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# **Private Participation in Infrastructure Projects and Determinants of Observed Contractual Arrangements: The Case of Brazil**

by

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# **1 Introduction**

## ***The Current Brazilian Situation and Type of Contract***

In recent years, fiscal deficits have been a chronic problem for the central government and most state governments. In 1997, for instance, the nominal deficit was about 6% of GNP. In this scenario, both central and local governments have been unable to make the necessary infrastructure investments to maintain adequate service levels, a situation that has existed since the beginning of the 1980s. For instance, investment in ports in 1993 was less than 15% of the figure in 1980, while in the railway sector investment fell from US\$1.9 billion in 1980 to US\$214 million in 1993 (Cavalcanti Ferreira, 1996).

As a consequence of fiscal deficits and under-investment, one of the main objectives of the infrastructure privatization program is to call on private capital to finance investments in infrastructure. Hence the type of contract that has to be established is one that transfers to the private sector the obligation to invest in public services. The idea of permanently selling the infrastructure companies and concessions to the private sector, though, would never have been accepted by opponents of the privatization program and a significant part of the population. So, it was crucial to keep the infrastructure firms in public hands, even if the concession period was long. For these reasons, the investment commitment of the concessionaire and limited duration are two important items of all privatization contracts studied here. Investment expenditures have to be made by the private sector, and those costs are to be recovered through operational revenues. Moreover, privatization revenues can be used to finance public expenditures in other sectors (e.g., social programs). The government has found build-operate-transfer (BOT) contracts most suitable for meeting these objectives and necessities.

## ***The Brazilian Political System and the Legal Nature of Contracts***

Brazil has a unified presidential political system. Currently, there are many political parties, with five considered of major size. In general, as in any other democratic country, the government has to negotiate with the parties when it wishes to approve a law. The country is presently experiencing a constitutional reform, so negotiations between the executive and legislative branches are frequent. Especially now, the executive cannot weaken its position and give ground to its opponents.

As a consequence, the federal government needs to concentrate congressional attention on topics related to constitutional reform. Therefore, the government would prefer not to spend political capital detailing the legal nature of privatization contracts. It could resort to executive decrees, but these could be easily revoked by any government, making such contracts more risky and less financially viable from an investor standpoint. Finally, it would be very costly in political terms to define international arrangements as to the legal nature of the privatization contracts. Consequently, the only realistic alternative left has been the civil contract, which has been adopted in all privatizations in Brazil.

Although civil contract seems to be the best option with respect to legal regime, it also presents problems. At least until a few years ago, the Brazilian government's commitment to honoring contracts was not very strong. For instance, it was not uncommon for firms contracted by the government to encounter great difficulty in getting paid on time (and often then only at a discount). When inflation was high, any late payment, of course, reduced the effective amount received. This was very damaging for those firms and the risk faced by the private sector was so high that the price agreed on had to be adjusted accordingly. As a consequence of this perverse practice, some private firms went bankrupt.

The judiciary power in Brazil has always played an independent role with respect to the executive power. The real problem, however, is the enforceability of its decisions. For instance, in the case explained in the above paragraph, a judicial decision would order the government to honor its contracts and pay its debt, but in practice the government would state that it would follow the judicial determination but would end up not doing so, claiming to be short of funds. The judiciary would sometimes accept temporarily this situation, but, even when that was not the case, another judiciary decision could take months or even years. Some of these debts have never been paid entirely and, consequently, this pattern can be interpreted as a de facto lack of enforceability of judiciary decisions.

On the other hand, the success of the privatization process is probably the main claim to success of the current government, which is not willing to accept any type of (serious) problem in this area. Hence, one can assume that the concessionaires of infrastructure services will have advantages when renegotiating contractual terms, because the government is afraid of facing a judicial battle with them, at least at this stage of the Brazilian privatization process. For

instance, the problems that occurred in the energy distribution sector in the state of Rio de Janeiro, discussed in detail below in the section on the privatization of Light, serve as a good example of the political troubles the Brazilian Government will face in the event of even small failures of the privatization process.

In summary, although civil contracts were not always honored in the past, the government seems to have learned the importance of a good reputation for honoring them. Moreover, all political forces, reflecting the popular consensus, are now conscious of the importance of property rights, so that if a given concession has been granted to the private sector, it will be maintained independently of the party in power.

### *Other Dimensions of the Contractual Arrangement*

The government opted for international competitive bidding in its contract assignment procedure, although there is still some political opposition to the presence of foreign firms in key sectors of the economy. The reason is that without the participation of international capital the auction competition would have been eliminated in several instances due to the extreme concentration in some of these markets, and especially due to the restricted access to capital markets by Brazilian companies.

The pricing rule is another important contract aspect. In all the cases analyzed, price caps and price indexation were the procedure. Price caps were chosen on the basis of international experience (it dominated rate of return regulation), specifically in the sectors analyzed here. Brazilian inflation has been under relative control since mid-1994 with an annual level of only 7% in 1997 and 3% in 1998. However, even with this level of inflation, indexation still has proved necessary because, among other reasons, there is always the risk that inflation will return to the high levels of the past, especially because the fiscal deficit is still a chronic problem in Brazil.

The regulation theory shows that under-investment is a potential problem of the price-cap regime. However, in the Brazilian case, the vast majority of investment targets are verifiable by the court. For instance, in the past year some of the telecommunication and energy concessionaires did not meet all the investment targets of their contracts. Consequently, they have been sued and fined heavily.



### ***The Brazilian Regulatory System***

Concessionaires in two of the six privatization processes we have studied, Port of Sepetiba and the Northeastern Railway Network, face some form of competition. So, in these cases there is no need for a regulatory agency or any other mechanism to avoid dead weight loss. Obviously, those markets are not strictly competitive, and, for instance, in the case of railroad services, there is some degree of imperfect competition in the transportation of some goods on some routes. In this case the privatization contract includes performance targets on production, which can be considered a form of regulation. In the other four cases, competition could not be considered an instrument to limit the concessionaires' actions. Hence, in the telecommunication and energy sectors, regulatory agencies were created. However in the case of Presidente Dutra Highway there is no regulatory agency as such, only an agency that ensures compliance with the contractual targets.

The regulatory agencies in Brazil were recently created, and it is difficult to predict their real role in the country's regulatory system. For instance, the precise role of the antitrust agency in the telecommunication and energy markets is still not clear. As a matter of fact, new antitrust legislation was established in 1994 and, consequently, the antitrust agency has just started operating.<sup>1</sup> Moreover, although the judiciary plays an independent role, the judges are not prepared to decide on regulatory processes.

### ***The Privatization Program***

Particularly in the case of the energy sector, the general impression we obtained is that privatization was designed mostly with the goal of maximizing the revenues from auctions.<sup>2</sup> Price rules and flexible quality and investment targets, among other favorable contract clauses, made the companies very attractive to the private sector. In addition, the regulatory agency did not even exist, for instance, when Light and Coelba were privatized. Hence, the process did not maximize market efficiency or public welfare. It is a fact that services were very poor before privatization and that the public sector had no investment capacity at that time. However, a better result could have been obtained if the concession process of utilities had not been considered an instrument to raise cash for the government treasury.

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<sup>1</sup> See Lemos and Schymura (1998) for a study of the economic view of the new Brazilian antitrust legislation.

In the case of the cellular b-band sector, the problem is the definition of regulatory rules, as the concessionaires did not know at the time of the auction what the telecommunications market structure in the future would be. For example, questions such as how, who and how many would be the exploiting wireless local loops were not yet answered. Without these answers a full understanding of the b-band market's degree of competitiveness is impossible. In this case, revenue maximization was an important target.

## **2 The Case of Light**

### *Context of the Case*

The Light Company has the concession for energy distribution and commercialization in most of Rio de Janeiro State. Until May 1996, when it was privatized, Light was a federal company. In terms of revenues, it was the largest privatization program up to that point. Light also has a concession for transmission and generation, but in the latter case this covers only 17% of total consumption. The other 83% consumed is bought mostly from Furnas and Itaipú, two public companies. Light was sold for the minimum price, US\$2.26 billion, corresponding to 55.8% of the total shares. This was considerably less than the R\$3.1 billion obtained from the October 1997 privatization of two-thirds of CEE, the distribution company in the state of Rio Grande do Sul, which serves one third of Light's consumers.

The privatization of Light is the most controversial in the country, especially because of the general perception that service quality decreased afterwards. Both the duration and frequency of service interruptions increased in the summers of 1997 and 1998 in comparison to past years. Moreover, in certain regions of the city of Rio de Janeiro black-outs are still part of daily life.

The type of privatization contract adopted reflects economic and political priorities of the central government not entirely related to the efficient operation of the market. The privatization of Light was given top priority by the central government, as it was considered of strategic importance for the entire utilities privatization process that one very large company be sold in that year to reduce political opposition and show the government's commitment to the privatization program. Up to that time privatization supporters considered the process too slow

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<sup>2</sup> For a discussion of electrical sector reform see Dussan (1996).

and not in fact guaranteed. After the sale of Light the privatization program was expected to have an easier path: people would understand that the program was for real and the objections from part of the population could also be reduced (or neutralized) once there was a general perception that the program was unavoidable. There was, as a consequence, a manifest propensity to make large concessions in order to sell the company. The problem, however, was that in speeding up the privatization of Light, the government had to sell it with a high degree of uncertainty about the regulatory regime and the future structure of the entire energy sector.

### ***Characteristics of the Contract Arrangements***

#### *Contract Description*

The concession contract is of the Build-Operate-Transfer (BOT) type. Structures and equipment for generation, transmission and distribution were transferred to the new concession holder when the contract was signed and will be transferred, together with any new investment, back to the federal government at the end of the contract. At the time of the Light privatization, generation and transmission operations within the electricity sector were a state monopoly.

The contract was assigned through international competitive bidding (an open auction), and there are termination provisions in the case of bankruptcy or breach of contract by the new owners. The duration of the contract is thirty years, renewable for another thirty years if both parties are interested.

There are no performance targets on output and employment. There are quality clauses but no explicit investment targets, only recommendations in the documents prepared by the government and the consulting firms involved in the privatization process.

Tariffs are to be readjusted annually and there is pass-through of generation costs to consumers. The price readjustment formula takes this into account, discounting it. The Index of Tariff Readjustment (ITR) is given by:

$$ITR = \frac{EP + (AR - EP) * (IGPm \pm x)}{AR}$$

where *EP* stands for energy purchased and *AR* for annual revenue. *IGPm* is a price index and *x* is a productivity index that will only be applied after the eighth year of the contract. Note that if

Light generated all the energy it uses, the *EP* term would be zero and tariff readjustment would follow exactly the price index plus or minus “x,” a productivity factor. The “x” term will only be applied after the seventh readjustment, i.e., in the eighth contract year. Hence, in this initial period the rule is a price cap, since without inflation the tariff will not be readjusted. However, in the following years, the productivity term may be used to mimic a system of rate of return regulation indexed by a price cap.

### *Key Incentive Issues*

There are two points concerning incentives worth mentioning. First, shortly before the auction date it became clear that only one group was interested in buying Light. Consequently, as the government had a strong strategic interest in selling the company, there were intense negotiations regarding the conditions of the contract before the auction. Given its bargaining power, this group obtained concessions such as the withdrawal of some investment targets and public financing of part of the value paid for the company. Not only was there no competition for the market, but these concessions increased the monopoly power of Light. The company was sold for the minimum price and, as a matter of fact, quality targets are very soft. The company has only to maintain the average levels of duration and frequency of service interruptions of the five previous years in every pre-defined sub-region. In those sub-regions where services are below the standards legally defined, Light has three years to achieve these standards (even if the quality is very poor). There are no fines for service interruptions within these limits, which in fact are below the average levels for the Southwest region of Brazil. As will be discussed below, uncertainty regarding the future structure of the energy market and the stability of the Brazilian economy proved the main reasons for lack of interest in buying Light.

A second notable incentive is that for eight years productivity gains will not be transferred to consumers. In the formula above, this means that “x” will be zero for the first seven tariff readjustments. Of course this clause was introduced in the contract to increase the value of Light, but it obviously hurts the public welfare. Note also that there is pass-through of generation costs and indexation of the remaining costs. It all adds up to the guarantee of a high profit margin for the next eight years.

## *Determinants of the Contractual Arrangements*

### *Contractual Objectives*

As stated in Section 1, the privatization of Light was considered of strategic importance for the entire process of privatization of utility companies in the country. The idea was that by selling Light (or any other large company) the government would show commitment to the privatization program and weaken opposition to it. Moreover, the reduction of uncertainties about the continuation of the program in the sector would positively affect the price of companies to be privatized in the future. In our understanding this was the primary objective of Light's privatization contract. There was, as a consequence, an evident propensity to make large concessions in order to sell the company. Such concessions, of course, increased expected profits. These concessions, along with a price rule that basically guarantees high profit margins for eight years, provide evidence that revenue maximization was a secondary but important determinant of the contractual arrangement.

In examining the case of Light in isolation and out of the context of the strategic objectives of the central government, however, it is clear that the process was far from ideal. The first problem is that in speeding up the privatization of Light, the government had to sell the utility at a time when there was still high uncertainty about the regulatory regime and the future organization of the whole energy sector. The law creating the regulatory agency, Aneel (Agência Nacional de Energia Elétrica), and defining its functions was still under discussion in the Congress at the time of Light's auction. In fact, the agency started operations only in December of 1998, seventeen months after Light was sold. Thus, at the time of the auction, nobody had a clear idea of its design, and there was no credible commitment from the government to a type of reform that would provide a stable environment and clear and steady rules for the sector. This degree of uncertainty clearly affected the interest of private companies in the auction, which implied a higher risk premium for the company. To solve this problem, the option chosen by the government was to introduce certain clauses in the concession contract (e.g., the price rule, the reduction of investment targets, etc.) and in the sale process (e.g., some bonds sold at discount in the market were accepted at face value in payment, there was subsidized credit from public banks, etc.) that augmented Light's attractiveness but increased the monopoly power of the company after privatization.

The fact that Light was privatized before the regulatory agency was created can perhaps be explained by a strategic stance of the central government. Their thinking was that the opposition would never vote for the creation of the regulatory agency in the first place, because this would give legitimacy to the privatization process it strongly opposed. This of course would imply delays in the entire program, which the government so dearly wanted to speed up. However, once one or two energy companies were sold, the need for a strong regulatory body would be obvious to the Congress, and particularly for a large group of opposition politicians with an interventionist bias. In other words, the privatization of Light would take too long if it had to wait for the regulatory agency to be created, but once Light was privatized, the regulatory agency would be quickly approved.

A final point to consider is that at the present moment there is a high degree of politicization of quality issues, brought about by last summer's black-outs and service interruptions in the summer of 1998. The association, by some sectors of society,<sup>3</sup> of poor-quality services with the large number of workers laid off increased the degree of politicization of labor. Finally, there has been widespread comment regarding the question of additional investment ordered by Aneel, suggesting in our opinion politicization of investment as well.

### *Market Structure*

Before the privatization of Light, all the transmission and distribution operations and almost all generation operations in the Brazilian energy sector were in public hands. The new design of the energy market is such that competition will be established in the generation sector, which will be entirely privatized. Moreover, free entry will be introduced. The transmission sector, though, will remain a public monopoly; as the government is not interested in transforming a public monopoly into a private monopoly. Finally, competition will be introduced in the distribution sector, at least for large consumers. However, due to the large distances in the country, and consequently the high cost of energy transmission, and the fact that potential competitors of Light in the distribution market are located in other states, it is not certain that competition will be established in reality.

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<sup>3</sup> Unions, politicians on the left and other groups opposing privatization.

For the reasons above, at least in the medium term Light will have a monopoly on energy distribution in its region. However, due to the contractual objectives explained above (mainly, the launching of the privatization program in the utilities sector) two types of clauses were inserted in the contract that increased the monopoly power of Light after privatization.

First, the contracts guarantee price indexation plus pass-through of generation cost to consumers for eight years. Hence, there are no incentives for cost reduction nor for wholesale price bargaining. Moreover, all the productivity gains will be kept by Light during this period. If we consider the price cap rule as an indirect, and more efficient, form of rate of return regulation, the specific rule in the present contract fails to control dead weight loss and to share any benefits of cost reduction with consumers.

Second, the clauses on quality targets are very soft. The company has only to maintain the average levels of duration and frequency of service interruptions of the last five previous years in every sub-region. In those sub-regions where services are below the standards legally defined, it has three years to correct them (even if the quality is very poor). There are no fines for service interruptions within these limits, which in fact, are below the average levels of the Southwest region. Note also that certain investment targets were withdrawn from the original contract proposal in order to enhance the interest of prospective buyers, reducing costs.

These two clauses allow rent transfer to the concessionaire after privatization. As a consequence, the attractiveness of the company increased, offsetting uncertainty about the future design of the sector and about government economic policy .

With soft targets, no strong regulatory regime and no competition at its auction, Light had no incentives to invest in quality and services. Although it did in fact increase investment considerably, its short-run strategy was to reduce costs and energy losses. If one considers that: (i) there is no competition in distribution, given the high price of energy transmission in the country (distances are huge and costs also high) and; (ii) the price cap rule introduced—for eight years no price reduction due to productivity gains will take place—guarantees very high rent for the whole period, one can conclude that the government sold Light almost as a long-term free monopoly.

### *Constraints on Contracting and Regulation*

*Limitation of Instruments.* There are no restrictions on foreign ownership in the sector. In fact, the Light concession was obtained by a group of foreign and national companies, among them Eletricité de France (EDF), AES Coral Reef Inc., Houston Industries Energy, Inc. and Companhia Siderúrgica Nacional (its largest individual consumer). EDS nominated the new CEO and, by the shareholders' agreement, is responsible for Light's operation. However, there was no competition for the market, as this was the only group which presented a proposal. As noted above, there was little interest in the auction, mainly due to uncertainty about the future market structure and economic policy. In fact, in order to stimulate bidders before the auction, some investment targets were removed to reduce future costs for the buyer, increasing the expected rent of the concession.

An interesting point to be analyzed is the government's attitude when problems with the new administration of Light came up. In accordance with the contract, there are limited instruments to force Light to increase efficiency and quality of services. The attitude of Aneel clearly shows this: it fined Light and ordered additional investments, especially in distribution. Moreover, it "suggested" the reinvestment of the entire profit from 1997 that was about to be distributed to stockholders. It is not clear, though if this order is legal and within the concession contract or if Aneel indeed has the power to set investment targets above those contracted. Most probably, Light partially accepted the order because of the fear of political retaliation or more concrete pressure and punitive actions from the central government (for instance, banning EDS from future privatizations).

As noted previously, the type of contract adopted depended heavily on economic and political priorities of the government which are not related to the efficient operation of the market. Moreover, uncertainty about regulatory regime and market structure was high because of the auction timing, so that concessions were introduced in the contract to increase the attractiveness of the company. These problems will likely last for the entire duration of the contract, and consequently, political and economic sanctions will continue to be used as threats against monopolistic action by Light.

*Asymmetry of Information.* Although there is a high degree of observability of output, investment, quality and employment, there is the potential problem of under-investment in technology (or obsolete technology). The company surely has privileged information about these

items and the regulatory agency has very few instruments to control them. Moreover, the composition of investment may also be a difficult problem to regulate. It may be more desirable in terms of the public interest to concentrate investment expenditures in some sectors that are not necessarily the ones that would be more attractive for the firm in terms of profit maximization (e.g., more investment in distribution and less in transmission). Again, there are few instruments in the hands of regulators, and none in the contract, to force Light to invest in a desired direction. As a matter of fact, these asymmetries are only partly dealt in the observed contractual arrangements, as there are no investment targets, only quality targets that are not difficult to reach.

*Contractual Arrangements and Market Characteristics.* The regulatory agency, Aneel, has a high degree of economic and legal independence. For the next three years its revenues are guaranteed in the federal budget. After that a tax on companies in the sector will be levied in order to finance its operation. Its members are appointed by the President, but they have to be confirmed by the Senate, and serve for staggered four-year terms which are not renewable. After the term they will remain for one year on the agency payroll without permission to work for the private sector. The termination provisions for the appointment are those included in the constitution and are related to corruption, mismanagement of funds, incapacity, etc. Otherwise, they have job stability for the entire term. In addition, the judiciary has no oversight of the agency.<sup>4</sup>

The structure adopted for the energy sector in Brazil assumes competition in generation and in distribution. However, as said before, particularly due to the long distances in the country, transmission costs will likely remain high and will work as a barrier to entry in the distribution of energy in regional markets. So local monopoly is likely to persist for a long time. However, one feature of the Brazilian privatization program will help regulators and reduce problems of asymmetric information. There is a limitation in the legislation to the share of the national distribution market a company, or the same group of companies, can hold. This share is 20%. In fact, up to this moment, there is very low concentration, and each state distributor was bought by a different group of companies, with very few exceptions. In São Paulo, Rio Grande

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<sup>4</sup> As said before, when Light was privatized Aneel had not been created (although the concessionaire knew by that time that it would be created in the near future ) so the question of its impact on the observed contractual arrangement is not applicable.

do Sul and Rio de Janeiro, as a matter of fact, the market was or will be split between two or more groups.

This fragmentation of the national market will allow regulators in the future to impose benchmark competition. Given that technologies are similar and so are cost structures, information about, say, Coelba, could be used to impose targets on other, less efficient companies. Even “anomalies” like heat waves that increases demand during summer will in reality affect many different companies in the same way.

Finally, some comments about predictability of costs and demand are in order. Electricity demand depends on, among other factors, income, numbers and type of consumers and stock of equipment and household appliances. It is not difficult to write an econometric model forecasting energy demand using these variables, or a sub-group of them, as independent variables. However, demand also depends on weather conditions, which are difficult to predict. For instance the summer 1999 heat wave in Rio gave rise to an increase in the use of air conditioners and fans, and consequently to the observed rise in electricity consumption. Therefore, there is a medium degree of predictability of future contingencies that affect demand. However, although studies on demand forecast were a pre-condition for participation in the auction, these studies were not incorporated in any form into the concession contract. There are no investment targets in the contract, much less investment targets by sector, and the only instruments that can be used to control the information asymmetries described above are indirect measures such as quality targets.

A large part of the costs in the present case comes from energy purchased from generation companies and wages. These costs are relatively easy to forecast, at least in the short and medium run.<sup>5</sup> The same is true for investment costs, which have gone down in the country recently due to higher competition brought about by openness. However, price instability was a strong factor in the recent history of the country, and a return to the high inflation of the recent past can by no means be ruled out (especially because some of the structural reforms necessary have not been accomplished yet). For those reasons, we think there is a medium degree of predictability of future contingencies that affect costs. As seen above, the formula for tariff

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<sup>5</sup> This may not be entirely true for energy purchase, as it is not clear what the effects on prices will be of liberalization of the wholesale energy market. However, once reform is completed, forecast conditions get better.

readjustment considers pass-through of energy cost, which in a certain sense is a means of defending the concessionaire's profit margin against price shocks and reducing the unpredictability of its operation.

### ***Preliminary Assessment***

Any performance assessment of Light's privatization contract has to take into account the "dynamic" strategy of the government in the privatization of public utilities. In this respect, after the auction of Light in 1995, several energy distribution companies were sold to the private sector at what is considered, in most cases, extremely favorable prices. Since then, competition for such companies has increased considerably as the perception of policy risk declined. Of course, good projection of demand expansion also contributed to the general interest in these companies.

However, the price paid by Light's consumers has been extremely high. Light was sold before an adequate regulatory reform and without a clear design of the future of the whole energy sector. Consequently, the concessions made as a premium for the policy risks created by this situation were high and did not give the right incentives for the new administrators to be efficient or to improve the quality of services. Without the start of the activities of Aneel (which only occurred in December of 1999) and the new design of the sector—promoting competition where possible and unbundling the sector—there was little reason to expect a significant improvement in services. The chaotic situation of services in the city of Rio de Janeiro in the summer of 1999 is the best illustration of this.

We now expect an improvement in the quality of services. Aneel has been extremely aggressive from the start, imposing costly fines (totaling two million dollars) due to the poor quality of services and mandating an ambitious investment program for Light. The company is now under strong political pressure. Popular reaction was very loud and some sectors of the government threatened intervention and called for termination of the contract.

A final and important point is the possibility of unbundling the sector. In fact, it is economically feasible, and it was done in Argentina, Chile, the UK and many other countries. The future design of the sector in Brazil will force vertical unbundling of generation, transmission, distribution and commercialization. Moreover, it will promote competition in

generation and distribution. At the time of writing, competition in the wholesale market is definitely expected to be introduced within a year's time: Furnas, Chesf and several generation companies will soon be privatized, private companies have already obtained concessions to build and operate hydroelectric plants, and energy self-production was approved by Congress last year, along with permission to sell excess output. Another feature of the new structure is that large consumers will be allowed to buy energy from companies other than the local distributor. However, Light was privatized, as already said, before this design was proposed, and the contract did not unbundle generation, distribution and transmission. It is very unlikely, unless both parties agree, that the unbundling of the sector will affect Light's contractual arrangement. The government and the regulatory agency cannot legally impose unilaterally any change in the contract.

Now that the Brazilian privatization program is launched and established and the revenues from Light's auction realized, it is natural to think that the objectives and incentives of the government have changed. In fact, one could almost expect that the government would be willing to recontract once its main objectives were obtained, as welfare maximization was not the top priority of the observed contract. For instance, there are now political pressures for the modification of the price rule which, among other things, is fuelling—or considered to be fuelling—the inflationary process.

### **3 The Case of Coelba (Companhia Elétrica da Bahia)**

#### *Context of the Case*

COELBA distributes electrical energy in the state of Bahia. This state contributes about 5% of the country's GNP (US\$40 billion), and has approximately 13 million inhabitants. COELBA is the sixth company in the country's electrical sector in number of clients, with net assets of R\$930.2 million and annual earnings of around R\$830 million. Coelba was privatized in July 1997.

Before its privatization, Coelba underwent a radical program of financial and administrative reorganization. The number of employees, which totaled seven thousand in 1993, decreased to 4,660 in June 1997, and the number of customers per employer rose to 495 in 1997, compared to 296 in 1993. At the same time, the Brazilian Development Bank (BNDES),

ELETROBRÁS and, to a lesser extent, the state government of Bahia, gave Coelba a capital injection of R\$275 million. This money was used mainly to buy back short-term debt. A large part of these bonds was later transformed into shares, reducing even further the debt burden.

Coelba's privatization took place more than a year after Light's. Therefore, it could be expected that the two utilities' concession contracts would be markedly different, as new information about the Light experience could be used to improve the later contract. The improvements, however, were surprisingly very few. As a matter of fact, the concession contracts of Light and Coelba are basically the same, with some minor adaptations. As was the case for Light, the structure of the sector was not ready and there was no regulatory agency for the sector in August 1997 when Coelba was privatized.

### ***Characteristics of the Contract Arrangements***

#### *Contract Description*

The contract is almost a copy of the concession contract of Light. It is of the Build-Operate-Transfer (BOT) type and the assignment procedure was international competitive bidding. In this case, however, a closed auction was used, as opposed to the open auction used to sell Light. There are termination provisions in the case of bankruptcy or breach of contract by the new owners. The duration of the contract is thirty years, renewable for another thirty years, if there is interest by both parties. There are no performance targets on output and employment, and there are quality clauses but no explicit investment targets.

As in the case of Light, the pricing rule incorporates caps with indexation. Tariffs are readjusted annually and there is pass-through of generation costs to consumers. The price readjustment formula is exactly that used for Light, with the Index of Tariff Readjustment (ITR), given by:

$$ITR = \frac{EP + (AR - EP) * (IGPm \pm x)}{AR}$$

where *EP* stands for energy purchase and *AR* for annual revenue. *IGPm* is a price index and *x* is a productivity index. The only difference is that the "x" term will now be applied after the sixth readjustment, i.e., in the seventh contract year. As in the case of Light, in this first period, before the productivity discount, the rule is a price cap. However, in the following years, the

productivity term may be used to mimic a system of rate of return regulation indexed by a price cap.

The assignment procedure was a closed auction, with heavy competition for the market. Forty-one companies (twelve of them foreign), divided into five groups, submitted proposals. The winning bid, from a group headed up by Iberdrola, was 77% above the minimum price, a record at that time. For this reason, all privatization auctions in the country now follow the closed envelope design. As is well known and soundly modeled,<sup>6</sup> in a closed bid auction contestants tend to bid their reservation prices, while in an open bid auction the winner will pay only the second highest reservation price plus a small premium to force other contestants to abandon the auction.

### *Key Incentive Issues*

The comments about quality targets and price readjustment made in the case of Light also apply to the present case. The former are very soft: Coelba has only to maintain the average levels of duration and frequency of service interruptions of the five previous years in every sub-region. In those sub-regions where services are below the legally defined standards, Coelba has three years (even if the quality is very poor) to achieve these standards. There are no fines for service interruptions within these limits. As for the price adjustment rule, it does not transfer any productivity gains to consumers for a long period. This clause increased the value of Coelba, but it obviously hurts the public interest. Moreover, with pass-through of energy costs there are no incentives to bargain down generation cost.

### *Determinants of the Contractual Arrangements*

#### *Contract Description*

The interesting question here is why Coelba's contract is so similar to the concession contract for Light. Since Coelba was privatized one year after Light, it was natural to expect considerable differences between the contracts. A learning process by Brazilian authorities and regulators could have taken place. Furthermore, the financial and administrative situation of Coelba was far

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<sup>6</sup> See, for instance, Milgrom (1989).

superior to that of Light at the time the latter was privatized. However, the concession contracts are basically the same.

### *Key Incentive Issues*

It seems to us that, as in many other cases in the Brazilian privatization program, maximization of auction revenue was the top priority of the government, and not public welfare considerations or the efficient operation of markets. Privatization of utilities is, of course, an excellent *opportunity to bring cash* to government coffers, which are in general depleted. Moreover, some states have no access to credit due to past mismanagement or high default risk. The use of state government-owned banks to provide easy credit has been prohibited. As current expenses in general exhaust tax revenues, there are very few sources to finance investment. Hence, the contract was written, as was the case for Light, to increase the attractiveness of the company to potential buyers and to maximize Coelba's selling price. This means high dead weight loss, especially from favorable price rules and soft quality and investment targets.

### *Determinants of the Contractual Arrangements*

#### *Contractual Objectives*

It is also interesting to note the role of BNDES in this process. Formally, except in telecommunications, the bank is responsible for the design of the privatization processes of all federal companies. In the case of certain state utility companies, (Coelba, for instance) it acts as technical and legal adviser. Another important role of BNDES is to finance part of the value paid for the privatized company. In these contracts, a subsidized interest rate is used, the TJLP (which stands for long-term interest rate). These favorable conditions of course are reflected in the price paid for the companies. This operation in the end represents a transfer from the bank (i.e., the federal government) to the states, as it causes, through this subsidized loan, a rise in value of the to-be-privatized state company. It can also partly explain the surprisingly high price paid for Coelba and many other state utilities.

#### *Market Structure*

As seen in the previous case, the new design of the energy market is such that competition will be established in the generation sector, which will be entirely privatized. Moreover, free entry will be introduced, though the transmission sector will remain a public monopoly. Finally, competition will be introduced in the distribution sector, at least for large consumers. For the reasons above, at least in the medium term Coelba will have the monopoly on energy distribution in its region.

The price rule in the present case is, as said before, a price cap with price indexation, identical to the rule in Light's contract: it includes an automatic pass-through of generation costs to consumers and annual indexation of the remaining costs. The only improvement here is that it will take only seven years for the productivity index "x" to be applied to price readjustments, instead of eight years. In any case, seven years with pass-through of generation costs and indexation is a long time. The fact that no productivity gains will be transferred to consumers in seven years means that, on the one hand, incentives for efficiency in production are small, and on the other, the rate of return will likely be very high with no regulatory mechanism to reduce it.

As already stated, if we consider price cap rules as an indirect form of rate of return regulation, the specific rule in the present contract fails to control dead weight loss and to share any benefits of cost reduction with consumers. No wonder Iberdrola and its partners were willing to pay so much for Coelba.

In the same fashion, another disadvantageous clause relative to performance quality, also exactly follows Light's concession contract. As explained before, the only obligation in this case is to maintain the average quality level of services (measured by the duration and frequency of interruptions) of the previous five years. For those regions where service quality is below the legal standards, the new administration has three years to correct the situation, with no fines for service interruptions within these limits. Again, there are no incentives, apart from profit maximization of course, for the new management to voluntarily spend on programs or equipment to increase quality of services.

### *Constraints on Contracting and Regulation*

*Limitation of Instruments.* There are no restrictions on foreign ownership in the sector and the Coelba concession was obtained by a consortium of companies under the leadership of the

Spanish firm Iberdrola. There are no legal restrictions on using government funds in the regulation of the services, but it is very unlikely that they will ever be used. There is good accountability of prices in the present case and, in fact, the price rule in the contract as seen before is a price cap with indexation. It is also feasible for the government to have direct control over quality, which is expressed in the contract by quality targets on the duration and frequency of service interruptions.

*Asymmetry of Information.* As seen in the previous case, there is a potential problem of under-investment in technology caused by asymmetry of information, as the company has better information than the regulatory agency, which has few instruments in this case. Again, the composition of investment may also be a difficult problem to regulate; there are few instruments in the hands of regulators, and none in the contract, to force Coelba to invest in a desired direction. These asymmetries are only partly addressed in the observed contractual arrangements, as there are no investment targets, only quality targets that are not difficult to reach. The degree of observability of output, quality and employment, on the other hand, are high.

*Contractual Arrangements and Market Characteristics.* As seen in Light's case, the regulatory agency of the energy sector has a high degree of economic and legal independence. Its members are appointed by the President, but they have to be confirmed by the Senate, and they will serve staggered, non-renewable four-year terms. A tax on companies in the sector will be levied in order to finance its operation. The structure adopted for the energy sector in Brazil assumes competition in generation and in distribution, but due to the long distances in the country local monopolies on distribution are likely to persist for a long time.

The second relevant issue in this section is related to the financial and administrative reorganization of Coelba prior to its privatization, and the impact of that reorganization on the auction result and observed contract. As mentioned, the company reduced the number of employees by one-third from 1993 to 1997. At the same time, capital infusions from federal companies and the state of Bahia allowed Coelba to reduce drastically its short-term debt (by buying back its own bonds) and, consequently, the amount of interest payment. Some of these bonds were later transformed into shares, reducing even further the debt-equity ratio.

The motivation for this reform was twofold, and both reasons were related to increasing the value of Coelba before privatization. First, there was a direct effect on its price because of the cash injection, debt restructuring and staffing reduction, given that demand was rising. Second, this reorganization increased the transparency of the company's financial and administrative situation and also of its technology. This in turn reduced the asymmetry of information, which of course had a positive effect on prices.

Finally, a minor comment is in order. As opposed to Light, and at least up to the present, there has been a low degree of labor protest (most workers were dismissed before privatization), and only a low level of protest involving investment and quality. As the Government of Bahia still holds a minority position in the company, there may be some vested political interest still at play.

#### **4 The Case of Cellular B-Band: State of São Paulo**

##### *Context of the Case*

Up to 1995, the telecommunications market was restricted to public (federal) companies, and private firms were constitutionally prohibited from operating in this market. Under the 1995 constitutional revision, fortunately, this market was opened to competition and, after that, the privatization of the companies operating in this market was approved. In accordance with the telecommunications privatization program, the process would start with the concession of the cellular b-band. The fixed telephony and cellular a-band privatization model would be defined later, as would the concession of wireless local loop exploitation.

Although the constitutional restriction was eliminated, in the state of São Paulo, as in almost all Brazilian states, up to March 1998 cellular service was offered by a single state-owned company. Due to lack of investment funds Telesp, the São Paulo state company, could never satisfy the demand for this service. For instance, the price of a cellular line in the secondary market reached a level of US\$4,000 in 1999. Besides that, the quality of the system never reached international standards.

For these reasons the privatization process had to begin as soon as possible. The chosen route was to keep Telesp in business and to open a second cellular band managed by the private sector. To the government this design seemed superior to simply selling Telesp to private firms. First, the supply of cellular services would increase faster, as there was no need to wait for the

privatization of Telesp. Second, competition after the privatization of Telesp would be guaranteed.

In this case, the government chose to use a combination of regulation and increasing competition strategies. Besides the participation of state companies, competition was established in the national b-band cellular market as a whole through the auction model. The country was divided into the following 10 areas:

Area 1 - São Paulo city;

Area 2 - State of São Paulo, except São Paulo city;

Area 3 - States of Rio de Janeiro and Espírito Santo;

Area 4 - State of Minas Gerais;

Area 5 - States of Paraná and Santa Catarina;

Area 6 - State of Rio Grande do Sul;

Area 7 - States of Goiás, Tocantins, Mato Grosso do Sul, Mato Grosso, Rondônia, Acre and Federal District;

Area 8 - States of Amazonas, Roraima, Amapá, Pará and Maranhão;

Area 9 - States of Bahia and Sergipe;

Area 10 - States of PiauÍ, Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas.

The consortia could participate in the auction of all areas, but each one could only be the concessionaire in two of them. So, although the contestant could submit proposals for all areas, the auctions were structured to eliminate the bid of a consortium that had already won in two areas.

The Area 2 (State of São Paulo) winner, Tess Consortium, was determined only in March 1998. As a matter of fact, the government had established that the name of winning bidder would be announced in July 1997. Nevertheless, due to a court battle between two consortia, Tess and Avantel, the final decision was postponed. This unpleasant situation was not well received by bidding participants, and some of them gave up participating in other area auctions. The final winner of the concession was the Tess Consortium, which paid R\$1.32

billion, 121% more than the minimum price. Besides Tess and Avantel, there were four other bidders for this concession.

***Characteristics of the Contract Arrangement***

*Contract Description*

The auction type was sealed bid. In each area, the winning bidder would be the consortium that offered the highest referential index (RI), with RI defined by:

$$RI = 0.6 \times ((E_p - E_m) / E_m) + 0.4 \times ((T_m - T_p) / T_m)$$

where  $E_p$  is the price offered for the concession, while  $E_m$  is the minimum price established. A bidder offering a price smaller than this is eliminated.  $T_m$  is the maximum tariff allowed. A consortium proposing a maximum tariff greater than  $T_m$  is automatically eliminated. Finally,  $T_p$  is the maximum tariff proposed by the bidder to be paid by consumers.

In accordance with the RI definition, the weighting of the price offered for the concession is 70%, and that of the tariff to be charged represents 30%. The RI value of the auction winner was 0.785390, as was the second-place bid. The contract assignment procedure was international competitive bidding. However, the maximum share allowed to a foreign enterprise in the winning consortium is 49%.

Actually,  $T_p$  represents a group of tariffs. It is composed of, among others, tariffs for the following services: local calls between cellular telephones in the same area; calls in different areas; calls between cellular and regular telephones; for receiving calls; monthly fee, etc. This mix will also be used in the price rule, which is basically a price cap with indexation. This “Referential Bundle” is given by:

$$RB = \frac{SIG}{36} + MF + \sum_{i=1}^6 m_i T_i$$

where SIG is initial service subscription, MF the monthly fee,  $T_i$  the type  $i$  tariff and  $m_i$  the weighting (minutes) of this tariff. The RF value of the auction winner was R\$62.24. Note that

these tariffs are also the maximum tariff to be charged, but the bidder may charge less if it chooses.<sup>7</sup> The readjustment rule for the Referential Bundle is simply

$$RF_{t+1} = RF_t \times (1 + VIGP-DI)$$

where VIGPM-Di is the annual variation of the general index of prices (IGP-DI) calculated by the Fundação Getulio Vargas. However, as long as the total variation of RF is not above that calculated by this formula, some items in the bundle may vary up to 20% more than the RF (which will have to be offset by some items increasing less than 20% or even decreasing).

There are performance targets on investment. The cities in the State of São Paulo were divided into five categories, in decreasing order of population. In the first five years, the minimum level of lines installed has to be such that it satisfies, at least: (i) in the first year, 100% of the demand of cities with more than 200 thousand inhabitants; (ii) in the second year, 100% of the demand of cities with more than 100 thousand and less than 200 thousand people; (iii) in the third year, 90% of the demand of cities with more than 75 thousand and less than 100 thousand people; (iv) in the fourth year, 80% of the demand of cities with more than 50 thousand and less than 75 thousand people and; (v) in the fifth year, 70% of the demand of cities with more than 30 thousand and less than 50 thousand inhabitants.

Performance targets on quality also exist, and all participants had to describe the quality to which they were willing to commit. As a matter of fact, a high quality level was a necessary condition for the contestant not to be eliminated from the auction. However, some of the quality standards were pre-set. For instance, in the first year of the contract the concessionaire would have at most 180 days to supply a new line requested by a customer, but only five days after the fifth year. The delay to obtain the dial tone has to be less than three seconds in 90% of the cases, and no more than five complaints per 100 customers are allowed. There were also numerous minimum technical standards that had to be part of any bidder's project.

The duration of the contract is 15 years, renewable for up to 15 additional years. In principle, if one of the targets is not reached Anatel can impose various forms of punishment that go from formal reprimand to termination of the concession. The dispute settlement procedure is

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<sup>7</sup> This bundle of tariffs refers to the basic plan, but the concessionaire may offer different plans for different types of consumers, as long as it also offers the basic plan.

regulatory agency discretion and court settlement. Anatel regulates the market, and the judiciary is the final judge.

### *Key Incentive Issues*

As in the case of Light and Coelba, b-band privatization was also considered an excellent opportunity to fund the government treasury. Certain stipulations of the auction, such as the guarantee of duopoly for a period of time, indicate a preference for revenue over competition in the market. As a matter of fact, the federal government was expecting to receive approximately US\$100 billion from privatization of the Brazilian telecommunication sector (but total revenues fell far short of that). The price offered by the consortia for the concession took into account the period of time they would operate under this condition. Due to the nine-month delay in the outcome, the expected returns from the concession decreased. Hence, some firms withdrew to compete in other b-band cellular concession areas. Still, the final price paid was not only high but also well above forecasts.

Note, however, that the b-band concessionaire will have competition in place from the first moment of operation. Therefore, it is possible that some clauses in the contract, such as pricing rules, be non-binding. This is so because price competition most probably will force concessionaires of both bands to decrease tariffs, monthly fees and subscription fees. The same will happen with respect to quality, as customers may favor the company that offers services with less interruption, easier dial tone access, wider coverage area, and other features. However, investment targets such as minimum number of lines in small cities, because of their high cost and low demand, were probably made binding in the expectation that Anatel would have to closely follow and enforce them. Even for larger cities, due to liquidity constraints and costly loans, the optimal strategy for the firms may be to delay investments and consequently the supply of lines and services. Note that the a-band concessionaire of São Paulo city was fined in the beginning of 1999 precisely because it was taking longer than contracted to supply new lines.

### *Determinants of the Contractual Arrangements*

#### *Contractual Objectives*

As mentioned above, up to 1995 there was a constitutional restriction on private participation in the telecommunication market. As a consequence, the technology adopted by telecommunication firms was obsolete, and there was pent-up demand due to under-investment. For this reason, the government tried to start the privatization process too quickly, and consequently some mistakes were made. However, it is important to state that those mistakes were never as big as—nor even close to—those observed in the case of Light.

In our understanding, the main problem in the privatization of the b-band cellular sector was the lack of definition of overall privatization arrangements in the entire telecommunication sector. The competitors did not know the privatization model, for example, of São Paulo State fixed telephony. On the other hand, the government tried to establish some kind of competition in the sector. As mentioned before, the government planned to create a duopoly, with the State of São Paulo b-band concessionaire and Telesp. Hence, efficiency of the system is of medium importance for the government.

As a matter of fact, the main reason for the government to start the privatization process so quickly was the need to finance part of the fiscal deficit. As already said, the government was expecting to obtain approximately US\$100 billion from the privatization of the telecommunication sector. Moreover, the government thought that the telecom sector had the highest revenue potential among of sectors to be privatized. Hence, the primary objective in the present case is revenue maximization.

Secondary objectives were quality improvement and investment increases. An interesting characteristic of the Brazilian cellular service market is pent-up demand. As we have already mentioned, up to 1997 the cellular services were provided by the public sector and the Brazilian government generally under-invested in the infrastructure sector, including telecommunications. As a consequence, the quality of service was extremely poor and the supply of lines well below demand. As already said, the scarcity of lines was revealed by the high prices of cellular lines in the secondary market. Moreover, the number of interruptions and incomplete calls was well above international standards.

Due to the current level of service quality, as well as low output and expenditures, one may conclude that, at least from the political point of view, the concessionaire does not face a

hard task. As a matter of fact, the situation is so drastic that the necessary investments to improve quality and output in the sector may be relatively small.

Finally, the concession of São Paulo b-band cellular service took place when the privatization process was relatively consolidated in the country, as opposed, for instance, to the case of Light. As we have already mentioned, Light was the first large company to be privatized in the Brazilian infrastructure sector, so that many compromises had to be made in order to increase its attractiveness to investors and to reduce political opposition.

The process of privatization of the telecommunication sector, on the other hand, is taking place without so many political constraints and in a less risky environment. Consequently, few compromises had to be made. This is a very important point. Besides revenue objectives, privatization of telecommunication services had the clear objective of improving the quality of services and extending service to a larger number of users at lower prices. The various quality and technical clauses in the contract can be understood in that context, as well as the investment targets. The price rule, as in all privatization contracts, was included to avoid non-competitive pricing behavior, or even collusion, but reality is showing that competition in the market will be strong. On the other hand, the concession time (fifteen years, renewable for another fifteen), as it is relatively long, was set perhaps set with the aim of maximizing auction revenue.

### *Market Structure*

It is economically feasible to unbundle the sector. The State of São Paulo includes a large number of cities, and each one of them could represent a market; the State of São Paulo cellular b-band market could thus be unbundled into several markets. However, if the sector were unbundled, a regulatory problem would arise, since the regulatory agency would have to price interconnected communications among too many different cities. Therefore, Anatel's market interference would increase, as it would have to define intrastate access charges. As a matter of fact, access charges are one of the most difficult regulatory problems. Laffont, Rey and Tirole (1998) discuss the problems associated with access charges, and a large part of the concession contract, following international standards, is dedicated to them.

There are close substitutes for the service. Telecommunications services are facing fast and intense technological innovation. In the near future, new technologies can be created, rendering old ones obsolete. So, enterprises that operate in this sector should be ready to invest

in new technologies. At present, fixed telephony and wireless local loop are two close substitutes for cellular services. In the State of São Paulo there is only one company offering fixed telephony services, Telesp, and no one is offering wireless local loop yet. The rules for wireless local loop exploitation have not yet been defined.

In other words, if one wants to understand the degree of competitiveness of the State of São Paulo cellular service market, it is also important to understand federal government intentions in fixed telephony and wireless local loop markets. Telesp will probably be privatized in 2001 ,but there has been no definition regarding regulation in fixed telephony at the time of the b-band auction, and so far no regulation of wireless local loop markets.

Once the rules of exploitation of telecommunication services are well defined, one may expect one fixed telephony provider, one wireless local loop provider, and at least two cellular phone companies operating in the medium run. In the long run, cellular services will be completely open to competition and any company that wish to enter the market will be allowed. All in all, it seems that the market will be highly competitive in the future and regulation less necessary. However, due to the uncertainties associated with the way these substitute markets will be structured, it is difficult to predict the real importance of the regulation. At the time of the auction, the prospect of competition was not obvious and many uncertainties remained, so that many clauses that possibly will not be relevant in the future were included in the contract, the pricing rule being the best example.

#### *Constraints on Contracting and Regulation*

*Limitation of Instruments.* Price accountability is good since it is very easy to verify the price charged by the concessionaire. It is not feasible for the government to have direct control over output if we understand product as the number of calls or total time of calls in a given period, although it is not difficult for the government to verify how many people receive or use the service. On the other hand, it would be relatively difficult for the government to verify investment if the target was measured in money units. Nevertheless, it can easily verify the level of investments through number of lines installed. It is no accident that the investment targets in the contract are of this type, avoiding the limitations of controlling the amount invested. It is also feasible for the government to have direct control over employment and quality. With

respect to quality, as already said, in the proposal the concessionaire had to specify the equipment to be utilized and the contract includes several quality clauses. One can conclude that the regulatory agency has instruments to regulate the sector. There are no legal restrictions on using government transfers to any sector.

*Asymmetry of Information.* The asymmetric information problem arises from the speed of technological innovation. When innovations are coming up it is difficult for the regulatory agency to evaluate in detail the concessionaire cost function and, consequently, it is also difficult to define a regulatory structure for the cellular service. In other words, the regulatory agency needs time to learn the supply and demand curve, and if the supply curve is often changing, the regulatory agency does not feel comfortable ruling in this market. Moreover, as we have already mentioned, Brazilian cellular service technology is obsolete. For this reason, at least in the near future, the supply curve will change considerably.<sup>8</sup> However, given the prospect of competition in the market, this problem may not be too serious. And, as already said, the price rule is conservative and limits the maximum prices charged to the (indexed) prices set in the contract.

As for the investment targets, the contract does include clauses that can indirectly diminish, if not solve, the problem. For instance, limits on the number of defects or complaints per line is an incentive for technological upgrade. At least up to this moment, most of Anatel's regulatory activity has concentrated on investment targets such as lines offered and quality standards, which are directly observable, but also are a clever way to avoid problems with asymmetry of information.

*Contractual Arrangements and Market Characteristics.* The degree of predictability of future contingencies that affect demand is high. Presently there is excess demand. Hence, at least for the next few years the concessionaire will try to meet that demand, and, at this time, future contingencies affecting demand do not appear to be an issue. On the other hand, the degree of predictability of future contingencies that affect costs is low. There are two points that have to be emphasized here. First, as we mentioned before, this sector is experiencing fast technological innovation. Any company that decides to engage in this market has to be prepared for unpredictable factors that affect costs. Second, in particular characteristic of the Brazilian case,

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<sup>8</sup> See Laffont and Tirole (1993) for a discussion of regulation with asymmetric information.

the economy is not yet completely stabilized yet (e.g., the fiscal deficit is extremely high). Therefore, it is not so easy to predict future costs.

It is, however, possible to write detailed contracts on investment, if we consider this as the number of people served. As a matter of fact, the present contract specifies minimum levels of investment. It is nonetheless difficult to predict future technology trends in the sector, so it is not possible to write a very detailed contract in this respect. The same applies to quality. Although the proposal and the contract defined quality standards, it is difficult to assure they will be considered adequate ten years from now.

As already said, it is difficult to observe output in the sector, when output is associated with traffic, i.e., number of calls. For that reason it is impossible to write contracts on output and this was translated to the observed contractual arrangement by simply not including clauses on output, but instead on investment, quality, types of services offered and technical aspects such as interconnection and type of equipment.

Finally, due to technological innovation, it is difficult to specify in the contract the number and allocation of employees. Nonetheless, it is possible to insert into the agreement the total number of workers that the concessionaire must have on the payroll. Of course, this can represent losses to the firm in near future. Note, however, that in the proposal the bidders were supposed to present a “human resources” plan, defining functions, number of employees per function, qualification, training programs, and other features. The plan can be changed after concession.

The regulatory agency Anatel was created by Law No. 9,472 of July 16, 1997, and its attributes were defined by Executive Decree No. 2,338 of October 7, 1997. In accordance with Article 1.1 of the executive decree, the agency will have administrative independence and financial autonomy, with no hierarchical subordination; the directors serve five-year non-renewable terms, and the agency’s employees are tenured civil servants. The five members of the regulatory board are appointed by the executive and have to be approved by the Federal Senate. The only termination provision for the appointment is if a member is convicted of a crime. Due to asymmetric information, many times it will be difficult to regulate matters such as output, investment, quality and employment. But, in accordance with the legislation, Anatel can do so.

Although expropriation caused by political or institutional conditions is not a serious possibility, there are clauses in the contract that imply its termination before the contracted date. The motives are all related to economic factors, such as bankruptcy of the concessionaire or quality of services. In that case, investment costs and that part of the concession payment not yet amortized will be refunded.

As previously noted, the Brazilian government does not have a good history of honoring contracts. However, politicians' behavior is changing and they are nowadays much more conscious about the importance of honoring contracts, specifically in this sector, due to the future privatization of several telecommunication service companies such as radio broadcast and cable television. Hence, we believe that the government has a special interest in creating a very good reputation here. Nonetheless, there were legal challenges in defining the winning bidder. Although in principle it did not affect the government's overall reputation for honoring contracts, it impaired the reputation of the program.

There are foreign ownership restrictions in the sector. First, as already mentioned, a foreign firm cannot have more than 49% of this concession, although this rule will cease to be in effect after 5 years. Second, the rules of Telesp privatization also restrict foreign participation in the Telesp privatization process. These clauses were concessions to or victories for the nationalistic sectors of the government (one must remember that in the recent past telecommunications were a public monopoly), and it might have affected the final price of the concession. It is difficult to evaluate if this was in fact the case, given the large number of bidders and the high price obtained.

### ***Preliminary Assessment***

Politically, the success of the telecommunication privatization process has been very important. As the privatization program is a focus of the current Brazilian government, the opponents of the program would use any failure of the process in such an important sector to weaken the government stance. As a matter of fact, problems in the telecommunication privatization process could have impaired the entire privatization program. Hence, it is not surprising that the federal government used intense marketing and media advertising to convince the populace of the of the program's importance.

The São Paulo State cellular services privatization has just finished. However, due to the low quality of services, we have no doubt that the improvement of the services will come soon. In Rio de Janeiro, for instance, where the b-band concession started operations in January, prices have been falling since, and many new services are being introduced almost every month. The subscription price is a fraction of what it used to be, and waiting time for a new line is now very short.

Due to technological innovations, Anatel will always face asymmetry of information problems related to the cost function. For this reason, the determination that each consortium can operate in at most two of the ten areas may represent a benchmark regulation. In the near future, we expect that the federal government will take the most competitive company as the benchmark and will define the price cap in all other areas as a function of the prices in the benchmark area. It is difficult to imagine any other instrument the federal government will have in order to reduce information asymmetry.

## **5 The Case of Presidente Dutra Highway (“Rio-São Paulo” Highway)**

### *Context of the Case*

The Presidente Dutra Highway links the two largest cities of Brazil, Rio de Janeiro and São Paulo. It is 406 kilometers long and is the busiest in the country: on average 200 thousand vehicles use it (or part of it) every day. Almost all transportation of goods between the two cities is done over this road, as railroad service in this case is almost exclusively for tourism. The highway is heavily used as a local road by the population of neighboring cities such as Duque de Caxias and Nova Iguaçu, in Rio de Janeiro State, and Guarulhos, Jacareí and São José dos Campos, in São Paulo State.

From the end of the 1980s until privatization, expenditures on maintenance and investments dropped continuously. As a result, road conditions were extremely poor, with serious pavement problems and general worsening of services. Consequently, safety deteriorated as well, as the number of accidents increased almost 20% between 1993 and 1995. Travel time and mechanical problems caused by poor maintenance also increased. The highway was included in the federal government privatization program in 1993, was auctioned in 1995 and transferred to private hands in February 1996. The main reason for its privatization was the lack of funding for adequate maintenance and necessary investments. As a matter of fact, public investment in infrastructure, especially in transportation, has fallen continuously all over the country since the mid-1980s. Hence, investment and quality were the primary objectives for the government.

### *Characteristics of the Contract Arrangements*

#### *Contract Description*

The concession contract is of the B.O.T. type. All the assets, and those acquired or constructed during the concession term, will be automatically transferred, without charge, to the central government at the end of the contract. More specifically, assets will be transferred to the agency in charge of operating and monitoring federal roads (DNER, Departamento Nacional de Estrada de Rodagem). However, certain investments not yet amortized or depreciated by that time will be reimbursed by the DNER if, in order to guarantee the quality of services in the last years of

concession, these expenses were formally authorized by DNER. The duration of the contract is twenty-five years, non-renewable.

The contract assignment was by an international bid tender under which the lowest proposed toll would win the concession. However, the toll proposal was the last phase of the assignment procedure. Preceding it were intermediate stages when firms had to demonstrate experience and expertise in highway construction, financial soundness, fulfill minimum capital requirements, present engineering projects, and meet other standards.<sup>9</sup>

There are termination provisions in the contract and two stages for private dispute arbitration: a team of experts and a settlement tribunal. The contract has performance targets only in investment and quality.

Finally, pricing rules follow a price cap with price indexation (there are no guarantees on rate of return). Toll prices are readjusted annually according to a formula which is a weighted average of four price indexes related to the sector (e.g., price index for pavement services, price index for bridges, overpasses and the like, etc.). However, the contract includes special clauses for price readjustment before the due date to ensure the economic and financial equilibrium of the franchise holder if there is any change in its obligations, such as tax increases. These special clauses provide grounds for possible opportunistic behavior in the future, but the contract leaves it up to DNER to decide whether it applies in each specific situation.

### *Key Incentive Issues*

The price cap rule adopted, and the possibility of renegotiating toll prices, may imply excessive or monopoly rents. The price indexation rule does not assume any productivity factor (the “x” in the Light indexation rule), but simply readjusts annually toll prices by the past inflation of sector prices. Hence, all the productivity gains will be kept by NovaDutra (the auction winner), increasing its profit margin, and there is no legal mechanism for decreasing this rate of return in the long run. Given the very low competition in the market, this situation is likely to persist for the duration of the contract. This could have been solved by increasing the competitiveness of the auction. However, minimum capital requirements, large rehabilitation investments in the first year and sunk cost issues specific to the sector, which favored Brazilian firms (for instance, a

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<sup>9</sup> For a discussion of highway auctions see Engel, Fischer and Galetovic (1996) and Tirole (1997).

foreign firm would have had to acquire a large number of expensive machines which local firms already own) prevented the auction from being perfectly competitive.

Regarding renegotiating and price readjustment before the due date, a recent example may be illustrative. Investments needed for safety and security have been considerably higher than those contained in the contract, as the number of fatalities did not decrease after road conditions improved. Several extra overpasses are being constructed in urban areas, and many kilometers of chain-link fences and barriers to avoid pedestrian crossing were also installed. The extra investments were compensated by an increase of 6.5% in toll prices in January 1997.

Termination provisions in the contract are similar to those in most infrastructure concession contracts. Termination could occur if, among other reasons, the concessionaire goes bankrupt, is convicted of tax evasion, stops services without cause, provides services below quality standards set in the contract, or does not correct service problems after being legally notified by DNER.

The two stages of private arbitration for dispute settlement are such that in the first one, a team of experts, appointed beforehand by mutual agreement between DNER and the concession company, is called by any of the parties. If either of the parties does not agree with the decision, it can take the problem within thirty days to a settlement tribunal also composed of three members (DNER and NovaDutra nominating one each, with the third nominated by common agreement of the other two members). This tribunal's decision may or may not be accepted by the parties. In this case they can take the case to the civil courts. This system was created exactly to avoid or increase the cost of court settlement, as there are two long stages of private negotiation beforehand. Moreover, a clear or unanimous decision in the first stage may be taken as a signal of a court decision, reducing the incentives for lawsuits.

As for investment targets, over the twenty-five-year concession there is to be an estimated US\$720 million of expenditures. This includes US\$114 million on emergency investments in the first year, construction of 30 km of frontage roads in urban areas, reinforcement of 284 bridges and viaducts, construction of one extra lane by the year of 2010 in the Serra das Araras, and repavement of all lanes, among other obligations. Quality targets include minimum standards for asphalt condition (both for the highway lanes and shoulders) and time for pothole correction after detection. There are daily fines if these standards are not met.

## *Determinants of the Contractual Arrangements*

### *Contractual Objectives*

Since the beginning of the 1990s, the Brazilian government has neglected maintenance of highways under public operation because of serious budget problems. For the same reason, construction of new roads and reconstruction of old ones were virtually halted. By 1995, the DNER estimated that at annual expenditures of at least one and a half billion dollars would be necessary for the next ten years, for maintenance and reconstruction of highways. However, in that same year only 200 million dollars were spent on this, and only 1,000 km of roads were refurbished.

As a consequence of decreasing public investment, traffic conditions became extremely poor, with an increase in accidents and travel time. Only 38% of the federal roads (paved) were in good or excellent condition at that time, and conditions on the Dutra were particularly bad, with serious pavement problems and general worsening of services. Safety deteriorated as well: the number of accidents increased almost 20% between 1993 and 1995.

Against this backdrop, the federal government decided to privatize, by the year 2000, at least 10,000 km of federal highways and to transfer a similar extension of roads to the states and municipalities. In the latter case, reconstruction was financed by resources obtained from multilateral organizations. The privatization of the “Rodovia Presidente Dutra” is in the first phase (together with the privatization of the Rio-Niterói Bridge and the Rio-Juiz de Fora Highway, among others) of this process, and it was chosen because of its importance to truck transport and its poor condition. Investment and quality were the primary objectives for the government: the contract includes various quality targets and ambitious spending targets such as the construction of additional lanes, some of them quite long, in several regions.

### *Market Structure.*

The President Dutra has the monopoly for highway transportation from Rio to São Paulo, and rail is not a serious option for passenger and cargo transportation. Given that air shuttle prices, though falling, are among the highest in the world (due to cartelization practices) there are no close substitutes for travel or transportation between the two cities. However, there is competition in certain regions from state and local roads. The recently extended Rodovia dos

Trabalhadores, a state road, linking São Paulo to Taubaté (100 km long) is maybe the most important case, as it is almost parallel to the Dutra. As this is also a toll road, in this instance quality rather than price competition is at issue. The traffic conditions and maintenance of the Rodovia dos Trabalhadores used to be much better than the Dutra before its privatization. The difference, while now smaller, still exists, so that a large part of the traffic is deviated to the competing road.

There was relatively strong competition in the bidding. Nine groups were approved in the technical and financial stages of the process. Of those, four presented tariffs proposals, which was the last stage. However, there are three factors that prevent monopoly rents from being completely eliminated by the auction. First, the large sunk cost involved in the operation of road concessions, which require high reconstruction outlays, might have given an advantage to local firms, thus reducing competition. Second, there were some mild restrictions on foreign participation. A foreign company could not enter alone in the bidding process, but only as a member of a group which included Brazilian firms. In this case, the group leader had to be a Brazilian company. Third, the winner might have underbid tariffs because of the possibility of renegotiating prices in the future.

The contract addressed the lack of competition ex-post facto, not only through the price rule, but also by safeguards such as the possibility of contract extinction (through rescission, annulment or expropriation of services), intervention for limited periods and fines. Those sanctions are to be applied depending on the gravity of the breach of the provisions of the contract provisions. Intervention, for instance, may occur to ensure proper service or compliance with legal, regulatory and contractual standards.

### *Constraints on Contracting and Regulation*

*Limitation of Instruments.* In general there are no public guarantees in privatization contracts in Brazil, and the present case is no exception. Price accountability is good since it is very easy to verify the price charged by the concessionaire. It is not feasible for the government to have direct control over output if we understand product as the number of vehicles that used the road in a given period, although it is not difficult for the government to verify statically the volume of traffic. On the other hand, it would be relatively difficult for the government to verify investment

if the target was measured in money units. Nevertheless, it can easily verify the level of investments through lanes or bridges constructed. It is no accident that the investment targets in the contract are of this type, avoiding the limitations of controlling the amount invested. It is also feasible for the government to have direct control over employment and quality.

*Asymmetry of Information.* Another potential restriction to regulation in the current case is the presence of asymmetric information with respect to the technology employed and, consequently, regarding investment and operational costs of NovaDutra. The renegotiation of tariffs explained above is an excellent example. The increase in toll prices was justified as needed to finance additional investments in safety. However, there is no guarantee that the approved price increase is not above that necessary to compensate these additional investments. NovaDutra surely knows its cost structure better than the engineers of DNER, and the negotiation relied partially on information supplied by NovaDutra. The contract includes several quality clauses and investment targets, with severe fines for non-compliance. This may be seen as an implication in the contractual arrangement of the presence of asymmetric information, although the problem is not completely resolved.

*Contractual Arrangements and Market Characteristics.* No designated regulatory agency oversees federal roads in Brazil. In the present case, the DNER (Departamento Nacional de Estradas de Rodagem) is simply the monitor of the contract, as well as the grantor of the concession. The DNER is also responsible for the construction, maintenance and operation of all federal roads not in private hands, and it previously operated the President Dutra Highway. As an agency subordinated to the Ministry of Transport, DNER's directors are appointed by the President for an undefined term (any director can be removed by presidential or ministerial order). Hence, it is obviously not legally independent, since its activities are subordinated to and overseen by the executive branch. Its budget is included in the federal government general budget, approved by Congress. However, in the case of the President Dutra Highway, it receives as part of the privatization contract a monthly fee from the NovaDutra Company for its regulatory activities related to this road. In the present case, the DNER will oversee contract stipulations including investments, quality and operation, as well as the financial situation of NovaDutra.

Being only the monitor of this specific contract and not a national regulator of road transport, DNER cannot rule on output, employment, investments and quality, if we understand “rule on” as going beyond targets contained in the contract. This is only possible if financial compensations are added. This is of course a serious restriction to its activity, as the price rule in the contract includes no element for transferring productivity gains to consumers. An independent regulatory agency with broader authority might have a mechanism to reduce the rate of return of NovaDutra, but DNER is bound by the concession contract, a fact apparently not taken into consideration in the contract.

The role played by DNER in this case is similar to the one played by CDRJ in the case of Porto de Sepetiba. Although its role is well defined, it is inappropriate. DNER was established for the administration and construction of roads, or to oversee construction by private companies, and has no expertise in regulation. As in the port sector, even its role as grantor of the concession could be transferred to the federal government. However, due to the monopoly structure of the market, a *de facto* regulatory agency would have to be established in this case, which would imply additional costs and political negotiation, as well as reduced political power for DNER. Given this, even today positions in this agency are highly coveted by politicians due to its visibility and command of local and regional works (e.g., small bridges and side roads, etc). The solution chosen by DNER thus might have represented the path of least resistance.

The lack of adequate regulatory reform in this sector does imply some policy risk. Demand risk implied by a fixed-term contract (as opposed to *least-present-value-of-revenues* contracts) is also present in this case, but given that the President Dutra Highway is a monopoly with no close substitute, variables such as population in Rio, São Paulo, nearby cities and cities along the highway, and regional income may help to forecast future demand. In any case, favorable clauses on price readjustment and price renegotiation to some extent compensate these risks.

### ***Preliminary Assessment***

Judging the contract performance from the perspective of the government, there is no question of its success. Due to emergency reconstruction and good maintenance by NovaDutra, safety and traffic conditions have improved considerably. Travel time, for example, has been reduced.

Furthermore, the central government has saved a considerable amount of resources. In the first year of operation the new administration spent 260 million dollars on improvements and operation. Moreover, the privatization of President Dutra Highway shows that it is possible to write detailed concession contracts on investment and quality, and more importantly, enforce them. The contract says no pot holes and one cannot find any in the Dutra Highway.

Two points, however, already stressed that may in the future hurt the control of the monopoly power. First, the rule of price readjustment is too rigid and does not contemplate any sharing with users of productivity gains. The lack of an adequate regulatory agency will not help to solve this problem, either. In this case there is no mechanism to reduce the rate of return of NovaDutra. The second problem is a certain propensity on the part of the government to renegotiate the terms of the contract, as in the case of the toll price increase in January of 1997, to finance extra spending on safety. We doubt that any renegotiation to reduce toll prices—say, motivated by an unexpected increase in demand—would succeed or even be started. However, at this point it is too early to take a stand on whether the renegotiations and price increases are out of line with the benefits accrued from the quality improvements. Our feeling is that they are not, but this is only an educated guess. Of course, it is hard to assess the project as a success with some evidence of over-price: It is relatively easier for a concession to improve quality if the monopoly rents are large. Once again, at this point it is relatively hard to take a stand in this case, especially because there is no close substitute and a decrease in demand was not observed.

## **6 The Case of Port of Sepetiba (Coal Terminal)**

### *Context of the Case*

Besides political constraints, one of the main factors that prevented the federal government from beginning to privatize ports was the opposition of labor unions, specifically, the Longshoreman's Union. Over several decades, due to its political influence, this union had an important role in the definition of Brazilian port sector policy. For most of this period it used its power to raise salaries, increase labor and social rights and, when the pressure to privatize arose, to deter the process. Nevertheless, in 1995, the pressure to grant port concessions to the private sector reached a peak, and the union had to abandon its resistance to that privatization model.

The coal terminal at Sepetiba in the state of Rio de Janeiro was one of the first to be privatized. Before privatization it was administered and exploited by the Companhia Docas do Rio de Janeiro (CDRJ). It will probably have four terminals in the future, but currently only one, the coal terminal, is in operation. Due to the urgent necessity for investments in rehabilitation and in inform technology, the Federal Government decided to privatize it. The port of Sepetiba is integrated with the MRS Logística railroad line, a railway network also privatized by the federal government.<sup>10</sup>

Before the privatization, due to under-investment, the port of Sepetiba was facing serious operational problems. Some important equipment and machines were broken, and CDRJ was not able to afford replacements. Hence, at that time it was fundamental to grant an operating concession to private enterprise.

In June 1997 Companhia Siderúrgica Nacional (CSN), Brazil's largest steel mill, was granted the port concession after winning the privatization auction. CSN was the main customer of the coal terminal at the port, and even before it was privatized all coal imported by CSN was unloaded there.

### ***Characteristics of the Contract Arrangements***

#### *Contract Description*

Although by the contract the concessionaire will have to buy new equipment, the investments entail primarily rehabilitation rather than new construction. Hence, we can consider the type of contract as rehabilitate-operate-transfer (ROT).

The auction was by sealed bid. The winning bidder was Companhia Siderúrgica Nacional (CSN), which was the firm that offered the biggest referential value (RV), with RV defined as:

$$RV = NPV \cdot (R\$6.40 / P_i),$$

where NPV is the net present value, R\$6.40 is the greatest “maximum price” to be established by bidders to sell the port services and  $P_i$  is the “maximum price” at which bidder is willing to sell the port services.

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<sup>10</sup> The MRS Logística railroad network is one of the main corridors for freight transportation from the city of Belo Horizonte. It passes through the port of Sepetiba and goes all the way to the port of Santos (the largest in Brazil).

The legal nature is a civil contract. The Companhia Docas do Rio de Janeiro (CDRJ) was responsible for the administration and exploitation of the Port of Sepetiba. The concession agreement was settled between CSN and CDRJ. Another function of CDRJ is to monitor the contract.

The contract assignment procedure was international competitive bidding. Additionally, if there were two firms/consortia with the same offer, the winner would be the domestic bidder.

The are performance targets on output: the minimum coal unloaded in the terminal is 3,000,000 metric tons. The investment targets state that the concessionaire has to: (i) rehabilitate the port infrastructure; (ii) buy new equipment, and; (iii) install a computer system to operate the terminal. As for quality targets, the contract states that the service has to be provided with quality, but does not explain what this means. There are no employment targets.

The duration of the contract is twenty-five years, renewable for a further twenty-five years. There are basically two termination provisions: (i) if CSN does not invest as much as established in the contract, or (ii) if service quality is not up to par.

The dispute settlement procedure is a sequence of private negotiation, domestic arbitration and court settlement. If there is a dispute, the sequence is the following: first of all, CSN and CDRJ try to negotiate privately. If the private negotiation does not work, they have to submit the problem to arbitration (“Processo Amigável de Solução de Divergências Contratuais”). If the domestic arbitration does not work, the dispute can be taken to court. There is no regulatory agency in this sector.

Price cap and price indexation are the pricing rules. Price cap is indexed annually through the IGP-m (General Market Price Index).

### *Key Incentive Issues*

The main fact with respect to incentive issues is that there is a monopsony in the Sepetiba Coal Terminal. CSN is not only the main buyer but is practically the sole one. This of course had serious implications in the auction process. First, it scared away possible bidders, as they were not in a secure position in the negotiations with CSN, which could, among other options, start to use other ports such as Santos or Rio de Janeiro. Second, with CSN expected to be the only

bidder, the minimum price became very relevant. It had to be very close to CSN's reservation price.

As CSN is the main buyer of port of Sepetiba coal terminal services as well as the new concessionaire, it can rehabilitate and invest in the terminal as it sees fit. This also means that it may favor its own operations at the expense of other customers or potential customers.

Finally, the options at that time were quite restricted. If the observed trend had continued much longer, the terminal most probably would have had to shut down. On the other hand, there was an obvious candidate to assume operations, given that it would be the one most hurt by the potential termination of Sepetiba Coal terminal operations.

### ***Determinants of the Contractual Arrangements***

#### *Contractual Objectives*

Due to lack of investment, many pieces of equipment and machinery had broken down, and the government did not rehabilitate them. So the terminal operation was at risk and at any time coal transported by CSN might not be unloaded. Consequently, the government, under CSN pressure, finally decided to privatize the coal terminal. As one can see, there were neither efficiency considerations in the government decision to privatize it nor political objectives in speeding up the contracting process.

As a matter of fact, financial objectives overrode economic efficiency. As we have already described in the first section, the government had not been investing in the entire infrastructure sector. The lack of investments did not leave many alternatives for the sectors to survive. In the specific case of Sepetiba, there was only one alternative, privatization, to finance the investment needed for rehabilitation. Hence in that specific case, maximization of revenues was not the main reason for the auction. Instead, the modernization and renovation of the port was the main goal, saving in the process investment money that the government claimed it did not have. Without those expenditures not only would costs go on increasing, but the situation could also deteriorate to the point that it was no longer feasible or profitable to use the terminal.

There are important vested political interests to be taken into account on the part of the Longshoreman's Union and the CDRJ workers. Together they represent the main resistance to modification in the sector. In general, costs were very expensive when compared to international

standards due to obsolete technology, generous welfare and labor benefits and high staffing levels. The government had always problems in its negotiations with these groups because of their obstruction of modernization or any modification in labor relations. They continue to resist further privatization efforts.

#### *Market Structure*

In accordance with CSN projections, in 1998 3.67 million metric tons of coal will be unloaded. This amount will progressively increase, reaching 9.10 million tons in 2002. In relation to these numbers, the proportion of fixed to variable costs will be:

Year 1998: 1.04

Year 1999: 1.04

Year 2000: 1.00

Year 2001: 0.79

Year 2002: 0.70

These figures simply reflect the fact that most capital outlays will occur in the first years, as one could expect, for renovation, and modernization. The contract provides for these circumstances.

There are potential close substitutes for the service. All other coal terminals in Brazil can be considered as close substitutes to unload coal if one takes into account that coal transportation from/to the ports of Sepetiba, Santos, and Rio de Janeiro, among others, is done by railroad. Moreover, in the Brazilian southeast region, all railway systems are linked and the distance between the port of Sepetiba and the main ports, particularly Rio de Janeiro and Santos, is relatively short. Those two ports were recently privatized (in Rio de Janeiro, only some terminals) which means that they are now more efficient and cheaper than they were few years ago. The contract, however, already includes maximum prices to be charged per unit unloaded.

#### *Constraints on Contracting and Regulation*

*Limitations of Instruments.* The degree of predictability of future contingencies that affect demand is low for basically two reasons. First, the Brazilian economy is facing uncertainty over

its exchange rate policies; consequently, hence, as the port service depends on international coal trade, port service demand is a function of this uncertain exchange rate. Second, this terminal operates basically with one good, and this concentration makes it more difficult to predict future demand.

Indeed, because of the low degree of predictability of future contingencies that affect demand, as well as the fact the federal government is willing to pay a high price to avoid the bankruptcy of the concessionaire, the agreement between the federal government and the concessionaire has to be, at least for the next few years, either incomplete or non-enforceable. As said before, the federal government has been using privatization success politically as one of its main achievements, and operational problems in some private concessionaires could increase opposition to the program. However, given the vertical integration of the port with CSN's steel mill, it is not likely that bankruptcy will be a problem in this case, as CSN would be hurt by any major problem at the port.

*Asymmetry of Information.* In the present case there were no asymmetry of information factors affecting the observed contractual arrangement. Both the domestic and international knowledge regarding the production technology used are large, as the degree of observability of output, investment and quality is high. Moreover, one cannot forget that the main user of the terminal services is also the new concessionaire.

*Contractual Arrangement and Market Characteristics.* There is no formal regulatory agency. Before privatization, CDRJ was responsible for administration and exploitation of ports in the State of Rio de Janeiro. When the port concession process started up, the new role of CDRJ had to be defined. Up to now, the option chosen has been not to create a formal regulatory agency in the sector, and in the present case CDRJ has been assigned sponsorship of the contract. This was a political strategy attempting to reduce resistance to the privatization process.

Although the role of CDRJ is well defined, it is inappropriate. In accordance with the agreement, besides being the "grantor of the concession," CDRJ also has to monitor the contract. However, as it is not the regulatory agency, it is difficult to understand what is meant by monitoring the contract. In other words, CDRJ has no expertise in regulatory issues and no staff with solid training or experience in the field. While it can observe whether contract clauses

are being respected, it cannot decide more sophisticated questions related to strategic behavior or rule on events not included in the contract. The observed contractual arrangement seems not to take this last point into account, as CDRJ has no say on issues that are not strictly in the contract.

As a matter of fact, there is only one possible role for CDRJ in this process, that is, the concession grantor, but it seems to us that it would be much cheaper to give sponsorship of the contract to the federal government. As a matter of fact, even if a decision were made for an agency to regulate the market, this regulatory agency could not be CDRJ, which was established only to administer and to exploit ports and not to regulate them.

### ***Preliminary Assessment***

If one assumes that the concessions to run ports in Brazil will all go to private hands and, moreover, that railroad services are already in private hands, it can be concluded that the degree of competitiveness in the port sector will tend to increase in the near future. So, it may not be necessary to establish a regulatory agency in this specific case. However, we have to take into account that ports, or any fixed asset of this type, tend to create monopolistic rents for their owners and therefore these services will need to be overseen by an official regulatory body.

Note also that the winning bidder, CSN, was the major user of Sepetiba Coal Terminal. It was CSN who pressured the federal government for privatization of the terminal, because it was in poor operational condition at the time and its future was precarious in public hands. So even before privatization there was vertical integration in the use of the port and the subsequent actual/operational verticalization may have increased the efficiency of this market.

## **7 Northeastern Railway System**

### ***Context of the Case***

The Northeastern System dates back to the last century. Over the years several tracks were constructed over different routes and in general not interconnected. Most of these were constructed by private companies, following incentives or guidance from the central government. At the beginning of this century, parts of these routes were interconnected in regional networks in order to create a railroad system. From 1957 to 1997, Rede Ferroviária

Federal (RFFSA), a public company, was responsible for the administration and exploitation of the Northeastern System. At the end of 1997, a concession agreement was signed. The controlling group, with the leadership of Companhia Siderúrgica Nacional (CSN), started operating a railway with 4,534 km of track in the States of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas.

The revenue of the Northeastern System comes mainly from hauling freight, which represents nearly 93% of total income. In 1996, the production of the Northeastern System amounted to approximately 700 million tons of goods, although it had previously reached the level of one billion tons during the 1980s. A large number of products are transported by this network: sugar, grains and cereals, cement, oil products, metal products, and ores and steel products, among others. Currently, oil products represent approximately a third of current production.

Privatization of the Northeastern Railroad was part of the overall program under which the national system (RFFSA) was divided into six regional concession areas. Before privatization, RFFSA experienced a radical program of financial and administrative reorganization. The number of employees decreased from 44 thousand in 1992 to less than 25 thousand in 1996. In the case of the Northeastern Railroad, total personnel went from five thousand in 1993 to 2,400 in 1996, and 1,600 by the time of privatization. The six concession areas were actually comprised of 12 previously existing “regional departments” that functioned almost as independent companies, duplicating their administrative, financial, commercial, legal and even operational structure. Moreover, RFFSA owned more than R\$4 billion in non-operational assets, mostly real estate along its routes.

In 1995 the World Bank approved a loan to the RFFSA aimed at emergency renovation work for the voluntary dismissal program. Due to bureaucratic problems, the contract loan was only signed after some of the six concession areas were already privatized. Hence, it was mostly used in the recuperation of the Northeast System, which was in the worst operational condition and was also the last to be privatized.

### ***Characteristics of the Contract Arrangements***

#### ***Contract Description***

As the studies for RFFSA privatization started in 1992 and the first of the six concessions (the East System) was sold in 1996, close to the time of Light's auction, the bidding rules were the same as for all auctions at that time, i.e., a British auction. The winning bidder would be the consortium that offered the greatest amount for the concession. The contract assignment procedure was international competitive bidding, and the contract was signed by the Northeastern Network Consortium and the Federal Government.

The contract includes performance targets on output. For instance, in 1996 the output was 0.7 billion net ton kilometer (NTK) and, in accordance with the agreement, in the first five years the minimum level of annual production is: (i) first year, 0.9 billion of NTK; (ii) second year, 1.2 billion of NTK; (iii) third year, 1.5 billion of NTK; (iv) fourth year, 1.7 billion of NTK and; (v) fifth year, 1.8 billion of NTK. The federal government must establish new annual goals for transport production, agreed upon with the concessionaire, for each subsequent five-year period. For this the concessionaire must present the grantor demand forecast for railroad transport, supported by specific market studies. But the contract does not detail how the negotiation of the goals will occur.

There are also quality targets. Note that here service quality means transport safety. The safety of services rendered shall be evaluated by the number of accidents/million train kilometer. The concessionaire shall reach the following minimum goals for reduction of accidents, based on the index of 170 accidents/million train-kilometer recorded in the Northeastern System in 1995: (i) 5% by the end of the first year; (ii) 15% in the second year; (iii) 25% in the third year; (iv) 35% in the fourth year, and; (v) 40% in the fifth year. The federal government must establish new annual safety goals agreed upon with the concessionaire for each subsequent five years period. Again, the negotiation process is not detailed. There are also indirect investment targets, specifically to enable the output and quality standards to be met.

The contract includes employment targets. The concessionaire has to take on the labor contracts of at least 1,600 employees of RFFSA and assure all labor rights existing on the date of transfer, including social benefits equivalent to the complementary pension and health plans. The concessionaire can fire some of these employees if it is willing to pay them the labor rights defined by RFFSA. As a matter of fact, of the 25 thousand employees left after restructuring RFFSA, nine thousand were fired after the first year of privatization. The employment

guarantees, as well as the generous voluntary dismissal plan, served two purposes. First, RFFSA was already liable for some one billion dollars in labor disputes it had lost, and simply firing redundant workers was not only complex in legal terms but also might have been even more expensive in the long run. Second, if labor unions were not as strong as they were in the past, they still had the capacity to mobilize workers and organize strikes. With these concessions specified in the contract, labor-force opposition to privatization decreased. As a matter of fact, all the concessions were sold without any problem in this area, an unexpected result.

The duration of the contract is thirty years, renewable for an additional thirty years. There are termination provisions: in principle, if one of the targets is not met, the Federal Government has the autonomy to the agreement. The dispute settlement procedure consists of private negotiation and court settlement. If there is a dispute, the sequence is the following: first, the consortium and the government try to negotiate. If the private negotiation does not work, the process is judged by the court. There is no regulatory agency in this sector.

The geographical scope of the contract is the states of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Alagoas.

### *Key Incentive Issues*

One important incentive issue in the present case is how close are the substitutes to rail transport in the region. One must take into account that the greatest share of the cargo transported by the Northeastern System is fuels (around 40% in most years) that currently cannot, for market or technical reasons, use alternative forms of transport. In this case price competition most probably will not happen, as opposed to the transport of other relevant products, such as cement, sugar, grains and cereals, which also use the services.

Output targets, however, may limit the freedom of the concessionaire to set its own tariffs. The minimum level of annual output, as measure by total NTK, will increase at more than 30% in the first three years and double in the first five. Those are ambitious targets, given that production actually fell in the last few years, and will not be met unless the concessionaire offers reasonable prices. Moreover, its profit margin will also be squeezed by the investments necessary to meet such goals and also to operate safely.

## *Determinants of the Contractual Arrangements*

### *Contractual Objectives*

Since the beginning of the 1980s the lack of investment has impaired the quality of services and induced a drop in production. After reaching one billion tons in the 1980s, the volume of cargo presently transported is less than 700 million tons. As in the other cases studied, the central government's financial problems were responsible for this under-investment. As a matter of fact, due to a lack of investment in maintenance, the reduced number of lines and competition from roads and coastal navigation, the political importance of the railroad in the recent past has been very small.

The reason for the privatization of the Northeastern System (and of the entire railroad system in the country, by the way) was to improve performance. If it is true that substitutes were available for some types of cargo, they were nonetheless very imperfect substitutes. For instance, the oil pipeline system in the region is not very large and covers few areas. Hence, the operational problems of the system were raising costs and reducing the productivity of many sectors in the region. Most probably the amount invested to prepare the network for privatization in the form of emergency renovation and voluntary dismissal programs was more than that obtained in the auction (less than R\$10 million), so that financial objectives were not the major concern here. The money saved in the form of future investments cannot be taken into account, as a positive financial result as the government would not make them anyway.

### *Market Structure*

The data sources for the proportion of fixed over variable costs (%) are the Northeastern Consortium projections. In this sense, the fixed cost does not include payroll and depreciation, while the variable cost does not include oil derivatives and maintenance costs. Hence, the projected proportion of fixed over variable costs is:

Year 1998 - 86%

Year 1999 - 78%

Year 2000 - 73%

Year 2001 - 71%

Year 2002 - 72%

As in the Port of Sepetiba case, the decrease of the ratio of fixed to variable costs is due to concentration of investment expenditures in the first years of concession. However, the contract does not include clauses on this issue.

The railroad industry presents the following characteristics, according to Kessides and Willig (1995): “Indivisibilities, pervasive economies of scale and scope, high costs of entry, and small-numbers competition in the railroad industry are all consistent with the likely persistence of prices in excess of marginal cost.” The contract is vague about tariffs and their readjustment. It says, for instance, that in the case of customers with a high degree of dependence on railway transportation the tariffs will be set by a specific and voluntary contract. Moreover, the readjustment period of the tariffs is also not specified. We understand that prices will be set by the concessionaire in order to reach the output targets, and this may in fact control profit margins.

It is economically feasible to unbundle the sector. The Northeastern System comprises the East-West line, which links the eastern western parts of the Northeast Region, and the North-South line, which connects the states of Rio Grande do Norte and Alagoas, passing through the states of Paraíba and Pernambuco. Hence, it could be broken into at least two networks. Moreover, tracks and train services may also be unbundled, as was the case in Colombia and the United Kingdom. As we already have seen, the Northeastern System was itself detached from RFFSA, with its scale assumed to be the most efficient based on geographical, economic and operational considerations. The concessionaire is not allowed to transfer any part of the track or rolling stock to a third party.<sup>11</sup>

In relation to competition, again according to Kessides and Willig (1995), “the sunk cost and longevity of railroad capital may suggest that the railroad industry is one in which contestability analysis cannot conceivably apply—these sunk costs generally suffice to deter entry by new rail lines. However, railroad services are far more contestable than these impediments to rail entry would suggest, because there are often strong competitive pressures

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<sup>11</sup> It is not clear to us why the government would not allow the sector to unbundle the track, or parts of the track, and rolling stock. A possible reason is the existence of cross-subsidies across sectors and types of services. If unbundling was possible, the concessionaire might want to sell at a profit the most promising services and, under the threat of bankruptcy, try to renegotiate the contract with the government. In any way, this was the norm in all privatization contracts in the sector.

from other modes of transportation—such as trucking and water carriage—on the rates charged for shipment of a wide variety of commodities.” In fact, the Northeastern System is facing competition from road transportation and coastal shipping. For example, a third of railway cargo presently consists of oil products, which could in theory be transported by coastal navigation, at least between the major cities that have a port. Road transportation and coastal shipping can thus be considered substitutes for railway transportation of certain types of cargo. In fact, due to the low quality of Northeastern System services before privatization, the railway had lost cargo transportation to roads and ships. The above facts are implied in the absence of price rules in the observed contract agreement. As seen before, there are only quality and cargo targets in the contract.

Once the accident targets are met, and especially due to the cargo targets, one can assume that the quality of service will improve and that the cargo transportation lost to these other modes will return to the railroad.

#### *Constraints on Contracting and Regulation*

*Limitation of Instruments.* There are basically two difficulties that limit the regulatory instruments. First, in accordance with the privatization contract agreed between the federal government and the concessionaire, the former committed itself to hand over the railway in specified conditions. Nevertheless, due to unforeseen events, such as a longer than predicted period of refurbishing rail cars and machinery, the railway was transferred in worse condition than stipulated. As a consequence, some of the targets will not be reached by the consortium. This will certainly imply future negotiations between the consortium and the federal government not foreseen in the observed contractual agreement.

Second, the degree of predictability of future contingencies that affect demand is low. The Northeastern System is competing with roads and coastal shipping, which makes it difficult to predict demand. So, the success of the administration and exploitation the system will depend not only on its own strategy, but also on the strategy followed by close substitute competitors. Hence, there is a chance of losses or even insolvency of the railroad. However, given that the federal government is not willing to face any failure in its privatization program, particularly in the infrastructure sector, any potential bankruptcy of the concessionaire would certainly be

avoided through renegotiation of the agreement. The effect on the observed contractual agreement was the inclusion of a clause, present in many privatization contracts in Brazil, that says that tariffs can be readjusted, at the concessionaire's request, above reference levels in case of permanent changes in the market or costs which may alter the agreed economic-financial balance.

There were no asymmetry of information factors affecting the observed contractual arrangement. Both domestic and international knowledge regarding the production technology used are large, as the degree of observability of output, investment and quality is high.

*Contractual Arrangements and Market Characteristics.* There is no formal regulatory agency in the railroad sector. As is the case in the Port of Sepetipa, the company that was responsible for the administration and exploitation of the services was assigned to be the sponsor of the contract and to regulate and monitor the services rendered under the concession. RFFSA is also the lessor of the railroad equipment, and when the concession expires the equipment will revert to RFFSA. As most workers were transferred to the six new concessionaires, RFFSA became, if not lean, at least much leaner than in the past, which can be positive given its new functions. However, as in the CDRJ case, RFFSA has neither regulatory experience nor autonomy with respect to the federal government. Its functions are well defined in the contract, but it is doubtful whether it can decide more sophisticated questions related to strategic behavior, for instance, or rule on contingencies not included in the contract. As in the previous case, the observed contractual arrangement seems not to take this last point into account as RFFSA cannot rule on issues that are not strictly in the contract, which of course cannot include all possible states of nature.

### ***Preliminary Assessment***

As already said, the Northeastern System is subject to competition from highways and coastal shipping. However, those are not currently close substitutes for some of the cargo that use rail transport, chiefly fuels. In this case competition will not produce efficient prices without regulatory guidance.<sup>12</sup> However, RFFSA has no mandate over prices, rates of return or investments, as a typical regulatory agency would have. So, the question reduces to whether

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<sup>12</sup> Of course, in the case of fuels, potential competition in the form of pipelines has to be taken into account.

output targets can, in this case, act as a device to control profit margin. It all will depend, in our opinion, on the propensity of the federal government to make concessions in this area. The RFFSA has no authority to decide on this subject, and the decision will be taken at the ministerial level.

It has to be said, too, that when the contract was signed the government agreed that it had to undertake some rehabilitation. However, it did not hand over the railway in the established condition. Moreover, the hand-over of the company took longer than expected, and the contract did not say anything about this type of breach. Consequently, some targets present in the contract most probably will not be reached by the concessionaire. The government and the concessionaire will have to renegotiate the agreement, and a legal battle may arise. It is important to stress again that those problems cannot be explained by the existing contract but by unforeseen events related to the government handling of the company prior to the privatization and the transfer of the company.

## **8 Conclusions**

In all markets we have analyzed in the present paper, government investment had been drastically reduced since the mid-1980s. Consequently, most of them needed urgent rehabilitation investments. Coelba, and particularly Light, needed investment because demand was increasing and, in the short term, firms would not have enough energy to meet the demand or quality of services would drop below accepted standards. In the case of São Paulo State cellular service the technology utilized was outdated. Besides that, service quality was poor and there was excess demand. The quality of Dutra Road services was also inadequate, the number of accidents was high, and there were pot-holes in the road. The coal terminal at the port of Sepetiba had almost ceased operations, and some important machines had already broken down without being fixed when the government decided to privatize it. From the mid-1980s to its privatization, the volume of Northeastern Railway transportation had dropped by approximately 30%, and the number of accidents was increasing.

As almost all infrastructure privatization took place very recently, it is difficult to analyze their economic impact. Nonetheless, although there are some critics of the privatization process,

we can expect that Brazilian social welfare will increase. As a matter of fact, the result of private investments will likely be so high that the social benefits will be felt soon.

Nevertheless, some additional considerations have to be made:

- (1) As Light was the first infrastructure firm to be privatized, the government introduced some advantages to the concessionaire in the contract and, consequently, we can expect few improvements in the sector. As a matter of fact, Light energy distribution suffered serious failures for two months during the summer of 1997. We expect that the Rio de Janeiro energy distribution services will improve, but not as much as if there had been no political constraints.
- (2) In general, the state governments privatized their energy distribution firms, and other utility companies, in order to obtain resources for future expenditures or even to finance current expenses. In most of these cases there was an indirect transfer of money from the federal government, by way of subsidized loans from BNDES to the auction winner. So, financial objectives took precedence over economic efficiency. In the case of Coelba, the contract agreed between Bahia State and the concessionaire is almost the same as the Light concession contract. Hence, Light and Coelba should have similar outcomes.
- (3) São Paulo State cellular b-band service currently faces competition from a-band cellular and from fixed telephony. In the future there will also be competition from wireless local loops. As the rules of the concessions in the competitors' markets have not been defined yet, it is difficult even to predict the overall structure of the Brazilian telecommunications market in the future. As a matter of fact, if these rules had been established beforehand, the auction result for b-band in São Paulo would have certainly been better. In addition, due to low quality services before privatization, we can be sure of improvement of the São Paulo State cellular services. Moreover, direct competition in cellular service will likely reduce prices and increase public welfare.
- (4) As we have described, the Dutra road has a monopoly on cargo transportation for some goods between the two most important cities in Brazil, Rio de Janeiro and São Paulo. The coal terminal at Sepetiba faces competition from the most important ports

in Brazil, Santos and Rio de Janeiro. The Northeastern Railway faces competition from regional roads and coastal shipping. Some of the many roads, railways and ports in Brazil are cargo transportation monopolies, while others are facing competition. Hence, as the output of all modes is cargo transportation, it is important to create a regulatory agency that would be responsible for regulating these markets altogether. This agency would take into account all intersections and links among different forms of transportation, establishing a more efficient regulatory environment than the present one, which is composed of a national and/or regional regulatory agency for each of these markets or even for a specific concession.

In summary, the infrastructure privatization process will bring improvements in the quality of services and the output will likely increase too. Nevertheless, if the government had given less importance to financial objectives the improvement in social welfare would certainly have been and in the future be greater.

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Table 1

	LIGHT	COELBA	SÃO PAULO STATE CELLULAR SERVICES	DUTRA ROAD	NORTHE RAIL SYS
Nature and Length of the Contract:					
Type of Contract	B.O.T.	B.O.T.	B.O.T.	B.O.T.	R.C
Legal nature of Contract	Civil Contract	Civil Contract	Civil Contract	Civil Contract	Ci Con
Duration of the Contract	30 Years	30 Years	15 Years	25 Years	3 Ye
Geographical Scope of the Contract.	Rio de Janeiro State	Bahia State	São Paulo State	Rio de Janeiro State	North Reg
<b>Bidding Criteria and Process:</b>					
Contract Assignment Procedure	International Competitive Bidding	International Competitive Bidding	International Competitive Bidding	International Competitive Bidding	Interna Comp Bid
Bidding variables.	Higher Price	Higher Price	Combination Of price and Tariff	Lower Tariff	Hig pri
<b>Performance Measures :</b>					
Pricing Rule	Price Cap with Indexation	Price C Index			
Performance Targets on:					
Output	No	No	Yes	No	Ye
Investment	No	No	Yes	Yes	Ye
Quality	Yes	Yes	Yes	Yes	Ye
Employment	No	No	No	No	Ye

<b>Dispute Settlement Procedures and Renegotiation Clauses :</b>					
Renewability of Contract	Yes 30 Years	Yes 30 Years	Yes 15 Years	No	Yes 30 Y
Termination provisions	Yes	Yes	Yes	Yes	Yes
Dispute Settlement Procedure	Regulatory Agency's Discretion Court Settlement	Regulatory Agency's Discretion Court Settlement	Regulatory Agency's Discretion Court Settlement	Private Negotiation Court Settlement	Private Negotiation Court Settlement
<b>Guarantees:</b>					
Existence of Government Guarantees/Subsidies	No	No	No	No	No
International Official Sector Involvement(e.g.Multilateral/ Bilateral Institutions).	No	No	No	No	No

**Table 2**

	<b>LIGHT</b>	<b>COELBA</b>	<b>SÃO PAULO STATE CELLULAR SERVICES</b>	<b>DUTRA ROAD</b>	<b>NORTHE RAIL SYS</b>
Importance of efficiency considerations for the government.	Medium	Medium	Medium	Medium	Med
Importance of financial objectives of the government over economic efficiency.	High	High	High	High	Hi
Importance of political objectives of the government in speeding the contracting process.	High	Medium	Medium	Medium	Med
- Shareholders	Small	Medium		Small	Srr
- Unions	Small	Small		Small	Med
- Consumers	Small	Small		Small	Srr
Degree of politicization of					
- Output	Low	Low		Low	Lc
- Investment	Medium	Low		Low	Lc
- Quality	High	Low		Low	Lc
- Employment	Low / Medium	Low		Low	Lc
Degree of financial interdependence between the regulatory agency and the firm.	Low	Low	Low	-	-

**Table 3**

	<b>LIGHT</b>	<b>COELBA</b>	<b>SÃO PAULO STATE CELLULAR SERVICES</b>	<b>DUTRA ROAD</b>	<b>NORTHE RAIL SYS</b>
Is it economically feasible to unbundle the production of the asset/service?	Yes	Yes	Yes	No	Ye
Are there close substitutes for the asset/service?	No	No	Yes	No	Ye
Degree of demand responsiveness to quality of the good/service.	Low	Low	Low	Low	Med
Are there externalities involved in the demand for the asset/service?	No	No	Yes	No	N
Are there instruments in place to control them?	-	-	-	-	-
Are there important externalities involved in the supply for the asset/service?	No	No	No	No	N
Are there instruments in place to control them?	-	-	-	-	-
Economic constraints imposed by other sectors (e.g. upstream/downstream sectors are official monopolies, etc.	Ups tream Sectors are Official Monopolies	Ups tream Sectors are Official Monopolies	None	None	No
Institutional constraints imposed by other sectors(e.g. the project can only obtain upstream/downstream resources from an ex-ante designated firm, etc.	None	None	None	None	No

**Table 4**

	<b>LIGHT</b>	<b>COELBA</b>	<b>SÃO PAULO STATE CELLULAR SERVICES</b>	<b>DUTRA ROAD</b>	<b>NORTHE RAIL SYS</b>
Legal restrictions to use of government transfers in the regulation of the asset/ service.	None	None	None	None	No
Accountability of prices.	Good	Good	Good	Good	Go
Is it feasible for the government to have direct control over :					
Output ?	Yes	Yes	Yes	No	Ye
Investment ?	Yes	Yes	No	Yes	N
- Quality ?	Yes	Yes	Yes	Yes	Ye
- Employment ?	Yes	Yes	Yes	Yes	Ye

**Table 4B**

	<b>LIGHT</b>	<b>COELBA</b>	<b>SÃO PAULO STATE CELLULAR SERVICES</b>	<b>DUTRA ROAD</b>	<b>NORTHEAST RAIL SYSTEM</b>
Domestic knowledge regarding the production technology used.	Large	Large	Small	Large	Large
International knowledge regarding the production technology used.	Large	Large	Medium	Large	Large
Degree of observability of:					
- Output	High	High	High	High	High
- Investment	Medium	Medium	Low	High	Medium
- Quality	High	High	High	High	High
- Employment	High	High	High	High	High

Table 4C

	LIGHT	COELBA	SÃO PAULO STATE CELLULAR SERVICES	DUTRA ROAD	NORTHERN RAILWAY SYSTEM
Degree of predictability of future contingencies that affect demand.	Medium	Medium	High	Medium	Low
Degree of predictability of future contingencies that affect costs.	Medium	Medium	Low	Medium	Medium
Possibility of writing detailed contracts on:					
- Output	Yes	Yes	Yes	No	Yes
- Investment	Yes	Yes	No	Yes	Yes
- Quality	Yes	Yes	No	Yes	Yes
- Employment	Yes	Yes	No	Yes	Yes
Degree of the regulatory agency's economic independence.	High	High	High	-	-
Degree of the regulatory agency's legal independence	High	High	High	-	-
Can the regulatory agency rule on:					
Output?	No	No	Yes	-	-
Investment?	Yes	Yes	Yes	-	-
Quality?	Yes	Yes	Yes	-	-
Employment?	No	No	Yes	-	-
Who appoints the members of the regulatory body?	Executive	Executive	Executive	-	-
Duration of the appointment.	4 Years	4 Years	5 Years	-	-
Renewability of appointment.	No	No	No	-	-
Termination provisions for appointment.	Yes	Yes	Yes	-	-

Is the Judiciary overseeing the regulatory body's activity?	No	No	No	-	-
Degree of the perceived independence of the Judiciary.	High	High	High	High	Hig
Degree of the perceived effectiveness of the Judiciary	High	High	High	High	Hig
Degree of the perceived effectiveness of the dispute settlement mechanisms in the contract.	Medium	Medium	High	High	Medi
Government's reputation for honoring contracts.	Medium	Medium	Medium	Medium	Medi
Type of Government.	Unified Presidential	Unified Presidential	Unified Presidential	Unified Presidential	Unifi Presidi
Foreign ownership Restrictions in the sector.	None	None	Yes	Yes	Nor