

**Argentina's 1990s utilities privatization:
a cure or a disease?**

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1. Introduction

Until the reforms introduced by the Menem administration in the early 1990s, Argentina's public services were sick. Argentina could not afford its investment needs and service quality was generally pathetic. While effective tariff levels (accounting for large shares of unpaid bills) appeared to be low, power outages were the expected norm in most of the country and when there was no electricity, there was often no water because water is pumped into buildings in most cities. If you were one of the victims, you would have a hard time calling either the water or the electricity company because ...the odds of having a working phone, let alone a phone, were against you. The initial conditions were so bad that the restructuring and the built-in privatization was seen as the right cure to the disease of the sector by many. And indeed, for much of the 1990s, the obvious positive impact of the remedy on service quality level and access for anyone living in Greater Buenos Aires--where most of the reforms started--was such that Argentina was viewed as a model of what private sector involvement in infrastructure services could represent for a developing country. Privatization felt then, indeed, as a cure. Every province and most users wanted to give it a shot.

For the last couple of years, however, Argentineans like many other South Americans, have begun to grow unhappy with the privatization strategy. The population is now focusing on solutions to its shrinking ability to pay resulting from an extended period of unemployment—over 4 years of recession—and long for the days of highly

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subsidized public service tariffs. Most have already forgotten the pre-restructuring frequent days without power or water and the 8 years waiting periods to get a phone line. To many, privatization increasingly looks like a virus rather than a cure. It is one of the changes brought with the liberal reforms of the 1990s and it must hence be bad.

The perception of privatization as a disease, whether justified or not, is likely to spread at least in the short run. The major change in economic policy implemented in January 2002 which included the pesification of the economy, a freeze on Bank accounts and severe limits on international capital and goods flows left most of the sector in a state of shock. Operators have essentially frozen investment, cut service quality and dropped maintenance to a strict minimum to cut costs--as in most of the rest of the economy. All infrastructure concession contracts need to be renegotiated, a highly publicized event which did not help the image of the privatization experience. This deteriorating image is symptomatic of a very emotional and dogmatic debate on the good and the bad of reforms. Much of the criticisms covered by the media is based on anecdotes and widely publicized incidents, with very little reference to more rigorous analytical studies.²

The main purpose of this paper is to provide some more analytical support on the actual effects of privatization on utilities. To do so, I survey some of the more analytical evidence on the health of the sector, identifying gains and losses and winners and losers of the privatization strategy.³ I do so in two steps. First, I offer a brief diagnostic of Argentina's utilities sector since its privatization based on a review of the more analytical evidence. In the second part of the paper, I propose an early assessment of the likely consequences of the January 2002 devaluation on the operators, the users and the

² Examples include the debacle of the failed Tucuman water privatization, recently featured in an article in the New York Times and a major outage that lasted several days in Buenos Aires a couple of years ago covered by most of the international press at the time. The fact that a fairly technical and a complex study by Galiani, Gertler and Schargrodsky (2002) finds that child mortality fell by 5 to 9% with water privatization with the strongest benefit accruing the poorest neighborhoods has not yet received much broadcasting in the general press.

³ I apologize because many of the results I quote are based on work I have been involved in directly as part of regular monitoring done at the World Bank. Whenever possible and relevant, I will also rely on additional sources of analytical results, including research carried out by a new generation of young Argentinean microeconomists. There is unfortunately not much to draw from because there has been very little quantitative work on the impact of privatization. There are many really good case studies type of publications with a lot of data but focusing on partial performance indicators only. See for instance, FIEL (1999), or Abdala and Spiller (1999)

government and on its implications for the perception that casual observers are likely to have on the privatization experience.

To conduct my assessment, I look at the performance of the utilities sector with the tools of a regulator and try to find obvious reasons in that performance that could explain the increasingly vocal criticisms of privatization. The ease with which I can use the tools of the regulators also provides me with an opportunity to assess the effectiveness of regulatory agencies and the extent to which this is a factor in determining whether privatization is a cure or a disease. I will argue that the weakness of the regulatory institutions and the limitations of the regulatory tools used in practice may be responsible for many of the undesirable side effects of the privatization medicine for the utilities sector. This consideration is however often left out of the more general debates.

The paper is organized as follows. Section 2 provides a brief overview of the privatization strategy. Section 3 sets out the analytical criteria a regulator would rely on to assess the performance of regulated companies. Section 4 summarizes the main results on of the privatization in terms of each criteria and uses it to assess whether privatization is closer to a cure or to a disease. Section 5 shows how each criteria has been impacted by the January 2002 policy changes. Section 6 gives my final diagnostic and the prognosis on the utilities sectors, focusing on the relative roles of the private and the public sector in that prognosis.

2. The increased role of the private sector in infrastructure in the 1990s

Beginning in 1989, Argentina committed itself to a wide-ranging privatization program covering utilities and transport services under the National government authority. The initial objective was fiscal: the government had decided that it could no longer afford to subsidize these services nor finance the investments required to ensure their proper operation.⁴ But in the process the government also tried to improve the

⁴ In transport, whatever could not be privatized was to be decentralized and it became up to the provinces to decide what to do with costly infrastructure services. The decentralization of rail and ports unfit to rapid privatization by the National government lead to the abandon of many low traffic services for instance. As for water and electricity distribution, they were provincial responsibilities to begin with and not all provinces have followed the lead of the national government in getting the private sector involved so that public and private enterprises are coexisting in these two sectors.

efficiency with which these services were being delivered. This entailed a major restructuring of each sector and the development of a regulatory capacity.

The main objective of the restructuring was to introduce competitive forces wherever possible. In electricity and gas, the vertical and horizontal separation of generation, transmission and distribution allowed the introduction of competition in generation and decentralized distribution to local regional monopolies, leaving some scope for future yardstick competition. Horizontal unbundling was initially the key to the restructuring of telecommunications, with the division of the public enterprise into two companies getting each roughly half of the country and with the separation of activities into three service groups, basic telephony (infrastructure and local phone services), international services (international calls, telex and data) and service in competition (national telex, national data, Maritime radio ...). The sector has now been fully open to competition in all its segments. In the water sector, two third of the population is now served by operator which competed in close to half of the provinces for concession contracts for the right to provide the service.

Overall, the effectiveness of the competition for the market strategy had mixed results. There were seldom many bidders for each transaction (i.e. 2 and 3 for telecoms, between 1 and 5 for the electricity distribution and transmission companies, between 2 and 8 for the gas distribution and transmission companies, between 2 and 4 for the water company). Many have argued that this was the consequence of the fact that the efficiency concern came second to the fiscal concern to the government. In most the sectors, the packages were designed to maximize the payoffs to the government first. Accounting for the payments made by the operators for the concessions in cash or in bonds, the payments made by utilities operators to the government were equivalent to about 4% of the 1994 GDP—7% for the rest of the privatizations. This is in addition to savings in terms of operational subsidies to these utilities companies and new taxes generated by the private operators.

The real challenge for the government was to organize the regulation of these industries since once the concessions were awarded, many of these were essentially local private monopolies. The definition of the regulatory regime was relatively easy. Until the changes introduced since 2002, most contracts were subject to prices caps but many

already included some pass-through rules of major cost changes not controlled by the operators which implied some cost-plus dimension. All tariffs were set in dollars and converted to pesos at the billing stage. Most were indexed to US inflation. The legal instruments used to implement and ensure enforcement of this rule varied significantly across sectors.

Dollar denominated tariffs and US based indexation were defined in a sectoral law for national and provincial Electricity and Gas distribution and for enjoy dollar denominated tariffs and US based indexation. The federal water and sanitation contracts enjoyed the rule as a result of a contract renegotiations and the provincial water companies covered this in its contracts. The telecom sector saw its tariff converted to US\$ by the convertibility law. The dollarization of these contracts were also all sanctioned by inter-governmental conventions. The sector specific regulators are responsible for implementation and compliance. All regulated tariffs have scheduled revisions of the cap to pass on to users some of the efficiency gains achieved. Many (water, rail, road) have already been renegotiated. Electricity Transmission and gas were subject to tariff revisions in 1997). The national electricity distribution companies are in the middle of an ordinary tariff revision which has been suspended as a result of the ongoing crisis.

The development of the regulatory institutions was much more complex. In the utilities sector, a national agency was created for the electricity and gas sectors (ENRE and ENARGAS respectively) which included in their mandate the monitoring of the three main electricity distribution companies for the Greater Buenos Aires. Provincial agencies were set up for the regulation of provincial water and electricity distribution companies—the water concession for Greater Buenos Aires is regulated by a agency representation the national government, the province and the municipality (ETOSS). The regulation of the telecommunication sector was to be done initially by the Communications Secretariat alone and increasingly with the Competition Secretariat over the last couple of years.

While the creation and staffing of the electricity and gas regulatory agencies followed the international best practice and had had major problems in fulfilling their obligations until the January 2002 events, the experience of the other regulatory agencies or authorities has been much more tense. The most problematic may have been the

Telecoms and Water regulators where there are not only staffing problems (skill mix and excessive numbers) but also concerns with the lack of transparency of the decision making process.⁵ The outlook is not encouraging. Since the mid-1990s, the division of responsibilities between the regulators and their sector ministries has been increasingly blurred for all sectors, reducing the independence of most regulators and in the process their accountability as regulators. This trend has been brutally accelerated by the handling of the renegotiation which could have been handled as an extraordinary contract revision but was instead taken over by the executive branch of government.

To sum up, Argentina saw a tremendous transformation of the way in which its infrastructure services are delivered. However, this brief accounts already suggests that one of the factors in determining the sustainability of that transformation was and still is the ability of the government to take on its new role.

3. How to assess the health of the sector?

There are clearly many ways of assessing any sector. Because the sectors covered here tend to include operators with significant market power, in fact, they are often local monopolies, I chose to look at it as an economic regulator would or at least should.⁶ The process is useful because it allows me to also make a more specific diagnostic of the performance of the state in its new role as a regulator. If I can report enough data in my diagnostic of the sector to make it analytically sound, the government is delivering in its new role as a regulator. Otherwise, it means that most of the data is secretly held by the regulators or...that the data does not exist, a sign of institutional weakness. The second option is the most likely explanation and the one that will emerge from the following evaluation.⁷ Understanding the incentives underlying that weakness will be important in the overall assessment of the privatization experience so far.

⁵ As for transport regulators, who have recently been merged into a single regulatory agency, the main issue has been the lack of independence from the political power.

⁶ This is a somewhat biased and partial view of the story. A more encompassing approach would be to adopt a general equilibrium modeling approach as suggested by Chisari, Estache and Romero (1999), Navajas (2000), Benitez, Chisari and Estache (2001). More on this later.

⁷ Abdal and Spiller (1999) make a similar case in their assessments of the Argentina regulatory institutions.

How would a regulator look at the performance of a sector it is supposed to monitor? Most regulators have complex mandates in which they are expected to address multiple concerns. The ranking of these concerns varies across countries and in many instances trade-offs are unavoidable. A few of these concerns seem to dominate and cannot be ignored. Very often they are written in the sector law or the decree defining the mandate of the regulator. This is the case in Argentina where the main concerns discussed next are covered in the law for the gas and electricity sectors.

Somewhat oversimplifying, it could be argued that the main concerns to be addressed by regulators provide a checklist which will allow an assessment of the state of the sector. The main three items in that checklist are:

- **The extent to which various dimensions of *economic efficiency* are met. The easiest approach is often to focus on *Total factor productivity (TFP)*.** This boils down to a ratio of output over input which is flexible enough to account for the joint effects on improvements across input and across outputs. When there is more than one input (and/or output), this calculation requires weights to be specified. These weights are usually based on price information which the regulator needs to collect...but seldom does. The TFP of two firms facing the same operating environment (at one point in time) can differ because of technical, allocative, scale efficiency or technological change and hence the regulator must be concerned with all of these, since the operator can control some of them some of the time but not all of them all of the time!
 - the degree of *technical and cost efficiency* , sometimes also called *the degree of productive efficiency*, reflects the concern to push operators to minimize costs for a given level of production or to maximize production for a given level of inputs.—one of the reasons why price cap became so successful..
 - *allocative efficiency* which reflects the need to ensure that tariffs reflect marginal costs. Related indicators include the wedge between tariff and costs, as well as the tariff structure and in particular the nature and design of cross-subsidies There are, however, many distortions in the factor markets, limited credit markets, rigid labor markets and complex tax systems, all of which are

completely out of the control of the regulator and should ideally be taken into account when doing a thorough efficiency analysis.

- **The extent to which the design of the service delivery meet the sense of *distributional fairness* promised by the government in its laws and decrees defining the mandate of regulators.** In general, this implies that tariff structures for each user type are consistent with the users' ability to pay. Related indicators include the tariff structure, in particular when the government cannot credibly commit to subsidies—and this is one of Argentina's problems. Cross-subsidies aimed at helping the poorest users tend to be common in this kind of situation and they were in Argentina before the reforms.⁸
- **The extent to which the operators are guaranteed to achieve *financial viability*.** ultimately, private operators are not interested in the business if, in net present value terms, tariffs (including subsidies) do not cover costs, once all contractual obligations have been accounted for as well as the cost of financing the operation. The related indicators are the match between the rate of return on capital and the IRR and the cost of capital for the operator which serves as a hurdle rate for the investment decision and the impact of risk allocation decisions built in the design of the regulatory regime.

Once a regulator has a clear picture with respect to these variables, it has a generally good idea of the state of the sector.

4. What's the evidence on the sector's performance from a regulator's viewpoint

This section reviews the evidence available on what has been achieved since privatisation with respect to the goals identified in section 3. There are many partial indicators on quality, coverage or investment that could make the case for the success of

⁸ One could add *dynamic efficiency*. It is a more subtle goal in that it tries to ensure that the operator has an incentive to think of future users and invest accordingly. This reinforces the importance of ensuring that tariffs cover costs, including the cost of investments needed for future users. Related indicators establish a linkage between demand forecast and current investment levels. In general however, regulators hedge and include service obligations clause that imply that the operator is required to have a concern for future users and plan its investment programs accordingly.

the public private partnership. For instance, since privatisation, the private sector has invested more than US\$16 billion in telecoms, more than US\$8 billion in energy and over a billion dollars in water and sanitation. Since privatisation also, outages have dropped by over 65% in electricity distribution and water pressure is now close to perfect in Buenos Aires (vs. 15% of the time before the reform) But I prefer to focus on TFP and to the extent possible on productive and allocative efficiency as the main measures of efficiency since they provide a more complete picture.⁹ I will also track down to the extent possible the evolution of tariff levels for low income users and income shares to be allocated to public utilities as an approximation of the distributional concerns. The last part of the assessment will come from the assessment of the evidence on the match between profit rates and cost of capital to discuss the financial viability of the operators of the sector.

4.1. What happened to economic efficiency since privatisation? ¹⁰

Section 3 already suggested that there are many efficiency concepts commonly discussed in recent regulatory debates, such as productivity, technological change or technical change. The annual reports of Argentina's regulatory agencies tend to document improvements in partial indicators which look at the contribution of specific inputs on outputs (labor productivity, number of customers per connection, ...). These are useful but economists prefer to account for the joint relevance of multiple inputs on the output of a sector.¹¹ These advanced efficiency measures are generally fairly technical concepts and the subject of a large literature which is not always very accessible to non-specialists and this may explain the reluctance of some to use them. It is however used in regulatory processes in general and tariff revisions in particular. They are crucial for any sector with incentive based regulatory regimes and all are in Argentina.

Depending on the data available and on the specific goals set in the regulatory framework, the regulator will either focus on the performance in terms of production, costs or both. The performance is generally measured as a percentage of the maximum

⁹ For more details see Coelli et al. (2002)

¹⁰ For a more specific overview, see Estache and Trujillo (2002)

¹¹ The main problem with partial indicators is that they do not yield consistent rankings of performance across operators. Some operators may be top performers in terms of the use of some inputs but average or worse in terms of some others.

production possible (e.g. volume/sales of electricity or water distributed/year, number of tons or passengers transported/year), or the minimum cost possible (distinguishing between operational and capital costs). The maximum production level is the *production frontier*. The minimum cost is the *cost frontier*. Efficiency levels in terms of production are equal to 100% maximum. In terms of costs, they are 100% minimum.

The measurement of the average and firm specific performance will depend upon data availability and the methodology chosen. The main measurement methods used in productivity and efficiency studies are:

- *price-based index numbers (PIN)*. Traditional index numbers approach to TFP measurement. Prices are used as the weights.
- *data envelopment analysis (DEA)*; A linear programming (LP) method which constructs a non-parametric production frontier by fitting a piece-wise linear surface over the data points
- *stochastic frontier analysis (SFA)*; An econometric method which estimates a production frontier of the form: $y=f(x)+v-u$, where y is the output, $f(x)$ are all the inputs, v is an error term capturing unpredictable perturbations and u captures technical inefficiency. A cost frontier (short run or long run) focusing on cost instead of output or a distance function can alternatively be used

In the telecommunications sector, it is increasingly common to rely on forward-looking cost proxy models. These are engineering-economic models developed in recent years as an alternative to the traditional econometric and accounting approaches to cost assessment. Engineering models offer a more detailed view of cost structures than is possible using econometric data. The engineering models (also known as cost proxy models) enable the regulator to estimate the forward-looking economic cost of the service without having to rely on detailed cost studies that otherwise would be necessary. An economic cost proxy model begins with an engineering model of the physical local exchange network, and then makes a detailed set of assumptions about input prices and other factors.

There is no single study that focuses on all sectors with one method for Argentina as can be seen in Table 1. The evidence is clearly partial in terms of the coverage of operators in each sector and partial in terms of the specific production processes and inputs that can be taken into account as a result of data limitations. The evidence is not strictly comparable because, for each sector, the researchers relied on different methods.

Table 1: An overview of efficiency gains from Argentina's reforms

| | Electricity Distribution | Gas Distribution | Water Distribution | Telecoms |
|--|---|--|--|--|
| Regulatory regimes | Price cap | Price cap | hybrid | Price cap |
| Possible approximation of annual efficiency Gains to be used in tariff revision | 1% (shift) | 2.9% (shift + average catching up) | 6.1% (shift + average catching up) 3.7% (without Mendoza) | 3.9% (shift + catching up) |
| Number of operators covered | 8 (EDEERSA, EDENOR, EDESUR, EDET, EMSE, EMSA, EPEC, EDELAP) | 8 (all of the distribution companies) | 4 (Buenos Aires, Mendoza, Tucuman and Salta) | Mendoza ¹² |
| Period of Assessment | 1994-2000 | 1993-1997 | 1993-2000 | 1991-2000 |
| Method of Assessment | Stochastic Production Frontier | Stochastic Production Frontier | Index number | Hybrid Cost Proxy Model |
| Efficiency concept measured | Technical efficiency | Technical Efficiency | TFP | Cost, Scale and Density efficiency |
| Variable explained | Sales | Nber of Customers | Water Production | OPEX + CAPEX |
| Source of estimate | Estache, Rossi, Ruzzier (2002) | Rossi (2001) | Estache and Trujillo (2002) | Benitez, Celani, Estache and Guasch (2002) |

Whatever, the method, the results reveal systematic efficiency increases across the board. The more detailed results available in the original sources tell a somewhat more subtle story and some operators have clearly done better than others. Moreover, in many sectors a good share of the gains initially comes from reductions in employment, which

¹² The study focuses compares hypothetical network's configurations in 1990 and 2000, using a census database on geographical characteristics and data provided by the suppliers. With respect to the cost, the study relies on a database provided by the FCC and an index composed by the industry-standard Turner index and the materials price index compiled by the Bureau of Economic Analysis of the U.S. Department of Commerce to represent the same cost in 1990. The study computes cost value disaggregated in two major groups. The Outside plant is composed of two elements, distribution and feeder and the Central Office plant--which also has two components: switching and interoffice. Even if the model computes the less expensive technology, the study assumes that the set of technology available in both periods is the same which means that the efficiency gains are probably underestimated.

would be enough to convince many of the workers that privatisation is a disease for the sector. Overtime however, as demand for the services grew during the 1990s, so did employment in many of the privatised companies, at least for a while until the macroeconomic crisis swept employment across sectors.

Overall, the results are robust enough to suggest that the operational shock given to the sector through its restructuring aimed at promoting competition and the flows of investment and capital brought by the private operators cannot be associated with a worsening of the economic performance of the sector as approximated by various efficiency measures. The evolution of the efficiency indicator would make the case for reform and privatisation as a cure rather than a diseases. Of course, the perception will not only depend on the size of the efficiency gains but also on their distribution.

4.2. How fair was the distribution of efficiency gains between users and operators?

Privatization could be perceived as a “disease”, at least from the viewpoint of some of the users, if the efficiency gains were not distributed fairly. An easy, although weak, test is to check on the correlation between efficiency and average tariff changes. A second test is to check on the changes in the tariff structure across user and consumption types and to see how each one compares to the evolution of efficiency. If the correlation between average tariffs changes and the evolution is positive and strong, it provides a weak proof that on average the gains have been fairly distributed. If each category gets a similar cut of the efficiency gains, the perception will be that the distribution was fair, even if differentiated distribution of gains may simply reflect improvements in allocative efficiency, in which there is a better match between cost and tariff per user and usage type. Table 2 summarizes the evidence.

The table suggest that the correlation between efficiency and tariff changes is weak at best. This means that the efficiency gains are apparently not passed to users on average. More specifically, technical/productive efficiency improved, which means costs dropped, but average tariffs did not by as much in general. It implies that a rent is being created. This rent is, at least for a while, consistent with the incentive base regime adopted by the sectors. If it is never shared with the users, it becomes a problem. It

reveals that the regulators are not resetting tariff properly when given a chance. It also means that there is scope for unhappiness among the users. Once all sectors will have gone through a formal tariff revision process, we will know more how much of the rent will be shared and how. For now, only gas distribution has had a formal review. The electricity distribution revision was due in 2002 and suspended as a result of the crisis. Telecoms went through an implicit review as part of a tariff rebalancing exercise and water as part of contract renegotiations.

Table 2: Comparing annual real tariff levels and structure changes since privatization to efficiency changes

| | Electricity Distribution | Gas Distribution | Water Distribution | Telecoms |
|--|--|--|---|--|
| Evidence on the correlation between average tariffs and efficiency changes | | | | |
| Annual average tariff change | -0.75%% | -0.8% | +1.75% | -0.6% |
| Possible approximation of annual efficiency Gains to be used in tariff revision | 1% (shift) | 2.9% (shift + average catching up) | 6.1% (shift + average catching up) 3.7% (without Mendoza) 1.9% (for Aguas Argentinas) | 3.9% (shift + catching up) [set at 2% between 91 and 96 as part of cap) |
| Evidence on the changes in tariff structures | | | | |
| Per unit residential charge (before taxes) | +2% for <150kwh -5% for >150kwh | +2.6% | +1.75% (for Aguas Argentinas) | -1.25% |
| Fixed residential charge Assessment since privatization | + 6% for <150kwh +0.6% for >150kwh | 1% | | + 7% |
| Total residential expenditure | +1.9% for <150kwh -3.3% for >150kwh | +2.1% | +1.75% | + 4% |
| Indirect Tax | 20-30% | 20-30% | 10-20% | 40-50% |
| Comments | Creative sector in terms of coming up with pricing and connection schemes responsive to low income level constraints | Only sector to have gone through formal tariff revision in transmission and distribution | Quick renegotiation of contract which included inclusion of temporary connection charge to finance new connections | Major rebalancing in 1997 that favored business and long distance callers; |

Source: Author calculations based on Delfin and Casarin (2001) and Benitez, Chisari and Estache (2001)

Before all regulators have had a chance to decide how to share the rents that were created by the incentive based regulatory regime, it is already clear that some of the users

have already won. Indeed, as seen in the bottom part, some users may be doing better than others at sharing on the efficiency gains. Indeed, this is the story told by the evolution of the tariff structure. This observation reflects an analysis by Delfin and Casarin (2001) which shows that reforms had different impacts across sectors and income groups through the tariff structure. Indeed, looking at this structure from the viewpoint of the residential users, Table 2 shows that, in their case, very often, both marginal and fixed costs increases. The only exception are large electricity users and telecoms users for which the marginal cost dropped

There are good economic explanations for what appears to be an unfair treatment of some of the users. Tariff rebalancing reducing international long distance calls tariffs and increasing local call tariffs in telecoms was seen, by the regulators and their economic advisors, as desirable improvement in allocative efficiency. Similarly tariff restructuring reflecting economies of scale in energy did seem attractive from an efficiency viewpoint since they were sending the correct economic signals.

So what went wrong? Besides the fact the implementation of these tariff structure changes was not always problem free, the main issue was a political one. These allocative efficiency improvements have all tended to penalize the lowest consumers which generally happen to also to be the poor. Without a corrective fiscal measure, the poor users may be worse off than they used to be, raising the spectrum of privatisation as a disease. One more however, this issue is a regulatory one, not an ownership problem.

It may be useful to point out that while these results are quite important and interesting at the microeconomic level, they fit into a wider story which accounts for the general equilibrium feedback effects of the reforms. Benitez et al. (2001) find that once these general equilibrium effects are accounted for, and ignoring the effects of any credit shock on the economy, the poorest families can benefit from US\$341 millions in equivalent variation (EV), or about 50% of their utilities bill thanks to increased job opportunities that result from overall reductions in production costs. Unfortunately, they also find that the gains from reforms in the sector are much too small in comparison to the losses that result from credit shocks such as the Mexican or Asian crisis.

Moreover, an important fact when trying to assess the distributional implications of privatization, is that the results also show that since the government are concerned

with the fiscal payoffs from reform, it will generally tend to prefer to leave a large rent to the operators. It results in a revenue 5 times larger than when the rent is redistributed. In other words, bad regulation is regressive but it is good fiscally since large rents imply large income taxes.¹³

The government is in fact a much more active player in this game than it appears. Over the years, all government levels have increased indirect taxes in the sector. Moreover, the privatized infrastructure sector generates US\$3.4 billion across government levels. The three government levels have imposed indirect taxes of 40-50% on telecoms services, 30-40% in energy and 10-20% on water services. This is 4 to 5 times what it used to generate when these services were public. The sector has become and continues to be a cash cow across government levels. The trick is that the users don't really care where the money they pay goes. What they see is that the bills go up.

The emerging perversity of incentives just illustrated already hints at a differentiation in the perception of the effectiveness of reform and privatisation. The fact is that tariff levels may have declined and did decline on average (except in water and sanitation) but a large share of the population did not see it because the regulator has so far focused on improving productive and allocative efficiency rather than on equity concerns. For as long as a large share of the population perceives that it is getting better service for the higher bill, there is no complain. Once the budget constraint becomes more binding because of unemployment, the degree of unhappiness of many individuals increases. Once the number of people with a budget increases as has been the case since 1997, the general unhappiness with the increased bills starts to grow, while the expectation of a good service quality has become the norm.

Returning to the criteria set out in Section 3, what this quick overview of the various quantitative analyses suggests is that Argentina, on average, ranked efficiency over distributional concerns. The natural coalition to support this ranking included operators and the government. The government could politically afford that coalition as long as Argentina enjoyed the illusion of having jumped on a fast growth track with matching expectations for income levels. This meant that it initially had a strong interest in weak or at least politically controlled regulators. Now that the dream is over, the

¹³ And this clearly ignores the governance issues associated with the potential for large reants.

ranking of objectives becomes politically more problematic but it is tough to give up on the tax revenue.¹⁴ Moreover, by the end of the 1990s while the crisis was expanding, it became too late to strengthen the regulatory agencies even if the need for regulatory technical skills and the autonomy to use them was quite crucial.

Table 2 shows in particular that it should have been quite important for the regulator to pay attention to changes in tariff structures. As pointed out by the detailed work conducted by Delfin and Casarin (2001), operators have essentially not only rebalanced tariffs between services as suggested earlier but also within services.¹⁵ While achieving the efficiency gains (i.e. cost reductions) expected to derive from the adoption of incentive based regulatory regimes, the operators increased their revenue by regrouping users and changing the composition of their two part tariffs. They generally significantly increased the fixed part across the board and reduced the variable part for some of the users. Moreover, in energy, the concern for efficiency built in the laws resulted in declining block tariff which for all practical purposes are regressive tariff structures.

In sum. in terms of this criteria, the privatisation strategy appears much more a victim of its own potential success with respect to efficiency gains. Implicit “collusion” by rational operators and a government with perverse economic incentives are such that both win from a weak regulator. A weak regulator in turn means that there is not much scope to make a strong analytical case for a fair distribution of the efficiency gains when formal tariff revision are scheduled. Some of the users and, in particular the poorest, are worse off. Even if for a while, access expands and prospect look good, privatisation may appear to be a cure for all, from the viewpoint of the poorest. Privatisation becomes a disease when unemployment increases. The weakness of the regulator and its capture by the government seldom appears on the radar screen of the users. The provider of the service is permanently on that screen. When the poor become the majority as the middle class melts into the low income class, the provider is the majority of screens. In other words, the provider becomes the source of the disease of the sector.

¹⁴ Keep in mind a big chunk of its current deficit problem is that it only generates revenue levels of 14% of GDP, significantly lower than what most countries are expected to generate, in particular those with strong social ambitions in their political agenda.

¹⁵ Bouille et al (2002) make a similar in a less formal way

4.3. How much margin for regulators in terms of the operators' financial viability?

A final key concern from the point of view of regulators is the extent to which the privatization design and the regulatory framework ensures the financial viability of the operator. This is usually ignored by theoretical regulatory economists and yet it is crucial in practice. The recognition of the importance in the academic literature may be attributed to Laporta and Lopez-de-Silanes (1999) with their work on Mexico. They analyzed a broad set of financial profitability indicators. The economic dimension of their work goes beyond the work of a regulator but is consistent with the evaluation proposed in this paper. Indeed, it tests for the extent to which the profitability improvements imply a trade-off in terms of higher prices and layoffs.

Galiani et al. (2002) run equivalent tests for non-financial privatized firms Argentina. These cover much of the infrastructure sector but do not distinguish between utilities and others. They monitor operating and net income/sales, unit costs, production and sales/employment, employment, real wages per employee, investment and prices. They shows that the increases in operating efficiency (which I covered from a more economic viewpoint earlier) underpin the major gains in profitability. Investment increased by over 350% but all this was achieved with an employment decline of 40% which cost labor cost significantly. Looking at the very heterogeneous group of firms, the effects on real wages of the residual workers and on prices are not statistically significant. Their overall assessment is thus that the privatization design improved the performance of the sector but at a social cost for the redundant workers and at a general social gain in terms of lower prices and better health indicators (at least in the case of water). To give an order of magnitude for the trade-off.: only 20% of the estimated increase in the median operating income to sales ratio seems to be due to workers' layoffs in Argentina.

Let me now return to the more limited viewpoint of a regulator. The Galiani et al. results echo to a large extent the assessments of the financial performance of a company in terms of its rate of return only. Table 3 for instance shows that these returns have been quite high in the water and telecoms sector and reasonably modest in the energy sector.

For a regulated company, this does not tell you much in terms of the financial variability of the firm and may in fact be misleading.¹⁶

In practice, from a regulator's viewpoint, the equilibrium tariff is the one that generates a net present value of 0 for the investment or the operation, which is equivalent to say that the forecasted rate of return is equal to the Cost of Capital assessed at the time of a tariff setting or revision. This assessment is driven by the cash flow forecast and builds it into the forecasted income statement of the operator and requires an estimate of the cost of capital.

Table 3: Return on Net Assets Among Privatized Utilities

| Before tax profits/Net Asset (in %) | | | | | | | | |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|---------------|
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Avg 94-00 |
| Telecommunications | | | | | | | | |
| Telecom | 13.96% | 17.44% | 17.98% | 15.29% | 18.23% | 20.98% | 16.93% | 17.26% |
| Telefonica | 18.62% | 19.91% | 16.89% | 18.88% | 23.96% | 19.49% | 9.29% | 18.15% |
| Electricity | | | | | | | | |
| | | | | | | | | |
| Edesur | -1.44% | 4.39% | 7.42% | 9.62% | 13.41% | 4.67% | 12.06% | 7.16% |
| Edenor | 1.25% | 4.69% | 6.73% | 9.96% | 11.59% | 12.05% | 11.40% | 8.24% |
| Gaz | | | | | | | | |
| Gas Natural BAN | 11% | 8% | 6% | 6% | 8% | 8% | 9% | 8.00% |
| Metrogas | 13% | 7% | 5% | 5% | 5% | 3% | 5% | 6.14% |
| Camuzzi Gas Pampeana | 13% | 11% | 6% | 5% | 5% | 6% | 6% | 7.43% |
| Camuzzi Gas del Sur | 17% | 9% | 10% | 10% | 8% | 9% | 12% | 10.71% |
| Water | | | | | | | | |
| Aguas Argentinas | 20.06% | 28.89% | 25.36% | 21.12% | 12.52% | 18.59% | 30.42% | 22.42% |

Source: Based on annual report of the companies

From a regulator's viewpoint, still, what's missing from Table 3 is a match between these realized, accounting rate of returns and the cost of capital assessed in the context of contracts or tariff revisions. If these realized rate of returns are higher, it essentially means that the operator made an excess profit. If they are lower, the financial viability of the firm was threatened and the regulator will have to adjust the tariff level or reduce the costs to the operator somehow. The Gaz regulator (ENARGAS) estimated the cost of capital for the distribution sector at 15.2% in 1997 and for gaz transport at 13.1%. This suggests that a rent is being created—as expected from incentive based regimes and

¹⁶ For a longer discussion of this issue see, Estache, Rodriguez-Pardina, Rodriguez and Sember (2002) or Green and Rodriguez-Pardina (1999)

implied by the efficiency gains assessed. The first tariff revision did clearly not wipe out the potential for cost reductions since rents continue to appear in the sector. For the water sector, the regulator assessed the cost of capital at 12.41% in a 1999 resolution...and before that and after that, profits rate were quite high.

What does this quick and dirty comparisons of costs of capital and rates of return on capital suggests? To some, it may imply that privatization is closer to a disease than to a cure...but it is not that simple again. It may simply reflect the fact that some operators are better at playing accounting games than others. The main problem is a weak governance standard and the lack of transparency and consistency on regulatory accounting. The guilty part however is the regulator, not the operator. Once more, privatization is far from being the disease. It may be a disease in that the wedge between costs of capital and rates of return tend to be too wide in favor of the operators, but no one knows, simply because the accounting systems do not allow that assessment at this stage. The regulators have not delivered on this ground either.¹⁷

5. The latest Argentinean crisis and its effects on the utilities.

What happened in Argentina on January 6, 2002 added to the bad perception of the privatization experience. In addition to a populist discourse by some politicians, the deterioration resulted from the impact of the firms of a plan that completely changed the way the private sector can operate in the delivery of public services. The main ingredients of the plan could be summarized as follows:

- a conversion of all debts of less than \$100,000 to pesos at a 1.4 exchange rate
- a de-facto conversion of equity into pesos
- a deposit freeze
- a dedollarization and deindexation from US or any foreign inflation but no clear compensation scheduled

¹⁷ To be fair, ENRE, the electricity regulator was scheduled to announce its assessment of the cost of capital and its estimate of the efficiency gains to be used for X factor in its price cap formula at the end of June 2002. All this was of course kept on hold as a result of the January 6 policy shock.

- a 180 days public services tariff freeze (which was recently extended for 120 days)
- a dual exchange rate system and the resulting additional red tape
- a decision to renegotiate all contracts considering:
 - The impact of tariffs on the competitiveness of the economy
 - The quality and investment obligation specified in contracts
 - The interest of the users and the access to services
 - The safety/reliability of the systems concerned
 - The profitability of the firms

More specifically, from the viewpoint of the operators the plan makes it almost impossible for Argentine companies to raise capital abroad. All imports, and external debt service will also essentially be impossible under existing contractual terms since the revenue base of the companies revenue is denominated in pesos. Moreover, since the plan has essentially wiped out private savings and limited withdrawals through the *corralito* and since unemployment has been rising fast, the operators expect a major drop in demand. Adding to this the fact that the payment system has collapsed means that operators have moved to cash payments, payments in bonds and barter.

As part of technical assistance provided to the first renegotiation commission, a few “back of the envelope” estimates of the impact of the pesification were conducted. Two approaches were taken: a macroeconomic view of the effects and a firm level view. The first relied on the general equilibrium model developed by Chisari and Estache and used in several earlier papers to assess various aspects of the privatization and provides a macroeconomic view of the effects of the shock. It tells a story at the aggregate sub-sector level (water, gas, electricity, telecoms), accounting for feedback effects on each income class through labor and capital markets. The model is calibrated with 2001 financial data for companies, 1997 data on household expenditure per decile (to get to the poverty aspect), the 1997 input-output matrix. It assumes a labor market with partial wage rigidities and sector specific capital inputs. Access to international capital flows is rationed for the government but not for firms. There is crowding out of local financial market of private firms by government. Inflation is driven by devaluation. Finally,

infrastructure investment and service obligations are financed by the privatized firms. The main focus of the simulation is on the total cost of infrastructure services per income classes (separating quantity consumed and price effects), the fiscal cost to government and the rate of return to infrastructure operators. The model also allows an overall assessment of the macroeconomic performance (growth and unemployment).

The model is a short run model. It focuses on the cost and benefits of allocative efficiency and the concern for fiscal and distributional goals. It is simulated to get the lower and the upper bound of the effects of the shock on the firm and on the user. This is done by running simulations in which there is either full absorption by the firm with a fixed tariff fixed in pesos or with a full pass thru to consumers through tariffs. In both cases, the depreciation is now so strong that we have to make some assumptions on how the agent will adjust. When the firm is expected to absorb the shock, it is assumed to cut investments to avoid bankruptcy. When the user is expected to absorb the shock, a redesign of the tariff is proposed with cross subsidies which ensure that the users stay within their budget constraint.

Table 4 summarizes the effect of a 250% devaluation on the operators of the utilities sector, that is the effect with inflation levels reached in September, 8 months after the shock. It shows how that if the burden of the devaluation is to be absorbed by the firms (i.e. with a full tariff freeze), even assuming that firms suspend their investments commitments, the profit rate in each sector drop dramatically, from 58% in the electricity sector to 83% in the gas sector (when expressed in pesos). If the shock is fully passed through to users, and assuming a rebalancing in which the rich users end up subsidizing the poor, the drop in profit rates is milder but still very significant, in particular in telecoms and water and sanitation. Note that in dollar terms, all operators are even worse off, as expected.

Table 4: A Macroeconomic view of the effect of pesification on *the Firms*: (% changes in profit rates from a 250% devaluation)

| | In Pesos | | In US\$ | |
|----------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| | Firm absorbs and cuts investment | User absorbs with cross-subsidies | Firm absorbs and cuts investment | User absorbs with cross-subsidies |
| Electricity | -58 | -35 | -70 | -54 |
| Gas | -83 | -49 | -88 | -63 |
| Water and Sanitation | -71 | -61 | -79 | -72 |
| Telecoms. | -81 | -77 | -87 | -84 |

Table 5 focuses on the government and the users. It shows how the well being of all the actors, approximated by a Gini coefficient, fall. The richest are particularly worse off. This is to a large extent the result of the fact that they also tend to be the local owner of these utilities and the reduction in welfare reflects a brutal wealth and income effect in their case. Also interesting is the fact that the government continues to face a dilemma and has to choose between minimizing the impact on the treasury and minimizing the impact on the users. This brings us back to the idea of the risk of collusion between government and operators. Of course, up to now, the evidence is that the collusion on this front has not taken place since up to now, tariff have not gone up in nominal terms...and the firms have responded by stopping investments.

**Table 5: Effect of Pesification on the Government and Consumers
(Change in the Gini per agent due to 250% devaluation)**

| | Assuming the firm absorbs the shock and adjusts by cutting investments | Assuming the shock is passed on to users and ability to pay constraint are met by introducing cross subsidies |
|-------------------------------|--|---|
| Effect on Government Revenue | -4% | -10% |
| Effect on Well being of Users | | |
| Poorest decile | -12.8% | -15.7% |
| Richest decile | -44.7% | -49.3% |
| Average | -34.7% | -37.5% |

The second approach is microeconomic. It focuses on trying to understand how a regulator would have to look at a specific electricity and water distribution company to discuss the consequences of the shock. Consider one of the cases we worked on. It deals with an electricity distribution firm with 70-% of its energy Purchase, 30% of its O&M cost (wages excluded) and 30% of its capital expenditures in US\$ and with an asset base expressed in Pesos. As with the macro model, full absorption by either the firm or the users is unrealistic. The main concerns were as usual with the impact on the poor and on the financial viability of the company. This is why I focus on the effect of the two extreme incidence cases for this operator in terms of their impact on residential users. The model is build on the actual client income and consumption profile of all the clients

of that company. We can then assess quite carefully the effectiveness of various tariff restructuring options.

Table 6 starts by providing a snapshot of the changes in the disposable income that results from the shock. It shows clearly that if the users must absorb the shock, the poorest will be hurt the most. The middle class however is likely to take a beating as well and is likely to join to number of unhappy customers criticizing the privatization...even if this is simply the result of an exchange rate crisis. The last column of the table shows how a cross-subsidy from rich to poor would smooth the pain for the poor. The outcome implies that there is no longer any significant difference between middle and low income class in terms of their share of income allocated to electricity.

Table 6: impact of the devaluation on the residential users.

| | Base Case Average US\$ bills/months/user | User absorb Average US\$ bills/months/user | Base case % of income | User absorb % of income | If cross subsidy from High to poor % of income |
|--------------------------|---|---|----------------------------------|--|---|
| Low income | 10.53 | 18.1 | 4.4 | 7.5 | 4.4 |
| Middle income | 13.87 | 23.6 | 2.5 | 4.2 | 4.2 |
| High income | 15.06 | 25.8 | 1.3 | 2.2 | 2.5 |

While this only gives a flavor of the sort of things than regulators can and should be doing analytically, it allows already to draw some interesting conclusions. First, it should be clear that it will be unrealistic to think of a pure pass through with no change to either the users or the operators. It should also be clear that neither are likely to be happy with the outcome and hence that unhappiness with the privatization and from regulation will come from both sides. Second, since the sectors and firms within sectors differ so much in terms of share of inputs imported, in terms of leverage, in terms of domestic vs., foreign debt and equity and in terms of demand, the incidence of the crisis and hence its solution will vary across sectors and firms. This will create further unhappiness and complaints about misunderstood reasons for differentiated treatment. Third, investment will drop for a few years. This will lead many to argue that the main payoff to privatization (i.e. more investment) has disappeared and hence put into question the

relevance of privatization. Fourth, the government will eventually have to face its dilemmas and come clean on its ranking of efficiency, equity and fiscal goals. Fifth, there is not much that the regulators can do at this stage, except maybe in terms of changes in the tariff structure and in the service obligations. Most of the story in the sector is driven by the macroeconomic problems: credit rationing, decline in aggregate demand and hence increase in unemployment. All these factors are much more damaging to the poor.

The latest developments suggest that the government is reaching similar conclusions even if the current administration has only very limited time before the general election in March 2003. For now, the strategy consists essentially in allowing a minimum (about 10%, with an inflation of close to 40%) tariff increase (August 1 was the target but was not met) to signal the Government's willingness to negotiate and then come up with a framework agreement with the concessionaires on the tariff adjustment mechanisms during the emergency period. Compensatory decisions and various tariff restructuring types are also being considered. Any solution will result in a catch 22 situation. Indeed any tariff increase will be used by the critics of privatization to argue that the private operators are a big part of the problem. An increase that threatens the financial viability of the operators will lead to cost saving efforts and eventually deteriorations in services...which will also allow the critics to beat on the operators. The alternatives are not great. The sad part is that the public sector is currently not up to the challenge on financial and possibly technical grounds.

6. Conclusion

The review of the evidence suggests that there are regulatory trade-offs stemming from a multiplicity of regulatory goals and the decision of whether privatisation is a cure or a disease depends on where the observer assesses the relative importance of these goals. Among the regulatory objectives, the main trade-off that emerges is between the concern for *allocative efficiency and fairness*. On the one hand, price discrimination in favour of the poor to achieve equity concerns has well-known undesirable efficiency consequences. Cross subsidies have long been criticized for this specific reason. On the other hand, when the ability of the government to finance direct subsidies is limited which is why some argue that cross-subsidies may be unavoidable if the social concern

should prevail over efficiency goals. Transparency in the menu of options and the costs and benefits of all options should increase accountability and ease the assessment of whether privatisation is a cure or a disease.

A second related trade-off involved the allocation of efficiency gains between users and operators, while maintaining the incentive of the operator is to maximize these efficiency gains. If all gains must immediately be passed on to the users, there is no incentive for firms to cut costs, since cost-cutting frequently has a high initial costly expense (staff, equipment, investments). At the other extreme, allowing the firm to keep all efficiency gains achieved in the delivery of a monopolistic public service is both socially and politically unrealistic.

Most of these issues could and should be addressed by strong regulators. How come they have not been tackled up to now? One way of answering the question is to try to track down the incentive structure of the various actors in the privatisation game. Think of the privatisation experience as a game between 3 main groups of players (the government, the operator and the users) and a potential referee (the regulator). Two of the players (the government and the operator) have a strong incentive to “collude” because they both gain from significant improvements in efficiency which are not passed through to users. One way for the government to meet it get its share of the rent created by the operators is to have a short sighted referee. This is roughly the story of Argentina during the 1990s.

Can the operator be blamed for the pain inflicted on some of the users? Not really, the private operator has generally delivered on the promise of improving technical efficiency. In doing so, they make money and expect the regulators to get them to share the rents at some point with the users through a due regulatory process. Can the referee be blamed? Probably, it could certainly have tried to get a better vision but it did not have much incentive or scope to do so. The residual suspect is the government. Argentina’s complex governmental structure ensure little accountability for many decisions—the country has not been performing in most governance rankings.

In retrospect, one of the mistakes of the observers and advisors was a failure to anticipate the major gains to “implicit collusion” between the government and the operators. The size of these gains as estimated by the macroeconomic models are such

that they can easily explain the adoption of a regulatory structure that would not be able to interfere significantly with that “collusive” behaviour. The main reason why tariff did not follow costs closely enough is that governments did not give the regulators the autonomy and ability to work on it. Some of the regulators did better than others but ultimately they never enjoyed the necessary autonomy. ENRE and ENARGAS for instance are actually quite competent by international standards. Had they be autonomous, they would have been able to handle the renegotiations as an extraordinary contract revision.

Before concluding, I would like to emphasize the key relevance of the larger context of privatisation. The recent crisis is a macroeconomic one and this crisis is what drives the performance of the operators and the unhappiness of the users. Privatized companies are an easy target. But the stylised facts and the general equilibrium modeling mentioned earlier suggests that unemployment or rationed access to credit and to savings is how the poor get hurt the most. Better regulation could smooth the pain in the utilities sector....but Argentina is also suffering from a major institutional crisis which impedes this necessary complement to the privatisation of monopolies to function properly. Better regulation would also further increase the gains of reform.¹⁸

To conclude summarizing my take on the question asked in the title, I would argue that the efficiency gains and investments levels observed are sufficient to bet against the idea of privatisation as a disease. If privatisation is a medication, it did, however, have side effects. The employments effects related to the restructuring did hurt but were handled through specific social safety nets. These were short term effects. The longer term side effects of the medicine that came with a decade of treatment may have been grossly underestimated . I don't think they were the result of an overdose of medication. I believe that they are the consequence of a system that compensates the doctors (i.e the government) as a function as the profit made from the medication. Once more, a strong accountable regulator would have minimized the consequences of this perverse remuneration scheme and would have ensured a fair and transparent balance in the handling of the various objectives. More of the efficiency gains would eventually

¹⁸ Chisari et al. (1999) suggest that the aggregate gains from efficiency are about 0.9% of GDP. The additional gains from good regulation are about 0.3% .

have been passed on to all users...but ultimately it may not have changed much on the perceptions since much of the debate has been and continues to be ideological, thin on analysis, strong on emotions.

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