base fixed. Alternatively, a fall in demand can lead to a reduction in the rate base to reflect current excess capacity, which places the risk on to the infrastructure owner. Risk allocation will have implications for the owner’s allowed rate of return.

The asset base should not require adjustment with a change in ownership. If a regulated company changes hands, then the purchase price paid by the new owner is irrelevant for the asset base. This has important implications for governments involved in privatising infrastructure assets and, as discussed below, may create political constraints for regulators.

Different valuation procedures usually involve the regulator evaluating assets at different times. For example, historic cost valuation usually involves the regulator examining initial infrastructure investments and applying a broad optimisation test at later regulatory reviews. In contrast, replacement cost or deprival value methods may involve little initial evaluation by the regulator but include more stringent revaluation procedures when the asset base is reviewed. These ongoing procedures may provide incentives for groups who are affected by revaluation, such as consumers of goods that use access as an input, to monitor the regulated firm and provide input to the

32 See Bonbright et al, *supra* note 2.

optimisation process. These groups may be better placed than the regulator to detect rate-base expansion and, if used carefully, can provide important information for the optimisation process.

Nominal and Real Rates of Return

The choice of rate-of-return will depend in part on the chosen asset valuation technique. For example, if the valuation technique is based on depreciated historic value then the owner of the asset will need to be compensated for the rate of inflation through a nominal rate of return. If the asset base includes an adjustment for inflation, for example by using replacement cost or inflation adjusted historic cost, then a real rate of return can be used.

The relationship between real/nominal returns and the rate base is not neutral. In particular, while combinations of base and return may lead to the same expected return to the asset owners they will not lead to equivalent flows of funds.

To illustrate this, consider the alternatives of historic cost valuation with nominal returns and an inflation adjusted historic base with real returns (called 'trended original cost' or 'general price level adjusted cost').³³ Let the initial rate base be set at \$100 and assume that the level of inflation is 10 percent per annum while the real rate of return is 5 percent so that the nominal rate of return is (approximately) 15 percent. I will assume that there is no uncertainty in any of these figures and no depreciation so as to focus on the relevant issue of the flow of revenues. I will also assume that the facility produces exactly the same quantity of services each year.

If historic cost valuation with a nominal rate of return is used then the owners of the capital equipment are allowed to earn \$15 per year for ever. Given the level of output, this will translate into a fixed set of nominal prices for consumers. However, this will involve a set of declining real prices. Consumers will face the same nominal prices over time despite the rise in both their nominal income and the nominal price of other goods.

If inflation adjusted historic cost is used with a real rate of return then the asset owners will receive a rising schedule of nominal returns. In our example, the owners will be allowed to earn 5 percent of \$100 in their first year, \$5. However, in their second year, their rate base will have increased by the rate of inflation. The rate base will now be \$110 and the owners will be able to achieve a 5 percent return on this rate base, or \$5.50. In the third year the rate base will have again increased to \$121 and the owners receive \$6.05. In the fourth year the base is \$133.1 and the owners receive \$6.66. This process continues with rising nominal consumer prices and a rising flow of nominal funds to the asset owners over time.

Both methods yield an identical return to the asset owners. However, they involve different nominal and real prices. Consumers face constant nominal but falling real

³³ For a discussion of these issues see M. Gordon, "Comparison of Historical Cost and General Price Level Adjusted Cost Rate Base Regulation" (1977) 32 *The Journal of Finance*, 1501–1512 or R. Anderson and D. Mead "A Comparison of Original Cost and Trended Original Cost Ratemaking Methods" (1983) 4 *Energy Journal*, 151–158.

prices with an unadjusted historic cost base and rising nominal but a constant real set of prices with the inflation adjusted historic base. In present value terms the consumer would also be indifferent to the price schedules if they had access to funds which enabled them to borrow and 'undo' the differences between real and nominal prices. If consumers do not have access to such funds then they may prefer the stable real prices over time. Also the adjusted base would appear to more equitably allocate the capital cost burden over time.³⁴

The analysis becomes more difficult if I allow for a change in quantities demanded. Assume that if income and all relative prices are fixed in real terms then consumer demand is stable over time. A falling series of real prices for one product (as occurs with the unadjusted base) will then lead to substitution effects. In particular, if the consumer can buy alternative products then these alternatives will appear relatively more desirable in the early years and less desirable in later years. Consumers will substitute away from the regulated product with the relatively high price in the short term and back to that product in the longer term as its relative real price falls. This substitution will tend to exacerbate the movements in real prices and will also destabilise nominal prices with the unadjusted base. To maintain the allowed rate of return in the short term, both real and nominal prices will need to be higher with the unadjusted rate base, while they will need to fall in the longer term.

Tax regimes may further complicate the analysis. Allowance for depreciation under taxation laws will often be significantly more rapid than the true asset life or the allowance made by the regulator. If the infrastructure owner is allowed a certain level of after tax revenues, then the taxation depreciation schedule will enable them to earn higher pre-tax revenues in earlier years of operation, resulting in higher consumer prices.

Other Issues in Asset Valuation

There are numerous other issues which need to be considered when implementing regulations involving an allowed rate of return on assets. For example, the regulator must guard against the infrastructure owner shifting costs between regulated and potentially competitive or unregulated areas. Brennan considers this problem from the perspective of the AT&T divestiture in the US.³⁵

The interaction between the rate base calculations, the revenue caps and the pricing rules that can be used by the infrastructure owner, needs to be addressed. How are the allowed revenues to be allocated over customer types or groups? Is price discrimination allowed? What form of tariffs are sanctioned by the regulator? While these issues are important, they are beyond the scope of this paper. Rather, I am concerned with the basic principles underlying the choice of asset base. In particular, what are the incentive

34 Brennan, *supra* note 28, shows that depreciation schedules can also be used to alter the time path of consumer prices. As he notes, "depreciation schedules can be chosen to generate efficient time paths of output prices" (p. 73).

35 T. Brennan, "Why Regulated Firms Should be Kept Out of Unregulated Markets: Understanding the Divestiture in *United States v. AT&T*", (1987) 32 *Antitrust Bulletin*, 741-93.

effects of choosing alternative asset valuation rules and how do these impinge upon economic and social welfare. It is to these central issues that I now turn my attention.

Incentives and the Choice of Valuation Method

Why the Choice of Valuation Method is Purposive and Asset Specific

The choice of an appropriate asset valuation technique will depend on both the questions being addressed and the nature of the relevant assets. There is neither a single valuation method that is appropriate for all circumstances, nor is there always an unambiguously preferred choice of valuation method for any specific situation.

To see how valuation procedures depend on the question being asked, consider the example, of a potential breach of s46 of the *Trade Practices Act 1974*. The market power of an incumbent firm depends on both current competition and on the potential for new competitors to enter the market. In certain (albeit limited) circumstances, even a monopolist may have little or no ability to increase its price above costs because of the threat of potential entry.³⁶ Nascent entry will be a potent constraint on monopoly power if there are few entry barriers in the relevant market. A test for entry barriers, and thus for market power, may consider whether the incumbent firm's profits would be high enough to entice a new firm to enter. Put simply, is the incumbent currently earning an abnormally high return from the perspective of a potential entrant?

It would be irrelevant to test for such returns using the incumbent's historic asset costs. Rises in price levels may mean that historic costs understate the current costs for a new entrant. Alternatively, technological change may have made the incumbent's plant and equipment obsolete, so that historic asset costs may overstate the cost of entry. The relevant asset base for evaluation of potential entry is the cost of plant and equipment to a firm entering the industry today — roughly, a measure of optimised replacement value.

As a second example, consider a regulator who wishes to compare the managerial performance of a number of similar firms. Rates of return on historic asset costs will be of little use for such comparisons. These returns will differ across firms, reflecting the variance in the age of each firm's assets and accumulated depreciation. To achieve a comparable measure of managerial performance, returns must be based on comparable asset valuations. In New Zealand, optimised deprival value is used to compare the performance of the countries electric distribution companies.

To see how the valuation procedure will depend on the nature of the asset, consider two different types of asset. First, an asset may provide a relatively fixed stream of services over its productive life and there may be few substitute inputs that can be used to augment those services. For example, a pipeline may provide a given flow of services over its productive life, with relatively little ability to move these services over time by either more or less intensive use of the pipeline.

Alternatively, an asset may provide a fixed total amount of services, but the flow of

36 See S. Martin, *Advanced Industrial Economics* (Blackwell, Oxford, 1993).

these services each period can be controlled by the owner of the asset. The owner may alter the capital flow but maintain output by using alternative inputs such as labour and other capital equipment. Such assets resemble a cake — the size of the cake is fixed but it is possible to eat more of the cake today and less tomorrow or vice-versa. In fact, most assets will be between these two extremes.

For a fixed-flow asset, valuation procedures will have no effect on the service flow over time. The owner of the asset cannot alter the flow which is fixed by the asset technology. Historic cost valuation of such an asset may provide a convenient way to regulate return without any adverse incentive effects. However, for a variable-flow asset, a regulator may want to use a valuation regime that gives the correct incentives for the owner to substitute alternative inputs for the capital asset where appropriate. Historic cost valuation is unlikely to achieve this. Greenwald suggests that a generalised version of replacement cost valuation may be appropriate.³⁷ I discuss this issue in detail further below.

For access under part IIIA of the *Trade Practices Act 1974*, valuation will apply to assets in industries characterised by a natural monopoly technology.³⁸ In such industries, competitive provision is socially undesirable. It is always cheaper for one firm to produce the relevant output than for this output to be produced by multiple firms. Of course, if there is only a single producer, this monopolist may have significant market power and will attempt to use this power to maximise its profits. Part IIIA is designed to address this conflict between socially desirable production and potential abuse of monopoly power by requiring the infrastructure owner to provide access to the relevant services.

The infrastructure industries that are most likely to be regulated through part IIIA have plant and equipment that, to a large degree, is sunk. The assets have few alternative uses and a low scrap value. Valuation for access to the services provided by these sunk assets needs to address two broad, conflicting questions. First, what asset valuation technique will provide the basis for optimal use of existing assets? Second, what valuation technique will provide the correct incentives for future investment in the industry?

Optimal Asset Use: Fixed-Flow and Variable-Flow Assets

After purchase and installation, the capital assets involved in infrastructure industries will often have few alternative uses outside the relevant production process. However, these assets may still have alternative uses within the production process itself. For example, the relevant capital asset may be used more or less intensively at various times. To maintain production levels when the asset is used less intensively, it

37 B. Greenwald "Rate Base Selection and the Structure of Regulation", 15 *The RAND Journal of Economics*, 85–95.

38 See M. Waterson "Recent Developments in the Theory of Natural Monopoly", (1987) *Journal of Economic Surveys*, 1, 59–80 and S. King and R. Maddock *Unlocking the Infrastructure?* (Allen and Unwin, St. Leonards, NSW, 1996, forthcoming).

may be possible to substitute alternative variable inputs. Fewer of these alternative inputs will be required if the capital asset is used more intensively.

To give a simple example, consider the flow of services from a railway line. Depending on the type of rolling stock used and the loads per axle, the line will be used more or less intensively. The lower the volume of rolling stock per tonne transported, the higher will be the load per axle and the higher the usage of the rail asset (the faster its rate of depreciation) to maintain a given level of transport services.

As noted above, in the extreme the owner of a variable-flow asset will be able to choose the intensity of use between the asset and alternative inputs while maintaining a fixed flow of output over time. In contrast, fixed-flow assets are necessary for production but, once in place, provide a constant flow of (potential) services over time. The majority of infrastructure assets are probably closer to fixed rather than variable flow.³⁹

Valuation of fixed-flow assets provides few problems once the assets are in place. So long as the assets are valued above their scrap value then there is no problem of distorted production. The owner will retain the assets in their current use and as the flow of services is fixed, the owner has no reason or ability to distort that flow. Of course, as I discuss further below, the choice of rate-base will affect the initial investment in the assets.

With variable-flow assets, the choice of valuation method will influence production. There will be an economically optimal flow of services from the asset which will depend on the cost of substitute inputs. For example, if the current cost of alternative inputs is low but is expected to rise sharply in the future, then we would prefer the owner of the capital asset to use those alternative inputs more intensively today, maintaining the stock value of the capital asset, and then to use the capital asset more intensively at a later date when the cost of the alternative inputs has risen.

If the owner is simply compensated for the cost of the variable inputs and depreciation, and receives a return on capital equal to his or her true opportunity cost, then he will be indifferent over the choice of inputs. However, economic efficiency dictates that, given the level of output in each regulatory period, we prefer the owner to use more capital in periods when the alternative inputs are relatively expensive, and less when the alternative inputs are relatively inexpensive. This can be achieved if the valuation of the asset in any period is determined *at the margin* by the productivity and cost of alternative inputs.

For example, if the capital input is substitutable with labour, and the real cost of labour is expected to remain constant in real terms over time, then efficiency dictates that the asset owner use his or her asset to provide a constant flow of productive services over its lifetime. However, if we expect real labour costs to rise over time, then we

³⁹ The asset owner will often be able to make marginal trade-offs between maintenance and asset life. However, for long-lived infrastructure assets these trade-offs are likely to be small relative to the on-going costs of operation. It may be reasonable to treat the assets as approximately fixed-flow if these are the only substitution possibilities facing the infrastructure owner.

would like the capital asset to be used less intensively today and more intensively in later periods. To provide the owner with the correct incentives to 'save' capital today, the regulator can establish a valuation regime that sets the marginal value of the asset in any period according to the cost of alternative productive inputs. If labour costs rise over time and the owner uses the asset less intensively in early periods, then he is rewarded by receiving an upward revaluation in the asset value as labour costs rise.

Greenwald considers these substitution possibilities for a fixed flow of outputs and deterministic asset life.⁴⁰ To provide the correct incentives for cost minimising capital use over time, he concludes that "[t]he 'efficient' value of any element in a utility's capital stock . . . is its replacement value, but only in a very general sense. Replacement here does not simply mean the minimum cost of producing an asset which performs the same function, but rather the cost of the most efficient alternative method for satisfying the required demand. Under some conditions the best alternative may simply involve physical replacement of the capital involved. In other circumstances, however, the minimum cost alternative may be to hire more labor, and then replacement cost would be equal to the increase in wages paid".⁴¹

A number of points need to be noted. First, Greenwald only considers a fixed flow of output over a finite number of regulatory periods. To the degree that a higher rate base feeds into higher access and final product prices, any valuation above scrap will create an allocative distortion. For variable flow assets, there will generally be a trade-off between cost minimising production and the optimal amount of production.

Secondly, Greenwald assumes that the starting point for asset valuation is the current cost at the time the regulatory regime is introduced. This starting point is based on Greenwald's interpretation of fair value rules in the US. However, efficient production incentives are provided by the *change* in asset value over time. For example, with sunk assets the initial valuation could be set at scrap value and then generalised replacement cost could be applied to consider the change in this base over time.

Thirdly, the applicability of a generalised replacement cost rule will vary with the type of asset under consideration. For the rule to be applicable, there must exist relevant and practical substitution possibilities that the owner of the asset can use at the margin. In practice, these substitution possibilities may be rare so that, at best, the generalised replacement value will apply to only a small fraction of utility assets.

Finally, the use of a generalised replacement rule may be practically infeasible. Such a rule is likely to be highly contentious. The regulator may be at a significant informational disadvantage compared to the owner of the assets when determining appropriate alternative methods of production. Customers seeking access will almost certainly view the substitution possibilities differently to the asset owner. To apply such a rule may be time consuming, litigious and provide little benefit compared to a simpler, if somewhat, arbitrary rule.

40 *Supra* note 37.

41 *Ibid* p. 94.

Sunk Assets and the Choice of Rate Base

There are significant differences between valuing new and sunk assets. In particular, while investment incentives are crucial for new infrastructure, if an asset is sunk then these incentives no longer exist. Valuing existing sunk assets will dominate the access debate in the short term. Owners of these assets who provide undertakings to the ACCC will often include pricing rules explicitly or implicitly based on the value of their existing stock of assets. There is a direct trade-off between the value that is set for these sunk assets, and consequently the amount of profit that the asset owner can receive, and the economic benefits that can be gained from the sale of access. The asset owner will prefer a high valuation of his or her capital stock. For a given allowed rate-of-return, this value will be translated into higher prices and greater profits but lower consumer benefits in the final market.

For example, consider access to a railway line. The higher is the value established for the line then the higher are the access charges that can be set by the owner. Consequently, the owner of the line will champion those valuation methods that inflate his or her asset value. For example, replacement and reproduction costs are likely to be substantially greater than depreciated historic cost or scrap value, and will be preferred by the owner of the railway. However, the line is a sunk asset. The owner will continue to supply railway services so long as the rate base exceeds scrap value.

The profits received by the access provider through his or her access prices will be drawn indirectly from the final market. Higher access fees will require higher final market tariffs to generate the revenues needed to pay for those access fees. To the degree that the final market price is pushed above the social marginal cost of production, inflated access fees will limit the economic benefits that can be gained from that market.

Valuation of sunk assets may create considerable conflict between the regulators and the asset owners. Consider, for example, the ACCC evaluating an access undertaking that covers sunk, fixed-flow assets. If the Commission wishes to maximise the economic benefits from access then it will want access prices to be as low as possible, subject to the relevant assets remaining in use. The optimal rate base is provided by scrap value. A lower value will induce the facility owner to scrap the asset. But a higher asset value will result in higher access prices and will tend to reduce the economic benefits that can be achieved from the relevant final markets.

The ACCC may face a variety of constraints if it attempted to implement scrap valuation for existing sunk assets. First, while scrap valuation may be optimal for existing assets it would set poor incentives for future investment. The Commission would need to use a different valuation regime for existing and new assets. As well as creating administrative complexities, it may also create considerable disquiet in the minds of new investors. Once they have invested and their assets are sunk, can they be sure that the Commission will not move to revalue their assets on a scrap value basis to improve economic efficiency? It may be difficult for the Commission to commit itself to using different valuation regimes for assets depending on whether they were sunk before or after an arbitrary date.

Secondly, using scrap value may be considered inequitable and unfair, both by the courts and the general public. A private investor would not have built (or bought) the facility if he had known that the Commission would, at a later date, only allow him to charge access to that facility to recover scrap value. Using scrap valuation is likely to result in only a negligible return on the initial investment, well below the investor's opportunity cost of capital.

One response to this second point is that the investor made his or her decision in full knowledge that, at a later date, he may face a change in the regulatory regime that would harm his or her investment. Political and regulatory risk are standard in any investment. If the investor did not believe that the *ex ante* return on the project at least compensated him for these risks then he would not have undertaken the investment. To claim *ex post* that it is either inequitable or unfair to impose a regulatory regime that is adverse to the investor is similar to claiming that it is unfair for a punter on the Melbourne Cup to have his or her horse run last. Both the investor and the punter knew the risks up front and decided on their actions accordingly. If a poor outcome results then it is neither unfair to the individuals nor desirable for society to compensate them.

Thirdly, regulators may face significant political hurdles if they value existing sunk assets at scrap. Many of the infrastructure assets that will be covered by undertakings or state access regimes are government owned. For example, the state governments own the major electricity transmission assets in Australia. In Victoria, gas transmission pipelines are state government owned. The federal government, as well as the various states, own almost all railway infrastructure. Some of these facilities have provided significant revenues for their owner governments. Some of these assets are either being privatised or are likely to be privatised in the near future. If regulators attempt to use scrap valuation for these assets then this would create considerable trauma in many state treasuries. The valuation of government owned assets is likely to be as much a political decision as an economic one.⁴²

Investment and Choice of Rate-Base

Asset valuation will affect the incentives for infrastructure owners to replace, improve or extend their capital assets and for new investors to develop infrastructure assets. While the cost of these assets may be sunk after the investment has been made, investors will only support new investment if they believe that, on average, they will receive a reasonable return on their capital.

In this section I consider the effects of asset valuation on investment incentives. For simplicity I will only consider fixed-flow assets. As noted above, variable-flow assets will generally have an optimal rule for asset revaluation over time. This will not, however, affect the starting point for asset valuation.

42 There is also an economic case for valuation above scrap if the government needs to raise other taxes when the revenues from its utilities falls. Alternative taxes may involve significant distortions. It may be more efficient for the government to raise revenue by valuing infrastructure assets above scrap than by raising other taxes.

1. *Investment Without Asymmetric Information*

An analogy can be drawn between new infrastructure investment in a regulated asset and an investor putting money “in the bank”. At the time of the original investment, there is no difference between the optimised deprival value, the historic cost of the optimal investment and the optimised replacement or reproduction costs. If there is no asymmetry of information regarding the optimal asset choice, then there will be no disagreement on the initial asset value. This value is analogous to a depositor’s initial bank account balance, with the allowed revenues mimicking interest payments and depreciation costs reflecting account withdrawals.

Asset valuation rules, however, will affect the investment return over time. Choosing different asset valuation rules will alter the volatility of the return. If the investor is risk averse, so that he must be compensated with a higher expected rate of return when volatility rises, then it is socially desirable to choose a valuation that minimises return volatility.

For example, compare historic cost and replacement cost valuation. When an investment is made, both historic and replacement cost are identical, but the expected flow of revenues under the two regimes will differ. The schedule of allowed returns under historic cost only depends on the depreciation schedule set by the regulator. In contrast, the allowed returns under replacement cost valuation will vary whenever relevant input prices or the prices of alternative technologies change. The regulated value of a railway investment under replacement cost will increase if there is a rise in the price of steel used in tracks but will fall if the price of steel falls. Under replacement cost valuation, a telephone system will be devalued if there is a new innovation which leads to a cheaper alternative technology but will be revalued if the cost of laying underground conduit rises. The investor and the customers bear the risk of these price fluctuations. The investor faces unpredictable changes in the value of his or her investment and the customers face price variability for the final products which use access as an input.

If there is no asymmetric information between the investor and the regulator at the time that an investment is made, then imposing risk on investors and consumers will not provide any offsetting benefit. Historic cost based procedures which implicitly insure both investors and consumers against technological and price risk, will generally be preferred to valuation methods, such as such as replacement cost or deprival value, which destroy these insurance possibilities.⁴³

2. *Investment with Asymmetric Technological Information*

Replacement cost procedures may provide better investment incentives if a relevant information asymmetry exists between the investor and the regulator. Compared to the regulator, the investor may have either better information about the optimal type of

⁴³ One caveat is that optimisation procedures will need to check that replacement cost does not fall below scrap value. If this occurs then it is socially desirable to sell the existing assets into their next best use and buy the alternative assets.

infrastructure investment, or may be able to acquire this information more easily. In such a situation, it is desirable to have an asset valuation system that provides incentives for the investor to both gain and exploit the relevant information. Historic cost procedures will not provide these incentives. Rather, historic cost simply gives the investor an incentive to choose the asset with the highest current cost. An asset valuation regime based on replacement value may provide better investment incentives.

As an example, consider that the investor must choose between a variety of currently available, alternative technologies. An investor in a mobile telephone network could choose between analogue and digital technology. If the regulator and investor have access to the same information then they both know the optimal technology based on current information. This does not mean that the regulator and investor will agree on the choice of technology. If the investor expects to receive more than his or her true opportunity cost of capital from the infrastructure investment, then he will wish to maximise his or her rate-base even if this involves choosing an inefficient technology. However, this is the standard problem of optimisation which must be addressed by any valuation procedure.

Alternatively, the investor may have better information about the optimal technology choice at the time the investment is made, although this information asymmetry will disappear over time. Historic cost valuation procedures will not provide any incentives for the investor to choose the optimal technology when making his or her investment. In contrast, if the regulator, at a later date, can punish the investor if he has chosen the incorrect technology, then this will provide the investor with an incentive to make an optimal investment decision.

Replacement cost valuation enables the regulator to punish the investor for an incorrect technological choice by placing all the technological risk on the investor. The investor will have significant incentives to reduce this risk. For example, if the mobile telephone investor knows that a digital system will be cheaper and/or more efficient in the longer term, compared with the analogue equivalent, then replacement cost valuation will punish him if he invests in the analogue technology by only allowing him to receive a return based on an equivalent digital system. If the investor is better placed than the regulator to make such a technological choice then using replacement valuation is likely to lead to more efficient investment choices.

While replacement cost valuation may improve investment incentives, this benefit should not be over stressed. To provide relevant incentives, the regulator must have an information disadvantage compared to the investor at the time the investment is made. But this disadvantage must be substantially diminished or have disappeared by the time the regulator calculates the replacement valuation. To punish the investor for an incorrect technological choice, the regulator must be able to determine the correct technological choice when revaluation occurs. If, in contrast, the regulator remains at an informational disadvantage compared with the infrastructure owner, then he will not be able to correctly assess replacement valuation and any incentive benefits will be lost. Put simply, replacement valuation will only provide the correct incentives if the regulator does not have access to the same information as the investor at the time the

investment is made, and so cannot judge the investment at this stage, but does have access to sufficient information at a later date to make a correct revaluation of the investment.

Even if a relevant information asymmetry exists, it will not usually be desirable to use pure replacement cost valuation. While it is useful for the investor to bear some technological risk whenever he can take actions to reduce this risk, placing all technological risk onto the investor will rarely be optimal. To the degree that technology and input prices are unpredictable, valuation procedures based on replacement cost will lead to excessive volatility in both investor returns and consumer prices. To draw a simple analogy, just because a car driver can take actions which reduce the probability of an accident, we do not necessarily want to ban automotive insurance.

If regulators believe that they are not in a position to adequately judge alternative investment choices at the time that the investment is made, but that they will be able to make such judgements at a later date, then they may wish to use a valuation procedure based on a weighted average of historic and replacement costs. The relative weighting will depend on the regulators' judgement about the incentive benefits of a replacement cost procedure.

Finally, by-pass and the potential for competition from alternative producers may provide some incentives for technologically efficient investment under historic cost valuation. For example, if historic cost leads to an asset valuation that greatly exceeds current replacement costs, then relevant consumers may be able to credibly threaten to by-pass the facility. Such by-pass will be inefficient if the asset involves a natural monopoly technology and the replacement cost exceeds scrap value. However, a credible threat of by-pass will give incentives for the consumers and the asset owner to negotiate to a mutually agreeable price that reflects current replacement rather than historic costs. The investor will take the possibility of future by-pass into account when making his or her initial investment and this may provide some (weak) incentive to choose a cost efficient technology.

3. *Summary*

Investment incentives depend on the choice of asset valuation technique. While all valuation procedures start with the current cost of the investment, they differ in the allocation of technological risk over time. The choice of optimal valuation procedure will depend on whether the regulator wishes to impose technological risk on the investor (and the consumers). Allocating technological risk to the investor can be useful if the investor is better placed than the regulator to evaluate current alternative technological options. Replacement cost valuation shifts technological risk to the investor and may provide desirable incentives in some circumstances. In contrast, historic cost procedures act like an insurance policy which shields both the investor and consumers from unpredictable price and technological fluctuations. The best combination of these procedures, to provide the correct mix of incentives and insurance, will vary from project to project and will depend on how the regulator believes both his or her own and the investor's information will develop over time.

4. Administrative Complexity and the Rate Base

No program of rate regulation is self-executing. On the contrary, any such program must be administered . . . Among the most important virtues of an original-cost rate is that of relative ease of administration in terms of speedier deposition of rate cases, definiteness of decision, and minimum expense to all parties . . .⁴⁴

Administrative simplicity is a key benefit of historic cost valuation. The cost information needed to calculate the rate-base is easily obtained by a regulator or any other party with access to the relevant firm's books. Inflation adjustment, say on a CPI base, can be easily constructed, and an agreed depreciation schedule can be superimposed without great difficulty.

The administrative benefits of historic cost valuation are particularly important in the context of access undertakings under Part IIIA. The objective of an undertaking is not to impose heavy-handed regulatory supervision on an access provider. Rather, undertakings should be statements of procedures that can be implemented by the access provider and access seekers with a minimum of regulatory intervention. Once an undertaking has been approved, it should work "by itself".

If an undertaking includes a rate base that is difficult, ambiguous and controversial to calculate then it will often result in dispute between access seekers and the access provider. Such disputes will occur even with historic cost valuation but they will be more easily resolved by the availability of relevant accounting and financial data. In contrast, under say optimised deprival value, disputes will be more difficult to resolve and may act as a significant impediment to the availability of access.⁴⁵

Practical experience in the United States shows that real profits for facility owners may differ relatively little with the chosen rate base.⁴⁶ If this experience were to be reflected in Australian access decisions, then there is a significant advantage in choosing a rate base methodology that limits dispute and administrative complexity.

Conclusions

Without belaboring the points, or even giving the weighty arguments which can be mustered to support them, it may be asserted that the bulk of modern accounting, economic, and finance theory, rightly or wrongly, supports the following conclusions:

- (i) the rate base should be based exclusively on original costs;
- (ii) depreciation should also be based on original costs;
- (iii) construction work in progress should not be included in the rate base;
- (iv) an allowance for funds used during construction should be included in the rate base; and

44 Bonbright et al, *supra* note 2, p. 224.

45 An important question which will not be considered here is whether the ACCC should even accept undertakings that are based on rate-of-return procedures rather than negotiated access.

46 W. Primeaux "Rate Base Methods and Realised Rates of Return" (1978) 16 *Economic Inquiry*, 95-107, H. Petersen "The Effect of "Fair Value" Rate Base Valuation in Electric Utility Regulation" (1976) 31 *Journal of Finance* 1487-90 and W. Primeaux, E. Bubnys and R. Rasche "Fair Value Versus Original Cost Rate Base Valuation During Inflation" (1984) 5 *Energy Journal* 93-108.

- (v) the allowed rate of return should approximate the cost of capital, with due allowance for risk.⁴⁷

The analysis presented in this chapter broadly supports the use of historic or original cost asset valuation for access purposes. The arguments in favour of historic cost are impressive. It is administratively simple and transparent. It involves less subjective assessment and guess-work and usually will provide adequate incentives for investment and equivalent operational incentives compared with alternative valuation procedures.

This said, the case for historic cost valuation is not overwhelming. I have noted a variety of circumstances where alternative valuation procedures may provide better incentives for allocative, productive or investment efficiency. For example, scrap valuation is likely to lead to greater allocative efficiency for existing sunk assets compared to historic cost valuation. Generalised replacement cost valuation will provide improved productive incentives and standard replacement cost procedures may improve investment incentives under certain types of asymmetric information.

Alternative valuation procedures should be considered on a case-by-case basis. At the same time, the burden to show the superiority of an alternative valuation regime should lie with those opposing the use of historic cost. There may be circumstances where an asset has significant variable flow characteristics so that the *change* in asset value over time should reflect changes generalised production alternatives. However, the additional complexity and imprecision that would accompany such revaluation procedures will often mean that any small incentive benefits are outweighed by administration and disputation costs. There may also be situations where it is desirable to use replacement cost procedures to impose technological risk on new investors. However, it must be shown that the additional investment incentives outweigh the costs of allocating increased risk to consumers and investors. There may also be severe practical problems. U.S. experience under the fair value rules of *Smyth v Ames*, show that replacement costs often become reproduction costs in practice.

Historic cost valuation still raises a variety of issues. For example, it may be desirable to maintain relatively constant real access revenues over time so that CPI-adjusted original cost measures may be preferred. However, CPI-adjustment will only maintain real revenues under fairly strict conditions and may be offset by depreciation allowances under tax laws.

Care needs to be exercised to avoid the regulated asset value falling below the opportunity cost of the asset in its next best alternative use. If the regulated value falls below scrap value, then the owners will have an incentive to sell the asset and replace it, even if it is economically efficient to maintain the asset in its current operations. The adjustment of historic cost for alternative use is especially relevant if the assets are only partially sunk. For example, land will often need to be revalued to reflect its current market value. If the regulated land value falls below the market price then the owner will simply move his or her operations and sell the land.

47 A. Danielson and D. Kamerschen "Economic Regulation: Old Wine in New Bottles" in J. Foster, G. Hall, S. Holmberg, C. Phillips and R. Wallace (eds) *Regulatory Reform, the State of the Regulatory Art* (Institute for Study of Regulation, Washington, 1984), p. 52.

In the short term, many of the assets that will be subject to access regimes are sunk, so that their initial regulated valuation can be set at any level above scrap value without affecting incentives. So long as new assets enter the rate base at their true (original) cost and optimisation procedures are used to ensure that the infrastructure owner is not simply duplicating existing assets to swell his or her rate base, the valuation procedures for existing assets are economically irrelevant. That said, both political considerations and concepts of fairness may dictate that the valuation procedures used for new assets are grandfathered to cover existing assets.

Asset valuation is only the first step in the process of determining access prices. Historic cost valuation does not eliminate the numerous difficulties that will arise when setting an allowed rate-of-return, allocating revenues over customers, and transforming revenues into prices. However, given its administrative simplicity and transparency, historic cost valuation will aid the entire access process.

Chapter 5

Telecommunications Across the Tasman: A Comparison of Regulatory Approaches and Economic Outcomes in Australia and New Zealand

Henry Ergas¹

The Background

The reform of telecommunications regulations began at virtually the same time in New Zealand and Australia. In New Zealand, the first serious steps were taken in 1986 with the commissioning by the Government of the Mason-Morris report into the operations of the Post Office.² In Australia, the Government initiated a review of telecommunications arrangements some eight months later.³ Close geographical proximity, the near simultaneity of the processes, and the fact that at the time both countries had Labor Governments did not, however, mean that similar outcomes eventuated.

In New Zealand, the Government set out on a course of rapidly removing all statutory constraints on entry and competition into the industry. Although the Mason-Morris report had only supported liberalisation of Customer Premises Equipment (CPE) and Value Added Services (VAS), a follow-up report advised that full liberalisation was feasible and desirable.⁴ On December 17 1987 the Minister for State Owned Enterprises duly announced that all statutory constraints on entry would be removed within twelve months. In accordance with an implementation package announced by the Minister on 16 June 1988, the *Telecommunications Act 1987* was amended to remove from Telecom

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2 Subsequently published as R. N. Mason and M. S. Morris, *Post Office Review* (Wellington: Government Printer, 1986).

3 The results of this review were set out in G. Evans, *Australian Telecommunications Services: A New Framework — Statement by the Minister for Transport and Communications* (Canberra, AGPS, 1988).

4 Touche Ross Management Consultants, *Telecommunications in New Zealand* (Wellington: Department of Trade and Industry, 1987).

(henceforth referred to as TCNZ) any statutory privileges; in parallel, the process of preparing TCNZ for privatisation was set in train.

The New Zealand Government decided against creating an industry-specific regulatory body; nonetheless, some sector-specific constraints were retained. Thus, amendments to the *Telecommunications Act* allowed for sector-specific regulations to be enacted; the most important of these (the *Telecommunications (Disclosure) Regulations 1990/120*) requires TCNZ to retrospectively disclose discounts granted from its standard tariffs. At the same time, in privatising TCNZ, the Government wrote into the new company's Articles of Association provisions aimed at ensuring that ordinary residential telephone service would continue to be made as widely available as before privatisation, including by requiring (1) that a local free (i.e. unmeasured) calling option be retained for residential consumers, (2) that the rental for rural lines be the same as that in urban areas, and (3) that residential line rentals not be increased in real terms, provided that this did not "unreasonably impair" Telecom's profitability. These "pledges" were to be enforced by the Minister of Finance, acting on behalf of the Crown, as the designated holder of a "Kiwi Share" empowered to veto changes to the Corporation's Articles.

The industry-specific regulations did not, however, extend to the terms on which TCNZ was to provide competitors with access to its network or to the manner in which it could price its services in response to competition. Rather, in the "light handed" approach adopted, the industry was to be treated like any other and made fully subject to the provisions of the *Commerce Act 1986*.⁵ The Government's view was that these provisions would be sufficient to achieve the objectives of reform; if matters proved otherwise, it retained the option of imposing more direct controls.

This trifecta — immediate full liberalisation, privatisation, light-handed regulation — contrasts sharply with the approach adopted in Australia. To the disappointment of at

5 The *Commerce Act* is the prime statute protecting competition. The Act is similar in some important respects to the Australian *Trade Practices Act* (TPA), notably in terms of its section 27 (loosely, the prohibition on price-fixing agreements) and section 36 (equally loosely, the prohibition on anti-competitive practices by firms with substantial market power). There are, however, several important differences, both of a statutory and of an implementation character, between the *Commerce Act* and its Australian counterpart. Some of these differences would seem to make the *Commerce Act* a more powerful instrument. For example, Part IV of the *Commerce Act* enables goods or services to be placed under direct price control where there is limited competition in the market and it is necessary or desirable for prices to be controlled in the interests of users, consumers or suppliers. Although this provision has never been used, it might be viewed as a threat which would constrain the pricing behaviour of dominant firms. Other elements, however, go broadly in the opposite direction. First, the *Commerce Act* does not grant the agency primarily charged with its enforcement (the Commerce Commission) with the powers which the ACCC has under section 28(1)(b) of the TPA to more or less "roam at will" in carrying out its investigatory role. This has limited the ability of the Commission to initiate investigations which might ultimately have led to changes in policy (see notably *Commerce Commission v. Telecom Corporation of New Zealand* [1994] 2 NZLR 421. Second, the *Commerce Act* does not contain any provisions matching the new Part IIIA of the *Trade Practices Act* (loosely, enacting an access regime for third-party access to facilities which a competitor could not reasonably replicate in circumstances where such access would significantly increase competition). Third, as a practical matter, the Commerce Commission has tended to be funded on a considerably less generous scale than its Australian equivalent.

least this author (who served as an Adviser to that review), the Evans review did not result in the opening to network competition; rather, only markets for VAS and CPE were to be liberalised. This in and of itself made complex rules demarcating the liberalised area from that which remained a monopoly inevitable. Moreover, with Telecom Australia being allowed to participate in both the “monopoly” and “competitive” areas, the scope for abuse of market power seemed so great as to require more direct and pro-active supervision than could be exercised merely by the TPA. The result was a relatively complex piece of sector-specific legislation (the Telecommunications Act 1989) along with a sector-specific agency — AUSTEL — responsible for implementing the regulatory aspects of the new regime.

The 1989 regime was flawed from the start: the demarcations on which it was based were quickly being erased by technological change; and most importantly, it did not resolve the problem of AUSSAT, Australia’s domestic satellite system, which was not financially viable merely as a carrier’s carrier.⁶ However, far from being simpler, the succeeding regime built on its predecessor in important respects, merely adding layers of statutory complexity and administrative discretion.

Here again, form followed function. The decision to license only one additional fixed network carrier (eventually Optus) and two additional mobile carriers (Optus and Vodafone) created a need for rules demarcating “carriers” from other industry participants, and fixing the rights and obligations of each of these.⁷ At the same time, the decision to (1) retain both Telecom Australia and OTC in public ownership (hence weakening the efficacy of any constraints which capital markets might otherwise have imposed on managerial empire-building) and (2) merge them into a single entity (thus seemingly reinforcing the market power of the dominant player), made the case for stringent controls over the incumbent’s conduct appear all the more compelling (the author again serving as a Consultant to the then Department of Transport and Communications on the drafting of the controls eventually implemented). The result was an intricate and highly complex set of legislative and regulatory instruments, which, in the words of a recent review, “are much more specific with respect to detailed facets of the sector’s operations than, for example, in the UK or the US”.⁸

The Pattern of Outcomes

Why the paths taken by Australia and New Zealand diverged so sharply is a subject

6 By 1989, AUSSAT’s annual revenues were a third lower than the projections built into the 1984 AUSSAT Financing Memorandum and twenty percent below those of the AUSSAT Board’s 1987 Financial Background Briefing to the Government. Retaining AUSSAT in its then form (that is, as a stand-alone carrier’s carrier excluded from direct competition in the STD market) would broadly have required the Commonwealth to assume a nil consideration for AUSSAT’s assets and inject a further \$600 million over the period to the mid-1990’s.

7 The fact that the Government was balancing the interests of each of these and — somewhat inconsistently — wanted to also promote the ability of resellers to compete with the carriers made the required complexity that much greater.

8 WIK-EAC, *Network Interconnection in the Domain of ONP: Study for DG XIII of the European Commission* (Brussels, European Commission, 1984), p. 207.

worthy of a paper of its own.⁹ Rather, the focus here is on *outcomes*: on the degree to which the differences in approach have translated into differences in performance.

A starting point, in carrying out this analysis, are the direct costs of regulation: that is, the resources which are consumed in developing and implementing the regulatory regime (be it through sector-specific agencies or through the courts). These costs can be viewed as “inputs” into the system¹⁰ — they are justified in so far as they lead to improvements in the “outputs” the system delivers. This leads naturally to a consideration of the “outputs” achieved. These can be conveniently assessed in terms of four dimensions of performance: (1) the productivity with which the industry uses resources; (2) the prices charged, and quality of service delivered, to consumers; (3) the degree to which social objectives have been met, notably in terms of ensuring widespread access to the standard telephone service; and (4) producer profits and the viability and effectiveness of competition. Each of these is considered in turn.

1. The Costs of Regulation

As has already been emphasised, the Australian regime is far more complex than that in New Zealand. Some idea of the difference can be obtained simply by comparing the physical dimensions of the statutory instruments involved. In New Zealand, the main sector-specific instruments (the Telecommunications Act 1987, the amendments to that Act, and the regulations enacted under the terms of its provisions) run to some 35 pages of text. Placed on a comparable basis, the relevant Australian instruments, excluding any regulatory decisions, run to well over 400 pages.

Developing and implementing the Australian regime is naturally a rather expensive undertaking. Over \$6 million is spent annually on telecommunications policy development in the Department of Communications and the Arts. AUSTEL’s budget is of close to \$14 million; the agency’s staffing is in the order of 150 people.¹¹ Although no public information is available, it can be estimated that the industry employs 100 to 150 people in functions dealing with policy and regulation, with the numbers employed outside the carriers (in lobby groups, law firms and consultancies) being at least equal to

9 Clearly, differences in political philosophy played a role: Fabian “social engineering” has retained a far higher degree of credibility in Australia than in New Zealand. More sordid motives may also have been at work: in New Zealand, the Government was proposing to sell the incumbent; the regime which was put in place minimised the regulatory risk which its purchasers would have to take. In contrast, in Australia, the Government was selling the right to be a challenger: and the regime which was put in place minimised the risk accruing to those purchasing the new licenses. And all of these factors interacted with the pressures placed by conflicting interest groups: in New Zealand, the Government seemed able to more sharply stand aside from interest group constraints; but in Australia, the need to assuage the Telecom unions always gave rise to an offsetting reaction — in the form of strong pressures to “put the boot in” — so that the resulting compromise was notable only for its complexity.

10 Note that the direct costs of regulation may differ greatly from the economic costs of regulation. The latter include the costs and benefits which arise from regulatory interventions, for example in terms of changes in relative prices.

11 This corresponds to the “Total Staffing Profile” reported in AUSTEL’S Annual Report.

those employed by the carriers directly.¹² Given these numbers, and admitting that there must be a large range of error, it seems difficult to believe that outlays on the Australian regime fall anywhere short of \$45 million annually.¹³

The New Zealand policy budget is less than one-fourth that in Australia.¹⁴ To this can be added the occasional costs borne at the Commerce Commission — costs averaging to some .5 of a professional person-year. Some 12 professional staff are employed by the carriers on regulatory issues, but almost all of these also have other responsibilities. Professional staff employed outside the carriers would not exceed 10 on a full-time equivalent basis. As a result, aggregate costs are not likely to be in excess of \$4 million annually. Even adding in an “annualised cost” for the Clear-TCNZ litigation,¹⁵ and assuming that litigation would continue on the same scale in the future, the aggregate costs are still, at \$7 million, less than a fifth their Australian counterpart.

The higher costs incurred in Australia have little to do with Australia’s greater size; rather, they are the result of opting for complex, sector-specific regulation. The issue is whether this choice translates into superior performance.

2. Productivity

When the reform process began, productivity levels at TCNZ’s predecessor organisation were significantly below those in Australia. This is not to say that Australia’s telecommunications industry operated at world best practice: far from it.¹⁶ But measures which in Australia had been taken a decade earlier — with the dismantling of the Post-Master General’s Department and the vesting of Telecom Australia as a Government Business Enterprise, operating largely on a commercial basis — had never been taken in New Zealand. Rather, responsibility for telecommunications remained located in what was, and operated as, a government department. The Mason-Morris Review highlighted the extent of the resulting deficiencies, including in terms of poor use of labour and materials, inadequate modernisation and the lack of any commercially sensible processes for cost accounting and management control.¹⁷

12 A search of Telstra and Optus internal telephone directories found some 60 people with “regulatory” in their title or section name. Not all of these are involved in regulation but many would have some involvement with it.

13 This includes outlays on technical regulation at AUSTEL but not by the carriers. Note, however, that the Australian figure excludes outlays at the ACCC. Making the adjustments so as to put the data on a basis comparable to New Zealand would slightly but not significantly reduce the difference in regulatory costs between the two regimes.

14 That is, appropriations for telecommunications policy advice in the Ministry of Commerce.

15 The costs this involved should be viewed as an investment in defining the rules of the game. In principle, these could be amortised by calculating the equivalent infinite-duration annuity; the more conservative approach adopted here is to spread them over the period of market entry (that is, from 1991 to 1996).

16 The extent of the deficiencies was highlighted in H. Ergas, E. Ralph and S. Sivakumar, *Reforming Australian Telecommunications: Report to the Business Council of Australia* (Melbourne: Monash University Centre for Information and Communications Technology, 1991).

17 Of the New Zealand Post Office Telecommunications Division’s 25000 or so employees, only 15 had qualifications in accounting; see I. Duncan and A. Bollard, *Corporatization and Privatization: Lessons from New Zealand* (Auckland: Oxford University Press, 1992), p. 150.

This situation changed dramatically with privatisation and the exposure to full competition. An investment surge reshaped TCNZ's network, giving it one of the highest rates of exchange digitalisation in the world. As new management introduced stringent controls on costs, employment levels were cut very sharply, with employee numbers at TCNZ falling from some 24,500 at corporatization to some 8,700 today. The combined result was a sharp fall in costs per unit of output. While changes were also occurring in Telstra (the successor entity merging Telecom and OTC) over this period, they seemed incremental in comparison, and notably involved only modest reductions in staffing.

The difference between the carriers in terms of rates of change can be assessed by comparing growth rates of total factor productivity (TFP): that is, the change in the combined volume of inputs (labour, capital and materials) needed to produce a unit of output. On the best estimates available, TCNZ increased its total factor productivity by 9.5 to 10 per cent annually over the six-year period to 1994.¹⁸ This is probably about twice the trend growth rate of TFP at Telstra.¹⁹ Taken over a six-year period, this implies that TFP levels increased by some 40 per cent more at TCNZ than at Telstra.

Some part of this was undoubtedly merely catching-up: that is, implementing changes which had been already familiar from experience elsewhere. The question is whether the process has gone beyond catch-up to the point where productivity levels are now higher at TCNZ than at its Australian counterpart.

The standard indicator of productivity levels used in the telecommunications industry is the ratio of main lines per employee. Going by this indicator, TCNZ's productivity levels are now considerably above those at Telstra — having been substantially lower a decade ago.²⁰

18 See D. Boles de Beer and L. Evans, "The Economic Efficiency of Telecommunications in a Deregulated Market: The Case of New Zealand", forthcoming in *The Economic Record* (1996).

19 The most recent published estimates of TFP growth for Telstra are those presented in Bureau of Industry Economics (BIE), *International Performance Indicators: Telecommunications* (Canberra: AGPS, 1995). The BIE's estimates are substantially higher than those used here, so some comment is in order. Three points are especially important. First, unlike Boles de Beer and Evans, the BIE used revenue weights in its output index. As noted some years ago by M. Denny and others (see Cowing and Stevenson (eds), *Productivity in Regulated Industries* (New York: Academic Press, 1981), pp. 179-218), this is dangerous in regulated industries and in this specific case will substantially overstate the rate of growth of output. Second, also unlike Boles de Beer and Evans, the BIE does not correct its input measure for economies of scale. It consequently understates the growth rate of inputs. Given a cost elasticity of around 0.7, the resulting bias is large (see F. Kiss in Courville, de Fontenay and Dobell (eds), *Economic Analysis of Telecommunications* (New York: Elsevier, 1983)). Third and last, the BIE appears to have made at least one error in the calculation of capital inputs. In particular, its estimates imply that the services Telstra derived from its capital stock were nearly halved between 1992 and 1993. Correcting for these factors — by using only call minutes as the index of output and adjusting inputs for a cost elasticity of .7 — yields an estimate close to 5 per cent. It is worth noting that very similar problems with TFP measurements for Telstra were discussed in a Consultant's Report on price caps to DOTAC in 1991; that report also estimated the trend growth of Telstra TFP at around 5 per cent.

20 Currently, TCNZ has some 194 access lines per employee and 248 access lines per "core telephone operations employee" — that is, excluding employees not providing PSTN-related services. The comparable ratios for Telstra are 135 and 190 (assuming that 70 per cent of Telstra employees — as compared to nearly 80 per cent of TCNZ's — can be classified as "core telephone operations employee").

A note of caution is nonetheless in order. This indicator is relatively simplistic, and the rankings it provides may not be closely correlated with those generated by more sophisticated measurement approaches.²¹ Nonetheless, when this indicator is considerably higher for one carrier than another, the likelihood of the rankings it generates being reversed by the use of a more sophisticated measurement approach appear to be lower, although they are by no means negligible.²²

3. *Prices and Service Quality*

As with productivity, the situation in New Zealand in terms of service prices and service quality seemed notably poorer at the start of the reform process than it was in Australia. Price structures were severely distorted: quite in contrast to the trend in Australia, the ratio of toll (STD) prices to rentals and local call charges (which in New Zealand are included in the rental) had risen in real terms during the decade to corporatization, just as underlying costs were moving in the opposite direction.²³ At the same time, the Mason-Morris Review came to the conclusion that toll prices exceeded those in Australia, confirming the results of surveys carried out by Siemens and by BT.²⁴ Finally, there were serious problems with service quality, including a high ratio of reported faults per main lines²⁵ and sharply rising waiting lists.²⁶

Again, the reform process reversed these trends. As of 1988, prices were rebalanced: sharp increases in residential rentals occurred between 1988 and 1991;²⁷ through the 1990's, the real price of residential access was (depending on the price index used for deflation) some 17% to 29% higher than it was during most of the 1980's.²⁸ As residential rentals were increased,²⁹ toll prices were cut drastically: on average, charges for toll calls declined in nominal terms by some 14 per cent annually over the seven years from 1988. Set at 100 for 1984, the weighted average inflation-adjusted price for the residential consumption basket decreased from 85 in 1988 to just above 40 in 1995,

21 The BIE, for example, provides an index of multifactor productivity which has a correlation of .25 with that for mainlines per employee.

22 In the BIE data set, for example, a 50 per cent difference in the ratio of main lines per employee is reversed in less than a quarter of cases.

23 The trend in New Zealand is evident from R. N. Mason and M. S. Morris (1986) *Post Office Review* Wellington: Government Printer at page 30. In real terms, rentals in New Zealand decreased by more than a third over the period from 1972 to 1988, falling far more sharply than toll charges. In Australia, in contrast, this period saw considerable price rebalancing. Thus, from June 1982 to June 1989, while the CPI increased by 68 percentage points, the Sydney-Melbourne charge was halved in nominal terms, the local call charge was increased by 110 points and the residential rental increased by 49 points.

24 An in-house study carried out by Telecom Australia at that time estimated that charges for a basket of 50 trunk calls in New Zealand exceeded those in Australia by some 20 per cent.

25 See de Beer and Evans *supra* note 18 at Figures 5 to 8.

26 Mason and Morris *supra* note 2 at Table 15, page 31.

27 The standard residential rental was increased from \$18.23 in May 1988 to \$28.96 in January 1991. See Duncan and Bollard *supra* note 17 at page 155.

28 See L. Evans, *The Effect of Telephone Rate Re-Balancing on Residential Access in a De-regulated Economy* (Wellington: Victoria University, mimeo, 1996), p. 11.

29 Business rentals were reduced by some 10 per cent in nominal terms from 1988 to 1991.

an annual decline of just under 10 per cent (a slightly greater rate of decrease being recorded for business customers).³⁰

It is difficult to compare the magnitude of these price changes with those in Australia. In contrast to the situation in New Zealand, the Australian Statistician does not maintain a reliable price series for telecommunications.³¹ At the same time, the series maintained by AUSTEL appear to be seriously flawed, notably for the early 1990's.³² Since the errors involved were never rectified, the current base is too high, possibly by some 2 percentage points, so that price falls have been somewhat less than claimed. Overall, it seems implausible that the real annual reduction in charges for price-capped services would have been of more than 4.0 to 4.5 per cent³³ — a rate about half that in New Zealand.^{34,35} Indeed, the Bureau of Transport and Communications Economics (BTCE) estimates that prices decreased more rapidly prior to the duopoly than they have in the post-Beazley years.³⁶

In short, prices appear to have fallen substantially more in New Zealand; but are they now lower or higher than those in Australia? Comparisons of this kind are difficult and inevitably controversial, if nothing else because consumption patterns differ so greatly between countries.³⁷ Nonetheless, existing studies in this regard may provide some guidance, though the need for caution in their interpretation needs to be emphasised.

These studies suggest that prices in New Zealand are now somewhat lower than those in Australia, at least for business users. The most detailed recent assessment is that for 1994 by the Bureau of Industry Economics (BIE). The BIE uses a "standard business

30 The data is set out in TCNZ, *Regulation of Access to Vertically Integrated Natural Monopolies: Telecom Response* (Wellington: TCNZ, 1995), pp 25–26. The index is calculated using end-year consumption weights.

31 Thus, the "telephone services" component of the CPI holds the nominal price of STD constant over the period from 2nd Quarter 1993 to 2nd Quarter 1994, despite the considerable discounting which occurred during that period as a result of the rising take-up of FlexiPlans. Moreover, again in contrast to New Zealand, the Statistician does not maintain (or at least disclose) a PPI series for telecommunications, making it difficult to assess trends in prices to non-final consumers.

32 This is the result of the manner in which AUSTEL calculated the change in price resulting from the increasing availability and take-up of Optional Calling Plans.

33 Even this exceeds the estimate given in Bureau of Transport and Communications Economics, *Evaluation of the Transition Period in Australian Telecommunications* (Canberra: Department of Transport, 1995), p. 8.

34 It should be noted that the series published by AUSTEL as part of its monitoring of compliance with the price cap use annual revenue weights, and hence will tend to record lower price falls than those assessed by TCNZ. Nonetheless, it seems unlikely that this would account for a gap of more than 1 percentage points, at least on conventional views about demand elasticities.

35 It is worth noting that the BIE, using a "national business basket", estimates that the rate of annual decrease in prices in Australia was 40 per cent that in New Zealand over the period from 1990 (see Bureau of Industry Economics (BIE) *supra* note 19 at page 75). The only service in which prices fell significantly more rapidly in Australia was IDD.

36 See Bureau of Transport and Communications Economics, *supra* note 33, p. 10.

37 An excellent discussion of this problem in general terms can be found in I. Castles, "Measuring Economic Progress" in *Productivity and Growth* (Sydney, Reserve Bank of Australia, 1985).

basket" which involves an aggregate of rental and usage charges. The essence of the BIE's results is that while telephone rentals are substantially cent higher in New Zealand, usage charges are, on average across services, 20 per cent lower. (The only area where the BIE estimates Australian call charges to be substantially lower than those in New Zealand is International Direct Dial (IDD) service). Given that call charges far outweigh fixed charges (rentals and connection fees) in the standard business consumption pattern, and taking account of fixed and usage charges for non-PSTN³⁸ services, the BIE estimates that overall New Zealand charges are just short of 20 per cent below those in Australia.³⁹

These estimates do not take account of volume discounts. The BIE has sought to correct for this by applying discount coefficients to various levels and patterns of outlay. Because the BIE assumes that volume discounts have been greater in Australia than in New Zealand, this very slightly reduces the gap in charges. However, this assumption is inaccurate. Rather, while TCNZ's published discounts (its equivalent of the Flexiplans) involve rebates somewhat smaller than those which were available under Telstra Flexiplans such as CS8 (now disallowed by AUSTEL), TCNZ, unlike Telstra, is allowed to offer customer-specific discounts, and does so on a considerable scale. Examination of information provided by TCNZ under its disclosure requirements shows that these discounts reach up to a further 40 per cent off published charges. Moreover, a large volume of business traffic is under contract-related discount. In contrast to the BIE assumption, it would therefore seem that volume rebates are significantly greater in New Zealand than in Australia.⁴⁰

On balance, it can be assumed that the average equivalent volume rebate for business traffic in Australia is in the order of 10 to 15 per cent, while that in New Zealand is in the 15 to 25 per cent. Applying these discount rates to the BIE estimates of annual charges increases the gap in effective charges to business between the two countries.

Whether the same ranking would emerge from a comparison of charges to residential consumers is not examined by the BIE. By and large, standing charges (rentals and connections) account for a far higher share of outlays for residential than for business customers; and residential rentals in Australia are about half those in New Zealand. However, local calls are included in the residential rental in New Zealand. Assuming that the average residential consumer made just 3 local calls a day would eliminate the gap in charges between the two countries.⁴¹

In short, prices now appear to be lower in New Zealand than in Australia, especially

38 That is, for services other than those of the Public Switched Telephone Network (PSTN). These are services such as mobile telephony, leased lines and ISDN.

39 See Bureau of Industry Economics (BIE) *supra* note 19, p. 48-67.

40 The BIE also underestimates the availability of discounts for smaller businesses in New Zealand. In particular, TCNZ offers a range of "association plans" attracting special discounts above those available from other charges. An attempt by Telstra to provide very similar discount plans in Australia was disallowed by AUSTEL.

41 The standard network planning assumption is closer to 4 local calls per residential line.

for business consumers. There is, at the same time, no reason to believe that the quality of service provided to consumers is lower.

TCNZ discloses considerable information about service quality, and several of the measures it uses are comparable to those monitored by AUSTEL. Comparison of these series suggests that quality levels at TCNZ are no lower than those recorded by AUSTEL.⁴² Surveys in the trade press, most of which deal with non-PSTN services primarily purchased by larger corporate customers,⁴³ generally rank TCNZ's service quality highly. Last but not least, the IMD's Annual World Competitiveness Report, which draws on surveys of senior executives from major international corporations, ranks New Zealand as the country (out of the 48 covered in the survey) where the telecommunications infrastructure "best meets business requirements".⁴⁴

4. Service Universality and Community Service Obligations

In both Australia and New Zealand, preserving universal access to the telephone service has been an important goal of public policy. In Australia, AUSTEL administers a complex scheme aimed at sharing the costs involved in providing service in high-cost areas; the operations of this scheme have been a source of considerable tension between the parties concerned. At the same time, the price caps have been used to drastically slow price re-balancing by Telstra, with the declared goal of thereby preserving service universality. In New Zealand, in contrast, the policy goal is pursued simply through the "Kiw Share Obligation" imposed on TCNZ, which though it also entails a cap on rentals, only came into effect once a major re-balancing had been carried out.

Despite this difference in the extent and content of regulation, there is no evidence that New Zealand has fared worse than Australia in terms of service universality. Precise comparisons are difficult, mainly because AUSTEL and the Australian Statistician collect and/or disclose only a very limited amount of the information (on service penetration and outlays by income and location) which would be needed;⁴⁵ this information is fully available in New Zealand. Nonetheless, three points can be made.

First, aggregate penetration (percentage of households with a telephone in place) is virtually identical in the two countries at 96 per cent.⁴⁶

Second, despite the substantial increase in residential rentals which occurred in New Zealand, there has not been a decline in penetration in the lower income quintile. Although penetration in this quartile did decline in the early 1990's, this was reversed by 1995, suggesting that the initial fall had more to do with the then depressed state of New

42 Compare AUSTEL, *Competitive Safeguards and Carrier Performance* (Melbourne: AGPS, 1995) at Figure 4.1, with TCNZ, *Half Year Report 1995-1996* (1995), p. 7.

43 See, for example, the "1995 Carrier Report Card" in *Data Communications* (March 1996), p. 64.

44 IMD, *World Competitiveness Report* (Lausanne: IMD, 1995), p. 596; Australia is ranked 11th in this aspect of the survey.

45 The data available on penetration relates to 1991 and on service outlays to 1993-94; the latter is highly aggregated and does not separate outlays on rentals from those on usage.

46 See for New Zealand, Evans, *supra* note 28, p. 11; and for Australia, Telstra, *Annual Report* (Melbourne: Telstra, 1995).

Zealand's economy than with movements in telephony prices.⁴⁷ Current telephone penetration rates in this income quintile appear to be very similar in two countries.

Third, assuming that penetration rates in the lower income quintiles are similar, low-income Australian households seem to make considerably fewer STD calls than their counterparts in New Zealand. In effect, Statistic's New Zealand's Household Survey estimates that in 1995 a representative household in the lowest income quintile spent 28 per cent of its telephony expenditure on long distance calls, up from 21 per cent in 1987.⁴⁸ In contrast, the ABS estimate of household telephony expenditure in this income group for 1993–94 is almost entirely accounted for by the rental and local call charge, with virtually no margin for STD outlays⁴⁹ — a pattern which has not improved over the last decade.⁵⁰ This confirms the impression that a major impact of the current price distortions (which keep rentals artificially low and usage charges artificially high) is to suppress STD demand in low-income groups.⁵¹

5. *Profits and the State of Competition*

It might be thought that the “light handed” approach to regulation would allow TCNZ to retain a substantial degree of market power and in consequence extract monopoly profits. While a rigorous empirical test of this proposition is beyond the scope of this paper, some evidence can be sought from surveys of the pattern of competition in New Zealand and Australia and the of the profitability of the predominant carriers.

It needs to be noted at the outset that market share is a poor indicator of competitive pressure, and that having a market which is divided up among several players is not a sensible goal for its own stake. This point was not lost on the New Zealand Government's advisers. In proposing full liberalisation, they emphasised that:

We believe that the case for competition hinges on the effects on Telecom. Competitors are unlikely to be more than marginal in size in the market-place, but their impact on Telecom could be substantial.⁵²

Entrants, in the advisers' view, would, at best, secure a few per cent of the market;

47 See Evans, *supra* note 28, pp. 12–14.

48 *Ibid.*, p. 14.

49 Thus, the ABS estimate of the weekly outlay is \$9.03 (see ABS Catalogue Number 6535.0 at page 23). Assuming a standard residential monthly rental of \$11 (so as to account for the timing of the survey) and 4 local calls per service per day gives a weekly outlay of \$9.4. Correcting for 90 penetration yields \$8.6 which implies an STD outlay of \$0.40 per week.

50 The STD margin is only slightly smaller if one uses the ABS Household Expenditure Survey for 1984 (ABS Catalogue No. 6529.0).

51 This was emphasised by Ergas, Ralph and Sivakumar *supra* note 16. Already at the time of liberalisation in New Zealand, the Minister for State Owned Enterprises released a special study showing that households with relatively high expenditure on toll (calls) include low-income households with Pacific Island heads and with Maori heads. It was consequently the Government's expectation that a fall in toll charges would be of benefit to many in low-income groups. (See Hon. R. W. Prebble, *De-Regulation of the Telecommunications Industry* (Wellington: Minister for State Owned Enterprises, 1987), pp 59, 60.

52 Touche Ross Management Consultants, *supra* note 4.

but rather than this share being relevant, what mattered in terms of welfare was the extent to which TCNZ was forced to behave as a competitive entity.

There is a compelling logic underpinning this view. However, looking to the long term, the pressures on a firm to continue to seek improvements in performance may slacken if it does not ultimately face real competitors in the market. In this perspective, it is relevant to assess the extent to which competitors have managed to establish a market-place presence. The issue here is whether the Australian regulatory system, which gives entrants considerable direct protection, has performed in some sense better than its New Zealand counterpart.

In practice, despite very substantial price cuts, TCNZ does not appear to have lost market share substantially more slowly than Telstra, excepting in the international market. Thus, TCNZ estimates that in 1995 it accounted for just under 80 per cent of revenues for national toll calls and for a similar share of international call revenues.⁵³ Closely similar results have been reached in a study by an international market survey organisation.⁵⁴ Clear itself claims a slightly higher market share.⁵⁵ In Australia, recent estimates suggest that Optus' revenues from STD are some 15 per cent of Telstra's and closer to 30 per cent for IDD.⁵⁶ Non-carrier service providers appear to be somewhat more significant in the Australian market, but this may well merely reflect the larger size of the market and the greater regulatory constraints on Telstra's ability to eliminate arbitrage opportunities.⁵⁷

Evidence of the extent of competitive pressures may also be sought from an analysis of TCNZ's profitability. A recent report by brokers BZW is of interest in this respect because it compares the financial performance and market valuation of a large number of carriers using a range of indicators.⁵⁸ In eight direct comparisons with BT, TCNZ is lower in three; in four with AT&T, TCNZ is lower in three. At the same time, the report estimates that the market imputes to TCNZ a Beta coefficient (a standard financial measure of risk) substantially higher than that for BT and indeed higher than for any carrier other than MCI. This is in and of itself a partial indicator of competitive conditions,⁵⁹ but it would also require TCNZ to secure higher margins so as to pay its cost of capital. Hence, one would expect to find TCNZ reporting somewhat higher earnings.

53 See TCNZ, *Annual Report* (Wellington: TCNZ, 1995), p 26.

54 See *Telecommunications Strategies Report 1995/96*, p. 229.

55 See InterData, *The InterData Telecommunications Handbook* (5th ed, Sydney: IDP InterData, 1995), p. 81.

56 See Northern Business Information, *Australian Service Providers: Industry and Market Analysis* (New York: Datapro Information Services Group, 1996); BZW, *Optus Communications* (Sydney: BZW, 1994); and BZW, *Regarding Telstra* (Sydney: BZW, 1996).

57 For reasons which are not apparent in terms of economic analysis, AUSTEL takes the view that Telstra's tariffs need to provide scope for profitable resale. It has therefore moved (under the powers vested in it under s.238A of the *Telecommunications Act 1991* (Cth)) to disallow tariffs which would reduce the market-entry opportunities for arbitragers — see, for example, AUSTEL, *Corporate Centre Long Distance: Preliminary View* (Melbourne: AUSTEL, 1996).

58 BZW, *Regarding Telstra*, supra note 56, pp. 66–77.

59 Though it presumably also reflects TCNZ's greater weight in the New Zealand equities market.

Broadly similar results emerge from a Putnam Hays Bartlett study published by TCNZ. This study, which relies on data from Annual Reports, finds that the ratio of operational earnings to net assets for TCNZ has been consistently below that for BT and nearly identical to that for AT&T. Given a higher TCNZ cost of capital, this might suggest that large economic profits are not being earned.⁶⁰

Overall, the impression derived from these analyses is that TCNZ's profitability is relatively high when compared to say, Telstra's, but not by so much as to necessarily point to the use of market power. Rather, the ranges involved are consistent with the view that (1) TCNZ is earning a return on its extensive investment in rationalisation and (2) market valuations have been affected by its demonstrated management abilities.⁶¹

Conclusions

Although it is difficult to measure the resources devoted to regulating telecommunications, there seems little doubt that these are very much greater in Australia than in New Zealand. However, four points emerge from a survey of indicators of telecommunications performance on the two sides of the Tasman:

- (i) Productivity has increased considerably more rapidly in TCNZ than in its Australian counterpart and absolute productivity levels now seem to be higher in New Zealand.
- (ii) Consumer prices have decreased considerably more rapidly in New Zealand and are now lower than those in Australia.
- (iii) The greater degree of price rebalancing which has occurred in New Zealand has not eroded service universality — rather, while telephone access has remained high, low-income New Zealand households now make considerably more use of the long-distance service than their Australian counterparts.
- (iv) Competition does not appear less vigorous in New Zealand than it is in Australia, and TCNZ's profitability is not outside the range for telephone companies in competitive environments, although it is high.

Three factors seem to be at work in generating these large gaps in performance:

- (i) Although it is widely recognised that competition, rather than ownership, is the primary factor affecting levels of efficiency, there seems little doubt that the decision to retain Telstra in public ownership has blunted the ability of the Corporation to carry out needed restructuring.
- (ii) At the same time, the duopoly environment has not been conducive to vigorous competition and has further blunted the pressures for efficiency.
- (iii) The problems have been greatly aggravated by the Australian regulatory regime which has, if anything, facilitated coordination in the duopoly. The

60 The study is attached to TCNZ, *Regulation of Access to Vertically Integrated Natural Monopolies: Telecom Response* (Wellington: TCNZ, 1995), Appendix 2.

61 This is certainly the view put by brokers: see, for example, Merrill Lynch Capital Markets, *New Zealand Telecom* (New York: Merrill Lynch and Salomon Brothers Inc, 1996); *Telecom New Zealand* (New York: Salomon Brothers, 1996) both referring to these factors as drivers of TCNZ's earnings and valuation.

measures involved include the tariff filing requirements, which give competitors warning of Telstra price moves; the provisions which limit Telstra's ability to discount; and the price caps on STD and IDD, which provide a "focal point" for strategic coordination among competitors.⁶² The New Zealand experience, in which this mass of constraints is absent, points to just how costly these regulations have been.

This assessment notwithstanding, it might be argued that the Australian regime has left a solid basis for future competition. Particularly at issue here is the roll-out by Optus of an extensive local network which directly competes with Telstra's — a roll-out which might have been less likely absent the initial duopoly. This roll-out, it is claimed, will allow far more direct and vigorous competition than has been observed to date.

This claim is difficult to assess. To begin with, the linkage between the regime as it has operated to date and Optus' roll-out decision is unclear. One of the major objectives of the regime was to tightly regulate interconnection precisely so as to avoid the need for infrastructure duplication. As a result, interconnection prices have been set and maintained at low levels. The argument that this has permitted or encouraged greater infrastructure duplication than would have occurred otherwise seems paradoxical.⁶³

At the same time, the impact which the roll-out will have on future competition can only be a matter for speculation. It might, in particular, be argued that the roll-out will merely cement the duopoly, since it seems unlikely that a third player will engage in an extensive roll-out.⁶⁴ Once the roll-out is completed, Telstra and Optus might well have few incentives to engage in vigorous competition, as against simply dividing up the rents available in the market. Given that they will each have enough capacity in place to service the entire market, the resulting equilibrium could be one in which capacity utilisation was low and hence effective social costs high. Seen in this perspective, the roll-out would merely continue the long tradition in Australia whereby firms sheltered from effective competition invest in excess capacity.⁶⁵ Consideration of the current roll-out by Optus of a network competing directly with Telstra's therefore seems unlikely to reverse the assessment made above.

All of this is not to deny that the New Zealand regime has imposed a heavy burden on those seeking to compete with TCNZ. It has: the life of TCNZ's competitors is by no

62 The caps, in other words, allow competitors to distinguish "non-aggressive" price moves by Telstra from price changes which might signal a price war. Economists have consistently pointed to the dangers inherent in placing price caps on products exposed to competition, but apparently with little effect.

63 It might be argued that this has been through an "infant firm" effect, where the initial protection (through the duopoly) allowed Optus to fund its roll-out. However, there is no evidence that the roll-out is being funded in this way, and the fact that Optus' owners have deep pockets makes this claim somewhat unconvincing. The element in the regime which, in practice, seems to have had a greater impact on the roll-out decision are the privileges and immunities granted carriers in respect of State and local authority planning requirements: but as the New Zealand experience shows, the grant of some powers in this respect does not require the complex regulatory regime imposed in Australia.

64 The duopolists might nonetheless face competition from highly focussed players laying fibre optic rings in CBD's and from wireless access technologies elsewhere.

65 See Henry Ergas and Mark Wright, "Internationalisation and Corporate Performance": in Reserve Bank of Australia, *Internationalisation of Australia's Economy* (Sydney, 1994).

means an easy one, and is certainly more arduous than that of their Australian counterparts. It may well be that outcomes in New Zealand would have been further improved had interconnection arrangements been achieved more expeditiously and at lower cost, as the new Part IIIA to the Australian *Trade Practices Act* seeks to achieve.

Ultimately, however, the goal of competition policy is not to make life easy for entrants — rather, in the words of Judge (now Justice) Breyer, it is to “bring consumers the benefits of lower prices, better products and more efficient production methods”.⁶⁶ Judged by this criterion, the Australian experience with “heavy handed” regulation seems to be a costly failure.

⁶⁶ *Interface Group Inc. v. Mass. Port Authority* 816 F. 2d 9, 10 (1st Cir. 1987).



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