Opportunistic Behavior and Legal Disputes in the Chilean Electricity Sector[¤]

Eduardo H. Saavedra[y]

Abstract

In this paper I analyze post-contractual disputes in the newly privatized electricity sector in Chile. I discuss the presumption that opportunistic behavior and disputes arise due to inadequate market design, ambiguous regulation, and institutional weaknesses. I also assess the presumption that a large number of legal (public) disputes are inhibited by the nonexistence of institutions able to verify and enforce contracts. An in-depth analysis of 6 cases of open con‡ict provides support to such presumptions and highlights the crucial role of an adequate (pre-privatization) market design. In addition, it concludes that the reduced number of open con‡icts observed in Chile is probably due to institutional weaknesses, which induces the parties to use private con‡ict resolution mechanisms.

Keywords: Privatization, Regulation, Incomplete contracts, Institutions, Opportunistic behavior, Con‡ict resolutions, Disputes, Electricity industry, Chile.

[¤]This paper corresponds to Chapter 3 of my Ph.D. dissertation Essays on Incomplete Contracts in Regulatory Activities from Cornell University. I am grateful to Kaushik Basu, David Easley, and Robert T. Masson for their dedicated advising, guidance, and support. I thank Federico Basañes and Raimundo Soto for very insighful discussions, both co-authors of me in a newer version of this paper. I also thank Michael Klein, Janus Ordover, and Robert Willig for their helpful comments on earlier drafts. Traditional disclaimers apply.

[y]Graduate Program in Economics ILADES/Georgetown University, Universidad Alberto Hurtado. E-mail: saavedra@uahurtado.cl Personal web page: www.uah.cl/profesor/es

Important Remark

I worked in this paper between 1997 and 1998. This version corresponds to that of June 1999. In the meantime, the Chilean Electricity sector has experienced some important changes, such as the discussion of a new Electricity Act during 2000 and 2001 – that introduces a free market for energy, an independent system operator, traders of energy, and reshapes the structure of the industry, among others issues – and the selling of Transelec to an independent foreign investor. However, I think that insights of my paper are still valid for any regulated industry with network characteristics. Moreover, since my paper with Basañes and Soto (Working Paper I-117) has another scope – with a newer but shorter version of the same topic which does not emphasize the same economic policy conclusions – I have decided to put this paper on the web.

Santiago; April 2001

1. Introduction

Privatization is, perhaps, the best instrument to induce e¢cient production and resource allocation when there exists enough market competition. Under this presumption, several Latin American countries undertook a rapid privatization process of public utility industries during the 90's.[1] Much attention was given to privatization and liberalization processes, but little attention was given to regulatory and institutional reforms, and the resulting market structure. Privatization relied on strict regulation of those segments in the market with natural monopoly characteristics, while liberalizing vertically related markets. Consequently, opportunistic behavior and a number of post-privatization disputes arose due to inadequate market design, ambiguous regulation, and institutional weaknesses. These con‡icts give rise to three questions: Can the costs of an inadequate or unsuitable regulatory design outweigh the bene…ts of privatization?[2] To what extent can the market structure and/or the regulatory framework be modi…ed to inhibit actual practices hampering the market e¢ciency? What would happen if judiciary and regulatory institutions were able to enforce or interpret complex contracts?

This paper is an attempt to answer these questions through analyzing a number of issues which might have played a crucial role in inducing or inhibiting disputes in the newly privatized electricity industry in Chile.[3] I have chosen this sector because of the fact that its privatization was to a large extent …nished in Chile a decade ago. Thus, it gives us enough time span to be able to observe at full length the evolution of disputes.[4]

From a theoretical perspective, post-privatization renegotiations and disputes may arise in equilibrium when contracts governing the relationship between regulators and …rms are incomplete and/or there are no institutions to enforce them. Thus, we should observe opportunistic behavior whenever contracting problems are present. However, legal disputes are not always present even when contracts are incomplete, as I will show in the case of Chile. One explanation for unobservable open con‡icts comes from the assumption that courts are absolutely unable to deliver justice, so that the parties never

[1] See Paredes, et. al. (1995), Schmalensee (1995), and Gilbert and Khan (1996) for a general discussion about the experience of the newly privatized utilities in these countries.

[2] Formal treatment and further references on the trade-o¤ between public and private ownership can be found in Shapiro and Willig (1990), La¤ont and Tirole (1991), and Schmidt (1996). An application to vertically integrated monopolies is discussed in Saavedra (1999). Bhaskar (1993) presents a survey of theoretical and empirical issues relating to privatization in developing countries.

[3] The same concern is further studied in Saavedra and Soto (1999). Basañes, Uribe, and Willig (1998) uses the same approach when studying post-contractual disputes in several Latin American countries and Artana, Navajas, and Urbiztondo (1998) provides an excellent revision of several post-contractual renegotiations in Argentina.

[4] Bitran and Saavedra (1993), Morandé and Sánchez (1992), and Muñoz (1993) illustrate the regulatory pitfalls in the Chilean electricity sector. Paredes (1995), Spiller and Viana (1996), and Morandé and Rainieri (1997) argue, on the contrary, that the regulatory reform was to a large extent adequately done in Chile.

engage in disputes (Hart and Moore, 1988). This assumption is not entirely convincing, however, because in practice judges do deliver, however partially, and so legal disputes might be worthwhile. A better explanation is that private settlements may occur in equilibrium following pretrial negotiations, which are not necessarily observed by third parties (Spier, 1992, and Skaperdas, 1992).

The qualitative analysis of observed legal disputes after privatization may shed some light on both the size of the problems related to the Chilean electricity sector and the consequent public policies necessary to improve its e¢ciency. In this paper I am primarily concerned with post-contractual disputes directly or indirectly arising from the privatization process. It, thus, comprises disputes between regulators and …rms, among …rms as long as they are the result of contracts in privatization periods or lack thereof, and between the antitrust commission (representing consumers) and …rms currently working in the industry or potentially interested in participating.[5]

The organization of the paper is as follows. In the second section, I start with a brief description of the structure of Chile's electricity sector with regard to production and consumption areas – in particular, its geographical structure – as well as to the regulatory framework and political economy issues arising from privatization. I think these elements are crucial in determining the manner in which the market works and, consequently, the likelihood of observing post-contractual disputes. In section three, I present six cases of open disputes in the electricity sector in Chile. Based on previous sections, in the fourth section of the paper I include a critical assessment of how market structure, regulation and institutional framework had helped to generate or inhibit disputes. Finally, I conclude the analysis in section …ve.

2. Brief Description of the Electricity Sector in Chile

This section describes the main characteristics of the Chilean electricity sector from the point of view of how its structure, development, and regulation might have inhibited or induced disputes.

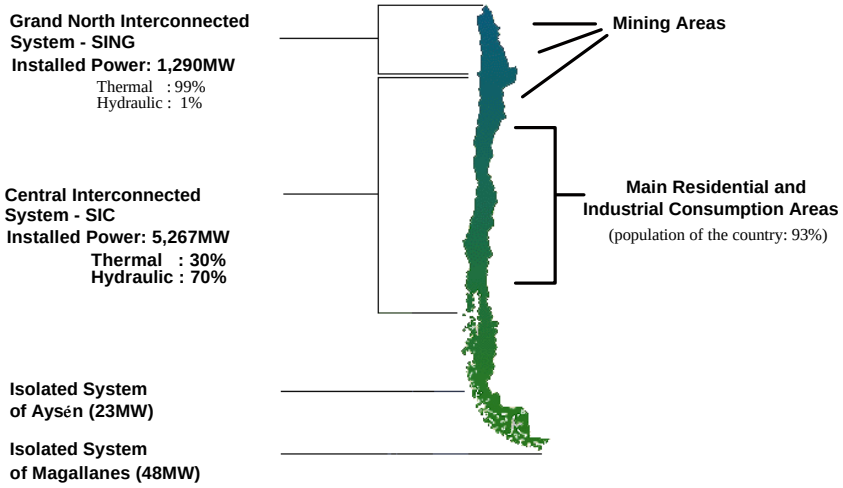
Notwithstanding limitations described below, the market seems to be, in spirit, adequately designed. The law provides institutions that smooth the working of the market (e.g. it considers institutions designed to coordinate daily operations and guarantee the quality of service); considers mechanisms to generate information in time and for all users, inducing transparency in transactions and easy monitoring by the authorities; and, …nally, whenever disputes appear, the law establishes con‡ict-resolution mechanisms and provides for an ordered manner to deal with them.

[5] As such, we dismiss disputes arising from the normal operation of an industry, which I call commercial disputes, which bear no connection to privatization processes.

2.1. Sources of Con‡ict from Geographic Country Characteristics

Chile is a very long but narrow country (3,700 miles long and an average width of 120 miles), located alongside the Andes mountain range. The climate is quite heterogeneous. The northern half of the country mostly comprises one of the driest desserts in the world (the Atacama dessert), with zero rain fall in most areas. The south, on the contrary, is characterized by abundant rain and snow accumulation. The weather is erratic, however, and annual rainfall tends to have wide ‡uctuations. Figure 2.1 summarizes the main characteristics of the electricity sector in Chile.

Figure 2.1: Structure of the Electricity Sector



This geographical situation con…gures a peculiar situation for the electricity industry and suggests several areas of potential con‡ict.

First, the Andes mountain range provides advantages to hydroelectric power generation in the center and south where water dams are relatively easy to build. On the contrary, gas and thermoelectric generation are the only viable alternative in the north. In addition, while thermoelectric supply is in broad lines deterministic, hydroelectric supply is random as it faces hydrological risks. Since thermoelectric and hydroelectric generator companies compete with very di¤erent operating costs in the SIC, it is inescapable that pro…tability will depend heavily on strategic actions undertaken by these

two types of …rms producing in several areas of potential con‡ict. This would lead to con‡icts between operators that a¤ect the performance of the whole industry, such as the management of water reserves by hydroelectric companies, the allocation of technical risk among …rms, the calculation of marginal and operation costs, the order in which each …rm's supply is dispatched to consumers, and the terms and structure of contracts among …rms. These issues are discussed in detail in sections 3.2, 3.5, and 3.6.

Second, the distribution and composition of demand also has conditioned the evolution of the sector. As shown in Figure 2.1, there are two main and independent electric systems: the Grand North Integrated System (SING) and the Central Integrated System (SIC). Each system comprises its own generation plants, transmission lines, and distribution networks. An important element that characterizes both systems is the rapid expansion of demand in them. In the SIC, energy consumption expanded at 7% per year on average in the 1989-1996 period. For the next decade, it is expected that demand will increase between 7% and 8% per year. In the SING, rapidly expanding mining operations has increased demand by 15% in the last three years, and it is expected to continue at similar rates for the next …ve years. As demand expands, business opportunities provides incentive for aggressive behavior among …rms and con‡ict is likely to appear, in particular when regulation does not adjust quickly enough to changes in the industry structure.

Third, since the country is narrow it is not feasible to build a network of transmission lines, so a unique high-voltage transmission line is the only economically viable structure (Bernstein, 1988, and Phillipi, 1991).[6] Consequently, the reform of the electricity sector was based on the notion that this con…gures a "natural" monopoly for transmission. Potential con‡icts may arise in the SIC because of the vertically integrated industry resulting after privatization, as explained in the next section. This issue is analyzed in the Colbún's new transmission line case in section 3.3.

2.2. Sources of Con‡ict derived from Privatization

The electricity sector in Chile was traditionally dominated by state-owned enterprises at the generation, transmission, and distribution levels. The structure of the industry changed markedly after the coup d' etat of 1973. Privatization was carried out according to the notion that electricity generation and large-size consumers were potentially competitive markets, while distribution and transmission were considered as local and natural monopolies, respectively (geographical considerations tend to support this no-

[6] Decreasing average costs are out of discussion here. Competition may be feasible in this context, however, if there exists a network transmission line with diversi…ed ownership, thereby reducing the transmitter's monopsony power. Ordover, Pittman, and Clyde (1993) presents an application of this potential competition to European railways.

tion as discussed above).[7] Accordingly, (partial) separation of the di¤erent productive stages started in 1981 by requiring Chilectra to dismember into one generation company (Chilgener) and two distribution companies (Chilquinta, in Valparaíso, and Chilectra, in Santiago). Endesa, on the other hand, was separated into …ve independent distribution companies, three generating complexes (Endesa, Pullinque, and Pilmaiquén), and three independent integrated systems Edelnor (in the north of the country) and Edelaysén and Edelmag (in the extreme south).[8]

The Issue of Vertical Integration[9] One of the criticisms arises from the structure of ownership that emerged from privatization, which is characterized by an important degree of vertical integration. Although the state monopoly was broken into di¤erent companies prior to its divestiture, Endesa was privatized with a dominant position in the SIC (see Table N± 1). Lack of due restrictions to ownership across segments of the industry, in addition, permitted Endesa to keep its virtual monopoly in high-voltage transmission. Moreover, privatization of distribution companies resulted in Enersis – the controller of Endesa – holding 74 percent of the shares in the main distribution company, Chilectra.

This vertically integrated structure has been the source of a large number of disputes and con‡icts. Democratic administrations have claimed repeatedly that Endesa's dominant role in generation and transmission does not allow for fair competition in the sector. Two large-scale lawsuits – described in detail in section 3.1 – are the main disputes in this regard.

A second line of criticism arises from the fact that divestiture led to the creation of several classes of shares with di¤erent decision-making power. For example, few preferential shares allow control of Endesa and its ancillaries. During most of the 90's, Enersis controlled Endesa with only 25% of shares.[10]

[7] Armstrong, Cowan, and Vickers (1994), Frankena and Owen (1994), Newbery (1996), and Vickers and Yarrow (1987) provide economic support to these considerations. That is, generation, transmission, and distribution are essentially di¤erent activities, with di¤erent features, such as technologies (scale and scope economies), demand (size and power of customers), competitiveness (e.g. feasibility of Yardstick competition), etc. Some authors include another segment of the market: supply to …nal consumers.

[8] The latter two systems are being scheduled for privatization as integrated monopolies (because of the small size of their markets). The other …rms are all now privatized.

[9] These claims against of the market structure resulting from privatization have been raised by Bitran and Saavedra (1993), Blanlot (1993), and Sáez (1993). Theoretical sustain of informational advantages hampering competition can be reached on Tirole (1988), chapters 8 and 9. Vickers (1996) discusses these issues from contracts perspective. Regarding the feasibility of …rst-mover advantages, see Gal-Or (1992) and Bagwell (1995).

[10] Preferential shares were created with the purpose of increasing incentives for e¢cient management (Grossman and Hart, 1980). Transaction prices for these shares have been considered by critics of privatization as being too low since book values were used, as opposed to market values (Marcel, 1989).

Table N± 1

Market Share in the Main Integrated Systems in 1997 (%)

	SIC	SING
Generation		
Endesa & ancillaries (Enersis holding)	59.2	8.0
Chilgener[11] & ancillaries	22.1	11.0
Colbún	12.0	-
Tocopilla	-	50.0
Edelnor	-	21.0
Others	6.7	10.0
Transmission (high voltage)		
Transelec (Enersis holding)	100.0	0.0
Edelnor	0.0	100.0
Distribution		
Chilectra –Santiago (Enersis holding)	40.0	-
Chilquinta – Valparaíso	20.0	-
Others	40.0	-

Source: National Energy Commission (CNE)

A third line of criticism arises from the "…rst-move advantage", since Endesa was given the sole responsibility for investment plans, which in turn gave her prime information on new commercial areas, water rights, reserves management, etc. In this case, informational advantages would have been used to discriminate or block the entry of potential competitors. Sections 3.1, 3.2, and 3.5 discuss these issues in detail.

Institutional Framework Privatization required important changes in the institutional setup of the market. In 1978 two institutions were created: The National Energy Commission (CNE), a decentralized advisory agency dealing mainly with planning and regulatory activities of the sector, and the Superintendency of Electricity and Fuels (SEC), the supervisory agency mainly dealing with quality of the service and safety facilities. A new legal framework was adopted in 1982, establishing norms applicable to all the companies in the sector, regardless of ownership. These norms included regulation of production, transportation, distribution, concessions, easements, prices, quality and

This point is of particular interest because it may signal some elements of corruption in the privatization process in Chile.

[11] Currently, Gener S.A., the second major holding in generation.

safety conditions of facilities, machinery and instruments, and the relationship of the companies with the State and the private sector.

In 1985, the CDEC – an acronym for Economic Load Dispatching Center – was created. The CDEC is a coordination unit, responsible of dispatching energy from generation plants to distributors on the basis of minimum marginal costs. In the short-run, the CDEC acts as a clearance house in the energy market, while in the long run it is in charge of planning the operation of the combined generation-transmission system. Only companies with a minimum generating capacity of 60 MW are allowed to participate in the CDEC's Board of Directors. In view of the concentration of property in generation in the SIC, Endesa and its ancillaries have controlled the CDEC, which has given rise to a number of disagreements among members, as noted in section 3.6

In addition to the CDEC, the SEC, and the CNE, two other entities play an important role in the mixed-owned electricity industry: the Antitrust Commission and the Ministry of the Economy. The Antitrust Commission, as its name suggest, is devoted to preventing non-competitive behavior in all markets, including the electricity sector. The commission has an investigative branch (Fiscal Económico) and two independent commissions. The Preventive Commission is a regional, …rst-instance judiciary body allowed to sanction non-competitive practices. The national Resolutive Commission is a second-instance court, also allowed to sanction malpractice. The Supreme Court is the only instance of appeal for sanctions applied by the Antitrust Commissions. The Ministry of the Economy has the right to set tari¤s (as proposed by the CNE) and promote the e¢cient development of the generation, transmission and distribution subsectors. Disputes arising from inadequate institutional setup are addressed in section 3.6.

2.3. Con‡icts Stemming from the Regulatory Framework

Regulation in the electricity sector is complex both from a technical and economic point of view. In addition, and as discussed below, in the Chilean case it is incomplete. Both elements suggest the existence of several areas which are potential sources of contract renegotiation and disputes.

Node prices Node prices, which correspond to the sum of the basic energy and power costs (plus a penalty factor), are the basis for most long-term contracts between generators and distributors. Costs in the SIC are obtained using an optimization model, which incorporates water supply restrictions and a projection of demand for the next 10 years.[12]

[12] The basic energy cost is calculated by weighing medium-term marginal costs at a speci…c point in the network, forecasted for the next four years of operation. In addition, the basic price of power is calculated considering a gas-fueled plant according to a formula that includes the cost of investment in diesel turbines; the cost of investment in transmission lines; the …xed operating and maintenance costs;

The current electricity law de…nes only the conceptual aspects of determining both basic energy and power costs. Hence, the determination of node prices allows for several areas in which disputes could arise. First, prices are determined on the basis of forecasts of water availability and a security margin. Since Endesa holds most water rights and manages water reserves, small hydroelectric producers have claimed it has an informational advantage which hampers competition in generation because of its free access to the cheapest productive factor: the water. This issue is further elaborated in section 3.5.

Secondly, security margins and other technical issues, on the other hand, are increasingly being disputed by thermoelectric …rms as being too bene…cial for hydroelectric companies, such as Endesa.[13] These disputes, though, should not be considered as determinant of the working of the industry, but they do re‡ect the potential damaging role that information asymmetry could play in the sector. Further details occur in section 3.6.

A side issue, but a crucial one, a¤ecting the work of the industry is that distributors have the "legal right" to buy at node prices to serve the regulated market. It is clear that economic quasi-rents could be obtained by a distributor since it can allocate purchases at will. Since short-run marginal costs di¤er between thermoelectric and hydroelectric producers during the year (because of changing levels of water reserves and weather conditions), a distributor could potentially bene…t a particular company by signing contracts for only part of the year. In the long run, this will produce high-pro…t generators and low-pro…t generators, and could eventually drive the latter out of the market (see section 3.2).

Regulated Distribution Markets The regulated price, which applies to consumers with a demand for power below 2MW, is determined by the regulator as a combination of the node price and a regulated margin, which corresponds to the imputed value-added of distribution. Distributors pay generators the node price, unless they have signed a contract specifying otherwise. Since the CDEC coordinates energy dispatch according to the lowest marginal costs, production is, in fact, separated from whatever commercial commitments a generating company may have. Consequently, the di¤erences between commitments and production must be resolved through open market purchases and sales

capital recovery factors; a theoretical power reserve margin of the electricity system; and losses on the transmission line. Finally, penalty factors correspond to marginal losses of transmission in the system, and they are determined by considering the distances from every node to the network, as well as the level of tension of the conductors. See Morandé and Rainieri (1997) for further details.

[13] For example, the 1997 season was extremely rainy (due to the El Niño Stream phenomenon). Dams, in several cases, over‡ew and companies were forced to allow the spillover. Since the spillover is a loss of money, the manner in which …rms' electricity supply was ordered mattered substantially. Firms dispatched last were forced to waste more water than …rms dispatched early. Since Endesa holds the majority in the Board of Directors at the CDEC, it seems possible it used its dominant role to its bene…t.

at a non-regulated transfer price in the spot bulk market.

Regulated prices are reviewed every four years. As such, it is a pre-announced negotiation, in which strategic behavior is likely. The mechanism, consequently, requires the government and …rms in the industry to agree on a vector of in‡ation-adjusted prices to be charged to consumers for a pre-speci…ed number of years. Prices are established such that an e¢cient …rm obtains a targeted rate of return on assets. Since such an e¢cient …rm does not exist, a simulation model is used as benchmark (this could be considered a form of yardstick competition).

In principle and under symmetric information, the mechanism should provide adequate incentives to …rms to reduce costs by forcing them to be more e¢cient than the simulated optimal …rm. Under asymmetric information, however, this mechanism has important shortcomings. For example, one unsolved problem is how the regulator obtains the cost structure of the e¢cient …rm. The experience shows that when information is based on actual market data, simulated costs are strongly in‡uenced by those of the existing monopoly, so that in practice this tari¤s setting mechanism tends to converge to the standard "rate of return" model.[14]

Transmission Tolls Since the Chilean regulation considers high-voltage transmission a natural monopoly, in order to ensure competition in the generation market in the system (SING, SIC, whatever), the law guarantees open access to transmission lines (easement): as long as it has excess capacity, the transmission company cannot refuse to serve any producer interested in dispatching energy to a consumer or to be sell in the spot market, even if the tari¤ has not been agreed in advance. Regulation, however, is incomplete in two important areas: transmission tolls and new investments required to expand the network when necessary. This has been one of the main sources of disputes among private …rms and we observe its adverse consequences on the society in section 3.3.

The 1982 Electricity Law did not consider clear procedures for setting transmission charges. It did not represent a problem during the 80's (Endesa was a state monopoly at that time). After privatization, however, the lack of de…nition became a problem. The legal framework was modi…ed in 1990 to establish the price system for the transmission sector. Although the law was passed and it covered the basic lines along which prices are to be set, its corresponding Statute (which determines prices in practice) has not been adopted to date.

When capacity is limited or new transmission lines are necessary, the law presumes that interested …rms and the transmitter can negotiate an agreement to do the required investments. To a large extent, the law does not consider the possible asymmetric bar-

[14] Armstrong, Cowan, and Vickers (1994), chapter 6, discusses the convergency e¤ect in the RPI - X British scheme. Their analysis is perfectly suitable to the Chilean mechanism. Chapter 3 of the same book summarizes the main drawbaks of the rate of return regulation.

gaining power of …rms, in particular when the additional demand is not substantial, nor the possibility of anticompetitive practices by the dominant conglomerate in the market.

3. Six Cases of Open Con‡ict

In this section, I present six cases of open con‡ict, which had either gone through the judiciary system (Antitrust Commissions, the Court of Appeals and the Supreme Court) or through private arbitration processes.[15]

Even most of those cases have elements of market structure, regulation, and enforceability problems, it is convenient to …gure it out that each of them has a major important cause. Consequently, I mainly relate the …rst two cases to con‡icts raising from inadequate market design of the industry, so that Enersis holding could have used its vertical integration characteristics in order to hamper competitors. In subsections 3.3 to 3.5 I describe cases mainly gathered by regulatory failures, such as opportunistic behavior due to both unsuitable or simply inexistent regulation. Finally, in subsection 3.6 I group con‡icts stemming from institutional weakness in Chile.

3.1. Vertical Integration Disputes

Vertical integration between Endesa and the only transmitter (Transelec) has been regarded by the government as the main potential deterrent to competition. Two major trials have been initiated, and subsequently lost by the government, in order to divest this vertically integrated conglomerate. During the …rst trial (1990-1992), the Fiscal Económico made a case against these …rms based on three elements: (a) participation of Enersis in generation (Endesa), transmission (Endesa and currently its ancillary Transelec) and distribution (Chilectra) hampered competition, (b) a set of allegations by Pullinque of non-competitive behavior from Endesa, and (c) the fact that one representative of Enersis was elected CEO of Endesa.

The Fiscal Económico argues that Enersis hampered competition using at least two mechanisms. One was through its control on the CDEC: Pullinque was called to generate energy many times when operating costs were above node prices; but it was rarely the case with Endesa and its ancillaries. The contrary happened when marginal costs were below

[15] The most publicized case is not presented here, however, because both there are still several related trials on courts and it is not closely related to the privatization process itself. In August, 1997 Enersis' comptroller-executives sold its preferential shares to Endesa of Spain using a supposed rather than cumbersome procedure, called in its moment "the century's business". After a couple of months, details of the procedure became publicly known, revealing that it was not a cumbersome and fair business but actually "the century's swindle". Currently, these former comptroller-executives have been sued by the Superintendency of Securities (SVS) for illegally using privileged information, having con‡icts of interest, and hiding relevant information to the regulator. In addition, the State Defense Council recently sued these executives for producing damage to the society.

node prices. This practice was considered discriminatory because it raises Endesa's pro…t to the cost of Pullinque's owners. In addition, Endesa was able to technically justify this strategy by congestion transmission lines on Pullinque's node during melting periods.

The Resolution Committee of the Antitrust Commission voted in favor of Enersis, however. The Supreme Court rati…ed the favorable sentence in a split decision. The Supreme Court's opinion declared that no evidence of abuse of power or misconduct accompanied the prosecutor's claim, and that divesting the holding would limit Enersis' constitutional rights. The only part of the claim with which the Supreme Court agreed was the election of an Enersis director as CEO of Endesa which could negatively a¤ect the necessary transparency and allow for practices aiming at the competitive functioning of this sector. Nothing in concrete was said, however, in order to solve this problem.

The Fiscal Económico started a new lawsuit against …rms belonging to the Enersis holding in October, 1992. This trial was kept low pro…le by the government, however, until 1994. In that year, Enersis acquired 12.5% of Endesa's shares and became the main shareholder with 25% of property, thus avoiding any action by the government against its control of Endesa. Consequently, the Fiscal Económico activate the second major trial against Enersis.

The Fiscal Económico extended a demand against Endesa and Transelec on the grounds that vertical integration could potentially hamper economic e¢ciency ("risk" of non-competitive behavior) through three ways:

- Distributor Chilectra could bene…t Endesa or its ancillaries by issuing preferential contracts, similar to those used against Pullinque (see above) and Colbún (see the next case).

- Enersis could use CDEC in order to bene…t Endesa or its ancillaries when dealing with the dispatch of energy from di¤erent generating facilities. The Fiscal Económico presumed that since Enersis has two of the four directors of the CDEC and Transelec actually delivers the energy, an integrated …rm could manipulate dispatch to its bene…t.

- Being Transelec an ancillary of Endesa, the latter obtains inside information from the former and receives special treatment regarding tolls and other speci…cations of its rival's contracts. In addition, Transelec may hold the release of independent generators consultation, regarding the cost of using the network to serve large customers, until Endesa or its ancillaries could match the best rival proposal.

The sentence of this second trial, issued in june 1997, favored Enersis again. The Antitrust Commission considered that the matter had already been judged in the previous trial, and that the Fiscal Económico did not show any evidence of malpractice by

Enersis or its ancillaries. In addition, the Antitrust Commission issued a set of "recommendations" for a better performance of the electricity sector. In some sense, these recommendations recognize potential anti-competitive practices in this sector that could be prevented by three changes in the industry. First, the authority should issue as soon as possible the statute of the sector in order to solve the existent ambiguities with respect to transmission tolls. Secondly, Transelec should open its property to the participation of other interested …rms (not done yet). Finally, distribution companies may publicly auction their purchases of energy and power (not done yet).

There are several elements that should be added to obtain a full characterization of the trial. First, the Fiscal Económico had a very weak case from an empirical point of view. In fact, the accusation is presented in terms of fears that Chilectra would grant preferential contracts to other Enersis …rms and fears that there could be con‡icts of interest within the CDEC derived from …rms being part of the holding Enersis. He o¤ered no characterization of how these practices could be implemented or what types of behavior would be consistent with these fears.

Second, it is apparent that the trial was ill-directed on the part of the prosecution. This could be observed in its reliance on legal arguments, disregarding economic facts. In addition, the prosecutor failed to convince the judges of the need to look at conditions which could allow for non-competitive behavior instead of documented proofs of such behavior.

Finally, it is conspicuous that other potential bene…ciaries of a de-concentration of Enersis which have had problems with Enersis before (such as Chilgener, Colbún, etc.) were not considered as witness of the accusation during the trial. It could be that either they feared retaliation from Enersis, preferred to maintain a low pro…le for strategic purposes, or there was no evidence of misconduct.

3.2. Market Discrimination: Colbún against Chilectra, Endesa, and Pehuenche (Enersis holding).

The most important dispute in market discrimination occurred in 1992, when Colbún charged Chilectra, Endesa, and Pehuenche for discrimination and predatory practices. A poorly designed contract facilitated Chilectra's discrimination against Colbún and, since the strategy favored Chilectra's related generator Pehuenche and increased Colbún's long-run marginal costs, this strategy was also considered predatory.

This con‡ict started as a dispute in the CDEC and, following the standard procedure, the Minister of the Economy acted as judge in the case. When he sanctioned in favor of Colbún, Enersis took the case to the Antitrust Commission on the grounds that the Minister of the Economy was not competent to sanction the matter. The dispute was analyzed by the Resolution Commission during 1992 without reaching a judgement. In September, 1992 Enersis signed an agreement to compensate Colbún for losses and accepted to

modify contracts. Chilectra and Colbún signed a long-term contract (1992-2001) with similar characteristics of those signed by other suppliers (Endesa and Chilgener).

The source of the dispute in this case stemmed from a 1989 agreement signed by all members of the CDEC regarding prorates in sales to distributors, a poorly designed contract between Chilectra and Colbún, and the disturbing role played by the appearance of a new operator in the generation market.

According to the 1989 clause, at each point in time Chilectra had to buy energy from producers, at node prices, according to each generating …rm's "load factor", that is, in relation to the power-energy ratio of the client. This clause was imposed in order to avoid non-competitive practices on the part of Chilectra and in favor of other members of the vertically integrated conglomerate (Endesa). Colbún, at the same time, had signed a contract to supply Chilectra on the basis of ful…lling Chilectra's needs whenever other suppliers (Endesa and Chilgener) could not meet demand. This left Colbún as the residual supplier in the market.

In 1991, Pehuenche – an Endesa ancillary – started operations and began to sell energy to Chilectra without compliance of the 1989 agreement. Chilectra interpreted the 1989 agreement as binding only for members of the CDEC at the time (that is, Endesa, Chilgener, and Colbún) but not for new members, such as Pehuenche. In practical terms, the load factor for Pehuenche was variable and ranged between 0% and 79%.

In 1992 Colbún complained that non-compliance with the 1989 agreement by Pehuenche was detrimental. The reason was that, being the residual supplier, Colbún was required to provide vast amounts of energy only when marginal costs were above node prices, and very little quantity during the rest of the year. This strategy left Pehuenche better o¤ (selling at node prices above marginal costs) at the cost of Colbún (selling below marginal costs), while Endesa and Chilectra were left indi¤erent.

Several elements make discrimination feasible.

- The contract signed by Colbún and Chilectra was clearly incomplete. The fact that Colbún was the residual supplier of Chilectra was not a problem under compliance of the 1989 agreement, but an unforeseen contingency proved the contract to be detrimental to Colbún. Colbún's strategy was clearly shortsighted, given that Pehuenche's facilities were under construction, and it could be fully anticipated that Pehuenche was going to be a major supplier in the market.[16]

- Since Chilectra, Endesa, and Pehuenche belong to the same holding, Enersis, it facilitates coordination among …rms to discriminate.

[16] There are political economy elements here, however. Colbún's main executives who signed such contract in 1989 were appointed by the military government, so that they knew they were stopping working in Colbún in March, 1990.

[2] With Chilectra's approval, Endesa gave Pehuenche the right to sell to Chilectra 190 MW out of almost 500 MW of power contracted between Endesa and Chilectra at that time. Chilectra and Pehuenche made a private contract considering a flexible supply of energy. This allows Pehuenche to use the above mentioned strategy to profit during snow melting periods, to the detriment of the residual supplier, Colbún.

These three elements were the basis of Colbún's accusation against Enersis for discriminatory and predatory behavior. As mentioned by Blanlot (1993), the long-run condition that marginal costs should equate node prices was not met.

Several authors favored Colbún's position (Bitran and Saavedra, 1993, Blanlot, 1993, and Morandé and Sánchez, 1992) and remarked that crucial factors facilitating discriminatory practices were the existence of a vertically integrated holding in the market and the existence of an incomplete (ambiguous) regulation in the electric industry in Chile. The wrong assumption in the regulatory framework about the non-existence of integrated firms in the sector and the presumption of competition in generation make discrimination practices feasible. Otherwise, since Chilectra always purchases energy at node prices, why it would discriminate in favor of Pehuenche?

Discrimination was profitable to Enersis because Pehuenche's profits – derived from its sales to Chilectra – were larger than non-realized profits by Endesa (due to its voluntary reduction in sales). This highlights the importance to Endesa of maintaining not only the control of Pehuenche but also a large share in its property (93%). Since Chilectra's stockholders were indifferent between accepting or not Endesa's decision, Enersis' control over the distributor (Chilectra) was also necessary to discriminate. Clearly, the discriminatory strategy was profitable only to those Chilectra's stockholders belonging to Enersis.

3.3. Colbún's Transmission Line Bypassing Transelec's Monopoly Service in Transmission

This case illustrates how an incomplete regulation (absence of pricing mechanism for transmission tolls), and the subsequent uncertainty faced by firms, induces socially inefficient decisions that reduces the society's welfare. That is, despite important scale economies in the transmission market of the electricity industry, private parties decide to build two high-voltage transmission lines.

Lack of a proper definition of transmission tolls and cost-sharing in expansion investments have been, perhaps, the most important areas of conflict and renegotiation in the electricity industry in Chile.[17] As mentioned, the law guarantees open access to the

[17] This applies to the SIC. In the SING, most transmission problems are not present because main customers (such as mines) require transmission lines that have no alternative use (i.e., lines running from

transmission network as long as capacity allows it. When capacity does not permit an additional user, investment in the network and its associated costs should be established freely through negotiations between the user and the owner of the network. The potential user, therefore, has the choice of connecting with the network of the transmission company (and avoid undertaking the investments) or, alternately, building the lines to satisfy its own requirements and connecting with the network at the points it deems most suitable. An intermediate solution would be to build the lines it needs and connect with the network only for the use of sections that have surplus capacity.

The law also establishes that the company that owns the facilities should calculate the value of the toll, the areas of in‡uence, the new replacement value, and how it should be prorated among …rms. Nevertheless, the transmission company should make the replacement values and operating costs for all the sections of the system available to all members of the SIC. A user who does not agree with the toll calculated by the company has recourse to arbitration.

In 1990, Colbún – then a stated-owned …rm – started to supply energy to Chilectra. From the beginning, Colbún and Endesa disagreed on transmission tolls and connection fees. Endesa-Transelec charges Colbún with transmission fees between $ 16 to $ 18 million a year; Colbún, on the other hand, made annual provisions (tentative payments) for $ 12 to $ 13 million, until the dispute was solved. By the end of 1992, both …rms agreed to call on an arbitrage commission to settle the matter. However, the commission was unable to determine what the transmission costs should be and the proportion that Colbún had to pay.

During 1994, Transelec and Colbún increased their di¤erences regarding the pricing of transmission tolls. According to a new study on transmission costs developed by Transelec, an annual payment of $ 21 million was consistent with the proportion of energy sent by Colbún to Santiago. Colbún rejected this proposal on the grounds that it was arbitrary, monopolistic, and aimed at increasing the pressure on the arbitrage commission to solve the dispute concerning unpaid transmission fees. Fearing it could loss the arbitrage and face further litigation costs, Colbún initiated the analysis of an alternative solution to its transmission problem, in the form of building its own transmission line to Santiago. A study concluded that the cost of building the line would be $ 70 million, which represented $ 7.5 million a year in terms of Colbún's cost of capital. Yearly operation costs amounted to $ 4 million. Consequently, owning its own transmission lines would represent, at most, a cost of $ 11.5 million a year.

After Colbún decided to build its private transmission line, Enersis (which owned Transelec through Endesa) followed two di¤erent strategies. The …rst one was to convince

---

the network to isolated facilities in the Atacama desert). This makes negotiations very simple: either the client or the generating company builds the transmission line (whomever is the most e¢cient builder or it is decided during bargaining). In fact, there are not disputes on this regard.

Colbún (and the government) that an independent line was an ine¢cient solution, not only from a social point of view, but also from a strictly private perspective. Accordingly, at the end of 1995 Transelec o¤ered a transmission fee of only $10.3 million a year. The second strategy consisted of starting conversations with the government in order to reduce or eliminate the vertical integration in generation and transmission markets. Endesa planned to divest Transelec and retain only 30 percent of the shares, while the rest would be allocated in the stock market to be purchased by institutional investors and other generating companies.[18]

Conversations between Enersis and Colbún lasted until January, 1996. Enersis requested that Colbún build only one 500 KVh line (and use existing Transelec facilities as backup), and later to transfer the line to Transelec as a capital participation. Colbún did not agree to this scheme, however, and in January 1996 started to build two 220 KVh transmission lines.

At …rst glance, Colbún's decision may appear to be politically motivated in an e¤ort by the government to curtail Enersis' political and economic power. A closer evaluation of the project, however, shows that in all likelihood this is not the case. In spite of scale economies in transporting electricity, Colbún's annual costs of using its own lines are only $ 1 million more than under Transelec's …nal proposal. However, building its own line gave Colbún the added advantage of avoiding litigation costs. Considering the history of con‡icts between Enersis' …rms and Colbún, it does not seem to be a high price to pay for independence. In addition, building only one transmission line and hiring backup service from Transelec, whose fees are not regulated, did not assure Colbún that Transelec would not use its monopoly power in the future to extract rents. This argument was of strategic importance in 1995 when the government was looking to privatize Colbún. The …rm's independence was considered to be crucial in …nding a majority partner.[19]

Colbún's transmission lines …nally entered into operation in August 1997.[20]

3.4. The Tari¤ Setting Case in the Regulated Distribution Market

This case is extremely important in showing us how legal ambiguities produced by a short-sighted regulator provides the scope for opportunistic behavior that reduces market e¢ciency.

[18] An ex-post analysis shows that this was not an Enersis' credible strategy. Its posterior decision was not to open Transelec's property to any other potential partner.

[19] Colbún cannot sell transmission services to other producers, however, because of Transelec's legal monopoly in this segment of the market. If the transmission activity were deregulated in future, this high voltage lines might be a new business for Colbún.

[20] Regarding the dispute between Endesa-Transelec and Colbún related to transmission tolls, the parties resolved this con‡ict agreeing that provisions made by Colbún between 1992 and 1996 would cover unpaid basic tolls. Thus, no extra payment from any …rm was required at the end.

After …nishing the tari¤s setting process on November 1996, the National Energy Commission (CNE) announced the new regulated distribution prices in the electricity sector which would be applicable for the next four years. Tari¤s were between 5.8% and 6.4% lower than the prevailing values. Distribution companies, however, realized that both a loophole in the law and the asymmetric information in the industry would provide them quasi-rents. In e¤ect, it was common knowledge that the way in which tari¤s are …xed in Chile could distort prices, so that they would reject the new regulated prices on the grounds that they were distorted.[21]

Immediately after the announcement, three major distribution companies – led by Chilectra – argued that the new tari¤s scheme was arbitrary and instituted an appeal before the Court of Appeals (protection demand). The main e¤ect of this appeal, in this case, was to inhibit the price changes until the court determines whether the CNE had the authority to install such price adjustment and proceeded according to regulations. Therefore, as long as the sentence is not given out, all distribution companies are able to charge prevailing (higher) tari¤s.

In order to signal their agreement with the fact that the electricity distribution was cheaper than it was four years before, so attempting to a¤ect court's rule, the three distribution companies reduced …xed charges between 26% to 42% (Chilectra reduced charges in 30%). These changes were implemented between November 6 and November 11. A similar reduction was implemented by another …ve minor distribution companies during the …rst week of December. However, reductions in …xed charges were negligible when compared with tari¤ reductions imposed by the CNE.

The regulator realized late that distribution companies were able to pro…t by delaying the tari¤ reduction announced by the CNE. This quasi-rents arise from the absence of legislation forcing monopolies to return to consumers any extra payments when the courts determine the need for tari¤ reductions. Accordingly, the government enacted legislation to close this loophole on December 4. This legislation could only be implemented after publication in the Diario O…cial (O¢cial Newspaper), which occurred only on December 28, 1996.

On January 31 1996, the Court of Appeals accepted the companies' demand. Immediately, both the regulator (CNE) and the State Defense Council – which joined the con‡ict as a consumer representative – appealed to the Supreme Court. The Supreme Court overruled the Court of Appeals' decision and the new regulatory tari¤s were into e¤ect on April 28.

Extra payments made in the December 28, 1996 to April 28, 1997 period were returned

[21] Both the regulator and the monopoly make their own estimation about costs of the benchmark (e¢cient …rm) and confront them. If after negotiation there remains some discrepancy, the …nal estimated cost of the e¢cient …rm is a weighted average of the estimates provided by the …rm and the regulator. Then, if the …rm does not agree with the new tari¤s, it may behave opportunistically by arguing against transparency on regulator procedures.

to consumers. Nevertheless, extra income obtained in the November 4 to December 27, 1996 period was not returned to consumers and distribution companies realized additional pro…ts of around $ 7 million as a result of the lawsuit.

3.5. Inadequate Allocation of Water Rights

This case highlights how the inadequate allocation of water property rights may deter entry in the generation market. Misallocation was an unforeseen outcome of privatization and clearly re‡ects the role of informational advantages created by inadequate regulation. Although this is not assessed in this paper, we presume that this market design failure is likely to negatively a¤ect the functioning of the electricity bulk market in the long run.

Water property rights are an important source of disputes for three reasons.

- Although the country runs north to south, watersheds run from east to west and are not connected among themselves (thus making arbitration infeasible).
- Since the country is so narrow and water descends from an altitude of 12,000 feet to sea level in less than one hundred miles, the possibilities for locating hydroelectric generating units are limited.
- The weather tends to be erratic, creating large hydrological risks.

Consequently, water rights become crucial for the development of hydroelectric companies.

Shortly before privatizing the electricity sector, the government reformed water rights which were at the time the sole property of the State. New regulations retained the property in the hands of the State, but established the right of private parties to request concessions to use water for consumption and other purposes. Rights could be claimed by any individual or …rms at no cost (except in the case of disputes, wherein the government could auction the rights). In addition, rights do not expire and there is no penalty for holding rights without e¤ective use.

Water rights held by Endesa at the time it was privatized were transferred to the new proprietor. These water rights largely exceed Endesa's investment plan; in fact, Endesa's water rights are such that if generating plants were built, production could increase by 3,100 MW, that is 75% of the SIC's current capacity. In addition, it holds water rights for another 2,000 MW in the south which could potentially be linked to the SIC at a moderate investment cost. After privatization, Endesa claimed another 79 water rights out of some 280 claims …led by di¤erent electric and industrial companies.

Operators in the market have expressed fears that Endesa could use water rights as an entry deterrence mechanism for other producers. The extent to which these water

rights can be e¤ectively used as a barrier to entry depends, as expected, on the availability of alternative sources for generating electricity. In this sense, newly built gas pipelines that import natural gas from Argentina have certainly reduced the value of water rights as a source of monopoly power in generation[22]. Nevertheless, in 1996 the Antitrust Commission recommended not to give additional water rights to Endesa to avoid "noncompetitive behavior." This led to the canceling of Endesa's Neltume project, a $ 300 million generating plant that was to have been developed during 1996–1998.

Moreover, extensive allocation of water rights to Endesa has also had entry deterrence e¤ects in other industries. In Aysén, a scarcely populated area in the south, Endesa holds 30% of available water rights but does not have any facility in operation, while the local state-owned generating plant supplies the entire current demand with less than one percent of the area's water rights. This situation has inhibited the development of an aluminum plant project which requires a large amount of electricity for its operation. Needing access to water rights, the Canadian company Noranda invited Endesa to be a (minor) partner in the $ 3,000 million project. The project stalled when Endesa declined the o¤er.

3.6. Institutional Weakness: The Relative Ine¢ciency of Regulators and Institutions Enforcing Contracts

There are …ve institutions in charge of regulating and monitoring the sector (CNE, CDEC, SEC, the Antitrust Commission, and the Ministry of the Economy). In general, these institutions convey a sense of acting in isolation of interest groups and political parties, which in turn implies that agents respect their decisions. Nevertheless, their limitations in terms of human capital and resources induces severe ine¢ciency in their performance, as well as high litigation costs and certain randomness in the decisions made. I summarize in this section several cases of open con‡ict directly related to the Antitrust Commission, CDEC, and CNE.

The Antitrust Commission During the past 8 years, legal demands have been very limited and, except for three large-scale trials, most of them have been of little economic impact. Tables N± 2 and N± 3 present a summary of trials and their corresponding judgements. In total, 16 suits related to the electricity sector with signi…cant economic content were initiated at both the prevention and resolution commissions. In addition, there were 9 other cases (unreported) in which individuals sued the electricity companies for minor issues (such as delays in connection or repair services).

[22] Marginal costs of gas-steam combinated-cycle plants are between of those by hidoelectric and thermoelectric plants during normal seasons. Thermoelectricity is the more expensive technology during these periods.

Table N± 2

Antitrust Commission: Proceedings of the Prevention Commission
(selected cases from 1989 to 1997)

Date of Proceeding	Date of Sentence	Parties Involved	Reason	Outcomes
Nov-10-89	Feb-05-90	Sinel (d) against Chilectra (d)	Overlap of geographic zones allows predatory practices	Overlapping is not allowed
Jun-07-90	Jan-29-92	CMET (telephones) against Enersis	Abuse of monopoly power (Chilectra doesn't pay services)	CMET withdraws accusations
Jun-27-90	Jan-27-92	Puente Alto (g) against Rio Maipo (d)	Abuse of monopoly power in the devolution of payments	Rio Maipo is …ned
Dec-07-90	Nov-25-91	Rio Maipo (d) against Puente Alto	Anticompetitive practices (P. Alto hides information)	The information was publicly announced
Jun-12-91	Aug-07-92	Puente Alto (g) against Rio Maipo (d)	Abuse of monopoly power (R.M. requires illegal guarantees)	Rio Maipo is …ned
Dec-13-91	May-13-93	Pedro de Valdicia against Litoral (d)	Abuses of monopoly power on installation and power supply	Rejected
Jul-29-93	Sep-16-93	CORFO ask advice	Whether auctioning Edelnor shares is legal	Auctioning adjust to law
Oct-26-94	Oct-05-95	Pullinque (g) against Endesa (g) and Chilgener (g)	Abuse of monopoly power when …xing tari¤s	Rejected
Jul-04-96	Nov-25-96	CNE ask advice	Whether new water rigths given to Endesa a¤ect competition	The court recommended to avoid it
	Dec-23-96	Endesa	Appeals the previous sentence	Rejected

Note: (d) distribution company; (g) generating company; (t) transmission company.

Table N± 3

Antitrust Commission: Proceedings of the Resolution Commission (selected cases from 1989 to 1997)

Date of Proceeding	Date of Sentence	Parties Involved	Reason	Outcomes
Nov-04-88	Mar-13-90	VTR (telecom) against Endesa (g)	Endesa asks VTR for a study but awards it to a rival …rm	Rejected
Feb-14-90	Mar-27-90	Chilectra	Appeals sentence of the Prevention Commission	Overlapping is allowed but tari¤s must be similars
Jun-05-90	Jun-02-92	Briones (particular) against Enersis & several AFP	Collusion to elect directors	Rejected
Jun-05-90	Jun-07-92	Pullinque (g) against Endesa (g)	Abuse of power market on the transmission grid	Rejected
Mar-20-92	Sep-15-92	Colbún(g) against Pehuenche(g), Endesa (g) and Chilectra (d)	Firms discriminate against Colbún	Colbún withdraws accusations
	Sep-26-93	Briones (particular)	Appeals previous sentence	Rejected
	Mar-22-94	Rio Maipo(g)	Appeals sentence of the Prevention Commission	Rejected. Rio Maipo is …ned for abuse of power market
Oct-02-92	Jun-11-97	The Fiscal Económico against …rms of the Enersis Holding	Vertical separation of this conglomerate	Rejected
Oct-10-95		Pullinque (g) against Endesa (g) & Transelec (t)	Appeals sentence of the Prevention Commission	Rejected
	Jan-07-97	Endesa	Appeals previous sentence	Rejected

Note: (d) distribution company; (g) generating company; (t) transmission company.

A second important conclusion that can be drawn from the tables is that trials tend to be quite long. On average, trials lasted 12 months in the Prevention Commission and 20 months in the Resolution Commission. Since most disputes go through both commissions, on average any dispute may take around three years to reach a sentence. Once the resolution commission issues a judgement, appeals must go to the Supreme Court, an endeavor that could last a couple of years more. For example, the two large scale lawsuits against Enersis holding described in section 3.1 were extremely long trials (2 to 4 years).

To a large extent the ine¢ciency of the Antitrust Commission comes from its lack of resources. Judges work ad-honorem, which may guarantee independence, but also implies they have little time for these matters which, in turn, lengthens the processes. The Commission's technical sta¤ is poorly paid and ill suited for the job because most

are lawyers with little training in economics, which is a common problem in developing countries.

There are also more structural problems. First, the resolution commission (highest in rank) consists of 5 members not necessarily trained to resolve technically complex and economically difficult disputes: one Supreme court judge,[23] two public officer appointed ex-officio, and two university deans (one from a law school, one from an economics school), who are randomly selected from all universities.[24] As is apparent given its structure, the commission rely on expert witnesses to weigh arguments, facts, and opinions. But given its limitations in financial resources, good advise is certainly not guaranteed. The government has realized these problems and increased the Commission's budget substantially for 1998.

Second, the legal system in Chile is very antiquated, based largely on "tangible" proofs of misbehavior and not amiable to acting on the grounds of reasonable presumptions. In fact, illegal practices must be specified in advance (typified). Moreover, the commission, being a public-law bounded unit, is only allowed to do things (instead of limited to do things, as is the case of the private sector). This limits the range of actions of the commission, both in areas of interests and in the type of proofs that are required to sanction non competitive practices. To some extent, this legal structure reproduces the spirit of the Chilean legal system which was designed in a way such that discretion in the public sector is rarely found (Napoleon's Code).

An early paper by Paredes (1988) analyzes the sentences given out by the Antitrust Commission since its inception in 1974. He found a relatively higher pursuit and sanctioning of vertical integration practices in oligopolistic markets, which are, however, largely justified in the literature as welfare improving (Tirole, 1988, chapter 4). The reasons for this inadequate behavior is to be found, according to Paredes, in two elements: the lack of clear definition of the purposes of antitrust regulation (which blurs the judgment) and the fact that practices that can be easily specified mostly correspond to mergers.

Third, fines are very low when compared to the potential benefits of malpractice, hampering the credibility of regulators. Fines levied by the Antitrust Commission in the 1975-1987 period amounted on average to $ 29,000, an the maximum fine was $ 147,000. For example, on May 1, 1997 a system failure left the 80% of the country without electric power for 55 minutes. The largest five generating companies and the transmitter Transelec were fined after an investigation proved that their response to the emergency was excessively slow due to cost considerations (the expected delay is around 3 minutes). The investigation concluded that the main reason was that since support

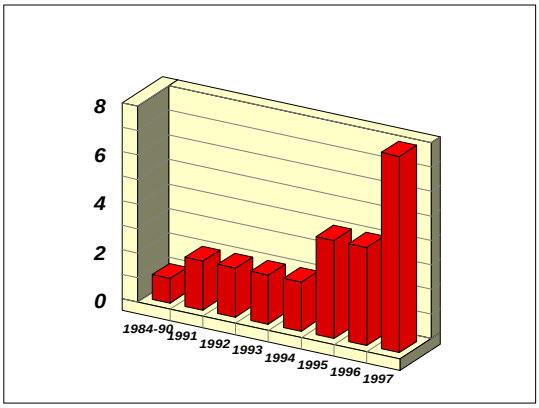
[23] Judges in Chile have no formal training in economics whatsoever.

[24] When the Antitrust Commission was formed in the mid-70s there were 7 to 10 high quality schools of law and departments of economics in the country, usually with highly trained personnel. This made the "academic" part of the commission trustworthy. However, later the government deregulated higher education markets. To date, there are over 70 schools of law and economics, whose quality is very varied.

units have a higher operating cost than a failing unit, the CDEC did not respond as fast as expected. Although maximum …nes were applied, these were minimal in comparison with average sales or assets of these six companies: each company was …ned less than $ 35,000.[25]

Limitations of the CDEC in Self-Monitoring As mentioned, disputes in the CDEC have been very limited. An indirect way to assess the lack of disputes regarding the working of the CDEC – on determining the short-run marginal cost and the allocation of demand among di¤erent producers – is by recognizing that many of these were muted, for example, when there is dissent by one or more members of the CDEC from the majority decision. Since CDEC's inception, the number of dissensions has remained rather low, as shown in Figure 3.1.

Figure 3.1: Dissensions in the CDEC–SIC



Although the number is very small, the trend is somewhat alarming. It may re‡ect several aspects of the evolution of the industry.

- As more operators enter the market (for example, through changes in ownership) they are challenging Enersis' dominant role.[26]

[25] In May, 1999 the Congress pass a new law that increases maximum …nes to $ 6 million. This changes was gathered by 4 weeks of continuous black-outs during April, 1999.

[26] Foreign investors have recently become to play an important role in the sector, as has been the case

- Dissensions have been used as a negotiation tool in disputes in other areas not necessarily linked to the electricity sector.
- The 1996–1997 hydrological year (May to April) was characterized by a severe drought and, for the …rst time in years, some rationing was considered (it was not adopted, though voltage was reduced by 5%). In these conditions, the CDEC was operating close to the point of "technical failure", a condition at which generators could be …ned, thus exacerbating disputes.[27]

The case of Chilgener accusing Endesa of abuse of power in the dispatch of generating plants during the last months of 1997 exempli…es a con‡ict within CDEC that went beyond standard procedures. Instead of taking its complaint to the Minister of the Economy, Chilgener went directly to the Antitrust Commission. This decision may re‡ect that Chilgener considered the issue beyond the boundaries of a standard CDEC con‡ict because the accusation dealt with intentional wrongdoing not a simple technical discrepancy. This lawsuit shows clearly that con‡ict within the CDEC has not only increased in frequency but also in virulence.

Chilgener's allegation was that, invoking security reasons, Endesa had forced the CDEC to allocate less energy than its capacity would allow to a crucial segment of the northern SIC. In this segment Endesa has no operations, so that Chilgener's ancillary Guacolda had to supply energy to cover the gap. Since Guacolda is a thermoelectric producer, at that particular time it would have been to its advantage to purchase energy in the spot market at marginal cost instead of producing it. Chilgener estimated the losses in the four months at $ 17 million.

The initial response of Endesa was to renounce its role as coordinator of energy dispatch in the CDEC, in retaliation to the lawsuit. Nevertheless, Chilgener and Enersis reached an out of court settlement and the lawsuit was dropped. The terms of the agreement are not public but it takes into consideration that Endesa may assume the economic cost incurred by Guacolda.

Weaknesses in the Management of the CNE The CNE, the agency in charge of de…ning the sector's policies and calculating tari¤s and prices, has played a crucial role in disputes in the electricity sector in Chile. It has been unable to issue the Statute of the Electricity Sector during the last eight years, despite the fact that an advanced draft was ready in 1992, creating major problems in the sector. Transmission tolls and investment charges are among the key issues that the statute should address.

---

of Endesa of Spain and its successful hostile take-over on Enersis (August, 1997 and February, 1999) and Endesa (May, 1999)

[27] The most severe drought of the century is happening in 1999. There are a big number of con‡ict among generating plants, distributors, large (free) customers, the antitrust commission, and the CNE because of systematic system failures in the SIC (black-outs) during April and May.

This delay is somewhat surprising, to the point that one is tempted to conclude that it is in the government's advantage not to issue the statute. However, the statute is likely to be technically complex, in particular when considering network expansions. Calculating prorate under asymmetric (and largely unobservable) information is very difficult. It is also possible that the statute will affect large players in the market in different ways, leading to political difficulties as a result. The two main holdings in the electricity sector (Enersis and Chilgener) have interest in several other areas of the economy and in other countries in Latin America, and are thus important political agents. Second, private sector executives consider the CNE to be politically weak to make sharp and quick decisions.

4. Analysis

From the point of view of supporting the actions of policy makers dealing with privatization and regulated markets, it is interesting to derive the main conclusions of the Chilean experience in the decade after privatization. When analyzing from the broad perspective the six cases of open conflict described in detail in the previous section, the main lesson can be grouped into two areas which are discussed below.

4.1. Why Disputing ?

Conflict, as expected, has concentrated in those areas in which regulation is incomplete, information asymmetry is high, and institutions are less able to control private sector activities and enforce contracts (Williamson, 1985).

The Chilean regulation is, in specific but important areas, still incomplete and imperfect. The different cases revised in this paper suggest that conflict has concentrated on problems arising from the existence of conglomerates (vertical integration), the non-definition of certain areas in regulation (transmission tolls and investment cost-sharing appear), and the opportunistic behavior of agents due to institutional weaknesses.

Vertical Integration and Inefficient Allocation of Resources One of the main problems of the Chilean privatization of the electricity sector is that it allowed the creation of a large vertically-integrated conglomerate (Enersis), that can use its market power in regulated segments of the market in order to reduce competition and obtain extra profits in competitive segments. This dominant position would not be of capital importance if information problems were irrelevant or if there was a very effective system of antitrust law, but since in the electricity sector asymmetric information and incomplete contracts are important, vertical and horizontal integration does matter.

Under symmetric information, vertical integration could be consistent with efficiency gains. In fact, in this case a monopoly does not need to integrate downstream to ob-

tain monopoly pro…ts; it is su¢cient to use nonlinear pricing mechanisms (Tirole, 1988, Chapter 4). The above analysis of the Chilean experience suggests that e¢ciency gains are eclipsed, however, when information problems are important and the country cannot rely on institutions to enforce an adequate regulation, the judiciary system is unable to resolve disputes at a reasonable cost or it randomly interpretes and incomplete contract, and players lack long-term commitment. All these problems – which should have been considered at the moment of designing the privatization process in Chile – have been responsible for much of the litigation observed in the 1990-1997 period.

The Chilean case also shows that once property rights have been allocated to the monopoly in the privatization process, they become very di¢cult to eliminate. In turn, this implies that the monopoly will spend resources trying to avoid further modi…cation to regulation of property rights (lobby). A clear example is that when sued for vertical integration, Enersis hired a large group of experts in electricity and industrial organization, virtually cornering the market (section 3.1). In addition, when regulation is not optimal, property rights can sometimes be used as legal entry barriers, as is the case of water rights described in section 3.5.

The experiences I studied suggest that under informational asymmetries, there exists elusive ways to bypass the antitrust law, which are very di¢cult to prove in court. As discussed in previous sections, operating within the limits of the law, the monopoly may behave strategically in order to predate the market. Another example of the importance of entry barriers against competitors occurs because the regulator is unable to monitor network connections. Even a well prepared regulator cannot elicit true information when informational asymmetries are important and investment is required to provide services to competitors, as discussed in the case of con‡ict when requiring the expansion of the electricity transmission network (section 3.3).[28]

A …nal example of non-improving welfare consequences of vertical integration stemming from the Chilean experience occurs when the monopolist uses its joint ownership in upstream and downstream …rms in order to increase its rents (as a conglomerate) beyond the limits allowed by regulation. In the electricity case, this happened when the monopolist in distribution used its market power to allocate purchases of electricity along the year such that it purchased from its related …rm in periods with low operating costs and bought from its competitors when costs were high, as addressed in the discrimination case against Colbún presented in section 3.2.

[28] See La¤ont and Tirole (1993), chapters 5, 9, and 10 for a theoretical treatment. Under static regulation, the explanation is that regulator has fewer instruments than those required to elicit unknown parameters (network expansion). Therefore, the monopolist may use this advantage in order to extract rents from competitors. This argument would be suitable to the Chilean electricity sector. Another explanation, certainly suitable to any developing country, is that in a dynamic setting the regulator may have no commitment, then ratchet e¤ect applies.

Ambiguities in the Regulatory Framework and Incomplete Contracts The Chilean experience in the recently privatized electricity sector shows the importance of designing an adequate regulatory framework to avoid post-contractual con‡icts. The lack of awareness of the possible future states of the world raised contracts incompleteness and induces opportunistic behavior in the market. Incomplete contracts do not specify nor make clear important aspects of the economic life of …rms in the market, not only a¤ecting to the natural monopoly but also a¤ecting competitors in related markets because of the existence of conglomerates. In Chile, ambiguity in the regulatory framework made possible that …rms with a dominant position behave opportunistically in order to extract rents from consumers and other …rms in potential competitive markets, as it has been seen in the indetermination of transmission tolls case (section 3.3) and the tari¤ setting case (section 3.4).

Privatization in Chile was initiated before completing the regulatory framework. Such a sequencing of policy is extremely dangerous in sectors with substantial informational asymmetries because, once in place, the monopolist will be negatively a¤ected with ex-post revisions of the regulatory body. Obviously, the monopolist has invested in rent seeking activities, capture, and in‡uences in order to impede expropriations of its rights, even though those revisions are welfare improvements from the society perspective.

In addition, uncertainty regarding property rights hampers the quality of the entrepreneurial class entering in the sector. Ambiguities in the regulatory framework makes investment more risky, so attracting more risk averse entrepreneurs and/or those with more lobby capabilities. Furthermore, when the government is unable to credible commit to policies in the long run, …rms rationally expect opportunistic behavior from the authority. Theoretically, the hold-up e¤ect occurs (Hart and Moore, 1988, and Williamson, 1985) and the country cannot undertake necessary investments in the sector in order to induce an optimal rate of long-run growth. This may be an explanation to both the small amount of investments in transmission lines and the failed attempt to de-concentrate the transmission segment in 1995.

Institutional Weaknesses and Disputes Chile's experience shows the importance of institutions in reducing the adverse e¤ects of ambiguities in regulation and vertical integration in regulated markets. As argued by the mechanism-design theory, transactions costs and incomplete contracts would be irrelevant if a country has prepared institutions to design and enforce more complex contracts (Aghion, Dewatripont, and Rey, 1994, and Maskin and Tirole, 1997). Nevertheless, in Chile there are several limitations (human capital, legal frameworks, …nancial resources) which impede governments to write complex and enforceable contracts, as suggested in the implementation literature.

The Chilean case shows that disputes in highly developed industries, as the electricity sector, are often of an extremely technical nature, which requires an independent and

well-trained judiciary system to resolve disputes at reasonable costs. Otherwise, the possibility of opportunistic behavior – as was apparent in the tari¤ setting case discussed in section 3.4 – will induce allocative ine¢ciency in the case that the judiciary system cannot adequately interpret legal loopholes. In addition, since the country lacks educated and independent judges, then there is space for the dominant …rm (or conglomerate) to use its market power against competitors in potentially competitive markets. That seems to be the case in several con‡icts in which Enersis has been involved.

When the judiciary system is unable to provide quick and fair treatment to disputes, it is in the advantage of both parties to use the services of an independent referee, which the parties have previously agreed upon. The main drawback of referees is that they lack the power to enforce actions or sanctions emanating from their referral. In Chile, referees have played an important role, as described in several cases in section 3, but their inability in issuing mandatory sentences limit their impact and have led the government to suggest the legal creation of refereeing commissions with sanctioning power.[29]

E¢cient privatization also requires educated and independent regulators to properly design complex contracts, minimize non-covered contingencies, and help the government to work out laws and statutes to improve e¢ciency in the sector. An endemic problem of regulatory agencies in Chile is the lack of a trained sta¤ to deal with their private sector counterparts. It a¤ects, for instance, the relative power of the government at the moment of renegotiating regulated tari¤s. Another example stems from the vertical integration case in section 3.1, where the Fiscal Económico lacked a consistent set of arguments to convince judges that presumptions in cases of regulation can be as important as tangible evidence.

4.2. Why Public Disputes might be Inhibited ?

Despite the open con‡ict cases described above, ten years of post-privatization experience shows that the number of publicly known disputes in the electricity sector is reduced. From the analysis of some of those cases, the explanation is threefold.

First, to a large extent, low con‡ict is the result of a regulatory design which, in broad lines, is well conceived. Regulation presents features which ensure monitoring and control, guarantees access to information, and provide an harmonic interaction among private agents and with regulators. Among these features, we may note the clear separation of the di¤erent stages of production, clear regulatory principles in each stage, con‡ict resolution mechanisms properly designed, lack of political interference, and a privatization process in which …rms presented a sound …nancial stance. The law provides several mechanisms and institutions that smooth the working of the market; in particular, it considers institutions designed to coordinate daily operations in an e¢cient manner and guarantee the quality

[29] Enforceability of referees' decisions is one of the novelties features of the newly Chilean Highway Franchising process. See Saavedra and Soto (1999) for further details.

of service. In turn, these elements reduce opportunistic behavior and rent-seeking, thus limiting disputes and con‡icts. In my opinion, these set of elements comprise a setup that has played the important role of signalling …rms the market structure that should be achieved in the long run.

A second explanation of the limited number of legal disputes is the weakness of the Chilean judiciary system. It presents technical and legal limitations which make litigation costly, slow and unpredictable in its decisions. Thus, as predicted by the theory, private parties solve their disputes in pretrial settlements.

As discussed in section 3.6, Chilean judges do not specialize in economic matters. Judges acquire formal education only in law; training in economics is informal and, undoubtedly, limited. In addition, it is acknowledged that the legal apparatus in Chile is very ine¢cient not only in terms of the speed a which cases are processed but also because of its tendency to rely on "tangible" proofs of misbehavior. In cases of non-competitive behavior, physical evidence is very di¢cult to obtain (in cases of predation it is actually impossible to obtain). Ine¢ciency, on the other hand, induces high litigation costs.

In addition to the lack of training of the judiciary system, the poor conformation of the judges within the Antitrust Commission make sentence di¢cult to predict. As shown in several cases of section 3, sentences have changed dramatically as cases progress in the judiciary system. In turn, this makes legal con‡icts risky in terms of results.

Hence, the private sector has incentives to engage in referrals with agreed-upon referees to avoid legal disputes. In fact, the 1982 Electricity Law proposes a number of situation in which parties should seek arbitration. In most cases analyzed in this paper, referees have played an important role in solving disputes, and even proposing mechanisms to amend regulation loopholes (e.g. suggesting transmission tolls and investment prorates). This mechanism is not su¢cient to resolve con‡icts, however, because decisions made by referees are not de…nite and can be appealed through to the judiciary system.

Third, the relative absence of litigation could also be the result of strategic actions by di¤erent players in the market. It has been argued elsewhere that the electricity sector could actually be a duopoly, in which not only tacit collusion is likely, but also …rms share a conduct code which force them to maintain a low public pro…le for disputes. The larger holdings (Enersis and Chilgener) would prefer a low pro…le for its disputes because a well publicized case could hamper their public image or, more troublesome, could induce intervention by the authorities.

An indirect evidence of this "velvet-glove" strategy is that, despite being a¤ected by Enersis misconducts, Chilgener has rarely engaged in open disputes with Enersis and has never participated in the vertical integration trials as part or witness. In fact, the main dispute among them, regarding abuse of power in the CDEC (described in section 3.6), was rapidly settled using a referee and avoiding open litigation. On the other hand, small …rms could feel intimidated by the large size of major players and …nd it safer to

maintain a non-aggressive stance.

Although the above considerations could explain the low frequency of litigation among …rms of the private sector, the public sector does not face the same incentives and constraints. One possible explanation is the scarcity of well trained personnel in the government. The fragility of the public sector's human capital in Chile is largely due to the insu¢ciency of resources and low wages, which makes pro…table for an individual to obtain experience in the regulatory agency and then to move to some …rm in the regulated industry with higher income, leaving less quali…ed and dynamic personnel in the public sector. In addition, this situation has the perverse that regulators expecting to obtain a position in regulated …rms will not make decisions that would negatively a¤ect potential employers, even if such decisions are welfare improving.

Finally, another possible explanation of the passivity of the public sector is that con‡ict is minimized because regulatory agencies are not willing to pay the political cost of engaging in reforms that would alter status-quo and pro…tability of some …rms in the industry. An element that would support this conjecture is the fact that the government has not issued the statute of the sector since the law was passed in 1990, despite being mandatory.

5. Conclusions

Public disputes in the newly privatized Chilean electricity sector provide us with a useful analysis of the causes of such con‡icts. The main lessons of our …ndings, from the policy maker's perspective, is that even though the Chilean experience shows a low level of open con‡ict, there is a large number of loopholes in the regulatory framework and important institutional capability constraints. The economic consequences of these problems on the competitiveness of the electricity industry are exacerbated by the existence of a conglomerate operating in all segments of the market. Certainly these problems, if extended to other public service industries, may inhibit a greater long-run growth of the economy.

The main conclusion of this paper is, therefore, the timing of privatization does matter. It is better – before privatizing – to strengthen capabilities of both regulatory and judiciary institutions, create an adequate regulatory framework, and properly design the structure of the market. The Chilean experience shows that it is extremely costly to incorporate main changes in market structure or even to enact regulatory reforms once property rights have been allocated to private parties.

Policy makers have, therefore, a number of yet-to-be-performed duties in Chile, not only at the level of the regulatory institutions related to the electricity sector but also for the central government in re-thinking major reforms in both regulatory institutional setup and the whole judiciary system.

A summary of our main …ndings is:

- Con‡ict, as predicted by the theory, has concentrated in those areas in which regulation is incomplete, information asymmetry is high, and institutions are less able to control private sector activities.

- Vertical and horizontal integration does matter when these informational and contracting problems are present. Hence, the importance of revising the market structure in the electric industry should be assessed in terms of the relative advantages of di¤erent feasible institutional arrangements, such as the existence of vertically related conglomerates, vertical separation, divestiture of the monopolistic transmitter, and so on.[30]

- There has been a reduced number of open and important disputes since the Chilean electricity sector was privatized in the late 80's. Such a fact may be explained by:

  - The regulatory design is, in broad terms, well conceived. Regulation presents features which ensure monitoring and control, guarantees access to information, and provides an harmonic interaction among private agents and the regulators.
  - The judiciary system presents technical and legal limitations which make litigation costly, slow, and unpredictable in its decisions. Then, a strategic response from agents (monopolies, competitor …rms, or government) to institutional weaknesses in the country is to avoid open con‡ict.
  - Major players in the electricity sector may have a tacit agreement to not make public their disagreements.
  - Private …rms capture regulatory institutions to maintain the status-quo.

These lessons are likely to be applicable to other naturally monopolistic markets in Chile whose privatization processes were done under the same liberal perspective; for example, telecommunications. Privatization and regulation of gas, water and sewage, and transportation has been partially implemented in Chile during the 90's considering further informational, transactional, and institutional constrains. Nevertheless, recent research (Basañes, Saavedra and Soto, 1999) shows that there are important components of learning-by-doing in the process of incorporating the private sector to traditional state-own activities.

Whether or not the Chilean experience is suitable to other countries is an open question. That is because, in practice, the degree of contract incompleteness depends on speci…c country characteristics (such as corruption, the legal framework, and the strength

[30] Saavedra (1999) presents a theoretical assessment in this regard.

of institutions) and on the particulars of the industry under analysis. Hence, our conclusions are better suited to others utility sectors and developing countries sharing similar characteristics to that of the sector analyzed here.

In the early 90's, privatization processes exploded around the world. Most privatizations in Eastern Europe – and other countries with former socialist governments – were undertaken in potentially competitive industries, so that our analysis is not applicable to those cases. On the other hand, several Latin American countries initiated a rapid process of privatization of natural monopoly industries in early 90's. Most of these country general characteristics are similar to Chile's, so that their governments took the Chilean privatization process as an example and many of them undertook deeper reforms than Chile's. A large number of post-privatization renegotiations and disputes in those countries have been recently reported (Artana, Navajas, and Urbiztondo, 1998, and Basañes, Uribe, and Willig, 1998). Such …ndings are consistent with ours, in the sense that, the faster and deeper the privatization processes (so, greater loopholes in reforms), the more con‡icts there are likely to be in equilibrium.

References

[1] Aghion, P., M. Dewatripont, and P. Rey (1994). "Renegotiation Design with Unveri…able Information". Econometrica 62: 257 - 282.

[2] Armstrong, M., S. Cowan, and J. Vickers (1994). Regulatory Reform: Economic Analysis and British Experience. MIT Press.

[3] Artana, D., F. Navajas, and S. Urbiztondo (1998). "Regulation and Contractual Adaptation in Public Utilities: The Case of Argentina". IADB Working Paper.

[4] Bagwell, K. (1995). "Commitment and Observability in Games". Games and Economic Behavior, Vol. 8, 2: 271 - 280.

[5] Basañes, C.F., Saavedra, E. and R. Soto (1999). "Post-Privatization Renegotiation and Disputes in Chile". Working Paper I-117, Graduate Program in Economics ILADES/Georgetown University, Universidad Alberto Hurtado.

[6] Basañes, C.F., E. Uribe, and R. Willig (1998). Can Privatization Deliver? Infrastructure for Latin America. John Hopkins University Press.

[7] Bernstein, S. (1988). "Competition, Marginal Cost Tari¤s, and Spot Pricing and Chilean Electric Power Sector". Energy Policy, August: 369 - 377.

[8] Bhaskar, V. (1993). "Privatization in Developing Countries: Theoretical Issues and the Experience of Bangladesh". UNCTAD Review, 4.

[9] Bitran, E. and E. Saavedra (1993). "Algunas Re‡exiones en Torno al Rol Regulador y Empresarial del Estado". In O. Muñoz editor, Después de las Privatizaciones: Hacia un Estado Regulador. CIEPLAN.

[10] Blanlot, V. (1993). "La Regulación del Sector Eléctrico: La Experiencia Chilena". In O. Muñoz editor, op. cit.

[11] Frankena, M. and B. Owen (1994). Electric Utility Mergers: Principles of Antitrust Analysis. Praeger Publishers.

[12] Gal-Or, E. (1985). "First Mover and Second Mover Advantages". International Economic Review, 26: 649 - 653.

[13] Gilbert, R. and E. Kahn (1996). International Comparisons of Electricity Regulation. Cambridge University Press.

[14] Grossman, S. and O. Hart (1980). "Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation". Bell Journal of Economics 11: 42 - 64.

[15] Hart, O. and J. Moore (1988). "Incomplete Contracts and Renegotiation". Econometrica 56: 755 - 785.

[16] La¤ont, J.J. and J. Tirole (1991). "Privatization and incentives". Journal of Law, Economics and Organization 7: 84 - 105.

[17] La¤ont, J.J. and J. Tirole (1993). A Theory of Incentives in Procurement and Regulation. MIT Press.

[18] Marcel, M. (1989). "Privatizacion y Finanzas Publicas: El Caso de Chile, 1985-88". Colección de Estudios 26, CIEPLAN.

[19] Maskin, E. and J. Tirole (1997). "Unforeseen Contingencies, Property Rights, and Incomplete Contracts". Mimeo, Harvard University.

[20] Morandé, F. and R. Rainieri (1997). (De)Regulation and Competition: The Electric Industry in Chile. ILADES – Georgetown University.

[21] Morandé, F. and J.M. Sánchez (1992). "Incentivos y Formas de Discriminación en la Oferta de Electricidad". Mimeo, Colbún S.A.

[22] Muñoz, O. (1993). "Hacia el Estado Regulador". In O. Muñoz editor, op. cit.

[23] Newbery, D. (1996). Privatization, Restructuring, and Regulation of Network Utilities. Cambridge University Press (…rst draft).

[24] Paredes, R. (1988). "Análsis de la Ley Antimonopolios en Chile". Revista de Análisis Económico, Vol. 3, 2: 135 - 158.

[25] Paredes, R. (1995). "Evaluating the Cost of Bad Regulation in Newly Privatizated Sectors: The Chilean Case". Revista de Análisis Económico, Vol. 10, 2: 89 - 112.

[26] Paredes, R., J. M. Sánchez, and A. Fernández (1995). "Privatización y Regulación en Latinoamérica". Revista de Análisis Económico, Vol. 10, 2: 3 - 19.

[27] Phillipi, B. (1991). "The Chilean Electric Power Sector in the Last Decade: The Design and Implementation of a New Policy". Papers of CERES Workshop on Electricity Regulation in the Southern Cone, Montevideo, Uruguay.

[28] Ordover, J., R. Pittman, and P. Clyde (1994). "Competition Policy for Natural Monopolies in a Developing Market Economy". Economics of Transition, Vol. 2, 3: 317 - 343.

[29] Saavedra, E. (1999). "Alternative Institutional Arrangements in Network Utilities: An Incomplete Contracting Approach". Chapter 2 of Essays on Incomplete Contracts in Regulatory Activities, Ph.D. dissertation, Cornell University.

[30] Sáez, R.E. (1992). "Las Privatizaciones de Empresas en Chile". In O. Muñoz editor, op. cit.

[31] Schmalensee, R. (1995). "What Have we Learn about Privatization and Regulatory Reform?". Revista de Análisis Económico, Vol. 10, 2: 21 - 39.

[32] Schmidt, K. (1996). "Incomplete Contract and Privatization". European Economic Review 40: 569-579.

[33] Shapiro, C. and R. Willig (1990). "Economic Rationales for the Scope of Privatization". In E.N. Suleiman and J. Waterbury editors, The Political Economy of Public Sector Reform and Privatization. Westview Press.

[34] Skaperdas, D. (1992). "Cooperation, Con‡ict, and Power in the Absence of Property Rights". American Economic Review, Vol. 82, 4: 720 - 739.

[35] Spier, K. (1992). "The Dynamics of Pretrial Negotiations". Review of Economic Studies, Vol. 59: 93 - 108.

[36] Spiller, P. and L. Viana (1996). "How Should it be Done? Electricity Regulation in Argentina, Brazil, Uruguay, and Chile". In Gilbert and Khan editors. op. cit.

[37] Tirole, J. (1988). The Theory of Industrial Organization. MIT Press.

[38] Vickers, J. (1996). "Market Power and Ine¢ciency: A Contracts Perspective". Oxford Review of Economic Policy, Vol. 12, 4: 11 - 26.

[39] Vickers, J. and G. Yarrow (1987). Privatization: An Economic Analysis. MIT Press.

[40] Williamson, O. (1985).The Economic Institutions of Capitalism. New York: Free Press.