Regulation Policies Towards Utilities and Competitive Industries. The Case of Argentina

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1. Introduction

Old theories of regulation of utilities considered a full-informed benevolent regulator that deals with a monopolist who achieved its market power through economies of scale or economies of scope that gave it cost advantages. The regulator was supposed to maximize the sum of producer and consumer surpluses, setting prices equal to marginal costs. But as most utilities have decreasing costs, marginal cost pricing produces losses for the monopolist that might be compensated through budget transfers or two-part tariffs. If these options are not possible, the benevolent regulator might use Ramsey prices, trying to minimize the welfare cost of obtaining the revenues necessary for the firm to recover its costs. In this framework competition is not necessary, either because it is not possible, or because the full-informed regulator can perfectly mimic what competitive forces do in other industries.

More recent theories point out that these assumptions about the regulators are not real. They usually have their own agenda, they have an information disadvantage vis-à-vis the regulated firm, they face political restrictions (current and intertemporal) and they may lack instruments that allow them to make commitments (and this augments the risk of opportunistic behavior). Moreover, the regulated firm may face competition in some segments of its activity. Therefore, the regulation of utilities is naturally imperfect and the social goals are not fully met.

In this more realistic scenario, the possibility of introducing competition to some activities of the private utility allows the regulator to reduce its informative disadvantage and gives better incentives to the regulated firm to reduce costs. By reducing the discretion of the regulator competition reduces the risk of opportunistic behavior and makes cross-subsidies unlikely.

However, both instruments of regulation (competition in some segments of the market and regulation) are imperfect. The best mix of both instruments to achieve social goals will vary from one case to another.

Finally, there is a strong correlation among three aspects of the reform process of public utilities: the design of the privatization process, regulatory practice and contractual adaptation. The instruments used to sell the public firms may affect the degree of competition in the market of the regulated firm and depending on the transparency of the auction they may ease or make more difficult contractual adaptations that may be necessary to overcome unexpected events at the time of the privatization. In any renegotiation of the contract the risk of “low balling” is always present, where firms make unrealistic bids to win the auction, and later attempt to change the contract in a bilateral negotiation with the government.

This paper reviews the Argentine experience with privatization and deregulation. In 1989 Argentina initiated a massive program that included energy, telecom, water and sanitation, railways, ports, airlines, pensions and highways. In some cases, the privatization was accompanied by the deregulation of the whole market or some parts of it, in other cases exclusive rights were granted for a period of time to the new owner or concessionaire.
The economic evaluation of this process is complex. On the one hand, important productivity gains were achieved in all sectors; on the other hand, in some cases there were flaws in the privatization process or in the regulatory framework.

One common critique is that, even in some cases in which the technology allowed for more competition, the regulatory framework was very restrictive (e.g. telecom and air travel). However, these two privatizations took place in 1989 and 1990, years in which the Argentine government was strapped for fiscal revenues and hyperinflation was devastating the economy. The idea to “sell a monopoly” to ease the fiscal problem is understandable, although it was suboptimal given all the problems that it created in later years.

Other problems have no clear justification because they are the consequence of flaws in the privatization process or in the regulatory framework. It is easier to detect these mistakes ex-post; what creates more worries is the tendency to repeat some of these errors in the recent privatization of the post office and airports.

The paper is organized as follows. In section 2 there is a summary of the most important results of the Argentine privatization process, in the following section there is an analysis of the regulatory frameworks, in section 4 there is a brief discussion about the regulatory agenda for the near future, and section 5 concludes.

2. Privatization, regulation and economic performance. The Argentine case

The Argentine privatizations were not only an important change for each of the sectors involved but also had important macroeconomic consequences. From a microeconomic point of view, the results of the privatizations should be assessed in terms of their impact on economic welfare. For example, Vickers and Yarrow (1988) see the privatization as a change in the regulatory framework that changes the incentives of the regulated firm. On the one hand, the drastic change in incentives has clear positive effects on cost minimization and improvements in static and dynamic efficiency; on the other hand, the monopoly power of the regulated firm and the inexistence of an “efficient and benevolent” regulator may affect negatively the allocation of resources.

Therefore, according to this vision, after the privatization one should expect to see important and rapid gains in productivity and innovation, with ambiguous impact on prices, which depends on the quality and efficacy of the regulatory framework. From a methodological point of view one needs to follow a case by case approach in partial equilibrium.

It is also possible to assess the impact of a privatization process from a macroeconomic point of view. For example, Boycko, Shleifer and Vishny (1996) argue that in economies in transition the privatization process might be interpreted as a deep political reform that gets rid of the public firms, traditionally dominated interest groups (unions, suppliers of the firm) with goals contrary to the social objectives. Therefore, the privatization increases the political costs of inefficient interventions in the economy because it obliges to make transparent subsidies that were previously hidden in the deficits of the public firms. According to this view, the privatization process is an efficient restructuring of firms in economies in transition and a means to avoid a direct political intervention in market processes.
From a methodological point of view this interpretation is complementary to the former one. They agree upon the incentives to minimize costs of the new private owners, but the second view requires a more general approach to evaluate the reform.

2.1. Characteristics of the Argentine privatizations

In this paper we followed the first route to analyze the impact of the Argentine privatizations. In Annex 1 we summarize the most important features of each one of the sectors analyzed, emphasizing market structure and the degree of competition allowed. There is a wide range of possibilities, from vertically integrated monopolies in telecom and water and sanitation, separation in three stages in natural gas and electricity with open competition in production and closed monopolies in transport and distribution, and deregulated markets in ports, airlines, pension funds and fuels. In railways and highways the government used concessions of different length and with different rules.

Price caps were the most common instruments of price control of regulated firms. In electricity and natural gas distribution companies are allowed the passthrough of the prices they pay for upstream gas and electricity. However, in other cases like water and railways, price caps are mixed with some elements of cost-plus regulation and in the case of interurban highways the RPI used is anomalous because it uses an interest rate index. Finally, in some sectors prices are not regulated (ports, airlines, fuels, pension funds).

The government attitude towards cross subsidies was also mixed. In telecom and water and sanitation they are pervasive, while in electricity and natural gas tariffs were rebalanced just before the tender offer, and this tendency continued after the privatization given the possibility of large users to by-pass the distribution companies and access directly to the wholesale market.

The degree of competition allowed varies from one sector to another. There is no competition in water probably justified by technological issues, there are closed monopolies for a period of time in telecom and airlines, there is growing competition in electricity and natural gas through third-party access to the distribution grids and there is free entry in generation of electricity, production of natural gas and petroleum, airlines, fuels and pension funds.

2.2 Economic performance

To assess economic performance, it is necessary to review the evolution of prices, quality and volumes both in the present and in the foreseeable future. There are five main indicators to check: a) prices, b) coverage of the service, c) quality of the service, d) investment, and e) productivity. The first three indicators have an immediate impact on consumer welfare; the other two are relevant to get an idea about future performance. It is also interesting to review the evolution of each one of these variables to get a preliminary conclusion about the hypothesis of Vickers and Yarrow (1988) mentioned above.

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2 Third party access in electricity was very important through the nineties and the regulatory agency was reducing the minimum consumption necessary to have the right to purchase directly in the wholesale market. In natural gas competition faced more restrictions.
a) Prices

The previous discussion suggests that one should not find a common pattern of price evolution, because there are differences in the time of the privatization, the use of cross subsidies previous to the tender offer and the degree of competition allowed in each sector. The Argentine experience during the 1990’s proves that this was the case. All nominal tariffs were deflated by the Argentine Wholesale Price Index (WPI). The results as of 1998 are the following:

Telecom. The average price declines since 1990, but with a rebalancing that increased the cost of the fixed charge and urban calls, and reduced the price of long-distance and international calls. The price per minute of urban call was similar to that observed in 1985 and much higher than in 1989 (the year previous to the privatization, but clearly this was a distorted price well below costs).

Natural Gas. Mostly privatized in 1992. Prices and margins of distribution and transport that are reasonable in historical terms and in comparison with other countries for residential and industrial consumers, and relative higher for commerce. Increases of residential prices of the early 1990’s corrected subsidized tariffs.

Electricity. Mostly privatized in 1992. Prices and margins of distribution and transport that are reasonable in historical terms and in comparison with other countries for all consumers. Drastic decline in the wholesale price of electricity caused by strong competition in generation and technological improvements.

Water and sewage of Buenos Aires City. Privatized in 1992. Prices as of 1997 were lower than in the early 1990s. Later discussions of the contract ended in higher tariffs.

Fuels. Deregulation started in 1991. The privatization started in 1989 and was completed in 1992. Net of tax prices of gasoline and diesel had an average increase of 5% in real terms between 1988 and May 1998. Prices to consumers increased 14% in real terms in the same period because of tax hikes. The price of petroleum was reduced by 35% in the same period.

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3 The use of aggregate indexes of public enterprise prices like those used by Sigep is misleading because the oil sector had a weight close to 75%. The index elaborated by the Argentine Bureau of Censuses is also subject to interpretation errors because it uses fixed weights of a low number of products offered by the utilities and consequently is subject to misleading changes when some of these products have an improvement in its relative price (like it happened at the time of the telecom tariff rebalancing of 1997, see Artana et al 1998 for a further elaboration on this point). Moreover in an economy like Argentina, that moved from hyperinflation to price stability and which in several years of the 1980’s used political prices of public utilities as instruments of fiscal policy, one needs to be careful about the base period, the use of price deflators, or the handling of cross subsidies.

4 The Argentine Consumer Price Index (CPI) during the 1990’s increased more than the WPI. Wages had a change that was in between the CPI and the WPI changes. Therefore, the results in the text should be interpreted as an upper bound.
Highways. Privatized in 1989 and 1990. Interurban tolls were in 1997 50% higher than at the time of privatization because of renegotiations that changed the financing of investments and tariff adjustments based on the LIBO rate.


Airlines. The four most important domestic routes had price declines of 36% in real terms from 1991 to 1996 due to strong competition.5

Railways. Average prices for passengers increased 9% between 1993 and 1998; and 3% for cargo, but there was a reduction in the government subsidy to favor low rates from $ 256 millions in 1986 to $ 87 million in 1997.

b) Service quality and coverage productivity and investments

In Annex 2 there is a summary of the most important results achieved in each sector. The figures suggest a more uniform result than those observed in prices. There are significant improvements in all sectors. For example, coverage doubled in telecom, and all firms invested huge amounts of money, regardless if the contract demanded mandatory investments (e.g. water) or give complete freedom to the firms, but subject to penalties for deficiencies in quality of the service offered (e.g. electricity).

The improvement in the quality of the service is also substantial. For example, digitalization of the telecom network increased from 13% previous to the privatization to 100% in 1998, blackouts of electricity were reduced sharply,6 the quality of the highways was improved, and ports reduced the average stay of a ship and improved punctuality. Labor productivity increased dramatically in all sectors.

c) Conclusions about economic performance

The results of the Argentine privatizations as of 1998 confirm the Vickers and Yarrow hypothesis. There were significant improvements in quality and coverage and firms invested heavily in all sectors, but the evolution of prices shows mixed results. Consumers were favored by lower prices in those sectors were competition was more important (airlines, ports and electricity at the wholesale market) or were the regulation was more professional and effective (natural gas or electricity).

3. Regulatory design

Regulatory policy should distinguish between potentially competitive markets from those of natural monopolies, taking advantage of competition whenever it is possible. In any case the regulatory framework must induce the regulator to act in defense of the consumer interest, taking also into

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5 Airlines prices increased from 1991 to 1993 and declined later after two new firms entered into the market.
6 In 1999, there was an increase in the number of electricity blackouts and a single episode that had several thousands of consumers without electricity for ten days.
account the interest of future consumers. A government respect of the contracts is necessary to maintain the incentives to invest. The role of the regulator is not to mediate between the firm and the consumer, but to act as an efficient representative of the consumers, taking into account the intertemporal consequences of its decisions.

This unidimensional objective of the regulation contrasts with other political goals that frequently are suggested in Latin-American countries. There are impacts on small firms or on employment, but the introduction of other objectives in the regulatory policy is inefficient and complicates unnecessarily the task of the regulator. Hence, the “right” regulatory policy should focus in only one side of the “counter”, the consumers, and ignore all other aspects. This is exactly what happens in competitive industries, and a well-designed regulation tries to mimic the functioning of competitive forces.

In pursuing this objective, the regulatory framework should contemplate that there are asymmetries of information, interest groups, political tensions, institutional weaknesses, etc., that only allow achieving second-best results. There is a trade-off between rules and discretion: rules (i.e. detailed contracts) become more attractive when discretion tends to be misused. This is less likely when professional bodies with incentive-compatible rules administer regulation, and where the judicial system has good reputation and experience about regulatory disputes. Given that there are always unexpected events, the regulator’s discretion is useful to solve these conflicts.

To protect the consumer’s interest it is also important that the regulatory instruments are correctly chosen. What is relevant for the consumer is not the investment but its effects on prices, service quality and coverage. These should be the targets of an efficient regulation, and not detailed mandatory investment plans that may become useless if markets conditions change. In competitive industries it is important that different commercial policies are respected. For example, there is usually a strong criticism to loss-selling practices, especially from the competitors of the firm that is selling “below cost”. A professional regulator should ignore these complaints and be focused only on the possibility to collude on prices or set monopoly prices after the price war is finished.

There follows a summary of what happened in Argentina during the 1990s in the regulatory design.

a) Auction mechanisms and concession span

In the privatization of government assets (through an outright sale or a concession) there are several important goals: i) to maximize government revenues but respecting the interest of the consumers, ii) to use transparent mechanisms to select the winner, iii) in the case of concessions to choose a time span long enough to allow for the amortization of the investments of the first years of the concession (which are usually important, given the low investment that was typical of public firms in Latin

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7 For example, an opportunistic regulation of prices that does not compensate the firm for its capital costs will benefit consumers in the short run, but penalize them in the medium term because new investments will not occur. The regulator should find a balance between the interest of consumers today and the interest of consumers in the future.

8 This is another application of the Diamond and Mirlees (1971) principle. For example, policies to increase employment are more effective working directly in the labor market, and not through special restrictions on the regulated utilities.
America), and iv) try to avoid “low balling” and to rely excessively in future audits of different targets and decisions of the firm. That is, one should favor transparent instruments, that allow for a simple selection of the winner, with duties that are easily enforceable and explicit mechanisms to adapt the contract if there are unforeseen events that suggest the need to renegotiate the original agreement.

For example, it is better to use the “two envelope” mechanism. The first envelope contains all the technical data about the firm. The second envelope which is opened only for those firms that qualify in the first stage, only contains the economic offer specified in only one dimension (e.g. highest price for the assets sold, or highest canon for the concession received). In multi-dimensional bids, where at the same time the firms offer canon, investment and prices, it is more difficult to ensure transparency or the selection of the most efficient firm. And even worse is to include demand forecasts that later are not fulfilled and open the door for a bilateral negotiation between the government and the firm who estimated big increases in demand (this augments the risk of “low balling” offers).

In those Argentine privatizations where assets were directly sold to the winning firms there were no major problems (telecoms, fuels, production of natural gas and generation of electricity and airlines). In the case of concessions there were some mistakes. In the privatization of water and sewage the winning firm was chosen according to the lowest average tariff offered, but the introduction of detailed investment plans resulted, a couple of years later, in renegotiations of the contract. In the privatization of passenger railways the concessions were for only ten years, a period too short to encourage additional investments to the minimum required (that were financed by the government). The most problematic cases were the concessions of cargo railways and highways because of the multidimensional offers (canon, investment), and the concession of ports in which the canon was supposed to be adjusted by the evolution of port fees fixed by the regulator according to its budget needs. This created incentives to lobby for a reduction in port fees that finally was approved by the regulator.

b) Market structure of the sectors

From a regulatory point, it is better to separate potentially competitive segments of the markets from the monopolic ones. To the extent that economies of scope or scale between these two segments are not very important, it is also better to divide the assets of the future privatized firms, allowing free entry to the competitive segment and regulating the monopoly price for the use of its network.

This approach was followed in Argentina in most cases. For example, in ports there was a decentralization of small ports to the provinces and competition among different firms in the port of Buenos Aires, separating different terminals to increase the extent of competition; in fuels, pension funds and generation of electricity the markets were deregulated; in water and sewage the concession was for an integrated monopoly, a right decision given the important economies of scale and scope and no significant potential competition. In the case of natural gas the three stages of production were vertically separated, but a concentrated upstream market worried the regulator and, in a couple of occasions, retarded the full passthrough of the price of natural gas. Even more problems appeared in

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9 In the privatization of Entel and YPF (the public telecom and oil companies) the government subsidized small investors. The objective to create a “new capitalism” clearly implied a lower government collection and no benefit for the poorest that have no income to get a piece of the subsidy.
the privatization of the telecom when the government decided to sell a 10-year monopoly on long distance and international calls (both segments potentially competitive at the time of the `privatization), and in the privatization of railways (an imprecise definition of the access charge to the rail blocked the development of long distance passenger traffic) and highways (with a sloppy price adjustment mechanism). In any case, some of these weaknesses may have raised the money collected by the government at the auction, to the extent that they may have increased the value of the privatized firms.

c) **Regulatory instruments**

It is very important that the variables that the regulator will supervise are clearly specified, recognizing that what is relevant for the consumer is the mix of price and quality and not the investments that determine them.

There were no major problems in the privatization of ports, pension funds, telecom, natural gas, electricity and fuels, either because prices were deregulated and only safety and quality were regulated or because regulated monopoly prices were not accompanied by mandatory investments.

In water and sewage and railways the government introduced mandatory and detailed investment plans that later turned to be inefficient or unnecessary given unexpected changes in total or regional demand, or improvements in the technology. These created a lot of pressures for bilateral negotiations that are not subject to the control of the tender process, and delayed any possibility of introducing competition. Mandatory investments create a problem of stranded assets just from the beginning of the concessions.

d) **Tariff structure**

Cross subsidies not only distort consumer decisions\(^\text{10}\) but also prompt measures that make competition more difficult and allow undesired transfers to high-income families. Therefore, the tariff structure should be free of cross subsidies, at the same time that it should try to minimize the difference between prices and marginal costs that is characteristic of services with important economies of scale.

The initial tariff structures respected these principles in natural gas and electricity (an important rebalancing in tariffs was approved before the privatization in the case of natural gas), and in cargo railways and ports because there are maximum prices that the firm may discount to compete for example with trucks.

In fuels wide differences in tax rates of diesel and gasoline have created an artificial incentive to purchase cars powered by diesel engines, and high specific taxes on gasoline has reduced the incentives for the firm to compete through prices. In the case of pension funds the suppliers are allowed to compete in two dimensions (fixed monthly commission and variable commission). This blurs the comparison of each pension fund fee, and induces the firms to compete through non-price dimensions.

More problems appear in the regulated tariff structure of telecom, where cross subsidies are pervasive (e.g. from urban commerce and long distance users to urban families and rural consumption) and make

\(^{10}\) Except when they correct for externalities like in the case of water and sewage.
competition in local calls more difficult. The rebalancing of prices in 1997 reduced partially the amount of the subsidies, but with several problems during its discussion.

The worst case is probably water and sewage. Cross subsidies are pervasive and anarchic among the current users (tariffs are lump sum charges based on a complex estimate of property valuations) and in favor of new users, which makes the regulatory task more burdensome because the incentives for the firm to invest in expansions of the network are not compensated at each marginal decision.

e) **Tariff adjustment**

Price adjustments should try to foster cost reductions. To achieve this goal tariffs should be based on costs only at intervals of time. This is the idea behind price-cap regulation that determines the regulated prices for a number of years. Only at the time of the price cap revision the regulator may look at the firm costs. In fact, although the change in the cap should be forward looking, in practice it is customary to check the profits obtained by the firm in the past. Hence, what one finds in regulatory practice is a mixed system that combines some incentives to reduce costs and some tendency to regulate prices close to the costs of the firm. It is also reasonable to allow the firm the passthrough of the costs that are completely out of its control.

There is no problem with tariff adjustment clauses in completely deregulated markets (pension funds, fuels, airlines), and in natural gas, electricity and telecom the adjustments were correctly designed (price caps for 5 to 10 years). But there are problems in water and sewage and passenger railways where hybrid formulas, that combine a price cap with cost-plus regulation if costs increases are higher than 7%, are in place. Finally, more errors and conflicts appear in the case of tolls; originally these contracts were subject to indexation by domestic prices and when indexation was prohibited in Argentina they used an adjustment clause based on 80% of the Libo rate. Using an interest rate in a formula to cap prices has no clear rationale.

f) **Institutions**

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12 Full passthrough has problems on its own because it reduces the firm incentives to purchase at minimum prices. And even if the upstream market is competitive there are other interesting questions. Who is in better position to ensure against changes in the relative price of the upstream product, the producer, the regulated firm or the consumer (full passthrough transfers this risk to the consumer)? Is the product upstream a commodity or is there competition in non-price dimensions (to the extent that there is competition in non-price dimensions, it is not certain that the regulator can easily monitor the regulated firm)?
13 Argentina uses as the RPI the Producer Price Index (PPI) of the United States. This is a consequence of price stability and the prohibition of indexation in contracts signed in pesos. This has created some problems: in deflationary episodes a political pressure to abandon a correction by foreign price indexes that grow more than domestic prices; in normal conditions the need to contemplate the difference in the nature of the PPI (an index of tradable products) and the RPI most used in other countries (which usually is an index of tradable and non-tradable products like the Consumer Price Index). This difference should be contemplated in the calculation of the X factor because by using an index of tradable the productivity gains of the regulated firm should be compared with those that will be achieved in this sector of the economy. This will usually lead to lower X factors. This was completely ignored by the regulator in the price cap revision of natural gas and by its foreign consultant (see FIEL 1997 for more details).
Given that there are unexpected events some discretion is necessary. If professional bodies, that are well designed so as to minimize political pressures and the capture by the regulated firm use this discretion, it is possible to reduce the risk of opportunistic behavior or an exploitation of the consumers.

Key variables for a good institutional setting are: autonomous agencies (e.g. procedures to chose the directors, stability in the positions of the directors, budget that has no major problem of incentives), with a professional staff, that supervise more than one firm (to reduce the asymmetry of information and the risk of capture) and public hearings that allow a decentralized supervision from the interested parties (the regulated firm, consumers, voters) and an ex-ante discussion of the problems that need to be solved.

The Argentine experience shows wide differences in terms of institutions. No major problems were observed in the cases of natural gas and electricity in which the regulatory bodies were created by law respecting most of the principles stated before. In the other extreme the regulatory body of telecom had a strong dependency of the Executive branch of the government, was created after the private utilities were operating and was intervened with the removal of the directors several times, the regulatory body of water and sewage has directors with strong political dependency, and the regulatory agencies of transport are agencies of the Executive branch, instead of independent bodies.

**g) Conclusions about regulatory design**

There were few mistakes in the regulatory design of the energy sectors. In the case of telecom it is possible that the mistakes could be attributed to the fact that it was one of the first privatizations and was done in the midst of a macroeconomic chaos. In water and sewage, some of the mistakes might be explained by the technological difficulties and the superposition of three governments in the regulation of one firm (the Federal government, the city of Buenos Aires and the province of Buenos Aires). It is difficult to find some explanation for other serious errors like the use of multidimensional bids in railways, or the adjustment of the canon in the port of Buenos Aires, or hybrid adjustments clauses in railways.

Looking in retrospective some of the errors could have been avoided at the time of the privatization, and others became evident as the regulatory conflicts appear. In any case, they should be useful for future privatizations at the Federal, provincial and municipal levels.

**4. The agenda for the future**

In the regulatory practice in most countries there appear some problems that demand new solutions and ideas. There are also specific issues relevant for each country. A summary of the most important areas for Argentina follows.

**a) Introduce more competition**
It is not necessarily certain that more competition eases the regulatory burden. The regulation of access prices is necessary for the consumers to benefit from competition upstream. In any case, the regulators replace one task by another: the regulation of the final price for the consumer for the regulation of access prices, although in this later case the regulator may benefit from the different interests of the new entrant and the owner of the network. In any case, more competition is desirable for the consumer.

Therefore regulation should avoid those decisions that restrict competition. Unfortunately, in Argentina there are some negative examples: i) the restriction for the employees to change from one pension fund to another only once a year reduces the options for the worker with no clear impact on lower fees, ii) a gradual deregulation of telecom markets since 1999, when the original contracts allowed to introduce open competition, iii) the extension of cross subsidies to finance the expansion of the water and sewage and natural gas networks that needed to be accompanied by restrictions on competition of the consumers penalized by the tariff structure to allow the recovery of the amounts invested, iv) the reduction in the canon paid by the concessionaires of the port of Buenos Aires, to ease the competition of these firms with a new entrant that build a port in provincial jurisdiction.

Another important issue in the promotion of competition is the interaction between the regulatory bodies of the utilities and the antitrust commission. The absence of a clear assignment of responsibilities (e.g., the regulatory agency studies the case and the antitrust commission takes a decision about competition issues) has created some problems in the past. One example is the passthrough of the price paid for natural gas. The temporary restrictions that the regulatory agency introduced in 1994 and 1996 seemed a response to a preoccupation for the impact of a concentrated upstream market; even if there was a problem in the upstream market the law was clear about the automatic passthrough. In fact, instead of using the distribution companies as a means to reduce the

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14 Helm and Jenkinson (1997) point out that competition is not an end in itself but an instrument to improve social welfare. Sunk investments create regulatory problems. How to finance “stranded costs” when they were not diluted in a lower price for the assets paid to the government at the time of privatization, how to allocate the risk of new sunk investments when the regulation bars one option to diversify risk through vertical integration and the restrictions to eliminate cross subsidies are just a few examples.

15 Pension funds compete in several dimensions: fees, security of the funds invested and return on the investment. High expenses in promotional campaigns that were questioned in Argentina may lead to duplications, but given the strong competition among pension funds it is unlikely that they will explain “high oligopolistic fees”. The duplication of costs apparently reduced the pension funds profits (this is confirmed by their balance sheets) and appears to be a “fact of life” in most competitive markets, specially if real-world competition has a Schumpeterian approach.

16 From year 2000 onwards, local telephone will be initially restricted to four firms, and long distance to 7 firms (later this number was increased). Apparently the regulatory agency tried to avoid “excessive predatory competition” like the one observed in Chile. This preoccupation looks exaggerated. From a theoretical point of view Sutton (1992) argues that if sunk investments are relevant the long term solution will be a concentrated market with stable prices, and if they are not as important there will be competition like in other markets. It was also argued that new entrants to the Argentine market would be protected from predatory practices from the incumbent. This argument is not relevant for multinational firms and it clearly implies more costs for those firms that could specialize in offering their services to niches; with the Argentine restrictions they need to associate with one of the four firms or get an authorization that obliges them to operate in a minimum number of markets.
upstream price of natural gas, the correct institutional setting would have been to allow the regulatory agency to sue the producers of gas in an antitrust case.

Third-party access is another instrument to favor more competition. There are several problems to solve. On the one hand, stranded investments (those investments that a distribution company made in the past under a different institutional setting that allowed them to recover their costs in a market restricted to competition) should be priced in the access price to the fixed grid to avoid artificial bypass.\(^\text{17}\) In the Argentine case there have been some problems because of take or pay contracts of electricity and different local taxes for interprovincial sales that penalized established distribution companies.

On the other hand, the access of small consumers rises some technical issues. Given the high cost of meters that register hourly consumption of electricity, it might be necessary to group consumers, with an estimate of their average consumption, to make possible the billing to the trader.\(^\text{18}\)

Another problem that is similar to the one posed by stranded investments, is the financing of universal coverage. If cross subsidies are used, restrictions to competition will be demanded by the incumbents to protect them from the cream skimming of new entrants. A better alternative that is compatible with competition is the auctioning of areas to the best offer in competitive bids based upon the minimum subsidy to ensure full coverage of the service. The firms can only charge the maximum regulated prices for local service. If this subsidy is financed out of charges to the users of the service the tax should be charged to all consumers so as to avoid any distortion in the functioning of competition.

b) \textit{Adjustment of the price caps}

The formulae used in Argentina are RPI – X + Y + K, where RPI is the PPI of the United States, X is an efficiency factor, Y is the passthrough of upstream costs, and K is the compensation for new investments.

In the case of the Y factor in natural gas the law allows for automatic passthrough; this is not the case in electricity where the distribution companies are allowed to passthrough only the seasonal price that is the average of hourly determined prices in the competitive wholesale market. The automatic passthrough creates incentive problems that may be offset by allowing the passthrough not of the actual price paid but of an average purchase price of all distribution companies or a contract price or a competitive wholesale price (like is done for electricity). The problems are aggravated when upstream markets are not very competitive. Moreover, restrictions on the passthrough also create problems because the passthrough transfers all the risk of fluctuations in the upstream price to the distribution company which is not necessarily the lowest cost “insurer”.

Other problems of incentives appear in the tariff discussion of the transmission companies. Given the public good nature of interconnected electricity grids it is virtually impossible to design a tariff

\(^{17}\) Waddams Price (1997) mentions that natural gas traders have had a cost advantage that was explained by stranded costs of British Gas due to take or pay contracts signed in the past when wellhead prices were higher.

\(^{18}\) This has been suggested in the United Kingdom. In Argentina, this grouping of consumers existed even before the privatization of electricity.
structure that adequately compensates for the investment cost. In Argentina the situation is even worse because more than 50% of the revenues of the transmission company are a direct function of its losses of electricity. In spite of the existence of penalties if quality deteriorates, there are clear incentives for the firm to augment electricity losses to increase its revenues.

Tariff rebalancing after the privatization also proved to be difficult in Argentina and highly politicized, at least for telecom and water and sewage.

In future price cap revisions there are several important issues to solve. First, the convenience of individual caps or caps on a basket of products. The second alternative has the advantage of giving freedom to the firm to approximate Ramsey prices.

A second problem is the calculation of the cost of capital to be used in the price cap revision. The first case in Argentina was the natural gas price revision of 1997. The usual practice in other countries is to estimate the rate of return for the regulated firms using the Capital Asset Pricing Model that starts from a risk-free return (the rate of public bonds) and adds a risk factor that compensates for the differential risk of the sector and the risk of investing in shares instead of bonds.

The problems in countries like Argentina are the lack of a well developed capital market, a short history of utilities quoted in the market, a tax treatment of debt financing that is different than in developed countries, and some problems in the estimate of the return on public bonds.

Finally, other problems were evident in the estimate of the X factor of natural gas companies using the Total Factor Productivity approach that a consulting firm suggested to the regulatory agency. NERA (1997) used 1970-1994 differences in productivity between the natural gas industry and the Argentine GDP to forecast the difference in productivity that will reign in the 1998-2002 period, ignoring the large structural changes that took place in the Argentine economy since 1991 and in the natural gas industry since 1992 (i.e., it ignored the structural break that makes any extrapolation of past figures completely useless). Moreover, the TFP method has several assumptions that were not applicable for the Argentine period analyzed. For example, it assumes an economy closed to foreign trade, full arbitrage in the change of input and factor prices, etc.

Therefore, mechanical extrapolations of methodologies used in other countries may be full of mistakes. Before using them in emerging economies it is necessary to make several corrections.

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19 See Visintini (1998) for an explanation of the procedure followed by the regulatory agency, and Chisari, Rodríguez Pardina and Rossi (1998) for a conceptual discussion of the issues involved. FIEL (1999 b) extends this discussion to the case of a provincial distribution company.

20 Some of the steps followed in the natural gas case illustrate about the problems. To estimate the Beta factors for distribution companies the Argentine regulator used Betas for distribution companies in the United States, and for transport companies, as they are regulated in Argentina with a price cap formula and not with ROR as in the US, it used Beta factors for US telecom firms. Moreover, it calculated the return on a long term Argentine public bond using the stripped yield of the Argentine Brady Par Bond, which tends to exaggerate the return since it includes the cost of the swap to “get rid” of the collateral that Brady bonds have. The alternative to use Argentine Global Bonds has also problems of its own because these bonds are more illiquid.

21 A critique to the NERA document can be found in FIEL (1997).
c) **Contract renegotiations**

The need to renegotiate a contract may occur for two reasons, either there were mistakes in the regulatory design or unforeseen events altered the initial conditions. In Argentina most contract renegotiations that took place during 1997 and 1998 were the consequence of errors in the regulatory design. The initial conditions of the contract were subject to renegotiation either when the auction included multivariable offers (railways and highways) or the contract included a detailed mandatory investment plan (water and sewage, and even worse in railways were mandatory investments were associated to demand projections that were important decision variables to select the winning offer), or the canon paid by the concessionaire has some relationship with the projections of demand (ports) or the time span of the concession was too short (10 years in passenger railways).

In some cases the renegotiation might also be explained because the government demanded a change in the investment plan (water and sewage) or an improvement in the quality of the service (subways). Bilateral negotiations might be avoided if the government can wait for the expiration of the concession but this may take a long period of time, or if the new investment or services added might be separated from the existing ones. In this second case, it would be possible to open a competitive auction for the expansion of the service, but in practice it might be very costly to make that disintegration of the service.

When unforeseen events are the cause of the renegotiations it is better that bilateral discussions are open to examination and criticism through public hearings. This may delay the process (increase the transaction cost of the final outcome) but makes the whole process more transparent, reducing the risk of future opportunistic behavior. If the original contract needed Congressional approval, the same process should be followed in the renegotiations, to ensure an adequate protection of property rights.

d) **Integration in Mercosur**

Argentina is a member of a trade union with Brazil, Paraguay and Uruguay. The basic rule for the integration of utility services should be the same applied to other goods and services. It is better to have uniform technical requirements to avoid the creation of artificial barriers to trade.

Beyond this general principle, two important discussions appeared in the integration process of utilities. The first case was the typical proposal to restrict exports of exhaustible resources (natural gas) only after domestic demand needs were satisfied. The second discussion had to do with a potentially integrated market for wholesale electricity, given the big disparity in size between Argentine and Brazilian generation capacities.

In the first case, any discrimination on exports of natural gas would be clearly wrong. The optimal extraction path for a price-taker country like Argentine is not dependent on who demands the product, but is only supply constrained. Restrictions on exports, that are common in many countries, retard investment in exploration and production of natural gas and wrongly assume that the government has better capacity than the private sector to forecast the evolution of prices.
In the case of integration of the wholesale markets of electricity of different size the problems faced by Argentine generators are not different than those faced by the producer of any tradable good. A big opportunity to export is opened together with the risk of a high depression in prices when the large economy enters into a recession or has an abnormal wet year that expands its hydroelectric generation. The private sector is in better conditions to diversify this risk than the government.\(^{22}\)

\(e\) **Institutions**

Argentina is a country with some institutional weaknesses in the judicial system and with some history of expropriation events when macroeconomic conditions were chaotic. This suggests that is convenient to “save” in the use of the Court system, relying in detailed contracts and independent regulatory agencies. Other institutional arrangements may increase the risk of opportunistic behavior and discourage future investments.\(^{23}\)

Hence, the Congress has a role in defining the regulatory rules and control ex-post the actions of the Executive branch and the independent regulatory agencies, but given the traditional problems of time inconsistency for politicians, the Congress should stay out from the process of tariff regulation and any other regulatory decision. The Executive branch should be responsible of the general policies that rule each sector and the professional bodies should have exclusive responsibility in tariff revisions and other regulatory issues (e.g., control of the quality of the service). Finally, the Courts should restrict their task to interpreting the contracts in the case of legal disputes, abandoning any distributional consideration that is responsibility of the Congress and the Executive.

Some lower-court decisions on the rebalancing of telecom prices did not respect these principles. The proposal to create a single regulatory agency under Congress supervision was another example of wrong ideas. The creation by presidential decree of some of the regulatory agencies and the intervention of others are other bad examples.

Another issue is the role of consumers in the regulatory agencies. Proposals to include one representative as director of the agency are not correct, since it will represent only one of the parties in the commercial relationship (the firm and future consumers are not represented). The government might help consumer associations to get technical assistance and they should be allowed to participate in public hearings, but not be part of the professional bodies whose role is not to mediate between the firm and the consumer, but to interpret, from a professional point of view, the regulations that in the first place should have been designed to protect the interest of current and future consumers.

Finally, in federal countries like Argentina there are other institutional problems. First, the Federal government should be responsible of any regulation that deals with interprovincial problems. For

\(^{22}\) The traditional assumption that the private sector is risk averse and the government risk neutral is highly questionable given the opportunities that the private sector has to diversify risk, including some alternatives that are more difficult for the government like purchasing assets in the other country. Even under the traditional assumptions the best policy would never be any non-price restriction on the trade of electricity; for example, trade taxes and subsidies are better second best instruments than restrictions on the quantities exported or imported.

\(^{23}\) See Levy and Spiller (1994) for a justification of this point.
example, the Federal government should regulate all networks because there are regional externalities. This was the solution adopted in Argentina.

Provinces regulate the local distribution of electricity and water and sewage. There are some arguments in favor of having only one regulatory agency at the provincial level (the lack of enough professional staff and the higher risk of capture when only one firm is regulated by each agency). In any case, there is still the possibility of “yardstick competition” among agencies of different provinces.

5. Concluding remarks

During the 1990’s, Argentina has witnessed profound changes in economic policy at the micro level: trade liberalization, deregulation of various markets, privatization of public utilities, etc. This has meant important improvements regarding the efficiency in the allocation of resources, cost minimization, technological development, improvement in the quality and availability of services, etc. However, there have also been weaknesses in the regulatory activity, which allowed the political exploitation of some dissatisfaction among an important segment of voters (particularly the “middle class”).

In this paper we summarize the results contained in FIEL (1999) in which a broad judgment of the Argentine regulatory experience in the 1990s is contained. We cover a very broad spectrum of sectors and issues. First, we include the regulation of utilities and policy issues in more competitive industries. Second, we revise decisions regarding the selection of particular market structures at the time of privatization, and given those choices judge the specific details of the regulatory design, including mandates, instruments, scope, constraints, etc. posed on the regulatory bodies, combined with the regulatory environment in which they act.

Our approach is comprehensive, not particularized by sectors. We first review the design and results obtained in the different sectors, then revise different aspects which have to do with such designs in each case and finally identify different salient regulatory decisions and future issues demanding regulatory involvement. This gives a different perspective on the true causality from “design to decisions to results” in order to improve future regulatory practice and cope with emerging public dissatisfaction while preserving the benefits of this new and better institutional organization.
<table>
<thead>
<tr>
<th>MARKET STRUCTURE</th>
<th>REGULATION</th>
<th>COMPETITION</th>
</tr>
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<tbody>
<tr>
<td><strong>NATURAL GAS</strong></td>
<td>Privatization: at the end of 1992, GAS DEL ESTADO (the public gas company) was divided in: Production, Transportation (two regulated regional monopolies) and Distribution (first eight, now nine regulated regional monopolies) with open access (physical and commercial by pass)</td>
<td>Price cap and passthrough of upstream prices in distribution. Tariff structure re-balanced before privatization (cross subsidies were eliminated and distortions were reduced). Unique regulation at National level.</td>
</tr>
<tr>
<td><strong>TELECOMUNICATION</strong></td>
<td>Privatization in 1990. ENTel was divided in two monopolies of basic (short distance) telephony and one long distance monopoly. A high vertical integration is maintained. Data transmission and other services are provided in competition</td>
<td>Price cap with real annual adjustment of 2% up to 1997 and of 4% if the exclusivity period is extended for 3 additional years. Price structure with important cross subsidies that respond to the closed and vertically integrated monopoly. Unique regulation at National Level.</td>
</tr>
<tr>
<td><strong>ELECTRIC POWER</strong></td>
<td>Privatization at the end of 1992. Vertical separation in: generation (from 10 to 44 generators companies), transmission (one main company at national level) and seven large distribution companies. There are also almost 31 regional monopolies, half concessioned to private sector. Open access with passthrough</td>
<td>Price cap with passthrough of the wholesale price. Regulatory federalism with strong national presence. Very strong competition on power generation</td>
</tr>
<tr>
<td><strong>WATER AND SEWAGE</strong></td>
<td>Privatization in 1992 with concession for 30 years (Obras Sanitarias de la Nación) in the metropolitan area of great Buenos Aires. Vertical (logistic, production, transportation and distribution) and horizontal integration (water and sewage)</td>
<td>A mix between price cap and costs-plus index with mandatory investments. Some problems with cross subsidies (infrastructure charges) and expansion financing.</td>
</tr>
<tr>
<td>ROUTES AND HIGHWAYS</td>
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<tr>
<td>Privatization took place in 1990. 19 highway concessions were made (12 years), regulated toll, and mandatory investments for maintenance, improvement and expansion.</td>
<td>Indexed by general price changes. In 1992 there was a renegotiation of the concession where an annual tariff adjustment mechanism of the 80% of the Libo rate was established.</td>
<td>Null in practice, almost null by comparison.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>SEA PORT</th>
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<tbody>
<tr>
<td>Deregulation process and concessions at the port of Buenos Aires; later competition with the port of Dock Sud. Various operators (6), 4 of them are big competitors in container transportation. New competitive developments in provincial ports.</td>
<td>Price freedom and flexibility in technical requirements.</td>
</tr>
</tbody>
</table>

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<tr>
<th>AIR TRANSPORTATION</th>
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<tr>
<td>Privatization in 1990 (Austral and Aerolíneas Argentinas) with domestic market reservation. With a progressive deregulation from 1994, growing participation of new entrants, as well as an increase in the number of frequencies.</td>
<td>Tariffs are deregulated.</td>
</tr>
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<tr>
<th>RAILWAY (TRAIN) TRANSPORTATION</th>
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<tbody>
<tr>
<td>Via Concession to private operators on separated units by service and region, maintaining the vertical integration between service operation and transportation net from 1993 to 1995. On cargo transportation, 5 different concessions were given (30 years), in suburban transportation, 7 concession (6 for 10 years, renewable and one for 20 years); long distance passengers transportation (interurban) was transferred to provinces (service was discontinued in general).</td>
<td>Periodical adjustments taking into account the investment plan, with renegotiations.</td>
</tr>
<tr>
<td>PENSION SYSTEM</td>
<td></td>
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<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
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<tr>
<td>The public Pension system was changed to a mixed Pension System with private administrators that compete in the capitalization segment since 1994 (17 AFJP's in 1998) NACION AFJP (a public supplier), warrants minimum returns on investment and the rest assures returns that can not be lower than 80% of the average of the system.</td>
<td>Two-part fees. Worker changes among AFJPs are allowed (two by year) without costs. Prudential regulation (investment limits and minimum diversification), free entrance and exit.</td>
</tr>
<tr>
<td>FUELS</td>
<td></td>
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<tr>
<td>Deregulation approved at the end of 1989. Multistage privatization completed in 1992</td>
<td>Prices completely deregulated since 1991</td>
</tr>
</tbody>
</table>

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<tr>
<th></th>
<th>TELECOMMUNICATIONS</th>
<th>ELECTRIC POWER</th>
<th>NATURAL GAS</th>
<th>WATER AND SEWAGE</th>
</tr>
</thead>
</table>
| **COVERAGE**           | Lines on service: from 3 millions to 6.12 millions (+104%) | Installed power capacity grows at 7.2% annual rate | Increase of: Residential consumers: 15% Transport capacity: 30% Pipes: 35% | Millions of users
|                        |                    |                |             | Water sewage     |
|                        |                    |                |             | 1991: 6 4.9    |
|                        |                    |                |             | 1997: 7.6 5.7  |
|                        |                    |                |             | +26% +16%       |
| **INVESTMENT**         | From $250 millions to $2500 mill/year - Cumulated more than 16 billion | $6.4 billion cumulative | $1.7 billions(cumulative) | $625 millions (3 years) |
| **QUALITY**            | Delayed repairs
1991: 23 days
1997: 2 days
Digitalization: from 13.2% to 99%
(100% in 1998) | 65% reduction in power cuts. (Edenor).
Thermal capacity unavailability reduction from 52% in 1992 to 23% in 1997. | Daily maximum injected volume (millions of m3/day) from 71 to 91 (+28%) | Pressure > 8
BA
GBA
1991 15% 13%
1997 97% 54%
Resolved claims
From 70hs to 37hs. |
| **PRODUCTIVITY**       | Employment reduced from 40800 to 27000 (-33%)
Lines on services by employee: from 75 to 225 (+196%) | Investment unit cost fall, from $7200 by kw (1972/1989) to $1930 (1992/1997) | Employment reduced from 10000 to 5600 (-44%) | Employment reduced from 9000 to 4200 (-53%).
Unaccounted water from 43% to 30%.
<table>
<thead>
<tr>
<th>Coverage</th>
<th>Roads</th>
<th>Ports</th>
<th>Fuels</th>
<th>Airlines</th>
<th>Trains (cargo)</th>
<th>Trains (passengers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National roads</td>
<td>Total</td>
<td>Paved</td>
<td>Transported load</td>
<td>Oil production</td>
<td>Thousands passenger/year</td>
<td>Transported load</td>
</tr>
<tr>
<td></td>
<td>1991: 28300km</td>
<td>4611</td>
<td>1991: 7.8 mill.</td>
<td>1989: 26.7mm/m3</td>
<td>Dom</td>
<td>1989: 10</td>
</tr>
<tr>
<td></td>
<td>1997: 29300km</td>
<td>6372</td>
<td>1997: 11.4 mill.</td>
<td>1997: 48.4mm/m3</td>
<td>Intern.</td>
<td>1997: 19</td>
</tr>
<tr>
<td>Var % +3.5</td>
<td>+38</td>
<td></td>
<td>+: 45%</td>
<td></td>
<td>Ton</td>
<td>1997: 6483</td>
</tr>
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</tr>
<tr>
<td>Investment</td>
<td>Total (mill)</td>
<td>From $290 to $555 (+91%)</td>
<td>Concessions: $1300 (total)</td>
<td>1991: $37mm/y</td>
<td>Cumulated up to</td>
<td>Planes</td>
</tr>
<tr>
<td>Quality</td>
<td>Quality Index (10=max)</td>
<td>1991: 3.9 4</td>
<td>1997: 6 7.3</td>
<td>Days on port</td>
<td>Lead was eliminated.</td>
<td>% flight per hour / authorized flights</td>
</tr>
<tr>
<td></td>
<td>1991: 16.2 days</td>
<td>1997: 2.8 days</td>
<td>1997: 2.8 days</td>
<td></td>
<td>Quality of the subproducts improved.</td>
<td>(94 vs 97)</td>
</tr>
<tr>
<td></td>
<td>(-55%)</td>
<td>(-55%)</td>
<td>(-55%)</td>
<td></td>
<td>Gas Station quality improved</td>
<td>81% 4540</td>
</tr>
<tr>
<td>Productivity</td>
<td>By each point of the SI: $20/km/day/TMD A with public administration, $7.6 on concessions (-62%)</td>
<td>Ton/worker/year</td>
<td>Without data</td>
<td>Without data</td>
<td>Duplicated of loads with strong employment fall</td>
<td>Employment declined from 17000 to 8450 (50%) Pass/km/empl: From 306 to 1194 (+290%)</td>
</tr>
</tbody>
</table>
References:


FIEL: Las tarifas de Transporte y Distribución de Gas Natural en la Argentina, Evaluación del Informe NERA, 1997.


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