Network Access Pricing and “Light Handed” Regulation: A Comparative Institutional Analysis

Mario Bergara
NETWORK ACCESS PRICING AND “LIGHT HANDED” REGULATION: A COMPARATIVE INSTITUTIONAL ANALYSIS

Mario Bergara
University of California, Berkeley
Central Bank of Uruguay

Abstract: Optimal regulatory framework choice is analyzed for network (unbundled) industries, by developing a comparative institutional analysis of network access price regulation and “light handed” regulation. The former constitutes a more hierarchy-like governance response. The latter represents a more market-like institutional solution to the regulatory problem. While the former is a specific agency-based arrangement (with a higher degree of political influence), the latter is a court-based system. Consequently, the main trade-off between both frameworks reflects the costs and benefits of having efficient political and/or judicial institutions. Price regulation is superior when the regulator’s distributional concerns are irrelevant and the degree of the informational asymmetry is lower. A poorly functioning political system and a high welfare cost of raising public funds makes price regulation less attractive. On the other hand, light regulation is more attractive when the potential rents are smaller, the monopolist is more risk averse, the judicial system is more efficient, and the threat of regulator’s auditing is more credible. The possibility of private transfers among firms makes price regulation more advantageous, while a higher information asymmetry among firms makes light handed regulation more attractive. The main results are consistent with a plausible interpretation of the drastic deregulatory process in New Zealand.

I am indebted to Richard Gilbert and Pablo Spiller for their permanent support and help in this project. I would also like to thank Federico Echenique, Joseph Farrell, Rodney Maddock, Miguel Villas-Boas, Oliver Williamson, Glenn Woroch, and participants at seminars in the Facultad de Ciencias Sociales de la Universidad de la República (Uruguay) and the 1997 Meeting of the Latin American and Caribbean Economic Association (Colombia) for their helpful comments and suggestions.
I - INTRODUCTION

Most of the countries that are restructuring their utility markets (electricity, telecommunications, natural gas, water) have followed a strategy of unbundling the supply of the respective complementary products and have imposed price regulation on the network access. This is the case of the U.K., Chile, Norway, Argentina, and Peru, among others. They have undertaken structural reforms introducing commercial incentives into their respective utility markets, in particular into the potentially competitive activities within each industry. They have generally used a specialized regulatory agency for each utility sector, and the courts have not had a major role in developing regulatory structures. In terms of competition law, they have left broad discretion within ministerial control and a limited role to individuals or courts. However, the most radical deregulation process is taking place in New Zealand, where network operating firms are subject to the so-called "light-handed" regulation. This approach to the regulation of utilities is based on common law and antitrust law, rather than on sector specific regulation. Companies operating in the utility markets are not subject to any particular formal pricing requirements, although they are subject to accounting disclosure, potential litigation, and the threat of price or rate regulation. An intermediate case appears to be the Australian regulation, in which the network operator is required to negotiate with any access seeker and the parties may request the intervention of a regulator who then determines the terms and conditions of access.

Direct control imposed by an industry-specific regulator will likely generate inefficiencies: the costs of operating the regulatory body; the information supply costs imposed on the regulated firm; the scope for it to engage in opportunistic behavior; the compliance costs arising from the distortions caused by imperfect competition; the losses associated with the possible corruption of the system through "regulatory capture"; and dynamic losses associated with the control by regulators of industry structure and conduct, which may inhibit new entry, competition, and innovation. Taking into consideration these costs of the heavier forms of regulation, "light-handed" regulation may seem to offer an attractive alternative. However, the soft regime may involve regulation that is too light handed and may result in firms with market power operating without sufficient restraint, to the detriment of consumers and to efficient production. The design of a regulatory regime must therefore weigh the potential costs and benefits involved.
While there is an increasing economic literature about network access pricing and price regulation, the literature on network access pricing in industries under light regulation is relatively scarce. The purpose of this article is to shed some light on identifying the factors affecting the choice of a particular regulatory regime in network industries, in a framework of a comparative institutional analysis. This implies the assertion that both arrangements under scrutiny differ in a discrete way as governance structures, such that they are respectively well-suited for some purposes but not for others. This is particularly relevant when problematic transactions have to be delivered (as is the case of regulatory services); that is, transactions that are beset with contractual hazards. By taking into account the remediableness criterion (i.e. a governance structure for which no superior feasible alternative can be described and implemented with expected net gains is presumed to be efficient), the study will consider how political and judicial institutions as well as economic factors could influence the regulatory framework choice.

The problem of how the design of a regulatory system might vary with a country’s institutional endowment has been analyzed by Levy and Spiller (1995). They focus on the role that a country’s institutions play in providing credible commitments to refrain from arbitrary administrative action. Systems of utility regulation confront a tension between their ability to commit to a stable set of rules and their ability to respond flexibly to changing circumstances. Countries differ in their institutional endowments, and hence in the way in which they can resolve this tension. They analyze how the internal organization of government interacts with electoral rules and the organization of the judiciary in allowing for regulatory structures to restrain administrative discretion.

This paper also stresses the importance of the relationship between institutional endowments and regulatory regimes and, in particular, focuses on the impact of political and judicial institutions on the relative merits of alternative regulatory arrangements. The comparative institutional analysis suggests that while price regulation is a more hierarchy-like governance response, soft regulation represents a more market-like institutional solution. The model presented here shows that price regulation will be superior where the regulator’s distributional concerns are less important, the degree of the informational asymmetry is lower, and the constraints imposed by judicial review on the regulator’s discretion are stronger. A poorly
functioning political system, a high welfare cost of raising public funds, and the absence of substantial information about the monopolist's technology will make "heavy" regulation less attractive. On the other hand, light regulation will be more attractive where the potential monopoly rents are smaller (i.e. a flatter demand curve), the judicial system is more efficient (i.e. lower litigation and decision costs), the environment the risk-averse monopolist faces is more uncertain, and the threat of regulatory intervention is more credible. If the network operator is allowed to make side payments to competitors in the downstream segment of the industry, soft regulation would become less advantageous. However, a higher information asymmetry between the monopolist and the competitors would make soft regulation more attractive.

The paper is organized as follows. Section II presents a description of three main issues related to the regulation of complementary products. First, there is a brief discussion about the relative advantages of bundling and unbundling the supply of complementary goods. Second, some relevant results found in the literature on network access price regulation are submitted. Finally, the main aspects of the "light-handed" regulation framework are summarized, taking the case of New Zealand as the leading example. In Section III, a comparative institutional analysis is developed by adopting a transaction cost economics perspective. In Section IV, a basic model is presented in which the regulator has distributional concerns and the possibility of auditing. Section V introduces a private agenda of the regulator and a risk averse monopolist. Section VI extends the model by allowing private transfers between the network operator and the competitors in the downstream segment of the industry. The effect of asymmetric information about the competitors' technology is analyzed in Section VII. Finally, Section VIII concludes.

II - REGULATING COMPLEMENTARY PRODUCTS

Electricity generation and retailing, natural gas supply, and long-distance telecommunications are all potentially competitive activities. However, firms cannot compete effectively in these sectors without proper access to networks which generally constitute natural monopolies. Independent bulk power producers require access to electricity transmission, natural gas suppliers must have access to pipelines, and long-distance carriers require access to local switching and termination. A relevant issue for regulatory policy is whether supply in these utility industries should be bundled or unbundled. Bundled supply calls for regulation of a vertically
integrated industry, while unbundled supply has each component regulated separately. The latter allows deregulation of the potentially competitive activities. A second main issue is related to the regulatory arrangement that will govern the industry’s activities and, in particular, how to solve the network access problem. In general, the network monopolist is subject to access price regulation and to the requirement to supply access to firms in the competitive market on the same terms as it does to itself. However, under the so-called “light-handed” regulation, firms are not subject to regulation, but to standard antitrust laws. These issues will be briefly described in this section.

II.1 - Unbundling Complementary Products

A main issue that needs to be addressed in designing the appropriate regulatory framework for any network industry is the choice between two alternative structural models. In the first, (potentially competitive) production and the network can be retained as a vertically integrated monopoly, perhaps with provisions for common carriage and access to a fringe of smaller producers. The other model is one of vertical separation, with the objective of ensuring competition in the competitive stages of the industry, while retaining regulation for the natural monopoly elements.¹ If the industry remains vertically integrated, regulation can be confined to a price cap on the basket of final products, and the industry is free to choose the most efficient organization of production and distribution. If the industry is vertically disintegrated, the network can be subject to separate regulation. The advantage of the latter is the competitive pressure when entry is feasible, and the resulting gains in efficiency may offset the transactions inefficiencies of the network. Vertical disintegration hinders cross-subsidization and makes pricing more transparent.

Gilbert and Riordan (1995) examine whether unbundled supply of component products or integrated supply of a bundled product is more advantageous to a regulator, particularly in the context of the electricity industry. They suggest that in a broad range of circumstances, the regulator does not benefit from unbundling the product and contracting separately for bulk power and transmission access. The reason why vertically integrated supply can be better for the regulator is related to the problem of “double marginalization” with successive monopolies. In the

¹ See Newbery and Green (1996).
electric power example, the integrated supplier is the local utility, while with component supply, an independent power firm produces bulk power and the local utility provides transmission access. With component supply, the independent power producer ignores the negative consequences of its actions on the profits of the local utility that provides transmission services, and the local utility ignores the profits of the independent power firm. Under a direct revelation mechanism, this makes the firm more willing to overstate their costs with component supply, thus increasing the price of bulk power to the regulator and increasing firms' information rents. However, they point out that component supply may be favored if the costs of components are correlated, or if the components are substitutes in production. An important extension concerns competition in the provision of one or both components. Unbundling supply can benefit the regulator if it leads to a more favorable probability distribution for the cost of bulk energy, either because the independent power producer has a lower expected cost than the local utility or because competition among independent producers expands the production possibilities for the bulk energy component of power supply. If the integrated firm's cost of generation has the same probability distribution as the cost of a single representative independent producer, then the possibility of even modest levels of competition among independent firms may be sufficient for the regulator to prefer component supply. The regulator benefits in the case of the component supply from horizontal competition among independent firms, which reduces information rents for bulk power supply, but integrated supply offers informational advantages associated with eliminating double marginalization.

II.2 - Network Access Price Regulation

Network access pricing has been analyzed under a variety of institutional, informational, and structural frameworks. For example, alternative settings can be considered depending on whether transfers from the regulator to the regulated firm are allowed or not. The nature of optimal access price regulation also depends partly upon whether there is vertical separation or integration (in the sense that the firms providing the final service are no longer symmetrically placed, since the regulated firm competes in that market facing a lower access charge than the

---

2 However, the comparison is more problematic if the integrated firm could employ the same technology as the most efficient independent power producer.
remainder firms). The nature of the informational structure is also relevant: some models recognize that the regulated firm has informational advantages over the regulator. Finally, the form of competition in the competitive sector also affects the optimal policy.\textsuperscript{4} According to Armstrong, Cowan, and Vickers (1994), marginal cost pricing principles are relevant for access pricing, but subject to a number of qualifications, and in a way that is sensitive to opportunity costs and to structural, competitive, and regulatory conditions.

Assuming that the regulator knows the marginal cost of access, with Bertrand competition, homogeneous goods, and fixed coefficients technology, the principles of optimal access pricing are exactly the same with vertical integration and with vertical separation. This is determined by the fact that the opportunity cost of access is the same for every firm (including the regulated firm). For any level of access price, production would occur by the most efficient means in any event. Then welfare comparison between separation and integration is neutral. On the other hand, in a Cournot framework with free entry, there is a case for subsidizing network access so as to offset oligopoly markups in the competitive sector. This result is due to the aim of inducing allocative efficiency, that is, marginal cost pricing of the final product. But the terms of access are likely also to affect productive efficiency, in particular, the extent of duplication of fixed costs, and this may be a countervailing influence. Thus, the welfare neutrality no longer holds in the Cournot setting.

Network access pricing under information symmetry is also analyzed by Spulber and Sidak (1997). They focus on the key issue of how to balance the interests of consumers, incumbent firms, and entrants, with incentives for entry, as deregulation proceeds. They emphasize that access prices should be set such that they satisfy an individual rationality condition for the incumbent firm, so that network access is granted voluntarily. They examine access pricing using several alternative competition models in the final product’s market: Bertrand, Cournot, and Chamberlinian competition with differentiated products. They suggest that the access price that

\textsuperscript{3} Ruff (1994) points out that successful unbundling requires identifying the basic functions of the industry, defining unbundled entities that can perform these functions coherently, and establishing well-defined market relationships among these entities.

\textsuperscript{4} Some of the following discussion will follow Armstrong, Cowan, and Vickers (1994), and much of it will be based on the assumption that the fixed cost of network provision can be financed by transfers independently of the (marginal) price of access.
maximizes social benefits subject to the incumbent’s individual rationality condition provides incentives for efficient entry, and is consistent with price reduction and output expansion relative to the regulated price and output. The extent of this output expansion depends on initial prices and technology, the elasticity of demand, and the cost efficiency of entrants.

Asymmetric information is obviously an essential part of a reasonable model of regulation. A main source of asymmetry is related to the fact that the marginal cost of access can be private information of the regulated firm. It has been shown in the literature that the weight that the regulator gives to consumer surplus and firm’s profits is a key parameter in the optimal access pricing. Loeb and Magat (1979) suggest that, in the absence of distributional concerns, the informational asymmetries have no deleterious welfare effects. The efficient running of the firm can costlessly be delegated to the firm itself, resulting in full allocative and productive efficiency. That is, price will equal marginal cost, and effort will be chosen to minimize total cost given the output level. However, if distributional concerns are relevant, this scheme is no longer optimal, and departures from either allocative and productive efficiency are desirable. The problem of designing the optimal regulatory scheme when the firm’s costs are unobservable was first formally analyzed by Baron and Myerson (1982). Here, the firm always makes a positive expected profit, due to its superior information. Price will, in general, exceed marginal cost. Optimal access prices, and the final product prices that they give rise to, have additional (positive) terms relating to informational rents. Because of distributional concerns, profits are bad for welfare, and it is optimal to trade some allocative efficiency in order to get a reduction in adverse distributional effects. There are also additional considerations: the regulated firm’s desire to raise rival’s costs, oligopoly markups, and possibly excess entry due to imperfect competition. Baron and Besanko

---

5 This literature refers to the regulation of natural monopolies and not necessarily to access pricing. However, since we focus on unbundled industries in which the natural monopoly component has been separated, the main qualitative insights of this literature is still relevant.
6 Lewis and Sappington (1988) have examined the question of how to regulate a firm with superior information about demand. They show that whenever marginal cost is nondecreasing, the first-best can be imposed. However, when the firm has increasing returns, the informational asymmetry does have an impact and the first-best cannot be attained. In this case, the best that the regulator can do is to set a fixed price and a fixed transfer to the firm. Even when this can be also applied to access pricing, the case of asymmetric information about costs appears to be of more interest for access price regulation.
(1984) introduces the possibility of auditing when the firm reports a high cost. An important separation result emerges in a broad range of cases (in particular, when the firm’s participation constraint is not binding): the optimal unit price will be the same whether or not the firm is audited and (possibly) penalized. The separation result is likely to hold if the maximum penalty is small, distributional concerns are small, demand is large, and the information asymmetry is not large. They suggest that the size of the auditing region increases with a lower auditing cost, a higher maximum penalty, and a lower weight the regulator places on the firm’s profits.

Laffont and Tirole (1994) approach the question of access pricing using their “hidden action” model of multiproduct monopoly regulation, in which the regulator can observe the level of costs but not the cost-reducing effort by the firm. Here, the factors that determine optimal access pricing include the welfare weight on profits, the nature of competition, the elasticity of firms’ supply in the price-taking case, whether final product prices are regulated as well as the access price, and whether lump-sum transfers are available. The information problem results in the firm underinvesting in cost-reducing activity. While in Baron and Myerson’s model the regulator faces a trade-off between attaining allocative efficiency and minimizing adverse distributional effects, in Laffont and Tirole’s model, the regulator faces a three-way trade-off between allocative efficiency, distributional effects, and productive efficiency.

It is not immediately obvious how asymmetric information affects the relative merits of vertical separation and integration. An important factor is related to the regulated firm’s incentives to raise rivals’ costs. It will require more in the way of transfers to discourage higher access prices when there is vertical integration. Vickers (1995) suggests that, on the other hand, integration may also lead to there being fewer firms in the deregulated sector and hence less duplication of fixed costs. The overall welfare comparison between separation and integration is ambiguous. Another aspect refers to the fact that integration may itself worsen the asymmetry of information between the regulator and the firm if cost information from the two sets of activities becomes blurred. This is an important reason for having separate accounts for separate businesses in integrated firms.

Most of the countries that are restructuring their utility markets (electricity, telecommunications, natural gas, water) have followed a strategy of unbundling the supply of the
respective complementary products and have imposed price regulation on the network access. This is the case of the U.K., Chile, Norway, Argentina, and Peru, among others. They have generally used a specialized regulatory agency for each utility sector, and the courts have not had a major role in developing regulatory structures (except perhaps in Chile and Colombia where the deregulation of long distance telephony was prompted by respective judicial decisions). In terms of competition law, they have left a broad discretion within ministerial control and a limited role to individuals or courts.\(^7\) This is the case even in the Australian example, in which the parties are required to privately negotiate the terms of access. Access to essential facilities is controlled by the Australian Trade Practices Act. Any party can approach a national regulator (the National Competition Council) requesting that a service provided by an infrastructure facility be declared subject to access. If a service is declared, the network owner is required to negotiate with any access seeker. If these negotiations are unsuccessful, then either the potential access provider or the access seeker may request the intervention of a second national regulator (the Australian Competition and Consumer Commission), who then determines the terms and conditions of access. Its determination is binding on all parties to the dispute.\(^8\) However, the most radical deregulation process is taking place in New Zealand, where network operating firms are subject to the so-called “light-handed” regulation.

II.3 - “Light-Handed” Regulation

In a framework of economic reforms, structural change, and liberalization, New Zealand’s business environment for industry and commerce has been determined by competition policy that, from the enactment of the Commerce Act in 1986, sought to minimize government and regulatory intervention and to place reliance on actual and potential competition for the regulation of prices and monopoly behavior.\(^9\) The legal framework was molded by competition policy that rested on much less regulation in general, and minimal industry-specific regulation in particular. This type of arrangement has become known as “soft” or “light-handed” regulation. These reforms are indicative of New Zealand’s willingness to rely on market forces in ways not yet attempted by

\(^7\) See Bishop, Kay, and Mayer (1995).
\(^8\) A simple model associated to the Australian regime can be found in King and Maddock (1997).
other countries. The Act was passed into law with the objective to promote competition in markets within New Zealand. In terms of trade practices, the Act prohibits arrangements among competitors that lessen competition in the market (section 27), arrangements among competitors that restrict the operation of other firms (section 29), arrangements that lead to prices being fixed amongst competitors (section 30), and prohibitions against a company abusing its dominance in a market by trying to restrict entry, prevent competitive conduct or eliminate any player (section 36). The Act also regulates mergers and takeovers. Companies seeking to merge or acquire assets are subjected to an asset test, which involves assessing whether the merger would lead to the acquiring or strengthening of a dominant position in a market, and if so, whether it would be likely to result in a benefit to the public which would outweigh any detriment resulting from that increased dominance. The Act also allows for price controls (currently there are none in place).

In New Zealand, the Ministry of Commerce is charged with monitoring commercial performance and the implementation of the Commerce Act. The Commerce Commission was established as a combined regulatory and quasi-judicial authority to administer the Commerce Act. There are no comparable industry-specific statutory regulatory authorities, and the Commerce Commission has broad sectoral powers including coverage of all utilities. Its decisions may be appealed to the High Court and then to the Court of Appeal. The Commission is an independent statutory authority but the government can publicly direct it to “have regard to” the latter’s economic policies.

The Commerce Act works on a case by case basis. New Zealand relies heavily on UK precedents for its interpretation of earlier antitrust legislation. However, in interpreting the Commerce Act, recourse has been made principally to New Zealand and Australian legal precedent, although also to the US. The High Court has recognized that the Commerce Act has prohibitions based on the Sherman Act and it has been willing to look abroad for appropriate legal precedent. Seminal cases have drawn heavily on some key Australian judgments, particularly with

---

10 There has been considerable discussion in the courts about the meaning of a “dominant position” in a market, how the presence or absence of dominance may be determined, and what constitutes “use” and “purpose”. In particular, because of the evidential difficulties in proving anti-competitive purpose, courts have sometimes inferred intent from observed conduct or effect. Observe that section 36 is a major difference with the U.S. antitrust law, although such language exists in many other antitrust statutes (i.e. Mexico, U.K., etc.)
regard to market definition, the lessening of competition, the definition of market power, and the interpretation of anti-competitive purpose and effect. On the issue of pricing or access problems with “essential facilities” (i.e. bottlenecks or natural monopolies), owners of essential facilities risk breaching the Commerce Act if they deny access to would-be entrants, or provide access only under conditions which leave an equally efficient firm unable to compete.

The overall thrust of the “light-handed” regulation policy is to encourage competition where markets are potentially contestable, and to focus regulation on non-contestable markets controlled by incumbent utilities. There has been separation of contestable and non-contestable elements of the utilities’ activities, either by the core non-contestable business being established as a separate company, or by the accounting ring-fencing of the two businesses. The terms and conditions of competitive firms’ connections to the network are not subject to an industry-specific regulatory body but are subject to the economy-wide Commerce Act 1986.

In telecommunications, soft regulation has meant open entry subject only to the contract for network services offered by N.Z. Telecom. Under Section 36 of the Commerce Act, Telecom cannot use its ownership of the network, and hence its network contract, to inhibit competition. “Light-handed” regulation has also been applied in the electricity industry since 1994. Interestingly, the industry itself has established an industry-owned, industry-specific supervisory body.¹¹ There are no legal impediments to entry into generation and to the provision of electricity distribution. Networks should not prohibit transportation of any generator’s or consumer’s electricity. Although there is no regulatory authority to oversee the industry, information disclosure requirements and standby regulation have been implemented by the Commerce Commission to impose “discipline” on the performance of participants whose behavior is not constrained by effective competition. Mandatory information disclosure is central to the soft regulation approach. For electricity companies, it includes audited financial statements (distinguishing monopoly activities from competitive activities), customer and supplier contracts, and pricing policies and methodologies. Companies are not subject to any electricity sector specific regulation, apart from the supply standards and safety regulation. They are, however, subject to the same antitrust and commercial legislation as the private sector. Furthermore,
distribution companies are subject to no price or profit regulation. The supply and distribution of natural gas is also evolving under soft regulation, and the industry is considering setting up similar mechanisms to those of the electricity industry. In sum, New Zealand’s approach to the regulation of utilities is based on common law and antitrust law, rather than on sector specific regulation. Companies are not subject to any particular pricing requirements, although they are subject to accounting disclosure, the threat of “heavy” regulation, and potential litigation.  

The experience since deregulation suggests several preliminary conclusions. First, New Zealand’s policy of “light-handed” regulation does not mean zero regulation. Actually, it is broad spectrum regulation since the Commerce Act covers almost all markets, irrespective of the industry involved. Second, competition law in New Zealand covers a larger scope of applicable activity than does competition law in other countries (like the U.S.). Several issues raised by the Commerce Commission or privately litigated in courts (such as interconnection fees, access to poles and other network elements, and number portability in telecommunications) would not likely be litigated under the antitrust laws in the U.S., but governed by a specific regulatory agency. The Commerce Commission’s role is different from that of most countries’ industry-specific regulatory bodies, in that it enforces general legislation. Actually, New Zealand does not appear to substitute competition policy for regulatory policy, but to include responsibilities taken by regulatory agencies elsewhere into its competition law. Third, the monitoring of the behavior of firms with market power is essentially done by the private sector. Although the Commerce Commission carries out its own surveillance and research, complaints are the main source of information used to decide which issues the Commission should focus on. Fourth, the efficiency of the judicial system is a critical aspect of the soft regulatory regime. High litigation costs and considerable court delays appear to be a main weakness of this framework. Finally, under these circumstances, the Commerce Commission will find it difficult to develop a very close relationship with “regulated firms”. This is essentially explained by two main aspects: the frequency and

---

11 A description of the deregulatory process in the New Zealand’s electricity sector, see Bergara and Spiller (1997).
12 It is interesting to note that under the Closer Economic Relations Agreement between Australia and New Zealand, Courts from each country are allowed to sit in each other’s jurisdictions to determine competition law cases.
13 A brief summary of the Commerce Commission’s experience is submitted in the Appendix I.
intensity of interactions between the potential regulator and the firm is much lower than in the case of an industry-specific agency, and there is a more important external monitoring of this relationship by third parties who are interested in the regulatory process. Additionally, there exists the need to follow rules that apply to all markets. Thus, the feasibility and extent of regulatory capture are considerably reduced.

The literature on network access pricing in industries under light regulation is relatively scarce. Burnell, Evans, and Yao (1995) analyze optimal, privately-chosen network contracts and the efficiency of bypass in oligopolistic network industries under soft regulation. They assume that the same network contract must be offered to each retail firm. They point out that the optimal contract from the perspective of the network is characterized for Nash equilibria in three cases: where the network operates as a separate firm, where it operates as a conglomerate with devolved decision making to its retail division, and where a conglomerate structure fully integrates the network and a retail firm. They also suggest that, given the possibility of bypass, unfettered oligopolistic competition under “light-handed” regulation will typically be efficient. On the other side, Pickford (1996) suggests that the threat of price control may, perversely, encourage firms to cross-subsidize to the detriment of potential entrants, and that information disclosure based on fully allocated costs may conceal that fact. He states that the application of the Baumol-Willig (or “efficient component pricing”) rule in New Zealand implies that the access charge can include monopoly rents. Thus, “light-handed” regulation may promote market distortions.

III - AN INSTITUTIONAL PERSPECTIVE

The comparative institutional analysis will be guided by the transaction cost economics reasoning and, in particular, by focusing on hazard mitigation through ex-post governance of incomplete contracts. As developed by Williamson (1996), transaction cost economics adopts a contractual approach to the study of economic organization and makes the transaction the basic unit of analysis. Refutable implications are derived from the discriminating alignment hypothesis: transactions, which differ in their attributes (frequency, uncertainty, and asset specificity), are assigned to governance structures, which differ in their costs and competencies (incentive

---

14 This section relies on the governance branch of the transaction cost economics. However, the institutional and the measurement branches of the transaction cost economics will also be taken into account in the model developed below.
intensity, administrative control, contract law, and adaptation ability), in a transaction cost economizing way. A convenient way to implement efficiency analysis is to take the institutional environment as given and be concerned with getting the governance structures right. Transaction cost economics advances the remediableness criterion: an organization form for which no superior feasible alternative can be described and implemented with expected net gains is presumed to be efficient. In order to develop a comparative institutional analysis, the alternative governance structures must differ in a discrete way. Ex-post governance responses to mitigate contractual hazards will be guided by the trade-offs between alternative modes of governance with respect to their capacities for autonomous and cooperative adaptation.

Network access pricing and “light-handed” regulation can be both usefully viewed as governance structures. The transaction to be delivered here will be the regulatory services in a network industry with the network as a natural monopoly and potentially competitive activities. As pointed out by Williamson (1997), regulatory transactions are often beset with asset specificity and information asymmetries and, because regulation under the guise of information asymmetry is sometimes used to promote redistributitional or ideological purposes, such regulation can be highly politicized. The contractual hazards to mitigate with regulation will be related to asset specificity, information asymmetries and the problem of small numbers and, in general, are associated to the possible extraction of monopoly rents by the network operator monopolist. The analysis will take the institutional endowment as given.

The issue here is associated to under what conditions do governments create regulatory agencies to command and control rather than modify the incentives which underlie decentralized decisions. In Fiorina’s (1983) words, why the “Congress delegates power to regulatory agencies instead of passing laws and allowing the courts to oversee their enforcement.” Actually this constitutes a question of legislative vs. administrative forms of government intervention.\footnote{As noted by McCubbins, Noll, and Weingast (1989), besides the regulatory instruments, the choice of administrative structure and process is also vitally important. Additionally, Spiller (1996) suggests that a major purpose of administrative procedures is to provide credibility to the government intervention. In the framework of utility regulation, he shows that depending on the nature of a country’s political and judicial institutions, the different regulatory instruments (administrative procedures, specific legislation and contracts) provide different degrees of regulatory commitment.} In the
case under scrutiny, price regulation can be seen as the administrative solution while the “light-handed” framework would represent a more market-like response. A reasonable question might be the following: since access price regulation and “light-handed” regulation are taken as alternative governance structures, is it possible that one regime can behave as the other regime just by setting the appropriate parameters? The answer is: no, because they differ in a discrete way.

The network access pricing regime implies the existence of an industry-specific administrative apparatus: a regulatory agency. In such a framework, strategic interactions will be very likely to appear. As summarized by Williamson (1996), “realizations often differ from declared intentions. A systematic factor contributing to this disparity is that the continuing relations between the industries to be regulated and the regulatory agencies are so close, the exchange of personnel so common,” and the comparative disadvantage of unorganized consumers to influence outcomes so great that the inevitable happened: in varying degrees, the commissions have become captive to the industries.” By providing a scheme of demand for and supply of regulation, Stigler (1971) suggests that industries that expect to capture the regulatory process will actively seek to be regulated. Even when the information asymmetries between the regulator and the regulated firm are still relevant, their degree is lower than of those between the monopolist and third parties, such as courts. Besides presenting a very interesting description about the behavior of regulatory agencies, Wilson (1980) states that these agencies must be viewed as coalitions of diverse participants who have somewhat different motives. Tension and change in the agency involve competition among the members of these coalitions. He also emphasizes the largely unsupervised nature of most regulatory activity.

Agency problems between governments (politicians, Congress) and regulators arise because regulators’ actions or sometimes the information underlying their actions are intrinsically unobservable, allowing them to implement a private agenda. In particular, Spiller (1990) presents a multiple-principals/single-agent model of regulation where politicians and interest groups compete to influence regulators’ decisions, generating many of the results associated with the

---

15 Salant (1995) proposes to take a strategic look behind the “revolving door” (regulatory officials frequently work for firms they regulate after they leave office) in order to improve performance of regulated utilities.
"self-interest" approach. In a similar framework, Spiller and Urbiztondo (1993) provide an informational rationale for allowing interest groups to participate in regulatory proceedings and point out that a major role for interest group monitors is to restrict the informational rents of the regulatory agency. Judicial review also restricts the extent of agency discretion. For example, an analysis of the consequences of judicial constraints in the context of a repeated regulatory relationship can be found in Gilbert and Newbery (1994). Moreover, Spiller (1992) states that multiple appeal levels make the agency more constrained to follow the initial legislative mandate.

Fiorina (1983) also introduces the role of uncertainty in the regulatory process. In particular, he suggests that potential regulatees may regard regulation as means of reducing the uncertainties inherent in market conditions. Under a regulatory agency framework the regulated monopolist can predict better the regulators’ decisions. The incentives intensity is then lower when these uncertainties are reduced through administrative regulation. Under the price regulation regime, regulators’ discretion is limited (and somehow partially controlled) by their interaction with the rest of the economic and political actors: Congress, presidents, courts, interest groups, and regulated firms. Additionally, even when specific and non-specific contract law is relevant in this regime, a more private-like ordering and administrative law are more likely to operate.

The "light-handed" regulatory framework will not require a specific agency and will rely on non-specific legislation. The strategic relation between the regulator and the regulated firm, even when it is not eliminated, is greatly reduced, as well as the possibility of regulatory capture. Action under this regime can be seen as a two-stage game in which the monopolist and the entrants in the competitive segment of the industry bargain in the first stage, and these competitors choose whether or not to go to court in the second stage. This framework constitutes a more market-like response to the regulatory problem. Inter-firm interaction is relevant here and the incentives underlying decentralized decisions are strong. Based on contestability theory, the monopolist is expected not to abuse his/her dominant position because of the possibility of being brought to court and of the threat of government intervention. Control by the entrants in the competitive segment means control by relatively well-informed agents who will operate as "fire alarms". The threat of switching to price regulation will also depend on the degree of commitment
of the government with the soft regime, introducing an additional uncertain component to the process.

Several factors lead to the impossibility that this court-based framework would operate in the same way as the agency-based regime. First, the feasibility and extent of regulatory capture are reduced because the frequency of interactions between the courts and the firms is very low and the external monitoring of these interactions are more important. Second, courts’ preferences are in general more ideologically-based. For example, Spiller and Gely (1992) provide systematic evidence on the role of politics and ideology in judicial decision making, suggesting a model of a politically sophisticated and ideologically motivated Court interacting with Congress and the president.\(^\text{17}\) Third, since Courts have to rule in a large number of issues, they are less likely to have a salient private agenda associated with the particular industry under scrutiny. Fourth, courts’ decisions will involve a high degree of uncertainty from the monopolist’s standpoint. This can be due to several factors: courts’ caseload, higher information asymmetries, higher costs of collecting relevant information, and so on.

The monopolist’s risk aversion can play a crucial role in this framework. Actually, one way to increase incentive intensity is to introduce a more uncertain environment from the network operator perspective and, thus, to take advantage from its risk aversion in order to discipline its pricing policy. The monopolist will be more cautious under this regime if it perceives a higher degree of uncertainty in the expected ex-post outcome of the regulatory process. The soft regime sacrifices administrative control in favor of having high-powered incentives underlying decentralized decisions. Note that asymmetric information plays a very different role in both arrangements. While in the price regulatory regime a higher degree of information asymmetry implies a greater departure from the social objectives, in the soft regulatory framework it adds more uncertainty, increasing the intensity of incentives underlying decentralized decisions (given the monopolist’s risk aversion).

\(^\text{17}\) They also suggest that interest-group politics matter when the Court’s ideologically based preferences are very different from those of the relevant members of Congress. Related to this issue, DeFigueiredo and Tiller (1995) shows that judicial expansion offers a politically efficient control mechanism for the legislature. Accordingly, Congress will be more inclined to pass judicial expansion legislation during periods of political alignment.
NETWORK ACCESS PRICING AND “LIGHT-HANDED” REGULATION

In sum, network access price regulation and “light-handed” regulation can be taken as alternative (discrete) governance structures, where the former constitutes a more hierarchy-like response and the latter a more market-like response to the regulatory problem. While the soft regime will imply high-powered incentives to the agents’ decisions, price regulation will rely on a broader use of administrative controls. While the “light-handed” framework will be more efficient in implementing autonomous adaptation, price regulation will show higher ability in terms of cooperative-like adaptation. Finally, while the soft regulatory mode works out of a legalistic, court ordering regime, price regulation will make a broader use of private-like ordering and administrative law. This is summarized in Table I.1:

<table>
<thead>
<tr>
<th>MAIN ATTRIBUTES</th>
<th>GOVERNANCE STRUCTURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTRUMENTS</td>
<td>PRICE REGULATION</td>
</tr>
<tr>
<td>Incentive Intensity</td>
<td>Weaker</td>
</tr>
<tr>
<td>Administrative Controls</td>
<td>Stronger</td>
</tr>
<tr>
<td>PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td>Autonomous Adaptation</td>
<td>Weaker</td>
</tr>
<tr>
<td>Cooperative Adaptation</td>
<td>Stronger</td>
</tr>
<tr>
<td>CONTRACT LAW</td>
<td>Weaker</td>
</tr>
</tbody>
</table>

The institutional analysis develop here will guide the construction of the following model. This formalizing attempt will stress the main attributes of the alternative regulatory arrangements. On the one hand, the presence of information rents and the strategic relation between the regulator and the regulated firm (through the existence of a regulator’s private agenda) will be taken into account in the price regulatory framework. On the other hand, the role of courts and risk aversion in more uncertain environment will be considered in the “light-handed” regulatory regime.

IV - BASIC MODEL

The basic model will focus on the choice of the institutional structure (in particular, the regulatory arrangement) that will govern the delivery of services in a network industry. More explicitly, it will examine under which circumstances network access price regulation and “light-
NETWORK ACCESS PRICING AND “LIGHT HANDED” REGULATION

handed” regulation are respectively more advantageous according to a social welfare criterion, assuming the supply in the industry is unbundled. Consistent with the discussion above, it will be assumed that there exists enough competition in the potentially competitive activities in order to make unbundling supply more convenient from the social standpoint. Following Shapiro and Willig (1990), we postulate the presence of a public-spirited agent, called the framer, who originally makes the choice of the regulatory institutional arrangement. This decision will be derived from the framer’s budget allocation to regulatory services ($\psi$). In particular, it will be considered that a high budget ($\psi_H$) will result in the existence of a specific regulatory agency associated to the industry under analysis, while a low budget ($\psi_L$) will imply that a regulatory commission will be in charge of regulating several industries. Under this assumption, a high budget allocation will resemble price regulation, while a low budget allocation will resemble a soft regulatory regime. The normative analysis can be cast in the following terms: What is the optimal regulatory governance structure for the framer to adopt, and how does this choice depend upon various features of the economic environment? The framer is assumed to act purely in the public interest and to have some distributional concerns.

The model is one of deregulation with network access. An incumbent monopolist provides a service that it delivers by means of a transmission or transportation network. With deregulation and unbundling, a number of $I$ entrants obtain access to the network (by paying an access charge $A$) and supply the final service to customers. The incumbent can compete in the final product market, but it is required to supply the service through an independent subsidiary that pays the same access charge as entrants do for using the network. The forms of competition in the final service market are assumed to be the same under any regulatory framework. The comparative institutional analysis will focus on the network access price. The framer’s welfare function will be:

$$W^S = CS\{P[A(\psi)]\} + \lambda \{\pi^N[A(\psi)]\} + \sum_{i=1}^{I} \pi^I_i \{P[A(\psi)]\} - k\psi - \Phi(T) = W[A(\psi)] - k\psi - \Phi(T)$$

where $CS$ represents total consumer surplus, $P$ is the price of the final product, $\lambda$ is the parameter reflecting distributional concerns (assuming $\lambda<1$), $k$ is the welfare unit cost of raising public funds, $\Phi(T)$ reflects the social impact of litigation costs (which will be described below), and $\pi^N$ and $\pi^I$
are the profit functions for the network operator and a representative entrant respectively. The higher the access price the lower the social welfare in the whole range in which the access charge is greater than the access marginal cost. This will be true because we assume $\frac{\partial P}{\partial A} > 0$ and, as suggested by consumer theory, $\frac{\partial CS}{\partial P} < 0$.

The access marginal cost $\alpha$ will be private information of the network monopolist and the regulator may know only the probability density and distribution functions of this marginal cost, denoted by $f(\alpha)$ and $F(\alpha)$ respectively. Since the monitoring costs and the regulator’s ability of obtaining information about the firm’s technology depend on the budget allocated by the framer, these functions will be conditional on the variable $\psi$. In particular, $f(\alpha | \psi_H) = f_H(\alpha)$, $F(\alpha | \psi_H) = F_H(\alpha)$, $f(\alpha | \psi_L) = f_L(\alpha)$, and $F(\alpha | \psi_L) = F_L(\alpha)$. A regulator with more resources will be able to have a closer guess of the access marginal cost than a regulator with a lower budget allocation. For example, if the regulator can use a signal $\rho$ to guess the distribution of the marginal cost of access a high budget allocation will imply that the regulatory agency will be able to observe the true value of this signal. However, by assumption, this will not be possible with a low budget allocation. Assuming that $\rho$ has density distribution $h(\rho)$ in the relevant interval $[\rho_L, \rho_U]$ the regulator will base the guess of the probability distribution of the access marginal cost on the marginal distribution: $f_L(\alpha) = \int_{\rho_L}^{\rho_U} f(\alpha | \rho) h(\rho) d\rho$. In the spirit of Baron and Myerson’s model, the distribution associated to the high budget allocation will be assumed to be the true distribution with positive values in the interval $[\alpha_L, \alpha_H]$. In this case, the regulator will be able to set the correct maximization problem without risking to violate any constraint and then will choose to set the optimal price. On the other hand, the distribution associated to the low budget allocation will be the one perceived by the regulator, but the public official will know that this is not the true distribution. This will imply a higher degree of information asymmetry. Since the framer and the regulator are aware of this informational disadvantage, they know that regulating in that case could result in violating either the monopolist’s individual rationality constraint and/or the incentive compatibility constraint. As explained in the Appendix II, a large information asymmetry
between the regulator and the monopolist that increases the information rents in a sufficiently high amount will make the framer to choose not to allow the regulator to set the access charge. The framer will prefer that better informed agents (the competitors in the downstream segment of the industry) play a more important role in constraining the monopolist discretion through court action. Social welfare will be higher when the monopolist (rather than the regulator) sets the price. In such a case, the entrants in the potentially competitive segment of the industry will incur monitoring costs and will play the role of “fire alarms”. However, the regulator will allow for the possibility of auditing the monopolist in the case of potential abuse of a dominant position. It is important to note that monitoring here will refer to the more or less continuous study of the regulated firm, the evolution of technological progress in the industry, and the like, while auditing will refer to a discrete (and quite exceptional) intervention by the regulator in order to develop a closer analysis of the monopolist’s cost structure.

For our purpose, we have to guarantee that the entrants’ profits will decrease with the access price. This will create the relevant conflict between the monopolist and the competitors in the downstream segment of the industry (otherwise, they would never go to court). The following condition will be necessary and sufficient to guarantee that $\frac{\partial \pi^E}{\partial A} < 0$.

Assumption 1: $\eta^p_A < \frac{A + \eta^X_A [P(A) - c_e - A]}{P(A)}$, where $\eta^p_A = \frac{\partial P(A)}{\partial A} \frac{A}{P(A)}$ is the elasticity of the final product’s price with respect to the access charge, $\eta^X_A = -\frac{\partial X(A)}{\partial A} \frac{A}{X(A)}$ is the elasticity of total demand with respect to the access charge, and $c_e$ is the marginal cost of a representative entrant for supplying the final service.

The model introduces the possibility of auditing. The regulator’s objective function will be: $V^R = W(A, \xi) + \phi(A)\{W(\gamma) - W(A, \xi) - q\}$, where $\xi$ is the regulator’s private cost of being brought to court (due, for instance, to reputation effects), $\phi$ is the probability of auditing, $q$ is the auditing cost, and $\gamma$ is the access charge set by the regulator after auditing. Following Baron and Besanko (1984), the regulator will audit if the cost report by the regulated firm is high (or if the

---

18 In what follows, for simplicity of notation $A(\psi)$ will be denoted by $A$. 

21
access charge set by the firm is high under a soft regime). As argued above, the degree of information asymmetry depends on the budget allocated by the framer. For simplicity, it will be assumed that the regulated price will be outside the auditing region when the budget is high, thus normalizing the probability of auditing equal to zero in this case. This is consistent with Baron and Besanko’s findings that the auditing region decreases if distributional concerns are relatively small, the auditing cost is high, and the information asymmetry is not large. In particular, the potential welfare gains from auditing will not outweigh the auditing cost under access price regulation. On the other hand, this probability will be positive in the case of a low budget allocation. In particular, the auditing policy can be interpreted as reflecting the commitment to the soft regulation regime, since it allows the possibility of regulator’s intervention when there is abuse of a dominant position. This probability will reflect the government’s degree of commitment with the “soft” regulation regime and will be the result of several strategic considerations, including mainly the reputation effects on other markets governed by the “light-handed” regulation framework. If the regulator audits, the way to penalize the firm is to recommend the framer to set the access charge \( \gamma \) (conditional on the auditing results), assumed to be stochastic with probability distribution \( P(\gamma) \) in the interval \([\alpha, A^{M}(\bar{\alpha})]\), with \( E(\gamma) = \bar{\gamma} \). The parameter \( \sigma^2 \) will reflect the variability associated to possible decisions.

The framer’s budget allocation will determine the main features of the regulatory regime. On the one hand, with a low budget, poor regulator’s monitoring abilities, a high degree of information asymmetries, and the possibility of auditing, the regulatory arrangement will resemble the soft regime. That is, the framer will not allow the regulatory commission to directly regulate the industry will not intervene unless there is a more or less permanent “abuse of a dominant position”. On the other hand, with more resources allocated to regulatory services, a specific agency without the ability to commit not to extract profits from the regulated firm, with better monitoring possibilities, and a lower degree of information asymmetries, the regime will result in network access price regulation. The regulator will choose to set the access charge in order to maximize his/her utility instead of leaving the price setting to the industry or to courts.

\[19\] This is also consistent when Baron and Besanko’s separation result does not hold, since in that case the optimal price is strictly less than the Baron and Myerson price.
NETWORK ACCESS PRICING AND "LIGHT HANDED" REGULATION

Two additional factors must be introduced in the analysis. The first one refers to litigation and decision costs, which will be assumed to be paid by the litigator. These costs (denoted by $T$) will be assumed to be stochastic, although agents know their probability distribution $G(T)$.\(^{20}\)

These litigation, decision making, and reviewing costs will include, among others, the payment of legal services, the resources required to become informed about the key variables (including, for example, auditing and monitoring spending), and the resources needed to perform the process and procedures required to issue a decision (including labor costs of holding hearings and writing decisions). The second aspect is related to the results’ distribution of an antitrust case. In particular, it will be assumed that if an entrant litigates against the monopolist, the Court will set the access charge equal to $\gamma$, whose properties were described above. A representative entrant will go to the Court if and only if the expected litigation and decision costs are lower than the expected gains from setting the antitrust case. Otherwise, the entrant will accept that the network operator sets the access charge ($A^{RH}$) in the soft regime or that the regulator set the regulated charge ($A^{R}$) under price regulation. Let $\delta$ denote the discount factor and $\tau$ be the number of periods that the Court needs to reach a decision in an antitrust case.\(^{21}\) Thus, a case will take place under the light arrangement if: $T < \sum_{t=1}^{\infty} \delta^t \left[ \pi^E(\gamma) - \pi^E(A^{RH}) \right] = \Delta_L$ and will occur under price regulation if: $T < \sum_{t=1}^{\infty} \delta^t \left[ \pi^E(\gamma) - \pi^E(A^{R}) \right] = \Delta_H$, where $\pi^E(\gamma)$ is the expected value of the entrants’ profits when the courts set the access charge. Assumption 1 guarantees that the right hand side of both inequalities are positive. Thus, the probability of an entrant going to the Court will be represented by $G(\Delta_L)$ and $G(\Delta_H)$ respectively. Note that if $A^{R}$ is lower than $A^{M}$, $G(\Delta_L)$ will be larger than $G(\Delta_H)$, and the difference between them will be larger, the larger the difference between a high and a low budget allocation.

\(^{20}\) Spiller (1992) analyzes the role of decision costs on regulatory agency discretion under judicial review. A study of how decision costs affect the choice of administrative and judicial instruments can be found in Tiller and Spiller (1995).

23
IV.1 - Access Price Regulation

Under a regime of network access price regulation, the regulator will set the access charge $A^R$ such that it maximizes his/her objective function, given the asymmetric information framework described above. This would correspond to a situation analogous to the Baron and Myerson's model. However, by introducing the possibility of judicial constraints the optimal network access price under price regulation will reflect this additional distortion. The access charge will then be affected not only by the informational rents obtained by the regulated firm (because of the information asymmetry about the access marginal cost) but also by the impact of the possibility of judicial review.\(^{22}\) The regulated price will be: $A^R = \alpha + \nu \left[ (1-\lambda) \frac{F_P(\alpha)}{f_P(\alpha)}, \Omega\{G(\Delta_H), \gamma, \alpha, \xi\} \right]$, where $\Omega\{G(\Delta_H), \gamma, \alpha, \xi\}$ reflects the effect of the possibility of judicial review and depends on the probability of the competitors of going to court, on the expected access charge the court will set, and on the regulator's cost of being brought to court. Since a higher access price implies a higher probability of court intervention, this factor is expected to influence negatively the access charge set by the regulator. The introduction of courts implies that the expected access charge will be: $[1-G(\Delta_H)]A^R + G(\Delta_H)\bar{\gamma}$. This access charge will be assumed to be smaller than the unconstrained monopoly access price.

IV.2 - "Light-Handed" Regulation

In a framework of soft regulation, the monopolist will set the access charge and the producers in the final product’s market are allowed to litigate against the incumbent’s choice. The network operator will be tempted to set the monopoly access price $A^M$, but will also take into account the possibility of being brought to court or of being audited by the regulator. Thus, the incumbent can choose setting a lower access charge in order to avoid facing an antitrust case or being audited. This strategically determined price will be denoted by $A^S$ and it will be determined such that $\sum_{r=1}^{\infty} \delta^r \left[ \bar{\pi}^S(\gamma) - \pi^S(A^S) \right] = E(T)$.

\(^{21}\) For simplicity, it will be assumed that the number of periods that the regulator needs to set the access charge when auditing is also equal to $\tau$.

\(^{22}\) Here we assume that truthful revelation is possible under judicial review. However, incentives for truth-telling given judicial review must be further analyzed.
Proposition 1: The network monopolist will set $A^S$ if and only if:

$$\sum_{i=0}^{\infty} \delta^i \pi^N(A^S) > \left\{ \sum_{i=0}^{\infty} \delta^i \pi^N(A^M) - \left[ G(\Delta_L) + \phi(A^M) \right] \sum_{i=0}^{\infty} \delta^i \left[ \pi^N(A^M) - \bar{\pi}^N(\gamma) \right] \right\},$$

where $\bar{\pi}^N(\gamma)$ is the expected value of the monopolist’s profits when courts set the access charge.

Proof: The proof is straightforward from comparing the present value of incumbent’s expected profits in the case of setting the strategically determined access charge and in the case of setting the monopoly access price (including the expected losses derived from an antitrust case or from being audited).

Proposition 1 shows that the monopolist will be more willing to act strategically (that is, to be more "cautious") under light regulation with more efficient Courts (reflected in a lower $\tau$ and a higher $G(\Delta)$), a less committed regulator with the soft regime (represented by a higher $\phi$), and higher valuation of future profits (represented by a larger $\delta$). The following step will consist in comparing the possible outcomes under the alternative regulatory regimes.

IV.3 - Comparing the Regulatory Frameworks

In order to compare the advantages of each regulatory arrangement, we have to consider two alternative cases, depending on whether or not the condition in Proposition 1 holds. Given the regulator’s distributional concerns, monopoly profits are bad for social welfare. Consumer surplus is the key component of social welfare and, as shown above, is a decreasing function of the access charge. Therefore, the comparative institutional analysis will focus on the network access price. However, two additional social costs must be considered. In particular, $K(k, \psi_H - \psi_L)$ and $D(T, \xi, G(\Delta_L) - G(\Delta_H))$ will reflect the impact on the optimal access charge of welfare costs of raising funds and of social costs of litigation on the framer’s utility. The welfare comparison is then developed in terms of one unit of access. On the one hand, the effect of the social costs of raising funds will represent a disadvantage to the price regulation regime (since it requires a higher budget allocation) and it will be larger the larger the unit cost of raising funds and the larger the difference between the high and the low budget. On the other hand, the welfare costs of litigation will represent a disadvantage to the soft regime (since it involves a higher probability of going to court) and it will be larger the larger the private litigation costs and
the larger the difference between the probability of an antitrust case under light regulation and under price regulation.

**Case 1: Condition in Proposition 1 does not hold**

In this case, the regulated firm will set the monopoly access charge and will be subject to litigation or regulator's intervention. As described above, the event of going to the Court will depend on the expected litigation and decision costs and the expected gains for the entrants.

**Proposition 2:** If the network operator sets the monopoly access price under soft regulation, a public-spirited framer will prefer access price regulation rather than "light-handed" regulation if and only if:

\[ \sqrt{(1 - \lambda) \frac{F_H(\alpha)}{f_H(\alpha)}, \Omega\{G(\Delta_H), \gamma, \alpha, \xi\}} + K(k, \psi_H - \psi_L) < \left[ A^M - \alpha \right] \frac{1 - G(\Delta_L) - \varphi(A^M)}{1 - G(\Delta_H)} \]

**Proof:**

The proof is straightforward from comparing the optimal access charges in both regulatory regimes and introducing the effects of welfare costs of raising funds and litigating. In order to prefer the access price regulation, the following condition must hold:

\[ \left[ 1 - G(\Delta_H) \right] A^R + G(\Delta_H) \gamma + K(k, \psi_H - \psi_L) < \left[ G(\Delta_L) + \varphi(A^M) \right] \gamma + \left[ 1 - G(\Delta_L) - \varphi(A^M) \right] A^M + D\{T, \xi, G(\Delta_L) - G(\Delta_H)\} \]

Rearranging terms yields the condition included in the proposition.\textsuperscript{23}

The first two terms of the right hand side represent the monopoly profits times the relative probability that the monopoly access charge is the actual access price plus the profits the monopolist obtains when the Court or the regulator set the access charge times the relative probability to be brought to Court or audited.\textsuperscript{23} Thus, Proposition 2 suggests that price regulation is better than soft regulation when the informational rents that the regulated firm obtains under the former plus the relative social costs of allocating a high budget are smaller than the expected rents under the latter plus the relative social costs of litigating. The expected profits here are a weighted average of expected monopoly rents and expected profits when the Court or the regulator

\textsuperscript{23} "Relative probability" refers to the probability of being brought to Court under the light regime relative to the probability of being brought to Court under price regulation.
determine the access price. This proposition also helps to understand how some factors of the economic and the institutional environment affect the choice of the optimal regulatory regime. It can be seen that there will be more room for access price regulation where the regulator’s distributional concerns are less important (a higher \( \lambda \)), where the degree of the informational asymmetry is lower, and where the constraints imposed by judicial review on the regulator’s discretion are stronger. By contrast, there will be more room for soft regulation where the potential monopoly rents are smaller (i.e. a flatter demand curve), where the judicial system is more efficient (i.e. lower litigation and decision costs), and where the threat of regulator’s intervention is more credible. Additionally, higher welfare costs of raising funds will make price regulation less attractive.

**Case 2: Condition in Proposition 1 holds**

In this case, the incumbent firm will set \( A^s \). Here, the monopolist tries to avoid being brought to the Court or being audited by the regulator.

**Proposition 3:** If the network operator acts “strategically” under soft regulation, a public-spirited framer will prefer access price regulation rather than “light-handed” regulation if and only if:

\[
\begin{align*}
&v \left[ (1 - \lambda) \frac{F_H(\alpha)}{f_H(\alpha)}, \Omega \{G(\Delta_H), \gamma, \alpha, \xi\} \right] + K(k, \psi_H - \psi_L) < \left[ A^s - \alpha \right] \frac{1 - G(\Delta_L) - \phi(A^s)}{1 - G(\Delta_H)} + \\
&(\gamma - \alpha) \left[ G(\Delta_L) + \phi(A^s) - G(\Delta_H) \right] + D \{T, \xi, G(\Delta_L) - G(\Delta_H)\}
\end{align*}
\]

**Proof:** In order to prefer the access price regulation, the following condition must hold:

\[
\begin{align*}
&\left[ 1 - G(\Delta_H) \right] A^R + G(\Delta_H) \gamma + K(k, \psi_H - \psi_L) < \\
&\left[ G(\Delta_L) + \phi(A^s) \right] \gamma + \left[ 1 - G(\Delta_L) - \phi(A^s) \right] A^s + D \{T, \xi, G(\Delta_L) - G(\Delta_H)\}
\end{align*}
\]

Rearranging terms yields the condition included in the proposition.\( \blacksquare \)

The interpretation of this result is analogous to the previous one. Again, price regulation is preferred to soft regulation when the informational rents that the regulated firm obtains under the former plus the relative social costs of allocating a high budget are smaller than the expected rents under the latter plus the relative social costs of litigating.
V - PRIVATE AGENDA OF THE REGULATOR AND RISK AVERSION

This extension of the model introduces the possibility of a political agenda of the regulator. Following Shapiro and Willig (1990), we will assume that the regulator has objectives similar but not identical to those of the framer. The regulator's objective function will now be:

\[ V^R = W(A, \xi) + \beta J\{s(\psi), P(A)\} + \phi(A)[W(\gamma) + \beta J\{s(\psi), P(\gamma)\} - W(A, \xi) - \beta J\{s(\psi), P(A)\} - q] \]

in which \( J(\cdot) \) reflects the private agenda of the regulator, \( \beta \) measures the extent of the divergence between the regulator's objectives and those of the framer (i.e. the salience of the public official's private agenda), and \( s \) captures the idiosyncratic nature of the regulator's private agenda. Shapiro and Willig (1990) also interpret the function \( J(\cdot) \) as the divergence between the objectives of a public official, who is subject to short-run political pressure, and the genuine long-run public interest. They suggest that \( \beta \) could represent the effectiveness of the political system. A well-functioning political system limits the ability of public officials to pursue their personal interests, leading to a low value of \( \beta \). Under the "short-run political pressure" interpretation, \( \beta \) measures the extent to which the regulator is subject to political forces that in fact diverge from the long-run public interest. Finally, the variable \( s \) is observable only to the regulator. Thus, the framer cannot charge a Court with the responsibility of penalizing the regulator for pursuing his/her private agenda. Note that the idiosyncratic nature of the private agenda specific to the industry under analysis will depend on the regulatory regime and, therefore, on the framer's budget allocation. A specific regulatory agency is presumed to have a more important private agenda associated with the industry it regulates (in the sense of regulatory capture) than a regulatory commission that has to regulate several industries. This does not mean that such commission has a less salient private agenda in general, but it is assumed to have a lower divergence with the public interest associated to this particular industry. Some factors allow us to argue in favor of this assumption and they are, in general, consistent with the regulatory capture literature and the multiple-principals agency view of regulation (discussed in the previous section). For instance, some industries that the commission must regulate might be producing substitute products (e.g.
NETWORK ACCESS PRICING AND "LIGHT HANDED" REGULATION

electricity and natural gas). Thus, the regulator has to regulate multiple and competing firms and each firm will be especially attentive to how its rivals are being treated by the regulator. As suggested by Stigler (1971), the defensive power of various industries which are affected by regulation must be taken into account. In this framework, excessively benefiting one industry will be against the other industry’s interest. This factor is also stressed by Salant (1995) in his approach of the “revolving door”. He suggests that when postretirement consulting income derives from multiple firms, a regulator will be reluctant to give special considerations to any one firm so as not to risk other potential consulting income. Another related factor consists of the fact that a regulator overseeing several markets is more likely to be caught when pursuing personal interests (diverging from the public interest), increasing the probability of being fired. This is consistent with the literature suggesting that a major role for interest group-monitors is to restrict regulatory agency discretion. Additionally, firms also often operate in multiple regulatory jurisdictions. Salant (1995) points out that under these circumstances, the uncovering of corruption in one jurisdiction can have an adverse effect on a firm’s profitability in other jurisdictions, making the firm and the regulator more cautious.

On the other hand, a regulatory commission that has to regulate several industries could be willing to implement an expropriatory private agenda (in the spirit of Levy and Spiller). This aspect takes particular relevance in industries with serious regulatory contracting problems, in which large specific investments lead to the possibility of hold up. Appendix II also suggests that a very expropriatory private agenda could provide the framer with the incentives to optimally choose a light-handed regulatory regime. A too low regulated price would imply that the network operator brings the regulator to court, and thus constrains the access charge that the regulator sets to the one that would arise after the judicial review. In such a case, it would be socially efficient to let the monopolist set the access price.

---

25 With his approach of demand for regulation Stigler (1971) analyzes the relationship between the railroad and the motor trucking industries regulation.
26 See Baron (1985).
Again, the framer’s budget allocation will determine the main features of the regulatory regime. With a low budget, poor regulator’s monitoring abilities, a high degree of information asymmetries, the possibility of auditing, and a less important private agenda specific to the industry under scrutiny (or an agenda associated to expropriatory goals), the regulatory arrangement will resemble the soft regime. With more resources allocated to regulatory services, a specific agency without the ability to commit not to extract profits from the regulated firm, with better monitoring possibilities, a lower degree of information asymmetries, and a more salient private agenda specific to this industry (in the sense of regulatory capture), the regime will result in network access price regulation. Additionally, the monopolist will be assumed to be risk averse, with a risk aversion coefficient equal to $\mu$.  

Thus, the access price under price regulation will be:

$$A^R = \alpha + w \left[ (1-\lambda) \frac{F_H(\alpha)}{F_H(\alpha)}, R(\mu, \sigma^2), R(\beta, \varepsilon, \alpha), \Omega \{ G(\Delta_H), \gamma, \alpha, \xi \} \right]$$

where $R(\mu, \sigma^2) \in [0,1]$ is a risk-adjusting term with $\frac{\partial R}{\partial \mu}, \frac{\partial R}{\partial \sigma^2} < 0$. The function $H(\cdot)$ reflects the impact of the nature of the regulator’s agenda and the extent of his/her different objectives on the optimal access charge under price regulation. This distortion will be lower when the regulator is more or less politically aligned with the framer, when the extent to which the regulator is subject to political pressures is small, and when the political system is more effective. It will also depend on the elasticity of the main variables in the industry (the access charge, the final product’s price, and the total demand) with respect to the nature of the regulator’s private agenda.

Under soft regulation, the monopolist’s risk aversion will influence the firm’s strategies:

**Proposition 4:** The network monopolist will set $A^S$ if and only if:

$$\sum_{t=0}^{\infty} \delta^t \pi^N(A^S) > \left[ \sum_{t=0}^{\infty} \delta^t \pi^N(A^M) - \left[ G(\Delta_L) + \varphi(A^M) \right] \sum_{t=\tau+1}^{\infty} \delta^t \left[ \pi^N(A^M) - \pi^N(\gamma) \right] \right] R(\mu, \sigma^2).$$

**Proof:** See Proposition 1.\footnote{Entrants in the competitive segment assumed to be risk neutral, since introducing entrants’ risk}
advantages of each regulatory arrangement, we have to consider two alternative cases depending on whether or not the condition in Proposition 4 holds.

Case 1: Condition in Proposition 4 does not hold

Proposition 5: If the network operator sets the monopoly access price under soft regulation and the regulator has a private agenda under price regulation, a public-spirited framer will prefer access price regulation rather than “light-handed” regulation if and only if:

\[
\begin{align*}
& w \left(1 - \lambda \right) \frac{F_H(\alpha)}{f_H(\alpha)} R(\mu, \sigma^2), H(\beta, \varepsilon_H), \Omega \{ G(\Delta_H), \gamma, \alpha, \xi \} + K(k, \psi_H - \psi_L) < \\
& \left[ A^M - \alpha \right] \left[ \frac{1 - G(\Delta_L) - \varphi(A^M)}{1 - G(\Delta_H)} \right] + (\gamma - \alpha) \left[ \frac{G(\Delta_L) + \varphi(A^M) - G(\Delta_H)}{1 - G(\Delta_H)} \right] + \\
& D \{ T, \xi, G(\Delta_L) - G(\Delta_H) \}
\end{align*}
\]

Proof: See Proposition 2.

Price regulation is better than soft regulation when the informational rents that the regulated firm obtains and the agency costs under the former plus the relative social costs of allocating a high budget are smaller than the expected rents under the latter plus the relative social costs of litigating. A poorly functioning political system will make price regulation less attractive.

Case 2: Condition in Proposition 4 holds

Proposition 6: If the network operator acts “strategically” under soft regulation and the regulator has a private agenda under price regulation, a public-spirited framer will prefer access price regulation rather than “light-handed” regulation if and only if:

\[
\begin{align*}
& w \left(1 - \lambda \right) \frac{F_H(\alpha)}{f_H(\alpha)} R(\mu, \sigma^2), H(\beta, \varepsilon_H), \Omega \{ G(\Delta_H), \gamma, \alpha, \xi \} + K(k, \psi_H - \psi_L) < \\
& \left[ A^S - \alpha \right] \left[ \frac{1 - G(\Delta_L) - \varphi(A^S)}{1 - G(\Delta_H)} \right] + (\gamma - \alpha) \left[ \frac{G(\Delta_L) + \varphi(A^S) - G(\Delta_H)}{1 - G(\Delta_H)} \right] + \\
& D \{ T, \xi, G(\Delta_L) - G(\Delta_H) \}
\end{align*}
\]

Proof: See Proposition 3.

The interpretation of this result is analogous to the previous one.

aversion would only complicate the model without adding any qualitative insight.
VI - PRIVATE TRANSFERS AMONG FIRMS

The model is extended here by allowing private transfers among firms. In particular, the network operator will be able to make side payments to competitors in the downstream segment of the industry in order to avoid being brought to the Court, even if the actual access charge is the monopoly price. Thus, it will be considered the case in which the monopolist does not act strategically under the "light-handed" regime (in the sense defined above). The network company will set the monopoly access charge and will not be brought to Court as soon as the following proposition holds:

**Proposition 7**: The access charge will equal the monopoly price and there will not be an antitrust case under soft regulation if the network operator is able to pay each competitor an amount equal to \( Z \), such that:

\[
Z = G(\Delta_L) \left\{ \sum_{t=1}^{\infty} \delta^t \left[ \pi^R(y) - \pi^B(A^M) \right] \right\}.
\]

**Proof**: The proof is straightforward from comparing the competitors’ expected profits when the side payment takes place and when it does not. In order to avoid the antitrust case and keep on charging the monopoly access price, the following condition must hold:

\[
\sum_{t=0}^{\infty} \delta^t \pi^E (A^M) + Z > \sum_{t=0}^{\infty} \delta^t \pi^B (A^M) + G(\Delta_L) \left\{ \sum_{t=1}^{\infty} \delta^t \left[ \pi^R(y) - \pi^B(A^M) \right] \right\}.
\]

Rearranging terms and determining the minimum \( Z \) yield the condition included in the proposition.\( \blacksquare \)

The amount the network operator must pay to each entrant in the competitive segment of the industry to sustain the monopoly price will be equal to the probability of going to Court under the light regime times the entrants’ expected gains of going to Court. The following step consists of determining when the network operator will be willing to make this side payment.

**Proposition 8**: The access charge will equal the monopoly price, there will not be an antitrust case under soft regulation, and the network operator will pay each competitor an amount equal to \( Z \) if and only if:

\[
G(\Delta_L) \left[ 1 - \varphi(A^M) \right] \sum_{t=1}^{\infty} \delta^t \left\{ \left[ \pi^N(A^M) - \pi^N(y) \right] - \left[ \pi^R(y) - \pi^E(A^M) \right] \right\} > 0.
\]
Proof: The proof is straightforward from comparing the monopolist's expected profits when the side payment takes place and when it does not:

\[
\left[1 - \varphi(A^M)\right] \left\{ \sum_{t=0}^{\infty} \delta^t \pi^N(A^M) - G(\Delta_L) I \sum_{t=r+1}^{\infty} \delta^t \left[ \bar{\pi}^N(y) - \pi^N(A^M) \right] \right\} \\
+ \varphi(A^M) \left[ \sum_{t=0}^{r} \delta^t \pi^N(A^M) + \sum_{t=r+1}^{\infty} \delta^t \bar{\pi}^N(y) \right] > \\
\sum_{i=0}^{\infty} \delta^t \pi^N(A^M) - G(\Delta_L) \sum_{i=r+1}^{\infty} \delta^t \left[ \pi^N(A^M) - \bar{\pi}^N(y) \right]
\]

Rearranging terms yields the condition included in the proposition. ■

The monopoly access charge could be sustainable if the potential monopoly rents are sufficiently large and the network operator is allowed to make transfers to the competitors in the downstream segment of the industry. The monopolist and the competitors would share the monopoly profits. This analysis implies that under such conditions, soft regulation becomes less attractive. These results reinforce the conclusion that there will be more room for "light-handed" regulation when the potential monopoly rents are smaller. However, the threat of regulator's intervention discourages the monopolist's strategy of setting the monopoly price and making side payments to entrants in the competitive segment of the industry. It must be considered that the implications in terms of reputation effects might be twofold. First, regulator's intervention in one market can increase the perception that the threat is credible and, thus, can help to discipline monopolists in other markets. Second, regulator's intervention can be taken as a signal that the "soft" regulation regime will be abandoned, implying negative reputation effects. Accordingly, if the intervention in one market implies a large reputation loss, "light-handed" regulation becomes less attractive. On the other hand, if this makes the intervention threat more credible, the "soft" regulation framework shows an additional advantage.

VII - ASYMMETRIC INFORMATION ABOUT ENTRANTS' TECHNOLOGY

In the basic model it was implicitly assumed that the monopolist knew the representative entrant's profit function. In fact, this can be interpreted in terms that the network operator knew the entrants' technology and, therefore, could make proper calculations in order to choose acting strategically or not. An interesting extension of the model involves the possibility that the competitors' technology (or any other factor affecting entrants' profits) is their private
information. In such a case, the monopolist will not know the entrants' cost and profit functions. For simplicity, we will assume that \( G(\Delta u) = 0 \), i.e. the probability of having an antitrust case under price regulation is zero.\(^{28}\) For our purpose, suppose that the competitors' profit function can be expressed as being conditional on their costs in the following way: \( \pi^c(\cdot) \). \( \theta \) will be the variable reflecting the information asymmetry between the monopolist and the entrants. It will be assumed to take values between a certain range: \( \theta \sim [\underline{\theta}, \bar{\theta}] \) with density and cumulative probability distribution functions given by \( l(\theta) \) and \( L(\theta) \) respectively. However, what is actually relevant in the model in order to determine the probability of having the monopolist brought to the Court is the variable \( \Delta_L \). From the network operator's standpoint, this variable has now become stochastic: \( \tilde{\Delta} \). Without loss of generality, it can be assumed that it will vary within a certain interval: \( \tilde{\Delta} \sim [\underline{\Delta}, \bar{\Delta}] \) with density and cumulative probability distribution functions given by \( s(\tilde{\Delta}) \) and \( S(\tilde{\Delta}) \) respectively.

The probability of facing an antitrust case is now perceived by the monopolist to be equal to \( G(\tilde{\Delta}) \) and, given the information asymmetry, it will not necessarily coincide with the true probability. It is not possible to determine a priori which of them will be larger and, therefore, we cannot conclusively assess if the introduction of asymmetric information will favor access price regulation or soft regulation. Note that if the perceived probability is larger than the actual probability of having the monopolist brought to the Court, there will be more room for "light-handed" regulation comparing with the case of symmetric information. This is due to the fact that the network operator will be more "cautious" and will set the monopoly access charge with a lower probability. On the other hand, if the perceived probability is lower than the actual one, soft regulation becomes less attractive by following an analogous reasoning.

However, the interesting aspect of this case is that, under a soft regulatory regime, entrants can go to Court in equilibrium. The information asymmetry makes impossible for the monopolist to know the true profit function of the potential competitors in the downstream segment of the industry. Thus, even when the network company knows the probability

\(^{28}\) It can be the case if the framer's budget allocation is sufficiently large. This assumption will not
distribution of entrants’ technology, it will not be able to determine the true probability of being brought to Court. The ex ante analysis developed here will not be sufficient to avoid the possibility of an antitrust case under a “light-handed” regulatory regime. Therefore, this case allows the possibility that an antitrust case takes place ex post. It would happen when the divergence between the actual and the perceived probability of having the monopolist brought to the Court is sufficiently large. Intuitively, an antitrust case can occur in equilibrium when the perceived probability is considerably lower than the actual one. This is more formally stated in the following proposition:

**Proposition 9**: Assume private transfers between firms are not allowed. Under a soft regulatory regime, entrants will go to Court in equilibrium if the network operator sets the access charge equal to: \( \bar{\alpha} = \alpha + \left[ A^M - \alpha \int [1 - G(\bar{\Delta}) - \varphi(\bar{A^M})] + (\bar{c} - \alpha)\left[ G(\bar{\Delta}) + \varphi(\bar{A^M}) \right] \right] \); and \( \bar{\Delta} < E(T) < \Delta_L \).

**Proof**: If the monopolist charges the access price described in the proposition and the second condition holds, the entrants’ expected gains of going to Court are larger than the expected litigation and decision costs.\[\]

Since the network operator considerably underestimates the probability of being brought to the Court, he/she will set a relatively high access charge. Therefore, it can be the case that it lowers entrants’ profits so much that it makes an antitrust case worthy from the competitors’ standpoint. Obviously, the incumbent will have incentives to negotiate with the potential competitors. A formal setting of bargaining with asymmetric information can constitute an interesting extension of the model submitted here.

The existence of asymmetric information about the entrants’ technology can also be used to explain why the framer could optimally choose a light-handed regulatory regime. If the monopolist also operates in the downstream segment of the industry (supplying the service through an independent subsidiary, for instance) the network operator will have relatively good information about the technology and other characteristics of the competitive segment. As explained in Appendix II, if the regulator is poorly informed about the entrants’ technology, litigation could take place if the regulator sets the price. The framer would have incentives to affect the qualitative insights of this section.

35
prefer the network operator to set the access charge in order to avoid the social cost of litigation. By relying on the actions of better informed agents, social welfare might be increased.

**VIII - CONCLUDING REMARKS**

The possibility of introducing competition into traditionally regulated network industries gives governments a choice in the institutional structure for the supply of their respective services. Once unbundled the supply of complementary goods and services, most countries that are deregulating network industries have chosen to continue regulating network access pricing. However, the most radical deregulation process is taking place in New Zealand, where network operators are subject to the "light-handed" regulation. Both regulatory arrangements are shown to differ in a discrete way and the main features of both regimes can be endogenously derived from the framer's budget allocation to regulatory services. Political and judicial institutions as well as economic factors influence the regulatory framework choice. While the network access price regulation is a specific-agency-based arrangement (with a higher degree of political influence), the light regulatory regime is a court-based system. Consequently, the main trade-off between both frameworks reflects the costs and benefits of having efficient political and/or judicial institutions. In general, however, the strength of political and judicial systems are highly correlated. Thus, countries in which the merits of the judiciary would make the light regulatory regime more appealing are also countries in which the political system is relatively thick and, thus it would be difficult to reduce the political interference in the regulatory process. This helps explain why reforms in countries with strong judiciary have not implied a deregulatory process as drastic as in the New Zealand case.

The main results of the model submitted here are consistent with a plausible interpretation of New Zealand's process. Deregulation and privatization in New Zealand had, among others, the intention to remove decision-making in former state-owned enterprises from direct political interference. Directors were political appointees and an annual "statement of corporate intent" had to be approved by the government. Moreover, interest groups could relatively easily pressure the government to hold inquiries into particular management decisions. A particular combination of a strong judiciary and a relatively thin political system made the "light-handed" regulatory regime feasible and attractive in New Zealand. When comparing the New Zealand and Australian
cases, the chairman of the Commerce Commission stated that “contestability theory appeared particularly attractive to New Zealand policy-makers...The Coasian view...also underlines the New Zealand competition policy tolerance for a wide range of intra-firm and trade practices, to be judged on their behavioral outcomes rather than by any pre-set structural thresholds. New Zealand competition policy, at this time, proved much interested in these theories than did Australia. This was partly because the New Zealand economy had structured underperformance, and consequently was more in need of structural reform than its neighbor. It was also partly because New Zealand's thinner political system meant such reform was easier to carry out.”

Also consistent with the model is the permanent Commerce Commission’s concern about the efficiency of the Court system, involving Court process, high litigation costs, some reluctance by courts to impose the maximum penalties allowed by the Commerce Act, its access to Court time for the necessary lengthy hearings required by some cases, and the Court delays. The potential benefits of the soft regime are critically reduced if the judicial system is not highly efficient, legal costs are not low, and cases involve unnecessary delays. Additionally, the light-handed framework may involve a late response to external shocks because the regulator has poor information and a low budget and the court process may be slow. If external shocks are frequent or important, the soft regime may be politically unstable since an increasing demand for heavier types of regulation may arise.

The qualitative insights described above have been derived by using a relatively simple model. Further complications in pricing access and governance structure choice will arise if additional issues are considered. For example, the existence of interconnected and competing networks can be introduced. Furthermore, alternative regulatory frameworks might induce alternative forms of competition in the final service's market. The role of interest groups' activities will also be of interest in determining the optimal regulatory environment. Additionally, a formal setting of bargaining with asymmetric information can constitute an interesting extension of the model. The potential impact of these issues on the choice of network access regulatory arrangements suggests the need for additionally study endogenous organizational modes and points out relevant topics for future research.

---

29 See Bollard (1997).
REFERENCES


NETWORK ACCESS PRICING AND "LIGHT HANDED" REGULATION


NETWORK ACCESS PRICING AND "LIGHT HANDED" REGULATION


APPENDIX I

THE COMMERCE COMMISSION'S EXPERIENCE SINCE 1994

GENERAL PROCEDURES AND COURT ACTION
The Commerce Commission’s objective is to bring about awareness and acceptance of, and compliance with, the Commerce and Fair Trading Acts. All information the Commission collects is accessed according to the investigation and enforcement criteria it has developed. The criteria ensure that a standard objective approach is always used by all staff. The criteria focus on matters that cause widespread or significant loss or detriment; people, organizations or practices that are repeatedly breaching the Acts; and issues where ruling by the courts is needed to clarify the law or provide a deterrent. The investigation criteria are used to help determine which matters should be investigated. The Commerce Act gives the Commission powers to use search warrants, to remove documents and other material, to require people and organizations to provide information to it and to require people to be interviewed under oath. The enforcement criteria are used to help determine what action to take after an investigation. This could be no further action; a warning; a settlement signed by the subject of the investigation and detailing how it will change its behavior; or court action. Warnings are issued for matters of lesser significance in terms of the enforcement criteria where it is believed that behavior is at risk of breaching the Act. Settlements are for matters of greater significance but there are still not appropriate for court action. However, the Commission will not consider a settlement unless it is otherwise prepared to take court action. A settlement may require the offender to admit liability, to formally promise to modify behavior, and to agree to publicity.

The Commerce Commission will take court action when the law needs clarification and development; when the issue cannot be fixed any other way (when a trader or company refuses to comply with a warning issues by the Commission, refuses to enter into a settlement with the Commission, or refuses to honor the Commission’s agreed settlement); when the conduct has had such significant effects that it is deserving of sanction from the courts; and when there is a practice in a whole industry group that breaches either Act (successful court action is used to warn every other member of that industry about continued use of that practice). Court cases play a vital part in the ongoing and the continued effectiveness of the Commerce Commission and this is done by applying the precedent case law developed through the taking of court cases. Further, without the threat of court action it would not be possible to achieve such a large number of
NETWORK ACCESS PRICING AND “LIGHT HANDED” REGULATION

warnings and settlements. All court actions are also the launching pad for the Commission to take proactive action across a sector or industry.

The government took the view that enforcement was partly a public good, and that the public elements of it would need to be further defined with both its policies and its enforcement to be publicly funded. It was also recognized that some elements of enforcement are primarily for private benefit, and that a system should be designed which offers incentives to private operators to comply, to regulate their industry, and also to take their own actions against perceived contravenors. Initially, penalties courts could impose under the Commerce Act were set very low, although in 1991 this was increased to a maximum of $5 million for a company and $0.5 million for an individual. The Act includes a range of instruments to deter contravenors, to allow a disadvantaged party to be compensated, and to allow the court to design other forms of redress. This includes pecuniary penalty/fines (to go to government), compensation/damages (to go to third parties), and injunctions, disinvestments and other orders to control future behavior.

Of greater concern to the Commission is the difficulty which the Commission has with the court process in general. That is firstly having deep pocketed defendants using pre-trial appeals on interlocutory matters to avoid or postpone a substantive hearing, and secondly in gaining access to court time for the necessary lengthy hearings required by some cases. Such delays impose unwarranted extra costs on both the Commission and private litigants and indeed on the courts themselves. Legal costs may be the reason of the scarcity of private Commerce Act litigation in industries with well resourced companies and many areas of dispute. The Commerce Commission took a harder line in enforcing the Commerce Act since 1995, after the “transition” period was over. Greater professional investigative skills and experience were then available to the Commission, and specific teams were formed to conduct major investigations.

The Fair Trading Act prohibits false or misleading claims about prices and the Commerce Act prohibits competitors colluding to fix prices. However, almost half of the Fair Trading Act enforcement actions involved false or misleading prices, most of them implied warnings and settlements. Under the Commerce Act, the Commission decided to take court action in the meat, car dealing, bakery, medical, brewery, natural gas, and electricity industries. It also accepted settlements from lawyers, rafting companies, dive shops, laboratories, and tourist boat operators.
The highest penalty to date under the Commerce Act was a total of $500,000 plus $350,000 costs against Port Nelson Limited for three breaches. The Commerce Commission states that the courts are showing some tendency to impose higher penalties on offenders. There was a big increase in Commerce Act warnings and settlements over the years, as seen in the Table I.2:

**Table I.2 - New Zealand Commerce Commission Warnings and Settlements**

<table>
<thead>
<tr>
<th></th>
<th>1993/94</th>
<th>1994/95</th>
<th>1995/96</th>
<th>1996/97*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warnings</td>
<td>20</td>
<td>27</td>
<td>29</td>
<td>38</td>
</tr>
<tr>
<td>Settlements</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

* Three quarters of the year ended March 1997.

**ELECTRICITY INDUSTRY**

Most of the interaction between the Commission and electricity industry players has concerned the Commerce Act. However, significant Fair Trading Act issues have also arisen. In particular, the power companies argue that electricity is not a good or a service for the purpose of the Act and, therefore, it does not apply to the connection contracts of domestic electricity consumers. The Commission’s view is that the supply of electricity to domestic consumers must comply with the statutory guarantees. The power companies have sought a declaration judgment on the issue and the two parties are currently awaiting court time to argue the matter. The Commission has warned twenty nine power companies that their contracts for domestic consumers were at risk of breaching the Fair Trading Act. Its concern is with the way the contracts try to limit the companies’ liability should something go wrong. The Commission has advised companies to ensure that domestic contracts should clearly state that the company is liable for all costs incurred through the company’s negligence and define those events that are within the company’s control and where its failure to deliver would make it liable to consumers. The Commission gave the companies time to amend their contracts.

In terms of the Commerce Act, the Commission has dealt with about twenty five business acquisitions which involved mergers between power companies. The Commission’s methodology in dealing with them and views regarding the relevant markets have received the approval of the High Court and Court of Appeal in the *Power New Zealand v Mercury Energy* case. The industry can now regard the law as being well settled in respect of future mergers between power companies. The Commerce Commission authorized in 1996 the proposed rules for the New
NETWORK ACCESS PRICING AND "LIGHT HANDED" REGULATION

Zealand Electricity Market after considering applications from the Electricity Market Company. The applications were for authorization of the pricing mechanisms, prudential provisions, and the adoption of metering standards. There had also been concerns that the proposed fees to be charged by the Electricity Market Company for participation in the New Zealand Electricity Market favored incumbent power companies over possible competitors. After the Commission began investigating, the fee structure was changed and now appears to have a more even competitive balance. The market structure was created by its participants and the Commission certainly does not see a role for itself in reorganizing the market.

The Commission has given several energy companies warnings about conduct that could contravene the Commerce Act. As a result, most of them have altered their behavior. The Commission has also arranged administrative settlements with electricity industry players. For example, Mercury Energy agreed to remove charges associated with access to its network by independent retailers after learning the Commission’s views that such charges were anti-competitive. There were also other settlements with Westpower and Tasman Energy regarding the use of the companies’ poles. In terms of court action, the Commission is presently prosecuting Southpower under sections 27 and 36 of the Commerce Act. The Commission is alleging that the manner in which the firm charges for access to its network and allocates its costs between its monopoly network business and its contestable electricity retail business is anti-competitive.

The MARIA agreement is an arrangement between competitors regarding metering standards. No formal complaints have been made and no current investigations are in place. However, the issue of metering standards and their different application to entrants and incumbents remains a thorny problem which the Commission may wish to take a further look. The Commission understands that the large difference between the cost of MARIA-compliant time-of-use meters which entrant retailers must use and those time-of-use meters which incumbent retailers have used represents a barrier to entry of retailers. The behavior of many integrated power companies has been in danger of breaching the Commerce Act: delays in the development of the use-of-system/conveyance agreement device to allow off-network trading by independent retailers; refusal to acknowledge the presence of access seeking independent retailers by failing to respond to correspondence; the introduction of negotiation and access fees for independent
retailers; the insistence on higher metering standards for entrants; the recovery of costs through the monopoly parts of the business; and the use of profit rebates in a manner which deters the entry of retailers. Besides the respective warnings, the Commerce Commission has several times made explicit the threat of court action or price control.

TELECOMMUNICATIONS

The telecommunications industry is extremely dynamic and technology driven. It has altered significantly since deregulation. These changes have led to substantial reduction in prices and improvements in services across the sector. At the same time, the industry has been opened to competition to an extent rarely seen overseas. Currently there are fourteen parties operating in the sector registered with the Ministry of Commerce, and more are entering the markets. The Commission notes the recent formation of the Telecommunications Industry Organization. It has been suggested that there is the potential for breaches of the Commerce Act to occur in this forum. The Commission will expect the parties to act within their obligations under the Act. There are seven competition disputes in the telecommunications sector at some stage of proceedings in the New Zealand legal system. The actions are over interconnection, number portability, bundling, the misuse of confidential information, the "hijacking" of customers who use a base toll call provider, and the Commission's decision to allow the purchase of a shareholding in SKY by Telecom.

The most highly profiled disputes have related to interconnection agreement prices and conditions, with access by Clear to the local telephone network of Telecom being the subject of extensive litigation. Telecom proposed the Baumol-Willig rule and Clear argued that this approach was in breach of section 36 of the Commerce Act. The rule was accepted by the High Court, rejected by the Court of Appeal, and finally in 1994 sanctioned by the Privy Council, New Zealand's highest court. After a lengthy review of the ramifications of the case by officials, the government issued a statement indicating that it would not wish to see the Baumol-Willig rule applied in future on the grounds that it would be injurious to competition. The final terms agreed on between Telecom and Clear (under government pressure) are below Baumol-Willig prices. It has been argued that the Telecom/Clear agreement paved the way for future interconnection agreements. The current topical competition issue is number portability. It allows customers to
switch carriers without having to alter their telephone numbers, thus giving customers a choice of carrier for services. Unwarranted delays in introducing full number portability to the marketplace effectively hamper competition developing in the telecommunications sector, and such delays have the potential to breach section 36 of the Commerce Act. The Commission believes that some parties involved in number portability negotiations are taking extreme positions and need to realistically reassess their positions. The Commission is monitoring the situation and the parties' conduct and threats with its involvement to assist the commercial process.

In addition to private litigation being taken, the Commission has received several complaints relating to bundling (where discounts are offered if customers take a combination of monopoly and contestable services). Where cross-subsidization occurs, bundling has the potential to breach the Commerce Act: if a monopolist offers a discount on its contestable service which involves charging below cost, the effect of the discount may be anti-competitive. The Commission investigated bundling of services by Telecom and found insufficient evidence to determine that Telecom may have breached the Act. A similar case was the Commission's investigations of complaints of alleged below cost pricing by Telecom in respect of its Internet access services business. Additionally, the issue of convergence (the coming together of telecommunications, broadcasting, computing, information and entertaining technologies) is of particular importance in terms of market definition. Clear, saying it wanted to prevent dominance of convergent markets, brought a case to the High Court against Telecom regarding the latter's attempt to buy a shareholding in SKY. The case was struck out by the High Court and will now go to a substantive hearing in the Court of Appeal.

Under the Fair Trading Act, the Commission has taken about eighty enforcement actions against telecommunications companies. These cases have generally involved the way the price of a product or service was disclosed at the retail level. The Commission has also sent numerous warnings and received several undertakings from cellphone retailers. The core problem with cellphone advertising has been that the overall impression given about the price of the cellphone and the price and conditions that apply to the cellphone package has been misleading.

NATURAL GAS MARKET
A major issue in the gas sector has been the existing Natural Gas Corporation (NGC) wholesale supply contracts with retailers which date back to 1980 and to the era of exclusive franchising. They contained a number of restrictive provisions which, by affecting the ability of both NGC and its utility customers to compete in new markets, were likely to breach the Commerce Act. In 1997, the Commerce Commission sent a clear warning that if they were not renegotiated within a reasonable time, the Commission would consider court action against gas companies. The specific concerns the Commission had about the contracts were: the requirement that the utility buy all its gas from the NGC; the restriction on NGC competing with utilities; the requirement that new delivery points be mutually agreed (preventing a utility entering another’s area); and the 15 year rolling term. The Commerce Commission welcomed the news that NGC and gas utilities have renegotiated their contracts or were on the verge of doing so. Powerco Ltd. and TransAlta have negotiated new contracts with NGC, while new contracts were yet to be negotiated for both Wanganui Gas and Enerco.

Another important issue recently has been the matter of inter-fuel competition, the extent to which other energy forms, especially electricity, are substitutable for gas. In a recent application by Powerco Ltd. to acquire Egmont Electricity Ltd., the Commission granted an authorization on the grounds that the detriments likely to result from the strengthening of dominance would be outweighed by the likely resulting public benefits.

**WATER SERVICES**

In the area of water services, the Commerce Commission has already dealt with a number of complaints, particularly where exclusive contracts have been given. The Commission expects that this is an area where companies will need to pay more attention to the Commerce Act.

**APPENDIX II**

A simple framework is developed here in order to identify the factors which can provide the framer (and the potential regulator) with incentives to optimally choose that the access charge is set by the network operator when this monopolist is subject to judicial review after entrants' court action. This result would resemble a light-handed regulatory regime. This simplified model will introduce social and private costs of litigation, the social cost of raising funds, and the regulator's private agenda as described above, and the framer's budget allocation to regulatory
services with the additional assumption that at least part of this budget is specific to the access charge setting activity \( \psi_f \). However, for simplicity we will assume no risk aversion and we will not introduce the possibility of auditing. Thus, the framer chooses whether or not to allocate funds to regulatory price setting activities and, if this is the case, the regulator sets the access charge subject to judicial review. Otherwise, the monopolist sets the price also subject to judicial review.

If the regulator is not allowed to set the access charge, the monopolist will solve the following problem: \( \max \pi^N[A(\alpha)] = [A(\alpha) - \alpha]X[A(\alpha)] \) subject to the judicial review constraint: \( \pi^E[A(\alpha)] \geq E[\pi^E(\gamma / \alpha) - T] \) where \( E(\cdot) \) is the expectation operator. In order to solve this problem, define: \( \gamma_{ce}(\alpha) = \{ \gamma / \pi^E[\gamma_{ce}(\alpha)] = E[\pi^E(\gamma / \alpha) - T] \} \). The optimal access charge set by the network operator will be the minimum between \( A^M(\alpha) \) and \( \gamma_{ce}(\alpha) \). In order to focus on the interesting cases, we will assume that the distribution function of \( \gamma \) is such that \( A^M(\alpha) > \gamma_{ce}(\alpha) \) for all \( \alpha \). Taking this result into account, a potential regulator with a private agenda will solve the following program: \( \max \nu^R = W[A(\alpha), \xi] + \beta J[\sigma(\psi), A(\alpha)] \) subject to:

\[
\begin{align*}
\pi^N[A(\alpha)] & \geq 0 \quad \forall \alpha \in [\underline{\alpha}, \overline{\alpha}] \quad \text{(IR)} \\
\pi^N[A(\alpha) / \alpha] & \geq \pi^N[A(\alpha) / \alpha'] \quad \forall \alpha, \alpha' \in [\underline{\alpha}, \overline{\alpha}] \quad \text{(IC)} \\
\pi^E[A(\alpha)] & \geq E[\pi^E(\gamma / \alpha) - T] \quad \forall \alpha \in [\underline{\alpha}, \overline{\alpha}] \quad \text{(JR)}
\end{align*}
\]

The first restriction is the monopolist’s participation constraint, the second one is the incentive compatibility constraint, and the last one is the judicial review constraint. Under these conditions, the optimal access charge set by the regulator will be the minimum between \( A^R [\alpha, \xi, (1 - \lambda) \frac{F(\alpha)}{f(\alpha)}, H(\beta, \sigma_H, \alpha)] \) and \( \gamma_{ce}(\alpha) \), where \( A^R(\cdot) \) is the optimal price resulting from a Baron-and-Myerson-like incentive scheme. Note that if \( A^R(\cdot) > \gamma_{ce}(\alpha) \), social welfare will be higher when the monopolist (rather than the regulator) sets the price because: \( W[\gamma_{ce}(\alpha)] > W[\gamma_{ce}(\alpha)] - k\psi_p \). Thus, a large information asymmetry between the regulator and the monopolist (consistent with a low budget allocation) that increases the information rents in a
sufficiently high amount will make the framer to choose not to allow the regulator to set the access charge. The framer will prefer that better informed agents (the competitors in the downstream segment of the industry) play a more important role in constraining the monopolist discretion through court action.

An alternative scenario introduces a potential regulator who is willing to implement a very expropriatory private agenda (in the spirit of Levy and Spiller). In this case, we introduce the possibility of court action by the monopolist. Thus, the monopolist participation constraint will be substituted by the following condition: \( \pi_N^N[A(\alpha)] \geq E[\pi_N^N(\gamma / \alpha) - T] \quad \forall \alpha \in [\underline{\alpha}, \overline{\alpha}] \), representing a second judicial review constraint. Define \( \gamma_{CEN}(\alpha) = \{ \gamma / \pi_N^N[\gamma_{CEN}(\alpha)] = E[\pi_N^N(\gamma / \alpha) - T] \} \).

After an analogous reasoning to the one developed for the previous scenario, the regulator will set the access price to be the maximum between \( A^R(\cdot) \) and \( \gamma_{CEN}(\alpha) \). In this case, the framer will prefer to have the monopolist setting the price (subject to judicial review) if \( A^R(\cdot) < \gamma_{CEN}(\alpha) \) because the social welfare will be higher: \( W[\gamma_{CEN}(\alpha)] > W[\gamma_{CEN}(\alpha)] - k\psi_p \). Thus, a very expropriatory regulator's private agenda could also lead to the framer to choose a light-handed regulatory regime.

Another feasible scenario implies information asymmetries between the regulator and the monopolist about the technology (or any other factor affecting the profit function) of the entrants in the competitive segment of the industry. In the two previous cases, court action does not take place in equilibrium because all agents could foresee other agents’ optimal strategies. In this case, however, litigation could arise in equilibrium. Assume, for instance, that the monopolist knows the entrants’ profit function (and, thus, can properly calculate \( \gamma_{CEN}(\alpha) \)), but the regulator does not (also consistent with the allocation of a low regulatory budget). Using some priors about the entrants’ profit function, the regulator can only get a stochastic \( \gamma_{CEN}(\alpha) \), which can differ from the true value of \( \gamma_{CEN}(\alpha) \). Thus, litigation could take place if the regulator sets the price. Again, the framer would prefer the network operator to set the access charge in order to avoid the social cost of litigation: \( W[\gamma_{CE}(\alpha)] > W[\gamma_{CE}(\alpha)] - k\psi_p - \Phi(T) \). Additionally, if the regulator’s private cost of being brought to court is sufficiently high, the optimal strategy for the regulator could be to refuse to set the access price and rely on the interaction among better informed agents.
In sum, the main factors providing the framer with incentives to choose a light-handed regime when judicial review is considered are informational asymmetries (where the potential regulator is poorly informed relative to other agents), the possibility of a very expropriatory regulator's private agenda, a large social cost of raising funds, a large social cost of litigation, and a large regulator's private cost of being brought to court.