

EVALUATING THE COST OF BAD REGULATION IN NEWLY PRIVATIZED SECTORS: THE CHILEAN CASE

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Abstract

We analyzed a hypothesis suggesting that the newly privatized firms in Chile produced little if any important advantages as they would have performed poorly once privatized and the hypothesis that the regulatory problems were the consequence of obvious mistakes that could have easily be avoided.

In spite of the fact that the only way to advance in this debate is by resorting to empirical estimates, no attempts have been made to define the nature of the regulatory problems that would question the convenience of privatization or empirically estimate the losses linked with obvious mistakes in the regulatory framework.

In this paper we do both, analyze whether indeed obvious and easily avoidable regulation problems in Chile's newly privatized sectors exist and, if it is the case, we empirically estimate the costs associated with this kind of problems. Specifically, we explore the nature of the so-called regulatory problems in Chile's newly privatized sectors (Electricity, Telecom. and Airlines). We measure the welfare costs due to regulatory procedures and compare them with the estimated efficiency gains arising from privatization.

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I. Introduction

Privatization has been one of the primary factors generating changes in the economies over the last decade. Western countries with some experience in privatization have given it as a process a positive evaluation on an overall basis. However, privatization has faced major stumbling blocks in most countries due to serious political opposition that has limited its extent. More recently, a growing concern in the literature on privatization relates to the problems arising from regulatory frameworks. This discussion has focused on the idea that the cost of inadequate and unsuitable regulation could have been extremely high but easily avoided.¹

On the other hand, the above hypotheses contrast with a much spread vision about the functioning of the regulatory institutions in Chile. In fact, Spiller and Viana (1991), Guash and Spiller (1995), Phillippi (1991), Hachette and Luders (1993), Beca (1991) and Bernstein (1986), all have basically argued that the way Chile developed and managed its regulatory framework is the way it should be done.

In spite of the fact that the only way to advance in this debate is by resorting to empirical estimates, no attempts have been made to define the nature of the regulatory problems that would question the convenience of privatization or empirically estimate the losses linked with obvious mistakes in the regulatory framework. Our purpose in this paper is to do both, analyze whether indeed obvious and easily avoidable regulation problems in Chile's newly privatized sectors exist and, if they exist, empirically estimate the costs associated with this kind of problems.

II. Efficiency Evaluation of Privatization in Three Privatized Sectors

Chile has had a relatively long experience with privatization. However, Galal (1992) and Luders (1993) are the only studies analyzing the welfare effects of this process. The reason why so little has been done is, in part, due to the fact that only a short period has elapsed since privatization began.

An important difference between Galal and Luders hinges on the counterfactuals. Galal projected historical figures to define counterfactuals and on this basis, he found that in a sample of twelve privatized firms in Chile, Malaysia, Mexico and the UK, eleven privatizations had in effect increased social welfare. On the other hand, Luders analyzed the short-run effect of privatization assuming that previously existing firms would go on operating in a deregulated environment.² Specifically, Luders compares productivity and financial indicators on the assumption of the same regulatory framework, and arrives at a conclusion quite in line with Vickers and Yarrow (1988), i.e., main efficiency gains can be brought about by deregulating firms and providing a competitive environment and not through privatization. In other words, while counterfactuals for Galal are basically historic figures, for Luders it is a State-owned company operating in a relatively more

competitive environment, with a sole task (maximizing profits) and with highly-motivated managers.

Because Galal provides estimates of the welfare effect of privatizations, including changes in the consumer surplus, we have opted to take his results as a reference in this study. However, a caveat is necessary; while the government may impose precise tasks on public sector managers in order to restructure labor, to reassign tasks, etc., it is likely that political pressures and the general operation of the public sector make it practically impossible to maintain efficiency over time. Thus, any attempt to restructure public sector firms so as to improve their performance should be expected to be a short-lived one.³ If this is the case, Galal's estimated welfare gains associated with privatization will be downward biased since previous to privatization, public firms were restructured and significant gains in efficiency appeared.

Next, we briefly describe the main findings regarding the social welfare effect of privatization for selected firms in those industries that concern us. We focus on Galal's study, which is the most complete one in the electricity and telecommunications cases, and in Parades-Molina (1995) in the airline industry. The purpose of this section is to have a benchmark and thus provide a dimension of the cost of the regulation problems we are interested in analyze.

2.1 Telecommunications (Compañía de Teléfonos de Chile (CTC))

It is in the case of CTC the Local Telecommunication Monopoly Company where the counterfactual is the most difficult to define and, accordingly, any welfare gain associated with privatization is controversial. Indeed, it is in the telecommunications industry where the most important changes have taken place since privatization.

Galal makes an interesting effort to specify some credible assumptions in order to evaluate what could have possibly happened if CTC had remained State-owned. Based on a number of assumptions, Galal concludes that CTC became a substantially different company as a result of divestiture. The main source of the difference was the greater availability of funds allowing it to provide a number of different services. The effect of the expansion was a considerably improvement in social welfare, accruing mainly to consumers. The estimated amount accruing to Chileans was US\$ 2.3 billion in US\$ of 1993, which is in perpetual annuity equivalent, 145% higher than the sales of the company in 1987.

2.2 Electricity generation (Chilgener)

Chilgener is an important, though competitive firm in the electricity generation stage. Galal estimated that after its privatization Chilgener's profits before taxes, or public profits, were US\$35.6 million in 1982, US\$25.9 million in 1986, the year of the divestiture, and US\$27.4 million, US\$32.1 million, US\$32.5 million and US\$33.1 million in the four years that followed (in US\$1993).⁴

The increase in public profits is, however, primarily explained by a price

effect. Productivity rose by about 6% yearly.⁵ However, the whole increase in productivity should not directly be explained as an efficiency gain associated with privatization. It may well be due to the productive cycle of Chilgener's thermo-electric plants.

Galat's findings suggest that after privatization Chilgener sharply increased its investment. However, Chilgener would probably not have invested less than it did if it had remained in the public sector. In fact, the Alfafal project, the only one undertaken immediately after privatization had been planned and initiated before divestiture.

The effect of privatization on consumer welfare assumed that Chilgener was a price taker. Since the counterfactual implied that the same regulatory setting would have prevailed, the effect on welfare was explicitly related to what happened to the company's profits. Under these assumptions, the social welfare gain in present value was US\$18.2 million, a gain representing 21% of Chilgener's 1987 market value.

2.3 Electricity distribution (Chilmetro)

An analysis of Enersis, and in particular of Chilmetro, the electricity distribution part of Enersis, is quite interesting from our view point, because Enersis, through this subsidiary has some monopoly power in this stage. Enersis did not show a significant change in public profits in the year of the divestiture. In 1985 public profits were US\$ 26 million (US\$ 1993), and they did not change a year after. Even though in 1990 public profits had considerably increased to US\$57 million, a trend towards a profit increase was under way ever since 1982 when Enersis was created. In that year, profits were US\$18.1 million. Therefore, though a relationship between profits and privatization in this case exists, there is not a clear causality between both of them.

There was, however, a main source of cost reduction which can be assimilated to the change in ownership, namely, the fall in technical losses and those deriving from pilferage and non-invoicing. These two type of costs had amounted 22.4% of purchases in 1983 and by 1989 had been reduced to 14.2%.⁶

The methodology resorted to in evaluating the welfare effect of Enersis' privatization considers the change in consumer welfare since this firm was subject to price regulation and, hence, the increases in efficiency were supposedly carried over to price reductions. The change in consumer's welfare was approximated by the price changes, corrected for by the change in the welfare of those that were initially consuming electricity for free and then had to pay for their consumption. Galat's conclusion is that consumers improved their welfare, mainly because regular customers were much better off than those who started to pay (i.e., those that had been "hooked up" previously and receiving electricity for free).

In short, the estimation of the increase in social welfare associated with Enersis' divestiture was US\$84.3 million (US\$ of 1993). This gain stands for 31% of the private value of Enersis in the year of the privatization.⁷

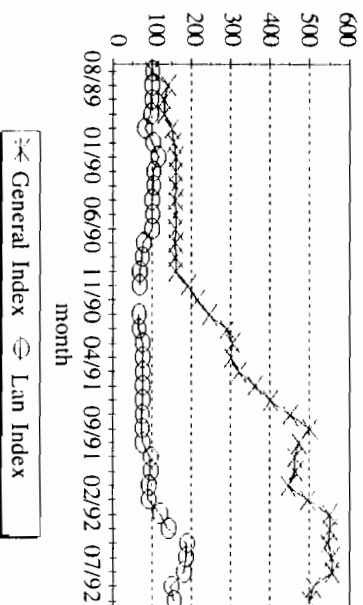
2.4 Airlines (LAN)

To date, the only analysis of LAN's privatization in terms of welfare effects is Paredes-Molina (1995). A main conclusion is that the whole post-privatization story of the company can be viewed in the perspective of the market value of LAN. In part, owing to the recession in the airline industry and also on account of the company's mismanagement, LAN represented a poor investment for the new owners and the Chilean State (Paredes-Molina and Ramamurti, 1995). As opposed to what had happened to other newly privatized companies in Chile, the value of LAN moved significantly below the Stock Price Index (SPI) (Figure 1).

Thus, while the SPI increased over 200 percent in real terms and an Index for Privatized Firms increased by 400 percent, LAN's value fell in absolute terms. Consequently, LAN's privatization did not improve its performance. However, the firm's reaction to adverse conditions seemed remarkable, as the detection and correction of the problem took a much shorter period of time that it is likely under public ownership. It is unlikely that an SOE could have reacted so quickly with, for instance, a massive dismissal of employees. Thus, it is difficult to assess what the situation would have been in relation to the flexibility and changes in its condition if LAN remained state owned.

The lack of evidence showing any significant improvement in LAN's performance added to poor managerial decisions in relation to expanding the fleet and massive workers hiring make us conclude that a sensible assumption is that LAN's privatization had zero effect on social welfare.

FIGURE 1
STOCK PRICE INDEXES



III. Welfare Evaluation of Regulations

3.1 The fight for integration in telecommunications: A case of bad pricing?

Privatization in the telecommunications sector in Chile was special because it was applied to two independent firms and not to a single structure as in the cases of Mexico and Argentina (Beza, 1991). The regulation of telecommunications in Chile affects both the local and the long distance segments. In fact, perhaps the most relevant and noticeable aspect of the post-privatization performance in telecommunications has been the continuous conflict between the main local and long distance companies, CTC and Entel.

Two are the most clear factors that have suggested that when telecom firms were privatized, the sector was not properly regulated: i) the huge incentives for vertical integration, and ii) the high return on capital shown by Entel.⁸ The incentives for each company to gain entry to the other's market probably caused important social welfare costs, though, a main component of the cost was the delay in the decision of the regulator, which should have been taken at the moment of privatizing the industry. That is, the government should have defined whether the local and long distance companies should be allowed to integrate from the very beginning. This would have avoided endless legal action, that took almost four years. A prompt decision would have also restrained the overinvestment by the two firms, each attempting to counter-act an unfavorable decision by the court.⁹ In turn, these incentives for vertical integration can be associated with the high ex-post return in the long distance segment, which has been deemed to be evidence of poor regulation. We focus on the regulatory framework prevailing at the moment of privatization, in particular, on the way rates were set, on whether the definition of these rates generated welfare costs, and on the consequences of subsequent competition in the long distance segment for both rates and welfare.

To illustrate this point, let's consider a long distance call between a representative place in Chile and a representative place abroad (say, Santiago and Los Angeles, USA respectively). This long distance call can be decomposed into laps. The first lap, is the "local exit," uses the local network. The owner of this network (CTC) provides a service and receives a payment. The second lap, "long distance exit," is associated with the long distance service. The service is provided by the long distance carrier (e.g., Entel) and includes the satellite service. The final lap is that between the entry point in the USA (e.g., Miami, FL) and the final destination.

Apart from the costs for the long distance carrier, which are those associated with its operation, including payment to the Chilean local company, and the investment cost, there is another cost to be borne by the Chilean carrier, called the Sharing Rate (SR), which is determined bilaterally by the American and the Chilean carriers.¹⁰

In addition, the negotiations between Chile and all other countries, allowed Chile to include an additional charge for the use of the local network when making an outgoing call ($\delta 1$). Given these factors, long distance rates were set at the marginal cost plus $\delta 1$, that is:

$$[1] \quad P = \text{Local cost} + \text{LD exit cost} + \text{SR}/2 + \delta 1$$

where P is the long distance tariff for consumers. Local cost is the cost for the local network which we assume is the same for entry and exit,¹¹ and LD exit cost is the long distance cost for exit calls.

Apart from $\delta 1$ however, this price does not guarantee that economic profits for long distance companies would be zero. Incoming calls, which are not directly charged to Chilean customers, create the following margin for long distance carriers:

$$[2] \quad \text{LD Margin} = \text{SR}/2 - \text{Local cost} - \text{LD entry cost} - \delta 2$$

where $\delta 2$ is a charge intended to distribute rents among the local network company and the long distance carriers. Consequently, total profits for Entel associated with international long distance calls were:

$$[3] \quad \Pi_{\text{LD}} = (P - L_{\text{cost}} - \text{LD}_{\text{exit}} - \text{SR}/2) N_{\text{exit}}(P) + (\text{SR}/2 - L_{\text{cost}} - \text{LD}_{\text{entry}} - \delta 2) N_{\text{entry}}(P)$$

where N_{exit} and N_{entry} are the number of outgoing and incoming calls, respectively. LD_{entry} is the long distance cost for incoming calls and the other variables were already defined.

We use official information obtained from the Telecommunications Undersecretary, and from Lopez and Sanchez (1993), all in US\$ (1994): i) The long run marginal cost of using the local network, L_{cost} , which we assume to be the same for entry and exit, is US\$0.0217 per minute; ii) $\delta 2$ is US\$0.1737 per minute; iii) $\delta 1$ is US\$0.2656 per minute; iv) $\text{SR}/2$ (average for all countries) is US\$1.3007 per minute; v) The marginal cost for long distance associated with the use of the network and the Satellite, LD_{exit} (assumed to be equal to LD_{entry}), is US\$0.3454 per minute. Traffic for 1991, a year close enough to privatization, was 74 million minutes of incoming calls and 48.2 million of outgoing calls. Then, it follows that the rate of a representative exit call was US\$1.93 per minute and the margin for Chilean firms associated with a long distance entry call is US\$0.7599 per minute.

A first approach to estimate the eventual welfare cost in this industry, is to calculate the rate that would provide the long distance company a "fair return" say, 15% per year on assets. To do so, we first recognized that profits for the long distance company come from the national and international segment. As Entel's Fixed Assets in 1992 were US\$266 million, total profits of US\$40 million would generate a return of 15%. Consequently, by resorting to [3], assuming that a change in the international long distance rates will not affect the profits in the national segment, and assuming a direct price elasticity of -1.3,¹² we conclude that the representative rate for international long distance that generates this return is US\$0.60.

As it clearly appears, this rate is much lower than the US\$1.66 ($\text{SR}/2 + L_{\text{LD}}$), i.e., the correct rate if SR is treated as exogenous or non-negotiable for Chile. It is not surprising then, the extremely high return on capital observed by Entel after privatization.

Even though this model explains the high returns on long distance, which in turn have been associated with excessive tariffs, they may simply reflect a high marginal cost.

Besides the classical arguments regarding rate of return regulation, it is easy to show that the correct rate should not be equal to that which provides a return on assets, for instance, of 15%. This rate, US\$0.66, is only 50% of SR/2, and of course, an even smaller fraction of the marginal cost. Consequently, we have to estimate the marginal cost which can be different that the rate that provides the far return. The marginal cost of making calls, that is, the calls that can be charged to customers, has three components: local cost (for using the national network, billing, etc.), long distance cost (for taking the signal from Chile to the entry point in the USA), and the cost of taking the signal from the entry point in the USA to the final destination. Since the first two components of the cost are borne by Chilean firms and the third by American firms, part of SR/2 should finance this third component.

To estimate this last cost we use information for the USA. In this country, as competition in long distance exists, we can assume that the marginal cost of a long inter-state long distance call is equal to the tariff paid by customers. Based on the different costs per call in terms of distance and time in the USA,¹³ we estimated that the expected cost generated to American companies by an incoming call from Chile to the USA is US\$ 0.3. Consequently, the social marginal cost of making calls from Chile is US\$0.66 (US\$0.3+0.34+0.02). However, the marginal cost for Chile of US\$0.66 per minute would be correct only if Chile could negotiate SR down to US\$0.3. Otherwise, this cost would be between US\$0.66 and US\$1.93 per minute, depending upon how much can Chile negotiate down SR.

Consequently, we can have different scenarios depending upon the extent on which SR is negotiated, to estimate the correct rate that should had been set at the moment of privatization and thus, to estimate the economic efficiency cost. Thus, if the marginal cost were US\$1.66 the deadweight loss would be US\$1.2 million per year, and if the marginal cost were US\$0.66, the total loss would be US\$ 26.0 million per year. To get these estimates, from Lopez and Sanchez (1993) we have assumed that the value for the elasticity is -1.3 and that this value holds for the whole price change.¹⁴

These magnitudes, though significant in absolute terms, are small when compared to the gains in efficiency achieved through the privatization process. In fact, even if this regulation had had a permanent effect and no change in rates had taken place, the present value of the maximum possible loss would represent only an 11% of the welfare gains accruing from privatization. Furthermore, the idea that the gains resulting from privatization represented a much more significant impact than the possible losses associated with imperfect regulation finds support from other evidence. While the cost of a five-minute daytime call from Chile to the USA just before the introduction of new structural changes associated with long distance competition was US\$7.5, the same call costs US\$17 when made from Argentina and US\$14 when made from Brazil. Even a call made from

Mexico costs US\$8.5, 13% more than the calls from Chile. Only similar calls made from Canada or the UK are considerably cheaper, with rates corresponding closely to our own estimates for Chile, assuming "perfect regulation."

A warning should be made however. Today in Chile the introduction of competition in long distance has reduced rates to US\$0.5 per minute. At the light of the above results, even though this rate were sustainable in terms of providing a fair return on investment to the firms, it is not efficient from the Chilean viewpoint if SR/2 is above US\$13.¹⁵

Summing up, if in this case a cost exists, it is a cost associated with bad pricing that, in any event, is in no way related with privatization. In other words, setting rates by a regulator should be done under public or private ownership, and nothing make us to assume that bad pricing is more likely under a private structure.

3.2 Privatizing with monopoly in electricity: Generation and transmission

There are two aspects related to the current structure of the market that can eventually restrain the possibility of competition in the generation stage in the electric industry. First, Endesa, the main generator in the industry, was privatized with an important share in the generation market and most water rights.¹⁶ The Chilean legislation states that to grant water rights it suffices to submit a development project and the right holds even if the firm does not use it at all. Therefore, it should be a source of concern if a firm holding good water rights and hence having a relatively low cost structure to develop a new hydrological plant could choose not only to delay the project, but also to use the rights as an entry deterrent. Second, Endesa was privatized with 100% of the high voltage transmission in the Interconnected Transmission System, hence became a monopolist from the very outset. The first problem may lead to a relative decrease in competition in the future. The second is the more interesting one from our viewpoint and it is the one on which we focus the analysis.

After privatization, the debate on the costs of keeping the previous structure in the electricity industry has been intense. The international experience, showing that dispatch and transmission are typically carried out by the same entities, has shed light on the internal debate. The notion that generation, transmission and distribution can be undertaken separately has not only contested Endesa's current structure but also been critical in the debate on how the privatization of Edelnor, the main generator in the North was conducted.

Even though in this case, we have been unable to provide an estimate of the social cost associated with this organization structure, our analysis attempts to provide evidence about the nature of the conflicts in the industry, what in turn may shed some light on the extent of such a cost. In what follows we analyze two questions: i) has the owner of the transmission system charged a monopolistic rate for the service?; and ii) has the owner of the transmission system foreclosed competitors by other means than charging a monopolistic rate?

a) *Monopolistic Rates?: The cases of Pullinque and Colbun*

In 1987 Endesa sold Pullinque for US\$ 32 million. Endesa's evaluation of the plant—US\$27 million—considered the National Energy Commission price projections and a transmission charge which, following the then current practice, should not have exceeded 10% of total sales. However, in August 1990 Endesa notified Pullinque that the transmission contract signed in September 1987 had expired and that a new contract had to be drawn up. Endesa stated that the transmission charge would increase from US\$622,000 to US\$ 2,635,000 per year.

The present value of this transmission cost increase was close to US\$ 17 million, representing more than 50% of the price paid for Pullinque. This means that if we assume that the expected return for Pullinque's investors was 12% at the moment of buying the firm, the increase in transmission costs reduced their return to 4.5%. It is not difficult then to understand Pullinque's position, that argued that the new transmission rate was an attempt to oust Pullinque from the market and represented an ex post contract opportunistic behavior deriving from Endesa's monopolistic position.

In a similar case, in June 1990 Endesa and Colbun, the State-owned generator became involved in a conflict with respect to transmission rates. The specific point here was the definition of the respective areas of influence and the associated new replacement value of the assets. Thus, although in 1987 Colbun and Endesa had agreed on an annual payment of US\$7 million for transmission services, in 1990 Endesa demanded a new contract amounting to US\$15 million. The conflict was solved through arbitration and the initial positions, US\$15 million and US\$9 million, respectively, were settled for US\$12 million.¹⁷

Setting a considerably higher value for transmission services without a change in the cost structure has been considered a symptom that Endesa was using its monopoly power. However, the change in rates could also obey to the fact that the new law provided a clearer framework for charging and adjusting rates to provide a reasonable return to the transmission system. To discriminate between these two arguments is critical in establishing whether a regulatory problem existed.

A first argument favoring Endesa's position that the increase in transmission rates was not the result of a monopolistic behavior is that the transmission system was regulated and it has remained regulated. While it is true that a law changed the DFL 1, 1982 and allowed increases in transmission rates, this surely was not intended to give Endesa greater monopoly power. Most definitely, the idea in the law was to provide a more stable regulatory framework, which in no way had existed before.

The sole change in the computation method could have generated conflicts as those described above. However, the change in the law seems also to have been aimed at increasing the returns to the transmission activity. If a competitive return was provided, conflicts may have arisen due to changes in wealth distribution but this in no way can be considered a source of inefficiency.

Even though no direct information exists to test whether Endesa increased the

return on transmission over the competitive level, until 1990 Endesa, the owner of the transmission system, showed a lower return on fixed assets than its competitors Chilgenet and Colbun. Furthermore, though Endesa's return increased after the amendment of the law, it has never obtained a return of 10%, which is implicit in the law governing electricity. Again, this evidence is consistent with the notion that the change in the law attempted to correct a wrong situation and induce investment in the sector. Less clear, but not contradictory with the evidence, is the fact that increases in rates were not necessarily associated with post-contractual behavior on the part of Endesa.

b) *Foreclosing competitors?*

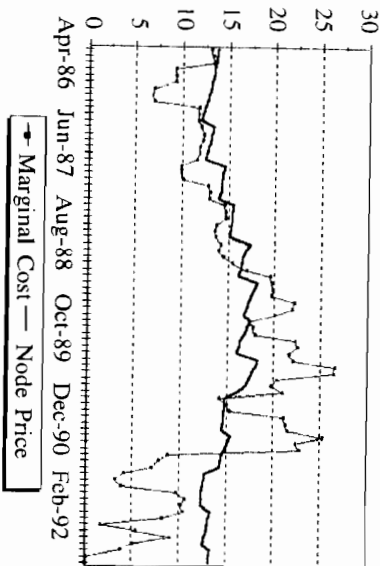
Through the foregoing analysis does not support the notion of abusive practices by Endesa in increasing rates, there is another possibility that has been considered in the literature and that is closely associated with the way privatization took place in Chile. This view considers that the actual regulatory scheme favors transmitters that are linked (via ownership) to generators (Morande and Sanchez, 1992 and Bianlot, 1993). We can analyze this mechanism by exploring a case in which Endesa was accused of using CDEC (Dispatch Center) to impose monopolistic conditions.

Colbun took Endesa to the Antitrust Commission arguing that the first used the CDEC and its norms to modify a contract and favor its subsidiary, Pehuenche. There was indeed a potential for discrimination, and which is quite relevant considering that members of the Interconnected Grid are required to provide for their contractual commitments firm power (either using their own power or making contracts for firm power from other generators).¹⁸ This obligation, along with the existence of alternative markets for generators, leads to a situation such that in some periods it may be more convenient to sell to some markets and not to others.¹⁹ More specifically, the hydrological fluctuations during the year produce important changes in the instantaneous marginal cost calculated by the CDEC. This means that power transfers among generators take place at prices that are not necessarily equal to the node price (i.e., the rate at which electricity sold to regulated distributors is set). That is why the hydrological generators would prefer to sell to the distributors at the node price (projected average over next 48 months of the instantaneous marginal cost) during the periods when they have the lowest marginal cost (e.g., September-December) and to sell to the CDEC at the instantaneous marginal cost between January and August (Figure 2).

The law attempts to avoid any sort of discrimination or collusion within the CDEC by requiring that all agreements have to be taken unanimously. However, the discrimination against a potential competitor by resorting to CDEC has been considered as one of the main problems of the regulatory framework (Bianlot, 1993).

Before Pehuenche initiated its operations, Colbun and Endesa signed a contract with Chilmetro, the distributor in Santiago, stating that the first two firms would supply energy to Chilmetro on a prorated basis (i.e., in terms of each

FIGURE 2
NODE PRICE AND MARGINAL COST



firm's power). Colbun argued that Endesa, Chilmetro and Pehuenche, the new Endesa's subsidiary colluded. Thus, when Pehuenche began its operation in April, 1991, Endesa transferred the contract it had with Chilmetro for 192 MW to Pehuenche, a formula which Chilctra accepted (Endesa continued to supply 300 MW). Then, Pehuenche and Chilmetro, in practice, modified the way the energy was supplied, with Pehuenche supplying more during its low marginal cost period. Pehuenche did not feel it had to keep supplying Chilmetro on an a priori basis of its power, since this was an internal norm determined by the CDEC, adopted without its consent.

In addition, Colbun and Chilmetro had signed another contract stating that the first would supply all the energy not provided by any other members of the CDEC. In other words, Colbun had to supply the difference between Chilmetro's consumption and the amount sold by Endesa and Pehuenche. This induced and allowed Pehuenche to create a delivery pattern such that most of its energy was sold when the node price was the highest and reduced it the rest of the period. Even though this contract produced important losses to Colbun, they are not explained by a problem in the regulation, but mainly by a loophole in the contract and Colbun's lack of foresight. Notwithstanding the above, the problem was readily solved in the court. The court ruled that the spirit of the law was clear, so Endesa had to compensate Colbun for its losses. Furthermore, there have been no additional problems of this sort to date. Consequently, the analysis of the case shows that no norms contained in the CDEC operation had a potentially harmful effect on competition. The damage produced on a competitor was the result of firms trying to take advantage of a loophole, and that was readily corrected.

Notwithstanding the above, a different and much clearer mechanism through which Endesa could have used its monopoly power is by protracting the period of

negotiation as much as possible. The law considers the mechanism through which disputes are settled, and ultimately, provides several months to negotiate the value of the transmission at the moment of defining use of the system (i.e., areas of influence). It is precisely here where more room for foreclosing exists. In particular, the law states that the transmission firm has 60 days to respond to a generator request for transmission. The answer must include a technical study in connection with the request. Following the generator's answer, the transmission firm has 10 additional days to submit its observations. Then, both have a maximum time limit of 30 days to agree on the final price for the transmission services, and if after that period there is no agreement, any of the parties (generator or transmitter), may resort to arbitration. In turn, the arbitrator has 180 days to solve the problem.

The evidence shows that negotiations have taken a long time and hence, that they likely have been a source of uncertainty to all generators other than Endesa. A symptom of the above is that, in 1994, four years after the law was enacted, there were still no final contracts regarding transmission between generators and the transmission company; only provisional contracts existed.²⁰ Additionally, to set up most provisional contracts, negotiations have taken up the maximum time limit allowed by law.

Empirical evidence on this point is limited, since there are not many generators making transmission contracts with Endesa. However, we have analyzed an important sample drawn from all prospective contracts between Colbun and Endesa. Thus, for all prospective clients located to the south of Colbun, for which the transmission costs are less important since they cut down the system losses, we observe the following facts: i) in all cases, Endesa took the maximum period allowed by the law, to furnish a response on the value applicable to the transmission; ii) the minimum period between the date which Colbun requested the estimated cost and the date of the provisional agreement was 8 months; iii) on average, the final transmission cost was 50% below the initial value given by Endesa. The exceptions were cases in which Endesa required financial contributions or cases in which the final customer (Colbun's customer) took the risk of the value of the transmission. In these cases, the difference between the initial and the final cost was 20%; and iv) in a number of cases, Colbun argued that after inquiring into the estimated cost with Endesa, the latter contacted the client and made another offer. In some cases Endesa was successful, and in others Colbun's initial price to the customer was cut considerably due to Endesa's intervention.

In conclusion, criticisms of policies with respect to electricity transmission have focused on the possibility that the transmitter will charge a monopoly price and on vertical integration between transmission and generation. We have found no evidence of monopoly pricing but some evidence that in the transmission negotiations, though Endesa complied with the law, it did not act expeditiously. The delay in Endesa's answers creates uncertainty especially because the margin that Endesa can charge is so wide. Consequently, although we were unable to estimate the costs of this regulatory problem, in this case there is a structural problem that can in fact be associated with the way privatization was carried out.

3.3 Concession overlapping in electricity distribution

The particular aspect of the Chilean experience relating to concessions and on which we focus our attention are cases where the law considers overlapping concessions.²¹ This is the case of the laws regulating the electric and telecommunications sectors in Chile which guarantee all firms who apply for a concession the right to receive it, unless it is technically not feasible to do so. Thus, the law requires the government to grant concessions, even when theoretically, at least, it is relatively more efficient to reject them.

There is no explicit foundation in the law to grant all concessions applied for; however, a sensible interpretation of the spirit of the law is that the regulator, by increasing the number of producers is creating the conditions for more competition which, in turn, would favor consumers. The underlying point here is not only whether the sector should be regulated or not, but whether given the regulation on rates and the existence of imperfect information, concession overlapping is an useful tool to increase the quality of service.

We have identified foregone economies of scale as a main source of costs associated with concession overlapping.²² Chilmetro and Sinel are two electricity distributors. Even though they overlap in some sectors, both preferentially serve different areas; Chilmetro an urban area, and Sinel a semi-rural one. There are different rates for each of these areas, since the cost of providing service to additional customers basically depends on the customer density in the area.

The electric law states that rates must be set for firms, not for the areas they serve; for instance, if Chilmetro basically serves an urban area, as it in fact does, the applicable rate will be an urban one. Thus, when Chilmetro started to serve the same semi-rural area served by Sinel, the latter was extremely concerned about an eventual cross-subsidy that Chilmetro could effect among the different areas it served. As rates are maximum levels, Chilmetro could eventually charge a lower tariff in the area where it competed with Sinel and oust Sinel from the market.

In April 1991, as a consequence of a complaint before, the Antitrust Commission, it was ruled that Chilmetro should charge the same tariff as Sinel (not lower) in the areas where both firms overlapped concessions. The Supreme Court, at a later date, ratified the resolution of the Antitrust Commission.

The economic foundation for the Antitrust Commission Resolution and the Supreme Court decision, as explicitly stated, is that "no competition was possible among the two firms." If that is true, however, overlapping concessions are not convenient. In other words, the eventual advantage of overlapping concessions is the possibility that firms could compete and thus reduce rates for consumers. With the Supreme Court decision, this possibility was ruled out.

On the other hand, concession overlapping would reduce economies of scale and thus, increase average cost. Even though we do not have information on cost functions, we can use some data to estimate this loss. A main source of information is regulated rates, which we assume are strictly determined by cost considerations. In fact, a basic criterion to set distribution tariffs is user density. Three indicators of user density are applied in this regulation: i) energy divided by the

number of inhabitants (KWh/inhabitants), ii) installed capacity in distribution transformers divided by kilometers of high tension line (T/Km HT), and iii) kilometers of low tension line divided by number of clients (Km LT/Clients).²³ Consequently, there is a clear relationship between rates and density or, in other terms, rates and the number of firms in a given territory.

The parameters used in the area definition indicate that, on average, firms considered in the urban area have a KWh/inhabitants ratio which is 38% higher than firms classified in the semi-urban areas. In turn, for those classified in the semi-urban areas this coefficient is 2.36 times the rural one. With respect to the second factor, (T/Km HT), firms in the urban area have a coefficient which is 3 times the one for semi-urban areas. The latter is 4 times the average of firms operating in rural areas. Finally, Km LT/Clients is the smallest in the urban areas and the largest in the rural ones. On average, firms classified as urban have a ratio of 7.28, the ratio for semi-urban areas is 19.55 (2.7 times that of urban areas) and the ratio for rural areas is 29.1 (1.48 times that of semi-rural areas).

By only considering KWh/inhabitants, no firm classified in the semi-urban and urban areas is so large that a reduction in its production by half through sharing its area with another firm would place it in the same classification area. Although this is not necessarily true with respect to the other two density factors, a sensible interpretation from the actual data is that concession overlapping that reduces per-firm customers by 50% should change the status of most distributors from a given area to the next higher cost level. In other words, a firm initially classified for instance as urban should be reclassified as semi-urban if it has to share its production with another firm of the same size.

The increase in rates coming from increases in costs associated with the change of area served, for instance from serving an urban area to a semi-urban was between 8% and 28% percent depending upon its fixed, energy and power charges. Based on current consumption for different customers and the composition between fixed, power and energy costs, our estimation of the increase in the rate which we associate with the cost for serving a rural area with respect to a semi-urban one, or a semi-urban area with respect to an urban one is 15%.

We can use this information to estimate the cost associated with concession overlapping for the whole economy. A first scenario is that concessions overlap in the whole ICS.²⁴ In 1993 the consumption in the ICS was 15,600 GWh (the power was 2,770 MW). The average rate the different consumption categories in March 1994 was US\$0.074 KWh. From the total electric energy, 67% is distributed by distribution companies and the remainder 33% corresponds to consumption of firms directly supplied by generating companies. This means that the consumption affected by the increase in rates at the distribution stage is 10,452 GWh. Also, based on Chilgener's estimations, we assume a price elasticity -0.38. From these assumptions we can estimate an upper bound for the social costs associated with the losses of economies of scale. Accordingly, an increase in costs by 15% would imply a reduction in consumption of 5.7%. This implies a yearly loss equivalent to US\$112.7 million; US\$3.3 million due to the reduction in consumption and US\$109.4 due to the increase in costs.

The above estimation however, represents an upper bound of the loss. The lower bound can be estimated from the losses affecting the customers who are served by the distributors involved only in the case we have analyzed and another one analyzed by Paredes-Molina (1995) also involving overlapping concessions. The consumption affecting these distributors was 750 GWh in 1994, with Rio Maipo being the firm with the largest share. Assuming the same elasticity for these firms, the social welfare cost per year associated with the increase in the costs (15%), would be US\$8 million.

In conclusion, concession overlapping has a potentially harmful effect, especially when, as in the Chilean case, firms are not allowed to compete. Although we have arrived at a very rough estimation of the potential social losses associated with the way overlapping concessions are carried out, they are considerable especially if compared with Galal's estimation of the increase in social welfare which was a consequence of privatizing Enerjis. In fact, the lower bound for the social welfare cost is US\$8 million, which discounted at the same rate as the one used by Galal is equivalent to a social loss of US\$80 million, almost equivalent to the benefits associated with Enerjis' privatization.

Notwithstanding the above, the social loss associated with overlapping concessions are in no way intrinsically related to privatization. This is so because the norm that originated the cost was not in the law, but introduced after privatization. Furthermore, it would be enough to stop granting concessions to end this cost.

3.4 Airlines: Privatization and the loss of an opportunity to deregulate

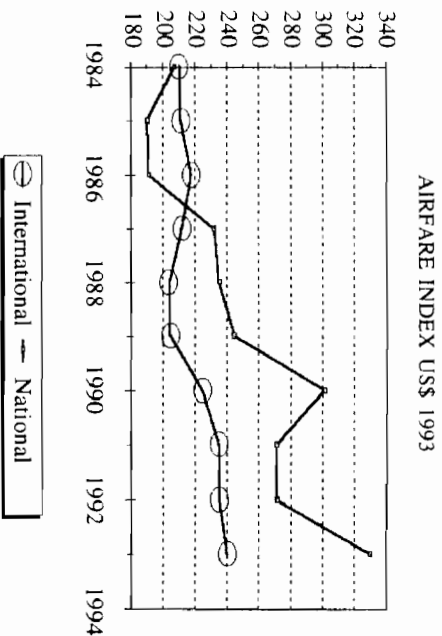
One could argue that due to the small size of LAN and the fact that the company was not a natural monopoly renders the case less interesting to study. However, we believe that the way in which privatization was carried out had important effects on social welfare. We argue that when LAN was privatized, there was an implicit agreement that the regulatory framework would not be modified, giving LAN an important advantage over potential competitors, since regulations imposes huge entry barriers in the domestic segment.

The effect of privatization on the airline market is difficult to assess since the market has suffered important changes which make it difficult to select a "natural" counterfactual. Although we have found no evidence of improvements in technical efficiency, there is some information which indicates that since LAN's restructuring as a new firm in 1985, that is, when it started to act as a private firm, airfares in the domestic market significantly increased.²⁵ If this airfare increase was the consequence of collusive behavior, it justifies our idea that an important opportunity to deregulate the industry in the domestic market was lost when privatization took place.²⁶ In other words, LAN with private incentives and monopoly power would have caused a social welfare loss as a result of the higher than competitive airfares. In such a case, the policy implications are clear: the social welfare loss could be reduced by deregulating the industry and allowing entry.²⁷

To estimate the social loss of limiting entry through the law, we must clarify if, in fact, by restricting cabotage to foreign carriers, as in Chile, competition is actually limited. We could say that any limitation to entry reduces competition. However, it is theoretically possible to have high competition with a limited number of participants in the market. Also, we could argue that national carriers are free to enter into the industry. Hence, it is critical to verify the real extent of competition among national airlines in the domestic market and the extent of entry barriers to national competitors. In any event, this is an empirical issue since, as McGowan and Seabright (1989, p. 283) state, "in spite of relatively low sunk costs of entry to the industry, there remain significant opportunities for the exercise of market power by incumbent carriers".

To begin with we consider the evolution of airfares in the domestic and international markets.²⁸ One could state that the evolution of airfares connecting points between Chile and international cities should be a good indicator of the evolution of the industry costs. This because after the deregulation of the international segment in Chile, extensive entry and exit have occurred, and since the and as Figure 3 suggests, after LAN's restructuring and the return of LADECO to private hands, more precisely in 1986, domestic airfares increased over costs, suggesting that a monopolistic margin appeared.²⁹

Furthermore, there is another much clearer symptom showing that the domestic airfares are higher than the international equivalent and hence above their competitive level. Comparable route airfares by distance and load factors are much higher in domestic than in international routes. Thus, the case of the roundtrip tariff between Santiago and La Paz Bolivia, which in 1994 costs US\$ 215 is especially relevant when compared to the roundtrip tariff of US\$ 393 between



Santiago and Arica, the latter being a stop-over on the way to La Paz (see footnote 28).

Finally, the number of agreements between the two domestic airlines regarding simultaneous operations suggests that the market did not operate competitively after privatization. Thus, while within the country in 1978 there were only two pairs of cities connected to Santiago in which LAN and LADECO competed (Santiago-Arica and Santiago-Antofagasta), in July 1983, there were nine city pairs in which there existed competition between the two airlines. However, in 1994 and despite the increase in traffic, there is still only 9 city pairs served by LAN and LADECO. Furthermore, some routes that are only served by LAN, such as Calama and Osorno, were also served by LADECO in 1983.

Consequently, the social efficiency loss associated with limiting entry into the domestic market can be estimated from the excess of price and the traffic reduction resulting from this excessive price. In this case, there is a loss affecting national carriers, which is not necessarily a loss for Chilean consumers or producers. In any event, as a change in the regulatory framework would only affect quasi-rents because through the price paid in the privatization the eventual monopoly rents were transferred to the State, we assume that the social benefit for Chile is only equivalent to a standard deadweight loss triangle. In other words, we do not consider as gains accruing to Chile any transfers to Chilean consumers from foreign owners of carriers.

To estimate the excess in airfares we first built an aggregate index for international rates. Then, we estimate the increase of this index in the period 1986-1988 which we have identified as the critical one in which competition was reduced. The difference between the growth in this index and an airfare index for the domestic segment is associated with a monopolistic margin. Second, to verify this estimation we compare international airfares with domestic ones for similar distances and load factors. If our methodology is robust, these two approaches should lead to similar estimates.

The data shows that over the last eight years, international airfares have increased less than the national ones. Considering the period 1986-93, real airfares for national routes have gone up by 73.06%, while airfares for international routes connecting Chilean points went up 14.3%. One could argue that the period taken is special since between 1984 and 1986 there was an important reduction in national airfares. This argument, however, does not invalidate the previous point. In fact, considering the period 1984-1993, national airfares increased by 58% while international ones did so at 13%. The latter increase is quite close to the increase in unit costs for IATA carriers, and thus, at least for this period, the rise in international airfares reflected changes in costs. Consequently, we could state that national airfares increased between 45% and 59% over their competitive level.

Confirming the above estimation, in 1993 the airfare for the route between Santiago and Arica (national) was about 70% more expensive than the airfare for a Santiago - La Paz (international). As stated above, Arica is a stop-over for a trip to La Paz, so no cost argument is applicable to this differential. Furthermore, even comparing the 1993 fare of a Santiago-Arica flight with the highest fare of

flight between Santiago - La Paz since 1982, the difference is 54%. Comparisons between other national and international city pairs such as Santiago-Puerto Monto and Santiago-Buenos Aires, and Santiago-Antofagasta and Santiago-Monvideo, though less significant, also show important excesses of domestic over international fares (see, footnote 28).

It is worth stating that these important differences in national and international airfares cannot be explained on the basis of either a sort of irrationality or random non-observable factors affecting domestic markets. Thus, the airfare per mile follows a quite consistent behavior for each sub-market, and systematically fall with distance, which reflects the higher fuel cost of the take off.

In conclusion, based on the differences in the increases in airfares experienced in national as compared to international markets, on the absolute differences in fares in 1993 and on the rationality of the whole airfare system, we conclude that domestic airfares after privatization were at least 35% above their competitive level.

The welfare costs associated with the rate level critically depend on the assumption of the demand elasticity. Paredes-Molina (1995) estimated the benefits of the open skies law assuming an elasticity of demand equal to -0.5, which in turn was estimated using information for the 1970s. As market conditions have changed considerably, especially because there have been relatively important increases in the non-business passengers as well as improved quality of substitutes, we tested the hypothesis that the price elasticity increased in absolute value in the period. Re-estimating the demand using information until 1993, we found no evidence for this hypothesis.

Under the assumption of a price elasticity of -0.5 and that prices are 35% percent over their competitive level, airfares could be 26% lower and traffic 13% higher if competition were operating. This means, that in 1993, for instance, instead of the 1.5 billion passenger-kilometers flown within the country, there would have been 1.7 billion. Considering that the weighted average of national fares is US\$0.116 per kilometer, the social loss in 1993 would be US\$2.9 million. Thus, if this regulatory situation does not change, and assuming the same loss over the years, which given the demand increases represent a very conservative estimation for the social loss, the present value of this cost is something over US\$29 million. Thus, the efficiency loss in the national passenger segment of this industry, which can effectively be associated with the regulatory framework under which privatization took place, is significant when compared to the gains associated with privatization and the value of LAN.

IV. Concluding Remarks

In this study we have identified the costs of regulatory problems that can be strictly associated with privatization in the newly privatized industries in Chile. We analyzed a hypothesis suggesting that the newly privatized firms in Chile produced little if any important advantages as they would have performed poorly

once privatized. The hypothesis is that the regulatory problems were the consequence of obvious mistakes that could have easily been avoided. This concern stems from the idea that the regulatory framework would be either too ambiguous or definitely unsuitable, to the extent that when State-owned monopolies begin to operate in the private sector they enjoy considerable leeway to take advantage of the monopoly powers available to them.

We analyzed different cases on which the debate has focused. First, we addressed the incentives for integration in telecommunications and the consequence of privatizing electricity generation integrated with transmission. Regarding the first, we showed that those incentives arise from high rents but not necessarily from bad regulation. Today those rents have disappeared precisely because competition was introduced into the long distance market.

More structural problems were detected in the way electricity was privatized, that is, a vertically integrated firm in generation and transmission. We verified that the transmitter can benefit its own subsidiaries by delaying its response to other generators. Even though the legislation tries to protect generators establishing a maximum response period, the evidence systematically indicates that the transmission owner, uses the whole period in order to favor its subsidiaries.

We have concluded that keeping the same pre-privatization structure for Endesa was a mistake. Although the absence of integration does not prevent the owner of the transmission system from colluding with generators in order to favor them in the contracts and share the monopolistic benefits, keeping transmission and the dispatch center separated from generation would have helped greatly to preserve and induce competition in the industry.

We also identified efficiency costs associated with imperfect regulation in two areas: i) overlapping concessions in electricity distribution and ii) barriers to entry in the domestic airline industry.

The first case shows how concession overlapping avoids taking advantage of economies of scale that, in this particular case, are important. Furthermore, the way concession overlapping has worked out in practice does not even promote competition among distributors. Actually, it was not the way privatization took place or even the specific norms in the electricity law which created this situation. The source of the problem was the regulations enacted after privatization, which have limited the scope for competition.

In the case of domestic airlines, the efficiency losses we estimated arose (paradoxically) from excessive regulation in the market. Here, as distinct from the electricity and telecommunications industries, it is more apparent that privatization took place under a flawed regulatory framework. Unfortunately, privatization occurred while significant barriers to entry into the domestic market were still in place. Hence, it is likely that part of the price received represented a capitalization of future monopoly profits. Specially if this was so, it is much more difficult to correct the original mistake, because of the implicit "property rights" established by the process.

The following chart summarizes the following main findings: i) in the telecommunications sector, regulation problems have neither being important nor

they were intrinsically associated with the way privatization was carried out; ii) in electricity distribution the cost associated with regulation was important, though it was the consequence of norms enacted after privatization; iii) in the airline sector the cost was the most significant compared to the gains in efficiency associated with privatization (the cost though was not significant in absolute numbers). In this industry though, the costs can be associated with the prevailing legal regime present at the time when privatization took place; and iv) in the electricity generation sector the cost associated with regulation arose from the way privatization was carried out, but we do not have an estimate of it.

On an overall basis, we have found evidence suggesting that even though some "fine tuning" was possible, regulation problems were limited to a couple of issues. Furthermore, privatization offered such important advantages that it would have been unjustifiable to delay it just to wait for a precise definition of a regulatory framework or solve most of the problems we analyzed here.

CHART I

Costs and Benefits of Privatization and Regulation

Industry	Efficiency Gains of Privatization Present Value (Millions US\$ 1994)	Cost of Regulation Present Value (Million US\$ 1994)	Nature of the Regulatory Problem	Structural Reversible
Electricity:				
Transmission	18.2	??	x	x
Distribution	84.3	80		x
Telecomms.	2300	120-260		
Airlines	0	29	x	x

Notas

- The analysis of specific regulations is in Paredes-Molina (1995). For this view, see Biran and Saavedra (1993), Bianchi (1993), Muñoz (1993) and The Economist (1995).
- Recall that deregulation and new laws precede privatization in Chile.
- This idea is implicit in many recommendations about the convenience of privatization. See also, Paredes-Molina and Ramamurti (1995) regarding Chilean Airlines privatization.
- The explanation for this fall in profits in 1987 is a landslide that destroyed Atalal, causing a loss of US\$3.4 million.
- The relationship between percentage changes in profits ($\Delta\pi/\pi$) and price-quantity and productivity effect is given by:

$$\Delta\pi/\pi = (\Delta\text{Sales}/\text{Sales}) + \Delta\text{TC}/\text{TC}$$
 where TC is total cost.
 Here, though, there was an additional element which facilitated the reduction in their namely, the political support to the company. In fact, an Enersis subsidiary which today operates in Argentina has not been able to reduce losses, since that country's government has not provided the means to enforce the law.

- 7 The changes in welfare can be decomposed as follows: (i) Consumers + ChS 7.7 billion; (ii) Producers + ChS 14.4 and (iii) Government - ChS 5.6
- 8 Enel's return on capital rose from 17.9% in 1980 to 51% in 1991.
- 9 CTC made important investments in optic fiber transmission to operate in the long distance market acting on the assumption that the Supreme Court's decision was going to favor it. As a reaction to this, the Antitrust Commission ruled that CTC should discontinue this investment.
- 10 When a call is made to the United States, the Chilean carrier must pay the American carrier SR2 and, thus, this becomes part of the cost for the Chilean carrier.
- 11 Basically the system can not tell the difference between an ingoing and an outgoing call at the local level. That is why in what follows we assume the local entry and local exit costs are the same.
- 12 This elasticity comes from López and Sánchez (1993) based on Mitchell (1978) and Bewley and Fiebig (1988).
- 13 For instance, in the case of inter-state calls, the cost for the first minute on a daytime call involving 100 miles distance is about US\$ 23 per minute, US\$ 24 for a 500 miles call and US\$ 3 for a call involving a distance over 3,000 miles. There are also special discounts and plans depending on clients' specific needs.
- 14 We assume a demand function, $q = e^{-p}$. From the information about price and consumption for year 1992, a is trivially obtained.
- 15 Unfortunately, information on current SR has not been possible to get since it is judged as strategic information by the carriers.
- 16 When Endesa was a State monopolist, it conducted the studies of the water potential in Chile and hence it obtained the water rights for the most valuable water streams for hydropower generation. Colbun's initial position in its conflict with Endesa was that the value to be paid would be US\$ 2 million higher than the one they were paying before the change in the contract.
- 17 The CDEC decides who operates based on costs and not on contracts.
- 18 The operation of the electric system in Chile allows the generators to sell in either of the following three markets: i) Big industrial customers at free prices; ii) Electric distributors, at node regulated prices (average of expected price over next 48 months); iii) Other generators through the CDEC at a short-run instantaneous system marginal cost. For details, see Morandé and Sánchez (1992), Bianchi (1993) and Paredes-Molina (1995).
- 19 Also the regulator has continuously given signals that the regulation on transmission prices will be modified which may explain this.
- 20 Before privatization, public firms often had a monopoly because the government refused to grant private licenses for operation. Moreover, public firms often were the ones who granted concessions and/or were empowered to directly regulate the market.
- 21 There are other ways through which concession overlapping may reduce welfare. Paredes-Molina (1995) estimates an increase in cost of distribution of 8% associated with defensive investment of an incumbent.
- 22 The algorithm to assign firms to areas and hence set rates consists in comparing the indexes for each firm with some critical values: i) 7.50 (KWh/inhabitants) lower bound for area 1; ii) 3.50 (T/Km HT) lower bound for area 1; iii) 9 (Km LT/clients) upper bound for area 2; iv) 4.50 (KWh/inhabitants) lower bound for area 2; and v) 65 (T/Km HT) upper bound for area 3. From here, six decision levels are defined, depending on whether the firm fits simultaneously into more than one category. For further details, see "Definición de Áreas Tripcas de Distribución," NCE.
- 23 To evaluate the social cost of concession overlapping at the industry level requires an assumption about the scope of concession overlapping. The cases we have reviewed are not necessarily representative of what is happening throughout the country. However, evaluating the cost only for the companies involved allows us to have an idea of the minimum cost associated with the concession overlapping. On the other hand, the maximum cost associated with this possibility requires the assumption that concession overlapping is possible through the whole ICS.
- 24 In 1986 LADECO was also returned to the private sector.
- 25 Even though it is always possible to modify the regulatory framework, it is clearly more difficult when the value at which the firm was sold reflects the then existing regulation.
- 26 Even though very few cases in the world of free entry of foreign airlines into the domestic airline

industry exists, they should not stop us from assessing the cost and benefits of such a move. Furthermore, Winston (1993) reports a number of studies dealing with deregulation in different industries and concludes that the additional benefits, if deregulation achieves optimality in the domestic airline industry in the U.S., would be close to 30% of those already attained by the previous and more structural form of the rate 1970's.

27 I used official information from the National Aeronautical Commission. LAN however has argued that it is applying discount fares in a significant portion of its flights. Unfortunately, yields by route are not available from airlines. Thus, there is a potential bias in our results which depend on the extent of national over international airfare discounts.

28 Between 1986 and 1992, the unit cost for IATA carriers rose 6.7%, while domestic tariffs rose 46% in the same period.

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