

Infrastructure Contracts with the Government: Design and Social Interest

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Abstract

This paper analyses the observed contractual forms in four Public Infrastructure Projects in Chile in which there is private participation. Using specific contracts, we focus on the design and some specific provisions contained in the contracts that may affect their performance. We analyze how different objectives than those of the law are imposed in the contracts, and how short run objectives followed by the institutions in charge of implementing policies, can pervasively affect long run performance and in particular, their incentives for ex-post renegotiation. We derive recommendations, including the need of a simple design on objectives, bidding variables, and that of including parameters to limit ex post negotiation.

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1. Introduction

Chile is one of the most stable economies in Latin America, with relatively well developed political institutions, low corruption levels, and a tradition of democracy, exceptionally interrupted in the early 1970s. In 1990, democracy was restored through a pacific process that did not compromised sound economic reforms and fiscal discipline. With a strong presidential regime, Chile has a clear separation of powers. The Executive has veto power in all decisions that affect the public finances (through spending or revenue raising). The Legislature is elected using a binomial system that induces the formation of coalitions. The Judicial is fairly independent and although it is well evaluated, it is slow and overloaded.

Over the last 20 years, Chile gained good reputation of respecting property rights by limiting the capacity of the government to expropriate wealth through taxes or administrative decrees. Together with the pioneering pro-market reforms implemented since the middle 1970's, this has resulted in an excellent rating for Chile among emerging economies.

One of the most important economic reforms implemented in Chile over the last 15 years was the enactment of the Infrastructure Concessions Law, aimed to increase the

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participation of the private sector in infrastructure projects. Until July 1998, the Concession Program included 21 projects, representing an investment of US\$ 3.5 billions. Concession Contracts consists of different legal bodies, but by far the most significant are the Concessions Law, enacted in 1991, the specific Auction Rules and the technical and economic offers made by the bidders. Chile has performed relatively well with its concessions program (see, Guash, 2000, Muñoz, Paredes and Sánchez, 1998 and Rufian, 1999), but some criticism on the design, incentives to renegotiate and performance have emerged.

The purpose of this paper is to analyze two critical issues arising in the contracts between the Government and the private sector. First, how different objectives than those of the law are imposed in the contracts, and second, how short run objectives followed by the institutions in charge of implementing policies, can pervasively affect long run performance. To this end, we analyze four contracts. Chile's stability and low corruption allows us to emphasize the role of the design on commitments and on performance (Levy and Spiller, 1996).²

The paper has four sections. Section 2 describes the nature of the contracts, the objectives of the different parties and the institutional setting. Section 3 analyzes four contracts, three of them written under the scheme of the Infrastructure Concession Law (Tunnel El Melon, Freeway Santiago - San Antonio, and the Santiago International Airport). A fourth contract, operating under a different legal body, but that also required a concession by the government (the allocation of the frequency 1900 MHz for Personal Communications Systems, PCS), is also analyzed in section 3. Section 4 concludes.

2. The Nature of the Contracts

In most cases where a monopoly right for the provision of infrastructure of public use is auctioned off, the number of potential bidders is relatively small. Standard economic theory suggests that this situation could lead to a bilateral monopoly result, and in such cases the result is indetermined. The theory of Auctions solves this indeterminacy considering the seller as a Stackelberg leader that has the ability of moving first committing to certain set of Auction Rules that the bidders know at the moment when they make they offers (Mc Affee and Mc Millan, 1987). Thus, the commitment to the rules previously established is a central element of the auction theory. They determine the incentives that the bidders have during the bidding process and also the ex-post incentives present once the monopoly right has been granted (e.g., the incentives to renegotiate).

Since the Auction Rules are decisive for the performance of the contract (Klemperer, 2002), and the incentives of the different players affect the design (Aghion, Alesina, and Trebbi, 2002), both, the incentives and the clauses and provisions contained in the contracts are key to evaluate performance.

² International Transparency, an organization that elaborates international rankings of corruption, concluded that Chile is the country with the lowest corruption level in Latin America.

2.1 Infrastructure Concession Contracts

Infrastructure concessions are contracts between the State and a private firm through which the latter gets the right to provide a service under significant market power (Kerf et al., 1996, p.1). One of the most interesting aspects of the concession contracts is that it is possible to create competition in the process of assigning it. Such outcome is equivalent to at least, second best regulation (Demsetz, 1968).³ However, key aspects to achieve these results are the design, the implementation and some specific regulations of the contracts.⁴

The explicit purposes of these contracts are two. First, to improve efficiency substituting direct price regulation, which requires information that is rarely available for the regulator, particularly regarding costs. Second, to increase equity, by charging a price to the users of the infrastructure and third, to increase investment financed by the users while the government frees resources for other ends.

The design of the contracts, however, may affect efficiency. For instance, granting the concession to the firm who pays more to the government will redistribute monopoly rents. In turn, granting the contract to the bidder that offers to charge the lowest price to consumers will eventually solve the efficiency problem in the case of a single product monopolist, but it is not the appropriate criteria in the case of a multi product monopolist. Additionally, in practice, unexpected events can occur, so once the monopoly is granted and operating, it is often convenient to modify some clauses of the contract in order to adjust to those unexpected conditions. However, the renegotiation may also change the philosophy of the process and be used to take advantage of the sunk investments made by the different parties, the firm or the government. Thus, balancing flexibility and the probability of renegotiation should also be a goal of a good contract design.

2.2 Objectives and Parties Involved

The declared objectives of the most recent government infrastructure programs and in particular, that of the Concessions Law is to increase investment and improve efficiency through the participation of private firms with experience in the provision of the services. Other objectives, such as improving access for the poor are often considered, but it was not explicitly included in the law. There is concern on the degree of monopoly power that can be exerted once the project, traditionally in the hands of the government, passes to the private sector. Consequently, contracts are expected to limit potential abuses by the monopolist.

Two other objectives that can negatively affect efficiency are commonly present in the contracts between the government and the private sector. First, coping with the concern on the budget of the institution that previously collected money from operating the

³ Because of the difficulty of getting information about the investment costs, there are advantages of substituting price regulation through concessions.

⁴ The design is important not only to produce theoretically efficient output, but also to limit renegotiation. See, Engel, Fisher and Galetovic (1997), and Bester and Sákovics (2001).

infrastructure that passes to or is substituted by the new private project. Most concessions change the financing from tolls collected by the Ministry of Public Works (MPW) or another institution, to collection of tolls by the private sector. In the case of the Santiago airport, for instance, the Air Force, through the Civil Aeronautical Authority (DGAC) obtained its revenues from the services provided by the airport until the concession was granted. As a result, the DGAC saw its revenues diminished after the concession started operating.

Second, the objective of public officials is often rather narrow and limited. For example, pursuing goals like “privatize firms”, “obtain as many private firms interested in the project”, or “get the largest payments to the government” are commonly defined by the public sector official. Very rarely the evaluation of public sector officials in charge of implementing the projects considers long-term efficiency. This is the case of most Latin American privatization processes that were judged on the basis of the proceeds obtained from the sale of the privatized firms, rather than on how they operated. In the same line, the number of firms participating in the bidding process judged the performance and the lack of participation use to be considered a failure.⁵

Balancing different objectives is complex. In the case of the public sector institutions that loose part of the funding they obtained from operating the infrastructure may require a different source of financing its new budget when the concession is granted to a private firm. However, if these institutions are directly involved in the process of granting the concession, they may attempt to affect the design for their own benefit or they may even try to boycott the process, imposing obligations to the private firm that are difficult to fulfill.⁶

3. Lessons from Infrastructure Contracts

In this section we analyze four specific contracts between the private sector and the government. Three of them were signed under the Infrastructure Concessions Law. A fourth contract, under a different law, followed the traditional relationship between the private sector and the government. This last contrast is important to consider since allow us to see whether the nature of the problems is similar or is associated with the Concessions Law.

In all the contracts considered, the Auction Rules established that the bidders had to present a technical and an economic offer. The technical offer usually included the financial and legal aspects of the consortia, project specifications, exploitation regime and the financing project, all of which is part of the contract. The Auction Rules also defined the responsibilities of the parties, the services to be provided and who will pay for the service. Also, all contracts were granted to the bidder that offered the best conditions concretely defined by the Auction Rules.

⁵ The lack of interest of private firms may be an efficient way to avoid the construction of white elephants or projects with a very low social benefit.

⁶ For a more general view, see White (2002).

3.1 The Santiago Airport.

In an airport, location provides monopoly power to the concessionaire. This justifies why not only the runway, but the airport itself, is considered a sort of natural monopoly and a clear candidate for the concessions program. Among the services offered by an airport, there are some that face enough competition, and hence do not need to be regulated, such as the duty free shops and food and beverage services, all of which can be obtained outside the airport at some additional but not significant cost. There are other services, such as communications and parking that although they are not strictly necessary to operate an airport, they are complementary to those provided by the airport. Some of them may not face enough competition because of the specific location and therefore may need to be regulated to some extent. Finally, there are services that are essential for the airport, such as the embarking/disembarking system, areas for the platform services and catering, counters and support areas for the airlines. There are some differences in the degree of competition in these essential services. The embarking/disembarking systems, for instance, do not have goods substitutes. As these services are essential for airline competition, besides price regulation, it is important that they be provided in a non-discriminatory basis.

Different institutions regulate the concession of the airport. The Concessions Division of the MPW, that depends from the central government, designs and enforces the contract, while the DGAC, the aeronautical authority that depends from the Air Force, monitors security and aeronautical services. Also, the Ministry of Finance has veto power in the design of the Auction Rules, since keeping a balanced budget is its responsibility.

The concession of the Santiago International Airport (AMB) consisted of a contract of Leasing, Development and Operation, for both, aeronautical and non-aeronautical services. The project required the building of new facilities in the passenger and freight terminals that would increase the existing capacity by a factor of 3 and 1.5 respectively, with a total estimated investment of US\$ 100 millions.

The process started in the second semester of 1997 with the publication of the Auction Rules and the concession was granted in February 1998. During the four-month period between the publication of the Auction Rules and the submission of the bids, 13 firms participated in the process and made more than 1,000 clarifying questions about the Auction Rules. The answers to such questions were published in 14 documents that become part of the Auction Rules.

The Auction Rules defined the services to be provided by the concessionaire, and explicitly excluded a number of services that would continue to be provided by the DGAC. Some of the services were subject to price regulation, like the embarking and disembarking system, the exploitation of the platform service areas and the catering areas. Among the non-aeronautical services, some were mandatory: food, parking, communications, counters, offices, duty free shops and public transport, and the rest voluntary.

The contract had a fixed term of 15 years after which the concessionaire has to return the facilities to the MPW. In the meantime, the facilities can be transferred to another firm, with the authorization of the MPW. There are also conditions that could lead to an anticipated termination of the contract.

Initially, the Auction Rules established as the bidding variable the lowest amount per passenger charged by the bidder, out of the total fee per passenger set by the Ministry of Finance (about US\$ 8 and US\$ 18 for national and international passengers respectively). This amount had a cap of US\$7 per passenger. However, 15 days before the date when bids had to be submitted, the MPW modified the bidding variable by adding a floor of US\$ 1.5 to the amount that could be requested by the bidders. It also added a second bidding variable: the percentage of reduction in the prices of the regulated services, reduction that however could not exceed 70%. The Auction Rules also established the obligation for the winner to pay to the DGAC an annual flow of about US\$2.5 millions during the first 5 years and US\$2 millions thereafter.⁷

The Auction Rules specified two types of performance goals, one associated with the building of the airport facilities and another associated with the operation of the airport. The first specified goals were clearly defined and thus, there was no room for discretionary behavior from any part. However, this was not the case of the performance indicators for the operation of the airport. Given the nature of the services provided by the airport, quality considerations use to be as relevant as the price. Each bidder had to include in the technical offer an Operations Manual, establishing the procedures to operate the airport and the quality standards, defined with reference to a similar airport abroad managed by one of the members participating in the consortia.⁸ The Auction Rules also included an instance to resolve controversies, whose resolutions are mandatory.

In sum, according to the bidding rule, the concession would be granted to the bidder that requested the lowest fee per passenger, within an allowed range, and the largest reduction in maximum prices for regulated services. In the case the bidding process ended up with a tie in the economic offers, the winner would be the consortium with the best technical offer.

The result was that the seven consortia that presented bids, made exactly the same economic offer namely: they requested the minimum possible amount per passenger and offered the maximum discount allowed (70%) for the prices for the regulated services. Thus, the project was awarded according to the maximum score obtained in the “technical offer”. The losers challenged the scores given to each consortium in Court. The problem emerged since the technical aspects emphasized aspects such as experience, “quality of the project” and the quality of the “Operating Manuals and Procedures”, which are all concepts hard to define objectively.

⁷ Such amount was theoretically equivalent to the revenues the DGAC received previous to the process.

⁸ For instance, the manual includes the maximum waiting period to get the luggage, or to be assisted at the counter.

a) Interest Groups, Incentives and Design

Two types of consumers were involved in the airport concession: passengers (and freight customers) and airlines. Passengers have important costs of organization and they did not become relevant actors in the process. Moreover, the bidding variable used did not affect them directly and therefore they did benefit from the competition only indirectly through the cost reduction for the airlines and from the eventual increase in the quality of the services provided. However, airlines obtained important price reductions of the regulated services in the process, at least from the levels initially stated in the Auction Rules, which were considered by them as being “too high”. A third interest party consisted of the Public Sector through three institutions, the DGAC, the MPW and the Ministry of Finance, each one with their own objectives.

The process redefined the role of the DGAC. That is why the services included in the concession and the definition of the bidding variable were so important, particularly for the DGAC and for the Ministry of Finance. The DGAC was the main beneficiary from the competition in the bidding process since it keeps the difference between the fee set by the Ministry of Finance and the amount requested by the bidder that won, which was the lowest allowable by the Rules.

b) Evaluation of the Contract

As a result of the bidding process, all participating consortia made exactly the same economic offer, and competition occurred only on the basis of “technical aspects.” As said, consumers didn’t see a direct reduction in the prices they pay for airport services.

It is clear the existence of opposite forces in the formulation of the design in this case. The higher the price for non airport services was induced by limiting the percentage of the reduction allowed over the initial price. This pressure to lower the requested fee that finally would be taken from the DGAC. In the Auction Rules the prices of the regulated services were set and a limit to the reductions imposed. The lack of real economic competition was thus a consequence of the floor and caps imposed in the Auction Rules, which in turn would favor the DGAC.

Introducing a small change in the Auction Rules, for instance awarding the project to the bidder who offered to return the facilities the earliest, would have been enough to avoid the “beauty contest” type of allocation that occurred. The proposal of such a clause was politically ruled out on unconvincing grounds (i.e., it was argued that a minimum period was required to make the project profitable). Obviously, the opposition of the DGAC to such clause obeyed to the fact that, by reducing rents, the requested price would have increased, reducing the budget of the DGAC.

3.2 The El Melon Tunnel

The El Melon Tunnel was the first infrastructure project built and operated under the Concessions Law in Chile. It is a tunnel located 130 kms. north of Santiago that allows to by-pass the El Melon gradient, a two-way difficult hill road. The tunnel reduces the travel

time considerably, particularly for people going to the beach in the central zone. The tunnel provides a new alternative for consumers and is not merely an improvement of the existing one, as it has been the case of most other roads and airports concessioned until the year 2002.⁹

The Auction Rules specified the construction period, the starting of operations and the procedures to apply sanctions in case of delays, non authorized service interruptions, charges above those authorized, delays in providing information required by the MPW and delays in other obligations. The Rules also established procedures for the expropriations of land required to build the project, which is an important source of risk. The expropriation would be carried out by the MPW and the payment, within some limits, would be assumed by the concessionaire. The Fiscal Inspector would be in charge of approving the advances of the project. The Auction Rules also established some requisites to limit the possibility of bankruptcy of the concessionaire. The debt could not exceed two times the equity and the consolidated equity should be at least US\$ 15 millions. A detailed budget and a financing program was required, considering debt, (terms and rates), an investment analysis and the expected costs.

There were several simultaneous bidding variables considered in this case: the toll charged per vehicle, an inflation adjustment rule, the length of the concession period, warranties requested from the State, additional services offered and a payment to (or subsidy required from) the State. More precisely, the bidder had to offer an average toll per vehicle, per hour, without discrimination among users, with a cap established in the Rules. The adjustment formula considered a 100% of the CPI, but it was left to the bidder to offer a length for the adjustment period: 3, 6 or 12 months. The choice of a longer period would increase the likelihood of winning.¹⁰

In April 1993 the project was awarded to a consortia integrated by Endesa S.A., Empresa Constructora Delta S.A. and by the Agencia de Sociedad Agoman Chile. Its offer defeated other three that met all the technical requisites. However, the offers of all the consortia were identical in most aspects. They offered the maximum toll allowed, the maximum period of concession allowed, requested the maximum guaranteed income from the State and the minimum length for the adjustment period. The only variable in which there was competition and hence turned out to be decisive, was the payment offered to the State. Belfi offered an annual payment of US\$ 1 million, Chilquinta US\$ 1.4 millions, Dragados US\$ 24,000 and Endesa US\$ 3.4 millions.

Incentives and Performance

The Rules were designed to assure that this first Concession project would come through successfully. The fear was that if the project was awarded using the minimum toll charged as the bidding variable, it might have been the case that it were not profitable

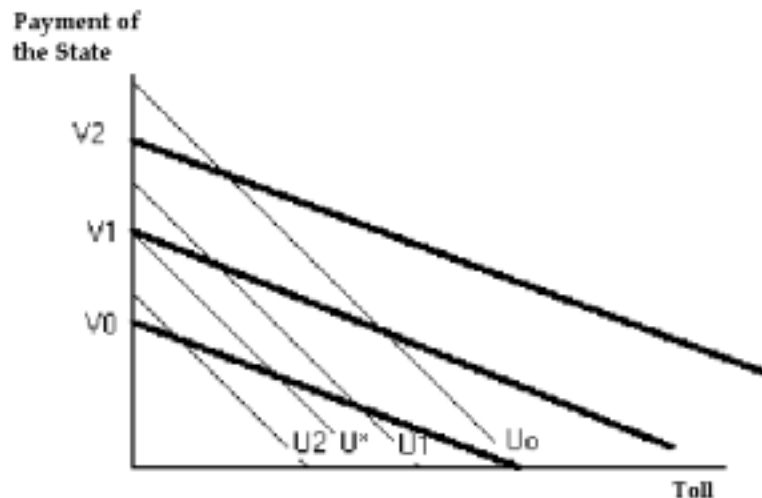
⁹ The existence of alternatives is important for the contract, since the degree of monopoly power that the concessionaire could enjoy, is key for the eventual regulation clauses that may exist.

¹⁰ The details about the way the rest of the variables were considered are described in Paredes, Sánchez and Sanhueza (2001).

privately. If no firms had participated in the process it might have been interpreted as a failure of the newly created Private Concessions Law. To avoid this, the MPW tried to guarantee the project in two ways: i) guaranteeing a minimum traffic in the whole system tunnel- road hill, and ii) including as a bidding variable the payment requested from the State (that could be positive or negative).

As it happened in the case of the airport, in spite of the seemingly sophisticated formula to award the project, all the concessionaires ended up competing on a single variable. This is not surprising if a well-known technology and common good practices exists. This can be illustrated in figure 1. The Auction Rules stated the government's preference for lower toll, and lower payment of the State through its "iso-utility" map described by U_1 , U_2 , U_3 , etc., where U_2 is preferred to U_1 , and so on. For the concessionaire, its utility increases with both the toll and with the payment of the State (i.e, V_2 is preferred to V_1).

Figure 1



Competition by firms will lead to a given V , let's say V_1 , where profits are the competitive ones. As the combination of toll and payment from the State is indifferent for the firm along each V line, and the optimum for the government, reflected in the weights given to the different variables, will lie along U^* . Consequently, the binding variable will be in this case, the lower payment from the State. Thus, it is not a coincidence that all concessionaires chose the same variable to compete. The question then is why the auction design included many variables.

Consequently, the relevant bidding variable, the payment to or from the State, guaranteed that there would be some firms interested in the project even in the case the project was not socially profitable. In this regard, the design could have effects on efficiency and generated incentives for ex post renegotiation. Furthermore, consistent with the high toll

that the process generated, the bidding variable maximized the payment to the government, but also created efficiency losses and induced ex-post renegotiation.

In fact, since operations started in 1995, the operator charges high tolls at least relative to those charged in the all the rest of the country, including newly privatized roads. In addition it has to pay regularly the amount it offered to the State plus an extra amount associated with an income sharing clause depending on the traffic in the whole system tunnel - hill road.

The political economy of the problem clearly emerges. The high toll “show” that the system is inefficient, that is, some vehicles avoid using the tunnel. Thus, pressures for renegotiation emerge not only from the concessionaire, but also from the consumers. The argument is that the concessionaire could reduce the tolls if it would not have to pay the more than US\$ 3 million it offered to pay the State in its bidding offer. Hence, a change in the contract would be in its favor and in favor of the direct consumers, but of course, against the non-represented consumers who do not use the tunnel. The government however has resisted the pressures to renegotiate. The reason is that, even though there are some reasons to explain the poor performance exhibited by the firm so far, strategic behavior and low-balling in the bidding process should not be discarded.¹¹

3.3 The Santiago-San Antonio Highway

The Santiago - San Antonio Highway, is a project consisting of building and operating a highway between Santiago and San Antonio, arguably Chile’s largest cargo port, located about 100 kms. east from Santiago. The highway has a small degree of substitution with existing infrastructure, since it merely improves the only existing road. The Auction Rules considered an ad-hoc committee in charge of evaluating technical aspects, the requirement of guaranties to respond in case of delays, minimum service standards, and a 23 years operation period. Also, as in the case of the El Melon tunnel, the Auction Rules considered a guaranteed minimum traffic and an income-sharing clause for extraordinary high revenues, based on an estimated cost. In this case, the concessionaire had to assume all the risks, including that associated with the technology of toll charging that would be defined by the MPW after awarding the concession. The Government included in the Rules a payment for pre-existing infrastructure, consisting of 20 annual payments of US\$ 4.8 millions and an additional payment of about US\$ 145,000 per year during the first four years. Finally, as in other infrastructure contracts, the Auction Rules had some flexibility to allow the MPW to modify some characteristics of the project. In such case, the MPW would afford the additional costs involved.

In case of a tie in the bidding variable, the Auction Rules established that the winner would be the one that requested the lowest subsidy from (or offered the largest payment to) the State. Thus, there was not a polynomial equation with different weights, but rather a recursive process, where the payment operated only if the toll reached the cap.

¹¹ The construction cost exceeded the budget estimated by the MPW and by the concessionaire by about 30%. A technical error in the prediction of traffic is unlikely. More possible is an error in the estimated elasticity of demand.

The project was awarded to the best economic offer, which only considered the lowest toll charged subject to a maximum of US\$ 5.¹² More precisely, among the six offers considered technically acceptable, the winner was the Consorcio Infraestructura 2000, which offered a toll of US\$ 1.74. The other bids offered US\$ 1.88, US\$ 1.97, US\$ 2.68, US\$ 3.41, and US\$ 3.53.

The Renegotiation Process

Two years after the project was awarded and in agreement with the Concessions Law, the MPW decided to modify the contract by requiring an improvement in the services, additional service streets, additional access to the highway, additional bypasses, improvement in local traffic, higher traffic flow standards and additional safety measures. In addition, the project started its operations late as a consequence of a delay in expropriations of which the MWP was responsible. Thus, the negotiation focused on three aspects: the cost of the new facilities, the period that the concessionaire was not operating due to the delay caused by the MWP and the way and amount to pay for the additional costs.

We do not analyze the extent to which renegotiating a contract may be a bad thing. We acknowledge that unforeseen events may lead to a mutual beneficial post contractual negotiation. Instead, we focus in the design of the Auction Rules that induced incentives to negotiate in a costly way. We can think that the absence of parameters would make the negotiation process difficult. However, this was not exactly the case and the MPW decided to introduce new parameters and criteria that favored the concessionaire, but created more uncertainty.

In the first place, the negotiation of the cost caused by the delays of operations was difficult to assess because there was nothing stated about this issue in the Auction Rules. The foregone revenue could be easy to estimate, since once the operation starts, one can estimate the lost revenue using the traffic flow observed in the real starting period. The problem was the estimation of the opportunity cost of the idle resources, which is something less relevant and measurable, but that was left open because of lack of clarity in the contract. Even when those of costs are usually considered in the typical contracts that the MPW signs with private parties, in the actual negotiation they were not considered as valid parameters.

Secondly, the Auction Rules required that the bidder reported an estimated unit cost for the facilities, but there was no incentive for them to declare the true values of those costs. Instead, reporting higher values would leave them in a much better negotiating position, as it was the case. The obvious alternative to obtain unit costs was to rely on the prices the MPW was using for its other contracts. Again, the MPW did not use those available prices to speed up the process, at the cost of introducing more uncertainty for the future negotiations.

¹² The Auction Rules established a relationship among different tolls in such a way that once the bidders made an offer for one type of toll, the rest was automatically determined.

The third element in the negotiation was defining the way to compensate the additional cost. The law considers different alternatives, like increase in the tolls, a longer period of operation or direct payments. The equivalence among these alternative ways is not trivial and was also subject of negotiation. In practice, an important part of the compensation took place through an increase in tolls. The negotiation focused on the effect on revenues that such increase would have, that is, on the value of the price elasticity of demand. The result of the negotiation was an increase in tolls of 18.1%, assuming that such increase would led to higher revenues in 11.9% (i.e., the implicit price elasticity was -0.25).

At least two lessons can be learned here. First, even in the case some parameters are not defined in the Auction Rules, there are other readily available variables, and the obvious ones should be used. Second, the Auction Rules could include a number of simple and obvious clauses that would have limited the scope for negotiation. As a matter of fact, some parameters were available, since that are frequently employed. Others, should be defined ex ante by the MPW, like prices, discount factors and price elasticities.

3.4 The Allocation of the 1900 MHz Radioelectric Frequencies for the PCS

In November 1995, the Subsecretaría de Telecomunicaciones (Subtel), the Telecom's regulator, opened a bidding process to award three national concessions in the band of 1900 MHz for mobile telephony (Personal Communication Systems). The process created several conflicts even before the frequencies were allocated. The bottom line was the high uncertainty produced by the Auction Rules that made very difficult for the bidders to evaluate their individual projects. However, in June 1996, the offers were presented and in October of that year, the frequencies were granted.

The main elements of the Telecommunications Law are that tariffs are free to final consumers, and that Subtel must assign concessions for free to those who request for them, except when there is excess of demand in which case Subtel must open a competitive tender process. The law also determines the elements that the Auction Rules must consider, and the technical requirements the bidders must fulfill. Specifically, bidders are required to present a technical project with the installations for the operation of the service to be provided and a financial project. The law also states that the concessions cannot be modified in terms of the elements considered to award them and establishes the sanctions in the case that the concessionaire does not meet the technical aspects, stages and terms.

The Auction Rules stated that the most relevant bidding variable in the economic offer was the increase in coverage, which was calculated weighting by population densities in different areas. The rules contained detailed requirements in installation, operation, types of services and the time frame to execute the project, which should not exceed 5 years.

The Rules also considered two guarantees of US\$ 750,000, and US\$ 42.5 millions, to guarantee the investment and operation of the project. The last guarantee was reduced by

one tenth each time a stage was properly completed. In June 23 and June 30, 1997, the official results were published granting three concessions as table 1 shows.

Table 1
Results of Frequency Auction in the Bandwith of 1900 MHz

	1st place	2nd place	3rd place
Firms	Entel Telefonía Persnal (Entel PCS)	Chilesat Telefonía PerSonal	Entel Telefonía Móvil
Partners	Entel : 59.16% Motorola : 40.84%	Télex: 50% Qualcomm : 50%	Entel : 80% Qualcomm : 20%
Score	98.35	85.98	76.77
Technology	CDMA	TDMA (original)	GSM
N° Stations	136	188	167
Bandwith	C	B	A
Counties Served	302	228	249
Execution Period	6 months	18 months	60 months

Source : Subtel.

Parties and Incentives

The objectives of the different institutions and parties involved in the process were very contradictory. Besides the cellular companies, that had incentives to delay the process, the Antitrust Commission, in May 1996, suggested that the concession should not be allowed to a firm holding another concession. Subtel, who finally decided on the Auction Rules, did not follow this recommendation. This latter is consistent with Subtel's objective of universal service, which is not necessarily the same as promoting competition. Furthermore, as became apparent, Subtel was pursuing the implementation of the PCS (i.e., "putting the sector in a very good technological situation") as quickly as possible.¹³

It is clear that there are more efficient, clear and transparent ways to allocate frequencies than through increase in coverage. As the number of frequencies was fixed and there was not a monopoly involved, the most direct and efficient way is through a payment to the State. On the contrary, allocating frequencies on the basis of the greater coverage in the shorter period of time induces inefficiencies, like providing coverage in areas where it is not economically convenient to do so. The equivalence between more traffic and lower

¹³ The above considerations may also explain why the Subtel did not solve minimal aspects to reduce uncertainty, like freeing the frequencies operated by the military. Instead, it left this issue to the firms. As a matter of fact, the way to clear the frequencies and the cost of it was very difficult to estimate and led to a judicial presentation because of the uncertainty that these actions generated.

tariff is true, but larger traffic is not associated with geographical coverage but with demand. The demand varies in the different counties, regions and areas. The weights given in the Auction Rules were based upon population, which is closely connected with the universal service purpose rather than to demand. In addition, the optimal investment timing has little to do with the incentives created by the Auction Rules, which induced to speed up investment in a not necessarily optimal way and to do cross subsidization.

Performance and Negotiation

As in the case of the tunnel, the incentives to renegotiate emerged rapidly. Renegotiation for delays in the investments in some counties was easily justified in a theoretical basis. The design of the contract favored renegotiation, which occurred through two ways. First, through pressures to extend the period to materialize the investment (part of the Auction Rules) and second, by forcing some changes in favor of the firms that would provide the service.

Regarding the first, in January 1998, Entel asked for a permission to merge its two projects in a single unit. This was in practice allowed and Entel's projects shared technology, transmission stations and commuting systems. However, the provisional permit granted to Entel allowing to do so, was questioned by the competing firms, particularly Bell South, based on the fact that it was against the Auction Rules and the Law.

The sequencing in the inspection and execution shows the way renegotiation occurred. On December 30th 1997, Subtel received the modified project, but it was on February 14th 1998 when it published Entel's requirement to modify the concession.¹⁴ On December 30th 1997 Subtel rejected the reception of the finished works by Entel PCS, because 10 stations out of the 210 due, were not ready. This event forced, according to the law, to execute the guarantee. However, Entel certified in front of a Public Notary that during the period between Subtel's report and the final date, it had solved the problem (between the 21hrs. and the 24 hrs. of December 30th). Entel presented the report to Subtel and at the same time presented a Legal Appeal to the courts on January 5th 1998.¹⁵ Subtel accepted the arguments given by Entel and decided, after several delays and also considering the report from the Comptroller General, not to execute the guarantee.

A second way of affecting the conditions was by applying the "calling party pays", which was considered critical for the competitive position of the mobile companies. During the process, Subtel systematically answered that the calling party pays was not a subject of the Auction Rules. Although it was by that time clear that to avoid major conflicts and accusations of defining the rules of the game on an ex-post basis, it would be better to

¹⁴ This lead to two complaints against Subtel.

¹⁵ In the complaint, besides stating that the allowed period was over, it was stated that the Auction Rules established that if the work done so far was rejected, the concessionaire must finish them within the same period of time. With this, Subtel was under questioning since it gave only three hours to Entel to solve the problem.

consider it explicitly in the process. Subtel, which had no legal tools to implement such policy, induced it through the decree of interconnection charges. Thus, Subtel created the conditions to make the mobile companies charge the LEX companies an interconnection rate such that they would not require charging a fee for the incoming calls.

4. Conclusions

Due to the acknowledged Chilean stability, developed institutions, and its early commitment to private initiative, the problems in the contracts between the government and the private sector are not basically related with corruption or incompetence reasons.

We analyzed four different contracts from where we draw a number of lessons. First, all the contracts had more than one objective, and frequently, contradictory. A general objective of the government, not necessarily convenient, was to assure that the project would be undertaken. In the case of El Melon Tunnel, where the bidding variable was the minimum sum requested from the State (or the maximum amount to offer), an efficiency problem emerged. High prices and the losses of the concessionaire, together with payments that it has to do to the State, induced a coalition between the concessionaire and the consumers to revise the contract.

As the cases of the concession of frequencies and the road infrastructure concession show, the design of the contract, and in particular, the bidding variable is key for the performance of the concession because of the incentives it produces. Some bidding variables induce, more than others, post-contractual renegotiations. The contract loses strength and renegotiations become harder when the bidding variable is not an economic variable. Additionally, renegotiations in the case of the PCS frequencies and the El Melon Tunnel were harder because the bidding variable did not affect consumers. In this sense, it is important to consider that in most cases, in spite of the existence of complicated polynomial formulas that seemingly meant to consider several variables in the process, there was a single operating bidding variable. If the objective is to assure the participation of several bidders, and more than one bidding variable is considered, it is convenient to introduce relevant economic variables, with the purpose of limiting the chances that the concession ends up being granted through a “beauty contest” that reduces transparency.

Second, design problems were more severe when an interested party was involved in the process. The DGAC affected the Auction Rules in a way that finally led to a beauty contest instead of an objective process based on an economic variable. As this case shows, the design of the contract matters for efficiency and for the incentives for ex post renegotiation. Hence, it is key to separate the ex post role of each party in the process, from its role in the contract design. In the case of the airport, there was not clear definition of the DGAC role, and by affecting the design, and the consumers, this entity improved its financing. The role of the DGAC in affecting the design of the contract not only involved the bidding variable, but also the structure of the tariffs, the floors imposed on them and the definition of the cannon. Moreover, from an efficiency point of view, the concessionaire should assume as many commercial activities as possible. However, the

absence of a budget, associated with a clear ex post role for the DGAC, limited the capacity of the MPW and the Ministry of Finance to make a better definition of the contract.

This was also the case of the frequencies for the PCS, which show that the problems are broader in scope and should not be associated strictly with the Concessions Law. In this case, the objective of the Subtel of getting the largest coverage possible, in the shortest period, conflicted with the Antitrust Commission's recommendation which was, to avoid granting to frequencies to the same firm. Furthermore, this induced renegotiation since having forced the firm to comply with the inefficient investment plans could have put the firm in financial jeopardy.

Third, the MPW in the renegotiation process privileged assuring certainty and reducing conflicts in the very short run, instead of providing a general framework for renegotiation. The government was concerned to guarantee that it would not expropriate the sunk investments. In a good sense, renegotiations allow reacting to contingencies not anticipated and so, it may enhance efficiency. Of course, it is necessary to impose a limit to such renegotiations, such that corruption and abuses be restricted. Paradoxically, instead of using the tools that were available, the logical ones, the government introduced new criteria, that favored the concessionaire, but not the risks associated to future projects. Moreover, whilst the law is flexible to allow different mechanisms to compensate in the case of negotiations, the contracts neither consider explicitly some logical variables nor how to apply compensations.

Fourth, changes in the TOR, particularly close to the closing date, reduce transparency and raise questions for the whole process. Even though one could argue that the changes are made for everybody and in that sense are fair, some participants are more affected than others with them. Furthermore, a change in the design favoring as the bidding variable the "technical project", will favor those with more experience, with larger capacity to innovate but with more powerful lobbying.

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