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Theory of Operation of a Modern National Economy

COMPETITION AND DEVERTICALIZATION IN THE BRAZILIAN ELECTRIC SECTOR

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1) Introduction

The process of deregulating the electric sector occurred in world-wide scale with the objective of creating incentives to the efficient behavior of the companies by the introduction of competition.

The industry of electric energy had its development under the form of verticalized (bundled) monopolies. From the 1970s, the exhaustion of the chances of economy of scale and the evidence of the inefficiencies by this industrial structure of centralized coordination caused sector dissatisfaction.

However, the proper characteristics of the industry had not allowed the structure of centralized coordination to be simply substituted by the market decentralization. As a result, the reforms had combined elements of coordination of the market (decentralized coordination) and centralized coordination. The competition was limited to the extremities of the productive chain (generation and retail), that had been deverticalized, and the transport, natural monopoly (transmission and distribution), that continued to be regulated.

This work focuses on the issue of competition versus deverticalization (vertical coordination) in the electrical sector. Chapter 2 approaches proper characteristics of the sector that create the necessity of complementary coordination to the one of

the market. Chapter 3 treats the coordination concept (vertical and horizontal), and its relation with the objective of the reforms: introduction of the competition. Chapter 4 deals with the evolution of the industry, with the objective of demonstrating why a verticalized structure was developed and what is its importance in the initial phase of this industry. Chapter 5 deals with the reform in Brazil, emphasizing the issue of the separation of the segments of the productive chain of the industry. Chapter 6 presents hypothetical cases that could occur in the Brazilian electric sector, to demonstrate that the verticalization (bundling) of the sector favors market power instead of competition. In the conclusion, the opinion of the author on the electrical industry reform that occurred in Brazil in the 1990s and on the changes carried through the Brazilian electric sector regulatory mark in 2004, in respect to the deverticalization (unbundling).

2) Characteristics of the Industry of Electric Energy

The industry of electric energy has characteristics that turn its coordination more complex than the coordination of the majority of the other economic activities. In addition, they do not allow substituting totally the structure of centralized coordination by the decentralization of the market. First, the energy transport is considered a case of natural monopoly, and, therefore, its operation in concorrencial regimen generates inefficiencies. Second, the energy can not be

stored and the structure of the industry in net causes great interdependences in its operation and in its expansion. Moreover, the service is essential in the measure where it is present in all the productive processes and generates positive and negative externalities for the remaining portion of the economy:

2.1) Natural Monopoly: natural monopolies occur when the production of a good is less costly when is carried through only one producer. In this case the market does not hold a great number of firms operating in efficient scale and scope, and barriers to the entry occur in function of the high necessary sum of investments.

2.2) Electric Energy is not storable: although forms exist to store electricity, as in batteries, the store cost is not economically viable.

The possibility of storage has an important role for the coordination of the segments of the production chain. The store inexistence compels that the supply equals the demand each moment. The store level consists of a signal of the necessity to adjust the production. It facilitates the coordination when making possible the delay of the adjustment between supply and demand. This characteristic has short term implications, in terms of operation of the industry, and long term implications, with respect to its expansion.

The electrical systems operate in balance in real time, the adjustment between demand and supply is practically instantaneous. An unbalance between supply and demand causes problems that, if not corrected, leads to black-out. In order to have coordination is necessary to program the dispatch, to predefine the amount of

energy to be generated by the plants and to keep operational reserves, to get the perfect balance in real-time.

In the long stated period, the maintenance of over-capacity is necessary. The capacity to generate and to transport energy must be significantly superior than the biggest demand, in order to minimize the deficit risk. The difference between installed capacity and demand of peak is called reserve margin. As the reserve margin implies costs, it is necessary to keep it in a minimum level, but ensure that it implies an acceptable risk of lack of energy for the society.

2.3) Physical, economical and financial interdependences: the electric sector is a network industry. Although the industry comprehends a set of distinct activities (Generation, Transmission, Distribution and Retail), there must be a system interdependence among them in order to have an efficient service. The construction of the net involves technology intensive in capital and high specificity of asset. The investments have high stated period of maturation and high fixed costs or economy of scale and are interdependent between the segments of the production chain.

Moreover, in the usual electrical system, there are many generators and markets; it is not possible to identify the origin of the flow of the energy. When consumers increase their demand, it is necessary that the generated amount is increased; however, there is no way to guarantee that the consumed energy is provided by the generator that placed more energy in the net. Thus, the contraposition of financial and physical flows demands coordination to guarantee that all generators are remunerated by the energy that had offered, even though

without knowing who consumed it, and all consumers pay for the energy that had demanded, even if not knowing who offered it.

2.4) Externalities and Public Good: externality occurs when the actions of an agent intervene on the function utility or the function production of other agents who are not involved directly in the economic transactions corresponding to this action. As the benefits or resultant costs of the action of the agent are not incorporated by him, the result is inefficient allocation. This means that this industry is responsible for the generation of costs and/or benefits, in the case of negative and positive externalities respectively that will go to fall over other agents of the economy. As example of positive externality, the electric sector is basic for the economic development because of its multiplier effect for the economy as a whole.

A similar concept to the externality is the public goods. These goods are characterized by its nonrival consumption and nonexclusion. The consumers who do not contribute for the production can not be excluded of its consumption and the consumption of the good does not diminish the available amounts for others consumers. In case of public good, the supply of the product does not follow market signals. In other words, if the decisions on the industry are only guided by market signals, the result could be low amount of supply in short term and low amount of investments in the long run. In the electricity industry, in case that one assumes that the market signals function efficiently, the market would solve the coordination, and the energy would become more expensive when scarce and the scarcity would be enough to reduce the electricity consumption, and the question

of the supplying would not be important. This characteristic creates the necessity of complementary coordination to the market.

3) Coordination

The coordination of the economic actions can be gotten of many forms, with different results. Important part of economic science was dedicated to demonstrate that the coordination by the market is more efficient, and that the price of the goods provides all the necessary information for efficient economic decisions. However, there are situations where the decentralized market does not generate efficient coordination, justifying the use of configurations to carry through transactions that hold other elements beyond the market.

Two types of coordination can be distinguished: vertical and horizontal. The former occurs among the segments of the production chain of an industry, and it is interest of the theory of the transaction costs. The latter deals with the relations between companies who act in the same segment of the production chain, in this context the market failures are analyzed.

The theory of the Costs of Transaction questions the reason of the existence of organizations if the price mechanisms, according to the economic theory, would supply the most efficient coordination. In accordance with this theory, some activities are not coordinated by price market, but in the interior of the firms. Thus,

the firms face not only production costs, but also costs of transaction, that include the costs to research the prices, to elaborate and to execute commercial contracts and the resultant costs of the involved uncertainties in the use of mechanisms of prices. The firm internalizes activities always when the cost to use mechanisms of prices (transaction costs) is superior to the one to organize the production internally (coordination costs).

An evolution of the theory does not limit it to the dichotomy market versus hierarchy, but it points to the possibility of the coordination of the transactions occur through hybrid structures, that combine characteristics of these two arrangements.

The problem of economic organization is treated as a contractual problem, where the basic unit of analysis is the transaction. The transaction between agents is not only the instantaneous and impersonal contract of market, there is, also, the lasting transaction, that generates commitment between the agents. Two behavior hypotheses are used: limited rationality and opportunism, supporting that "any attempt to seriously deal with the study of economic organizations must consider the agreed ramifications of rationality and opportunism in conjunction with the condition of specificity of asset"¹. The implication of limited rationality is the impossibility of the agents to develop complete contracts, or either, where the all possible situations are foreseen to occur in the future, and where safeguards will be institute for any possibility. The opportunism hypothesis is the action that objective the proper interest in fraudulent way and means the incomplete or

¹ Williamson (1985). Free translation

distorted revelation of information aiming to confuse other agents. The opportunism presence creates uncertainty related to the economic transactions.

The specific assets are defined as lasting investments that are developed in support to particular transactions, and that can not be recovered without sacrifice of its economic value, in case the contract is breached, since the best alternative use for such assets is much less attractive than the original.

The presence of specificity of the assets is not an exception, but it constitutes a basic element in the capitalist societies. There are three crucial effect of the consideration of specificity of asset: the contractual relations are not impersonal anymore; the continuity of the relationship starts to be basic to the agents and the contractual and organizational safeguards appear to give support to such relations. The existence of specific assets turns the relation along of the productive chain a species of bilateral monopoly; therefore the disruption of the contract means important losses for at least one of the parts. In this situation, purchaser and salesman have conditions to use its strategical position to take advantage and to negotiate incremental profits when unexpected events occur that turns necessary the adjustment of contracts. Even if the common interest is the continuity of the contract, each part will tend to take off the best advantage possible of its bargaining power. To ameliorate the confidence between the agents is necessary the constitution structures of governance. One of the possible answers to prevent the transaction costs is the vertical integration. But this option means the abstention of the incentives of market, what constitutes a trade-off.

The transaction costs have great importance for the organization of the transactions of the electric sector. The magnitude of the specificity of the assets

can be measured by the difference between the value of the investment in its original use and the return propitiated for an alternative use. In the case of the electric sector, this difference assumes substantial values; therefore the value of the alternative use is minimum. As the activities are linked, the interdependence between the investments is very important, thereby causing a delay of investments in function of the exposition to the opportunism. The investments in generation and transport are at the same time complementary and substitute. Complementary because transmission (or distribution) lines are necessary to make the generated energy arrives at the market, and generation is necessary so that lines exert their function. Substitutes because investments in transmission (or distribution) line that interconnect a surplus market to a deficit one substitute investments of generation in the deficit market and vice-versa.

The high costs of transaction were one of the reasons why the hierarchy (verticalized structure) was adopted as a form of usual governance in the history of the industry of electric energy. The involved uncertainties in the structure of the contracts and the difficulties in its monitor turned the transaction costs, among the stages of the production chain of the sector, prohibitive, what origin the monopolies vertically integrated.

From the 1980s, the technological innovations had had great impact in the function of the industry. The drastic reduction in the cost of processing necessary data for the monitor of the electric flows; the long-distance operation of the electric equipment; and the instruments of financial risks management propitiated by the diffusion of the use of computer science diminished the space for opportunist

behaviors. Thus, allowing the coordination of some transactions between agents to return to the market.

However, as the level of specificity of the assets remains high and the stages of transport of the production chain remain a natural monopoly, the devolution of the transactions' coordination to the market has been carried through simultaneously with the regulations. Their aim is to limit the power of market of the agents who owned the transport nets (transmission and distribution).

The horizontal coordination deals with the question of the failures of market in the net industries. The natural monopoly is the more important failure in this type of industry.

Situations of natural monopoly can be classified as permanent or temporary. The first one occurs when the average cost continuously decreases in relation to the produced amount; in this case, the monopoly is justified for any size of market. The second happens when the average cost decreases only in determined interval of the produced amount. Thus, when the market develops, the condition of natural monopoly ceases to exist.

The electricity transport (T and D) has the characteristics of permanent natural monopoly. The operation of more than one company in this activity generates duplication of costs; therefore the development of overlapped nets is necessary to serve the same geographic space. During the initial phase of the industry of electric energy the generation was a temporary natural monopoly. In this period, the generation plants supplied only the local markets and the demand was not sufficient to allow that more than one plant operated in an efficient form.

When the markets had developed and they had connected, the operation of more than one plant in each market started to be efficient. (the technological advance can have a similar effect as the rise of the demand, in the case of the electric sector. For example, in the 1990s, the diffusion of the cycle combined gas turbine generated a great reduction in the minimum efficient scale for the energy generation, which made possible the efficient operation of some plants, even in markets of limited size).

4) The Electrical Industry Development Pattern

The birth of the electricity industry was in 1878, with the development of the first light bulb and the construction and operation of the first electrical generation and distribution system by Thomas Edison. From this pioneering initiative, the private entrepreneurs were responsible for the initial phase of the supply of electric energy.

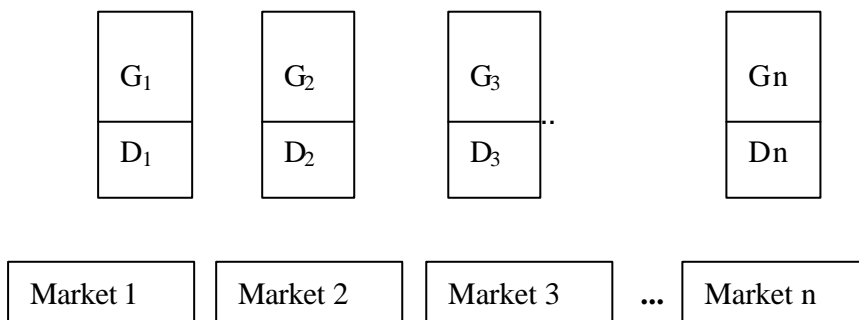
At the time, the use and the transport of energy were limited. The electricity was used only for illumination and transport was done in direct current and in low voltage, resulting in high losses. Because of these restrictions, the industry was initially structured in a decentralized form and with as many units of generation as many markets.

With the alternated current invention, in 1885, the transport could be carried through in high voltages and with fewer losses. With the overcoming of the limitations, the markets had extended and the companies had increased their size. The growth of the number of companies and the expansion of the existing ones propitiated the dispute of consumers between companies in the same area.

This situation resulted in inefficient competition through overlapping of the nets and duplication of the costs. The first State intervention acts in the sector happened, which established concessions for the exclusivity area (considering the existence of natural monopoly).

The structure of regional monopolies started to be dominant, where each market was supplied by a source of generation (G) and a distribution system (D). (Figure 1)

Figure 1- regional monopolies

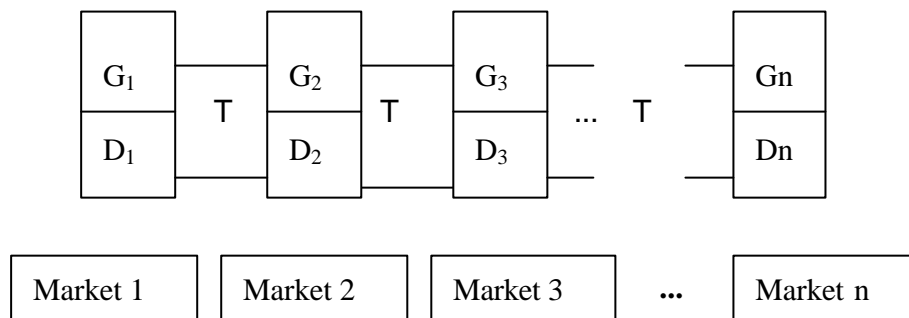


However, the regional markets were not great enough to allow the operation of the generation plants in the most efficient form, and the configuration in natural

monopolies did not allow the full exploitation of existing economies of scales and scope in the energy generation.

Thus, the transmission lines (T) had started to be constructed, establishing connected markets and allowing the flow of energy among them. (Figure 2)

Figure 2 - interconnected markets



The interconnection of the system generated an important economy for the industry. Therefore, as it is not possible to store energy, the necessities of investments in the industry are determined at the moment when the demand of electric energy is greater, and the demand of an interconnected system is lower than the sum of the demands of each market individually, generating an economy of scale.

With this interconnection process, there was a merging movement of the companies that were responsible for the regional monopolies. The State was back to intervene to coordinate this process. In the United States (in the 1930s) the

Public Utility Holding Company Act (PUHCA) was promulgated and, later the regulatory agencies, Public Utility Commission (PUC), were created. In Europe, the State assumed the structuring process of the industry of electric energy. France and England created state monopolies as did Brazil, with the nationalization of the energy utilities .

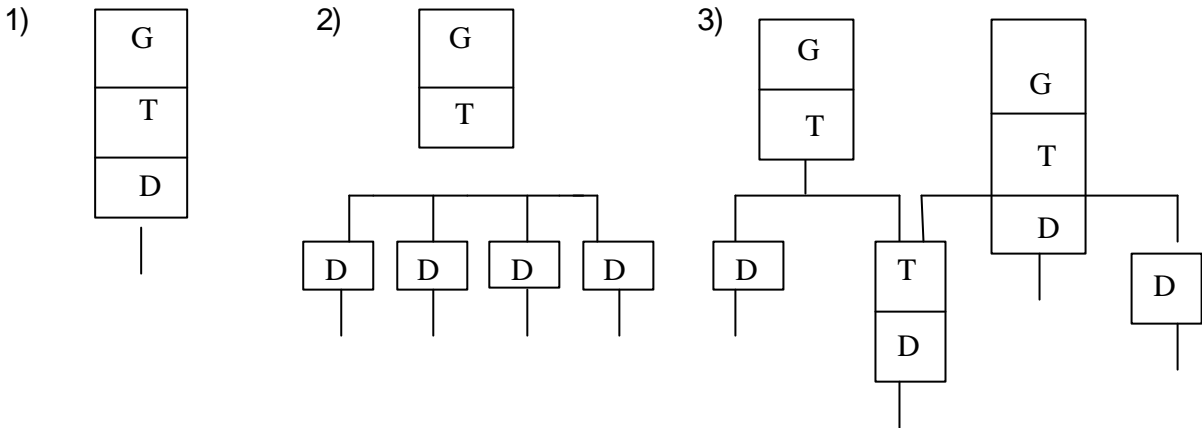
Thus, a monopolistic and verticalized (bundled) structure was formed for the industry of electric energy and had an important role in its expansion. In the expansion of an industry of this nature the assets are essential, and as the investments between the segments of the production chain are interdependent, the verticalization (bundling) eliminates the possibility of opportunist behaviors and provides an efficient coordination for expansion.

In the thirty years that followed the World War II, the industry expanded, by means of economies of scale, and the costs diminished. Consequently the price of the electricity decreased, making possible the entry of new consumers and the increase in the demand of existing ones. This process resulted in the reduction of electricity tariffs and an improvement in the quality of the services of the utilities.

At this time the structure of the electric energy supply industry presented some variations, but always with a high centralization of coordination along of the production chain and with the companies vertically integrated. There were basically three configurations: the first one totally verticalized (bundled), as in the French case; the second where the generation and the transmission were developed by only one verticalized company and the distribution was carried through by regional companies; and the third, in the case of Brazil, was a hybrid model where companies who carried through the three activities , in a verticalized form, coexisted

with other companies that held only transmission and generation, or only distribution. The coordination was totally centralized, with regards to the operation of the industry and the planning of the investments.

Figure 3 – Configurations



From the 1970s, however, the chances of gain of scale and scope in the industry had depleted and the utilities had started to face financial difficulties due to rise of the financing and operation costs that had taken place, mainly, due to the oil crisis. At the end of the decade there was a general dissatisfaction, with the consumers unsatisfied with the gradual increase of the prices, and the companies criticized the regulating government for not compensating their costs

5) The Deregulating Reform

The reform of the electric sector happened in the developed countries as part of the policies of redefinition of the State role and liberalization of the economic activities. The objective of the reform was to allow free competition and its consequent benefits for the society, through an increase in efficiency.

In Brazil, the reform was an integral part of policies pro-market implemented in the beginning of the 1990s. The reform frameworks were defined in the Project of Restructure of the Brazilian Electric Sector, RESEB, elaborated by the consulting firm, Coopers & Lybrand, with Brazilian specialists. The final report, presented in 1997, drew the new model for the Brazilian electric sector, and defined the role of the institutions and the new industrial structure.

The intention was to privatize all the distribution assets. In the generation segment, only nuclear plants and the Brazil's share of the Plant of Itaipu would continue in property of the State. The Federal companies, as well as some state ones, were supposed to be separated into T and G before privatization. Beyond the vertical separation, the generation plants were supposed to be restructured in smaller companies to avoid too much market power in one company and promote competition. The model guaranteed that the transmission lines would continue state owned and only new projects could be executed by private capital.

The new structure of the industry was drawn to introduce competition. One of the main pillars to introduce competition is the separation of activities, or unbundling, in order to give transparency to the market, avoid market power and information asymmetries, and to regulate the monopolistic activities while deregulating the competitive ones.

After reform the electricity market in Brazil would be predominantly free and competitive, with large consumers, retailers and distribution companies choosing their suppliers and the purchase of energy being made in two manners: bilaterally contracting or in the spot market.

Bilateral Contracts between producer and retailer or consumer, or between retailer and consumer, would be agreed by parts concerning terms, price, duration, delivery point, guarantees in a private environment. These contracts would not need to be approved or even registered by the regulator and would serve as a financial instrument to hedge both parts against fluctuations of spot price. The only bilateral contracts that would be under supervision of the regulator were those between distribution companies and their suppliers. Although those companies could choose their suppliers and define the price and purchasing conditions with them, they would have to follow some rules to pass these prices to the customers. Producers, retailers and free consumers would need to buy or sell non-contracted energy resulting in differences between the energy contracted and that actually produced or needed. These differences would be cleared in a spot market in a multilateral trade mechanism that would define the spot price of energy in a half-hourly basis. The spot price would reflect the short run marginal cost to produce

energy at each time and would represent the match between supply and demand curve.

The dispatch of plants would be coordinated by the Independent System Operator – ONS who would follow an optimization model that simulates the entire interconnected system behavior (divided in 4 electrical regions called submarket) in the following 5 years. In this model of power pool, the economic dispatch is determined based on models run centrally by a dispatch center which receives information about costs and operation conditions of all agents participating in the pool. The marginal cost of producing energy by a hydro plant reflects the cost of the future rationing of energy.

The structural and institutional modifications of the Brazilian electric sector started to be introduced in 1993. In this year Law number 8,631 extinguished the equalization of tariff. The tariffs began to be established between the utility and the granting authority, and had to cover the specific costs of each utility.

In 1995, Law number 8,987, called The Concessions Law, made possible the entry of private capital in the sector, and implanted the system of competitive bids for granting concessions. This law made possible the grant of the energy services exploration by a third, and the concession contract celebration, considering the separation of the activities.

In the same year, Law number 9,074, created the figures of the free consumer and the independent producer of energy (IPP), indispensable for the installation of a competitive environment; and also instituted the free access to the transport nets.

The regulatory agency, National Agency of Electric Energy - ANEEL, was created in 1996, by Law number 9,427, and started to operate in 1997. The agency

had, among others, for purpose of stimulating the competition in all the segments of the sector to act in accordance with a criterion that prevented anti-competitive practices and hindered the free access to the electrical systems.

This set of laws initiated the process of privatization of the Brazilian electric sector.

In 1998, Law number 9,648 regulated the Wholesale Market of Electric Energy (MAE) and defined the rules of organization of the National Operator of the Electrical System (ONS). It established the bases for the competitive market and determined that the purchase and sale of energy were freely agreed between the agents. The activities of generation and retailing of electric energy would have, by this law, to be exerted in competitive character and the services of transmission and distribution would continue to be regulated activities, being all under the restrictions of economic concentration and of market power. The law also determined the restructure of Federal companies, in order to privatize them (G and T).

In fact, it can be said that the guideline of deverticalization given by the report of the restructure of the Brazilian electric sector was not a specific object of Law, stated only implicitly in the regulatory mark of the industry.

The process of privatization of the generation of energy faced politics constraints and corporate interests and were not completed. Only four companies had been privatized, which represented 20% of the revenue of the sector. And, even though, the process of privatization in the activity of distribution advanced; self-dealing was instituted, to attract new investments. Thus, a Distribution Company could purchase electric energy from a Generating Company of the same

economic group or sell energy produced by itself to its consumers until the limit of 30% of the energy demanded by these consumers.

6) Hypothetical cases

The induction of the deverticalization as an incentive mechanism to the competition aimed to inhibit the allocation of risk and costs of the activities of independent production and retail of energy, which were competitive, for the utility of electric energy, which was regulated. As the deverticalization was not enforced by law; the process of privatization of the Federal Generation companies was not completed, and self-dealing was permitted, the industry in Brazil became susceptible to opportunist behaviors of their agents.

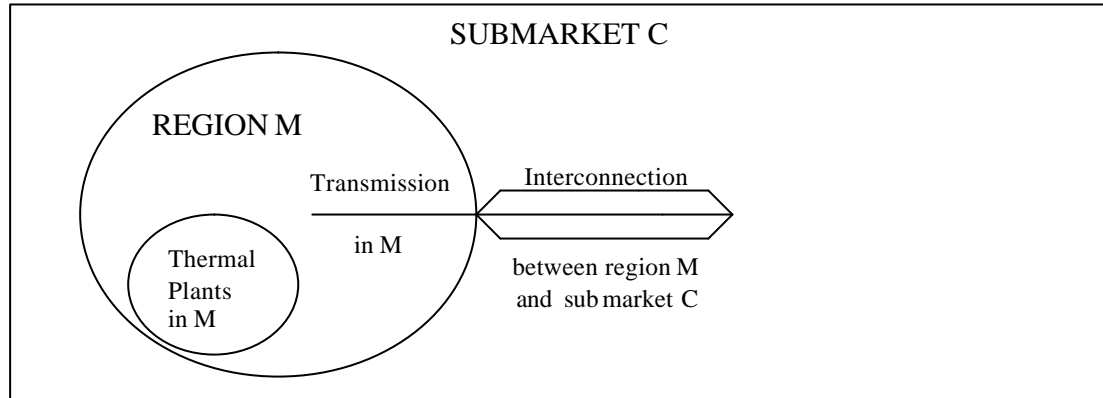
The following hypothetical situations show examples that could have occurred in the Brazilian electric sector because of the fragility of its structure.

6.1) Between Generation and Transmission:

6.1.1 Suppose the existence of a great geographic region (M) that is still in economic development, located inside of the electric submarket C. Its main cities, or load centers, are located far from each other and the demand for energy is in strong and persistent growth. The energy supply to this region is carried through by

thermal plants, located inside it, and by interconnection transmission lines that link the region to the rest of the submarket (Figure 4).

Figure 4



As explained previously, to establish the optimum dispatch and the minimum price of the energy (spot market price) in a submarket, the ONS uses computational programs that do not consider transmission restrictions inside the submarket. The plants declare their price and the dispatch is done, in order of priority, beginning by the cheapest plant.

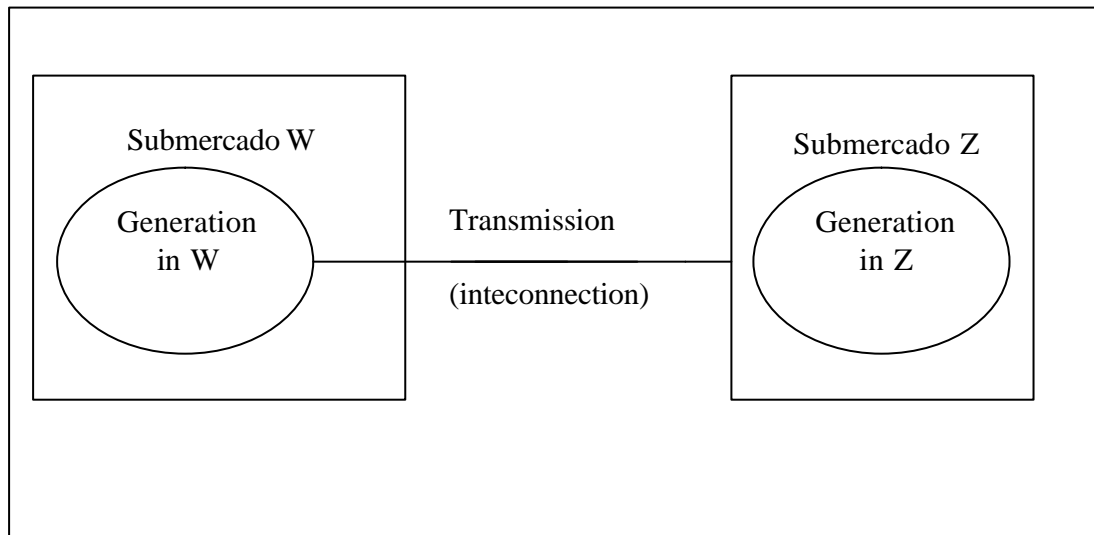
If the generation company is verticalized, or, in other words, generation and the transmission are owned by the same economic group, a defect in the transmission line can be simulated, making their generation plants be dispatched in real time, no matter the price that they had declared, since they are the only supply source of the region.

A monopoly case is created, where the company determines the price of its product. With this opportunist behavior the entrepreneur can make improper profits.

However, if the company was deverticalized, or, in other words, generation and the transmission were not in the same economic group, there would be no opportunity for opportunist behaviors, the company would not have market power and their plants would not be dispatched.

6.1.2 Assume two submarkets, W and Z, linked by a transmission line. (Figure 5)
The former one, during most of the year, sends energy to the latter one.

Figure 5



If there is transmission restriction between the submarkets, the price of the energy goes up in Z and the generating company of submarket W is benefited, therefore W will sell energy at a higher price. On the other hand, if the transmission capacity of the interconnection increases, it also increases the possibility of the submarket Z generating company to supply the submarket W. In other words, the

generating company in W would lose market or face competition of the generating company in Z, therefore the energy in W would be cheaper.

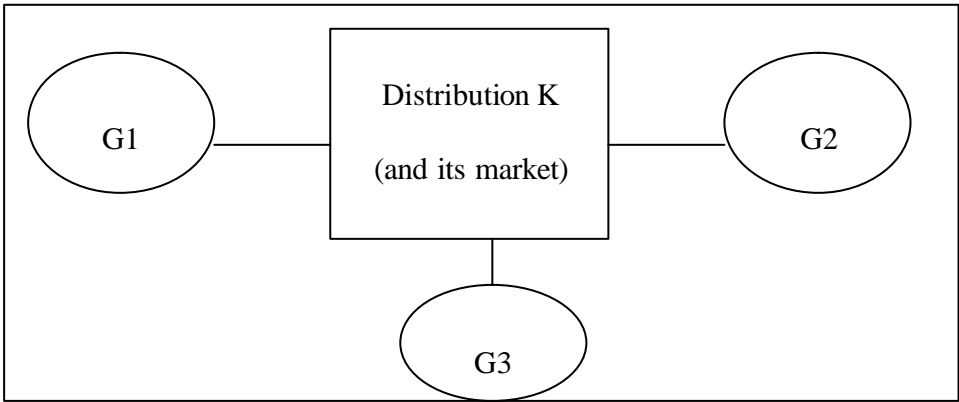
Studies show that the best alternative for the necessary expansion of the electric system and the supply of the two submarkets was the duplication of the interconnection transmission line.

If the generation in W and the transmission company are owned by the same economic group, it would not have interest in expanding the interconnection capacity. Or, the deverticalization would propitiate the competition and the result would be lower prices.

6.2) Between Generation and Distribution:

Assume a distribution company K and a generating company G1, owned by the same economic group. There are other generating companies, G2 and G3, which compete with G1 to sell energy to K, so this company K can supply its market (Figure 6).

Figure



As distribution is a regulated activity, the regulator defines the maximum value of the energy price that the distribution companies sell to its final consumers (called Nominal Value -VN).

The company K would, at first, buy energy from G1, until 30% of its demand (because self-dealing was permitted), and later it would buy from G2 and G3.

Thus, G1 would have no stimulation to be efficient, therefore no matter the price of the energy it produced (limited by VN), it would pass to K and this distribution company would transfer for its consumers. Or still, G1 could operate efficiently, and because of opportunist behavior, do not transfer the efficiency profits to the final consumers, selling energy at a price much higher than the one by which it was produced.

If verticalization were not allowed, G1, G2 and G3 would have to be as efficient as possible, to generate energy at a lower price, and this would benefit the consumers.

7) Conclusion

Despite the important effort in constructing a model for the deregulation of the industry of electric energy in Brazil, it can be said that the guideline of

deverticalization (unbundling) given by the report of restructure of the sector did not materialize.

The reform intended for the vertical and horizontal restructure of the industry. Companies that participated in more than one stage of the productive chain would be induced to form separated companies to operate each activity, and the privatization process would be used to promote the horizontal deconcentration in generation and in distribution.

The deverticalization as an incentive to competition aimed at impeding the allocation of risk and costs of the competitive activities to the regulated activities. Therefore, due to the existing asymmetry of information between utility and the regulatory agency, audit practices are not efficient enough to restrain the allocation of risks and costs between competitive and regulated activities in verticalized companies.

The concessions that resulted from the bidding processes or the extensions of the existing ones began to be granted by separated concession contracts for activity, suggesting the separation or deverticalization of the segments of the production chain of the industry. However, the orientation for the migration of the generation (a public service) to the purpose of the privatization of the state owned generating companies did not happen.

In March of 2004, by means of Law number 10,848, changes in the regulatory mark of the sector had been introduced, with the objective of guaranteeing the energy supply and promoting tariff moderation.

With respect to deverticalization, it established the obligation of separation of the activities of generation and distribution, with the end of self-dealing. However, it did not modify anything in relation with generation and transmission.

The law was a significant advance, therefore the possibility of opportunist behaviors between distribution and generation companies practically ceased to exist. However, as the separation of generation and the transmission was not required, there is still the possibility of the coexistence of interests to get profits from competitive activities and the rights and guarantees given to the public service (as the economic-financial balance) under the same enterprise ceiling. This coexistence can cause the transference of the risk and inefficiencies of the competitive activities to the regulated ones, damaging the consumers.

Besides, this situation makes difficult, if not impracticable, the audit actions of those improper behaviors by the ANEEL.

And, as stated before in this paper, there is a trade-off between the lower transactions costs of a verticalized (bundled) industry and the incentives of the market, in a deverticalized (unbundling) one. If the industry is only partially unbundled, for some industry agents, the costs will rise but without the benefits of a free market.

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