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# Privatization of infrastructure facilities in Latin America: full economic effects and perceptions

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# ABSTRACT

Existing appraisals of infrastructure reforms around the world, and particularly in Latin American countries during the last 15 years, show various discrepancies among scholars, and a sharp contrast vis-à-vis a growing critical view of the average citizen in Latin America. This paper examines possible reasons for those divergent evaluations, introducing a simple analytical framework that allows to contemplate often missing variables that characterize the outcome of privatization reforms (direct and indirect effects on prices, and overt and covert effects, on taxes, prices, employment, etc.). While perceptions are surely formed by multiple factors, it is highly advisable that reforming countries correct unsustainable policies and hidden subsidies to state-owned firms well before selling them, so that the comparison between pre- and post-privatization performance can be better computed by all citizens, minimizing the risk of posterior (undeserved) dissatisfaction and criticisms that might lead to policy reversals.

# 1. INTRODUCTION

The evaluation of privatization and market-oriented reforms in public utilities and infrastructure sectors, so typical during the 1990s in developing countries, is far from reaching consensus. Sure enough, such consensus should not be expected regarding an overall assessment of diverse reforms of different quality: stories of successes and failures should be observed according to the characteristics of each reform, both across countries and across sectors within each country. Clearly, there is no reason to expect that a reform should have the same impact on overall welfare regardless of the objectives under which it was pursued, its specific characteristics, quality, institutional environment, pre-reform conditions, technological setting, etc.

Nevertheless, the lack of consensus is much deeper: various professional evaluations of a given reform too often reach very different conclusions. Leaving aside researchers' political attitudes, those different views could be due to diverse weights given to the various dimensions involved in reforms (prices to various kinds of users, quality, coverage, investment, direct employment, productivity gains, profitability of operators, etc.), neglected or poorly measured impacts (cost of implicit and explicit subsidies prior to reforms, indirect employment, etc.), improper selection of counterfactuals (in particular, the implicit assumption that pre-reform standards were sustainable), etc. Surprisingly enough, many disagreements also result from limitations of the available data and their inconsistent reconstruction by observers.

While more research is needed in order to settle this debate, it is also key to notice that public opinion in Latin America (as reported in widespread public polls) tends to support the more critical appraisals. Indeed, according to some surveys and public polls (Table 1 below for instance), citizens who initially favored market-oriented reforms in the midst of highly deteriorated public services provided by the State, became increasingly critical over time about the way privatizations were conducted, regulation was instrumented and results were delivered.[1]

[1] *In 2005 there was a strong recovery compared with the more critical appraisals of 2002 and 2003, suggesting that the view towards privatization is correlated with the overall performance of the economy (i.e., the perception is not so critical after a couple of years of strong recovery and growth, such as 2004 and 2005 were for the region).*

**Table 1. Percentage of individuals who think the privatization of the public companies have not been beneficial for the country**

| | 1998 | 2002 | 2003 | 2005 |
|---|---|---|---|---|
| Brazil | 49 | 62 | 67 | 59 |
| Venezuela | 49 | 62 | 68 | 56 |
| Mexico | 51 | 72 | 69 | 62 |
| Chile | 49 | 78 | 71 | 63 |
| Honduras | 53 | 66 | 75 | 69 |
| Colombia | 61 | 77 | 76 | 60 |
| Paraguay | 54 | 81 | 77 | 78 |
| Peru | 56 | 68 | 78 | 69 |
| Ecuador | 48 | 60 | 80 | 67 |
| Nicaragua | 54 | 70 | 80 | 71 |
| Bolivia | 51 | 77 | 81 | 75 |
| Guatemala | 38 | 71 | 84 | 72 |
| Uruguay | 71 | 84 | 84 | 64 |
| El Salvador | 46 | 65 | 85 | 78 |
| Argentina | 68 | 86 | 88 | 75 |
| Panama | 80 | 69 | 90 | 86 |
| **Average** | **54** | **72** | **78** | **69** |

Source: Latinobarómetro.

Public polls many times tend to look for aggregate evaluations of overall reforms of public utilities ("are you in favor or against state-owned enterprise", etc.), without controlling for other public policies or changing contexts that might be independent of the reforms evaluated, failing thus to disentangle the relative merits of various reforms and the impact of non-reform determinants. In the case of Latinobarómetro in particular, the question about privatization performance comes after a series of questions about corruption and poor institutional development, which might also bias the answers towards a negative view. In any case, telling from the "stated preference" of users as we now know them, the merits of public utilities' reforms in the 1990s were very dubious, supporting the more critical views about Latin American infrastructure reforms.

Therefore, research should not only be directed to provide the correct analytical framework to help settling recent and current debates among researchers regarding the welfare outcomes of privatization and liberalization in infrastructure and public utilities (in short, "utilities' reform"), but it eventually should also be able to detect why does the average citizen thinks so negatively of reforms even in cases when he/she actually benefited from them, if indeed this is the case.

Furthermore, the analysis has to recognize the many interdependencies involved among various dimensions of a given reform. For instance, evaluating the impact of an infrastructure reform on a given group of society (the poorest quintile for instance) requires not only the comparison of direct prices and quality of service to users who belong to that income-group who are currently served, but also the cost and quality of substitute services previously consumed by those people who gained access to the service after the reform, the change in employment opportunities for that group attached to such specific reform, the cost/benefit impact on that group that is due to changes in subsidies (the structure of taxes to finance state-owned enterprise –SOE– deficits and the structure of government spending to apply new taxes collected on public utilities and privatized firms), the effect of the reform on prices and quality of third goods and services consumed by those individuals that are provided by industrial and commercial users of the infrastructure service, etc., all of them highly speculative issues even assuming that the pre-reform situation was sustainable. To complicate matters, the evaluation should even consider which set of rules –pre and post-reform– contributes to the overall progress in productivity, both within the specific regulated sector and economy-wide, as this increased productivity will be a key determinant of future employment and real wages of workers in the country, prices of other goods and services, etc.

While this last observation might be read to be a recommendation to adopt a general equilibrium model, conclusions from such a model will most likely be highly disputed and lack widespread acceptance due to the typical “black-box” nature of such computations, numerous speculative assumptions, etc. Indeed, if the evaluation is not simple and transparent enough, able to explain why the actual results might be perceived differently by various observers (including of course people’s opinions reflected in public polls), its impact on the general understanding of the merits and limitations of existing reforms will be very limited.

## 2. A RESEARCH PLAN TO EXAMINE FULL RESULTS AND EVALUATE PERCEPTIONS

A sufficiently ambitious research plan, taking care of the above shortcoming as much as possible, could significantly contribute to the existing literature and public debate in various ways:

1. Helping to weigh contrasting empirical conclusions about privatization and liberalization reforms in infrastructure and public utilities, and therefore to detect their relative merits and validity.

   *Such contribution will perhaps prevent counter-reforms that are undeserved, and/or revise the design and implementation of reforms that have not been beneficial to society as a whole and to the poor in particular.*

2. Gaining much more detailed information about the determinants of people's perceptions about privatization and infrastructure reforms, identifying mismatches between perceptions and objective outcomes originated by indirect and covert effects of infrastructure reforms.

   *These findings would point out the importance that future studies be more careful in contemplating direct and indirect welfare effects of infrastructure reforms (and the limitations of not doing so), account for the sustainability of pre-reform situations, pay close attention to the selection of counterfactuals, etc., and that proponents of infrastructure reforms will pay more attention to the required integrality of sector-specific reforms and the overall quality and consistency of public policy (being also careful in making more explicit the hidden initial conditions and effects of reforms, which would facilitate a correct professional evaluation and a more accurate public perception,*

*minimizing the space for disagreements originated in poor quality or availability of data).*[2]

3. Last (but not least), regarding those instances where welfare results of reforms were in fact negative (in general or for a given income group of society), advancing the necessary adaptations in design and implementation to improve results.

A central part of this more ambitious research plan is the construction of an analytical framework capable of dealing with a more complete evaluation of infrastructure reforms. In that regard, some previous observations are in order:

1. There are different infrastructure reforms, by which the rules governing the provision of services significantly change, but typically involve one or more of the following changes:

   a) in the identity of the firm in charge of provision (the introduction of private sector participation by transferring the ownership of assets, concession, contracts; etc.),

   b) in the structure of the market (horizontal, regional and/or vertical separation; degree of competition / exclusivity allowed; etc.),

   c) in the (effective) institutional separation / concentration of design, control and regulation, and provision,

   d) in the rules about pricing, investment, risk-allocation, etc.

2. In various ways, the introduction of private sector participation complements many of the other dimensions of reform (for instance, privatization helps the division of roles, more transparent pricing, elimination of exclusivities, promotion of competition, etc., by improving the credibility of such reforms), but reforms including privatization not necessarily go together with structural reform and liberalization (i.e., while it might be a necessary condition for an integral reform, it is not a sufficient one). In what follows,

[2] *The diverging perceptions might also be due to limited information of side-impacts of reforms, selective memory about the pre-reform status, deceived over-optimistic expectations, envy and fight for shares with new owners of public firms, externalities from other reforms or economic-political environment –exchange rate appreciation of domestic currency, corruption, etc.–, self-confirmatory bias, short-term evaluation or impatience, etc. Of course, the goal of such research plan is not to explain or isolate every element that contributes to such mismatches, but instead*

infrastructure reform is defined as a reform that introduces private sector participation in any significant way.

3. Infrastructure reforms in developing countries typically are part of broader policy reforms, which tend to include changes in fiscal rules, monetary policy, exchange-rate policy, free-trade liberalization, etc.

4. Exogenous changes in the environment (international markets for exports, debt, technology, etc.) affect the results of overall reforms and particularly infrastructure reforms.

5. Infrastructure reforms tend to respond to multiple –admissible– initial objectives (as a political signal, as a mechanism to receive new funds, to commit avoiding operational deficits, to attract new investment and management, to develop domestic capital markets, to improve coverage, etc.), but seldom (if ever) they state that one of their goals is to improve the welfare of the poor, or even to improve the distribution of income. Whatever their goals were, however, it is relevant to assess the impact of infrastructure reforms on income distribution and/or any given group of society, in particular because such side-impact might recommend (or not) changing some features of the design of infrastructure reforms.

6. The effects of infrastructure reforms vary across different people. Typically, observers recognize different categories of users –including various residential, commercial and industrial types–. Nevertheless, since all of them are citizens (or at least, the welfare evaluation is done for the country as a whole, including all its inhabitants who we assume are permanent citizens), the best way to approach the issue is to consider the direct and indirect impacts of reforms on various citizens, whether they are former employees of reformed firms, new employees of those or other firms in the reformed sector, employees in third activities, unemployed, etc., owners of capital, non-owners of capital, etc., users of reformed services or people without access, etc.). Indeed, limiting the analysis to

*to help minimize eventual misjudgments due to the characteristics of the reform and/or its extremely partial evaluation.*

various regulated categories of users most likely leads to wrong results: indirect impacts are not accounted for, and the aggregation of welfare categories is not possible.

7. The previous observation means that the productivity gains (and eventually profits) obtained by regulated firms only have an impact on welfare once they are transferred to users through lower real tariffs and/or quality. Therefore, considering in particular price-cap regulations where there is –by their very nature– some lag between cost reductions and their price reflection, the welfare effects of reforms might be delayed (meaning that an immediate evaluation will underestimate its full impact).

8. Considering then all individuals (people), the various impacts of infrastructure reforms can be defined as direct or indirect for each of them.

   a) First, changing prices and quality of infrastructure services affect directly those people who have access and consume them both before and after the reform.

   b) Second, reforms also change the likelihood of access to the infrastructure service, particularly important for low-income groups and/or services with low initial coverage.

   c) Third, prices and quality of substitutes (of privatized services, such as natural gas) might be affected by the reform.

   d) Fourth, layoffs (net of severance payments) in the reformed firms are a direct impact on former employees of the reformed / privatized firms.

   e) Fifth, whether or not people have access to those services –before and after the reform–, they can be indirectly affected through changes induced on employment opportunities elsewhere (either with contracting-out suppliers for those reformed firms, with new competitive entrants in those infrastructure services, or in the rest of the economy with commercial and industrial users who have access to better / worse and cheaper / more expensive infrastructure services).

   f) Finally, users and non-users of infrastructure services are also indirectly affected by changes in the pattern of taxes and subsidies applying before and after the reform. In

this respect, it is convenient to distinguish between fiscal changes that could be separated from the infrastructure reform (for instance, changes in value-added tax, property tax, etc., which directly affect the prices paid by users of the reformed services) and those which have a direct impact upon the key variables that characterize the service after the reform (in particular the elimination of state-owned firms' operational and investment deficits paid through the tax system), since these latter funds are implicitly replaced by direct income from tariffs.

9. In short, comparison of pre- and post-reform welfare requires the consideration of two (near to) equilibrium (financially and economically sustainable) situations, disentangling direct and indirect effects of infrastructure reform on different types of citizens (users and non users –i.e., citizens– of different income groups).

10. Since citizens typically cannot assess the indirect effects of infrastructure reforms upon them, the sustainability of the situation previous to reform, the long-run effects of relatively recent infrastructure reforms, the complementary effects of reforms on other public policies and exogenous changes in the environment, etc., their perception of the welfare effects of infrastructure reforms cannot be expected to coincide with the actual, complete results. Of course, various indirect effects could cancel out each other, and the direct effects therefore would coincide with the full effect of the reform. Also, indirect effects might be negative, and people might not perceive dividends from reforms simply because they are not there.

11. Existing studies on the welfare effects of privatization and infrastructure reforms in developing countries often suffer one or more limitations:

    a) Insufficient analysis of indirect effects (typically no computation and insufficient acknowledgment of implied limitations).

    b) In some cases, this is due to the fact that impacts are measured distinguishing different categories of users –residential, commercial, industrial, etc.–, which correspond better with regulatory information on price structures and consumption baskets but miss many important cross-effects between users and between users and non-users.

c) In the few cases when the evaluations consider indirect effects, this is done through a general equilibrium analysis with computational models which are not very convincing (too many assumptions, many of which are quite arbitrary, yielding aggregate results that put together direct and indirect effects), limiting the validity and (most importantly) the impact of their findings.

d) Lack of sustainability (counterfactual) analysis of pre-reform observations (prices are compared without even accounting the saving for tax payers who stopped contributing to finance the operational deficit of state-owned enterprises, or are compared with unreasonable –severely inefficient– cross-subsidization structures).

e) Poor basic information (particularly when the quality of the new regulatory institutions created is also unsatisfactory), including incorrect and/or irrelevant pre-reform information. More generally, results are often distrusted based on the poor quality or insufficient transparency of the basic data they are based upon.

f) Questionable interpretations that fail to distinguish between poor results and deceived expectations about reforms (forgetting the natural short-run "ineffectiveness" of price-cap regulation, therefore identifying lack of short-term correspondence between tariffs and cost reduction as "unfair distribution of efficiency gains"; not considering the fixed cost component of attending each individual user and the joint fixed costs of infrastructure services, which leads –for instance– to judge a two-part tariff as regressive; etc.).

# 3. A GENERAL FRAMEWORK TO EVALUATE WELFARE IMPACTS OF INFRASTRUCTURE REFORMS

With these observations in mind, let's consider a new general framework that allows us to analyze the impact of infrastructure reforms on various citizens (users and non-users) according to their level of income, contemplating also direct and indirect effects of reforms, which provides a potential explanation of the discrepancies between actual and perceived results of such reforms.

Denote $B^i$ the utility of citizen type i (the typical citizen within the income-distribution quintile he/she belongs), and define it as the following (simplified and indirect) function of net personal income, prices and qualities:

$$B^i(Y^i, P_I^i, P_{NI}^i, q^i),$$

where

$Y^i$ is the net income of individual i (including the value attached to government spending less taxes directly falling on him/her),

$P_I^i$ is the (vector of) price(s) of infrastructure services (before taxes) consumed by individual i,

$P_{NI}^i$ is the (vector of) price(s), corrected by quality, of other goods and services consumed by i, and

$q_I^i$ is the quality of infrastructure services consumed by i.

Consider now each of the arguments of $B^i$, as shown below:

$$Y^i[G^i - T^i + W^i(D_I, D_{NI}).L^i(D_I, D_{NI}), \varepsilon^i],\ P_I^i[D_I, D_{NI}, \varepsilon^i],\ P_{NI}^i[D_I, D_{NI}, \varepsilon^i] \text{ and } q_I^i[D_I, D_{NI}, \varepsilon^i],$$

where:

$G^i$ and $T^i$ are the level of government spending and taxes affecting directly individual i,

$W^i$ is the wage rate relevant for individual i,

$L^i$ is the (exogenous) level of employment relevant for individual i,

$D_I$ denotes the design of public policy toward infrastructure services,

$D_{NI}$ denotes other dimensions of public policy (monetary policy, trade policy, quality of overall legislation, etc.), and

$\varepsilon^i$ is a vector of exogenous, "environment", parameters that affect individual i (i.e., technology, international credit market conditions, etc.).

Notice that labor income, prices of infrastructure and other goods and services, and quality of infrastructure services all depend on the characteristics of public policy towards infrastructure, but they all also depend on other public policies and external –exogenous– conditions.[3] On the other hand, while labeling effects of the infrastructure reform on one particular individual as "direct" or "indirect" actually depends on the specific characteristics of such individual (his/her employment situation, access to infrastructure service, etc.), it is convenient to classify as *direct effects* all those accruing to the reformed sector (through $P_I^i$ and $q_I^i$, and through on $W^i$ and $L^i$ for people at the reformed sector), and as *indirect effects* all changes provoked on third markets and government behavior (i.e., over $P_{NI}$, $G^i$ and $T^i$, and on $W^i$ and $L^i$ for the rest of the people).[4]

Of course, citizens will hardly (or sufficiently) perceive the indirect effects of infrastructure reforms on third markets (labor, final goods and services provided by commercial and industrial users of infrastructure, etc.), particularly since they cannot distinguish what determined such situation (a change in $D_I$, $D_{NI}$ or $\varepsilon^i$). (Not only that, if the pre-reform prices did not allow full cost recovery, citizen's perception of the "full initial price" –which includes the direct price paid by

[3] *Rents to shareholders of privatized firms are not included in $B^i$ under the assumption that such shareholders are a small fraction of the highest income citizens, and that these rents are not directed to other domestic investment (i.e., any positive indirect effect from the rents of privatized firms is neglected).*

[4] *Indeed, the infrastructure reform might –and typically does– induce a change in the allocation of government spending and tax burden affecting each individual i in a different manner, particularly when state owned enterprises were running a deficit before their privatization. While these fiscal changes are formally treated as a separate reform, a correct assessment of the infrastructure reform needs to compare two sustainable situations pre and post-reform, which means that the initial deficit of state owned firms should be computed as a (hidden) price paid by users and non-users prior to reform, according to the general tax structure applicable for public spending of any kind. Therefore, only fiscal changes beyond the elimination of state owned firms' operational and investment deficit impacting upon individual i should be treated as a fiscal reform that is independent of the infrastructure reform.*

users and the hidden price or rather tax paid by users and non-users through the tax system to cover operational and/or investment deficits pre-reform– will certainly be quite limited, even though the elimination of the deficit is a direct effect of the infrastructure reform.) Finally, both direct and indirect effects of infrastructure reform coexist with the effects of other reforms or changes in the environment, affecting the well being of individuals in different manners, and obviously complicating the evaluation of each individual piece of the overall reform.

Indeed, allowing all kinds of policy and environment changes (reform and shocks, respectively), and denoting changes between period t=0 and t=1 with $\Delta$, we have that:

$$\Delta B^i = \Delta B^i/\Delta Y^i \,.\, [\Delta Y^i/\Delta G^i - \Delta Y^i/\Delta T^i + \Delta(W^i.L^i)/\Delta D_I^i + \Delta(W^i.L^i)/\Delta D_{NI}^i + \Delta Y^i/\Delta \varepsilon^i] +$$

$$\Delta B^i/\Delta P_I^i \,.\, [\Delta P_I^i/\Delta D_I^i + \Delta P_I^i/\Delta D_{NI}^i + \Delta P_I^i/\Delta \varepsilon^i] +$$

$$\Delta B^i/\Delta P_{NI}^i \,.\, [\Delta P_{NI}^i/\Delta D_I^i + \Delta P_{NI}^i/\Delta D_{NI}^i + \Delta P_{NI}^i/\Delta \varepsilon^i] +$$

$$\Delta B^i/\Delta q_I^i \,.\, [\Delta q_I^i/\Delta D_I^i + \Delta q_I^i/\Delta D_{NI}^i + \Delta q_I^i/\Delta \varepsilon^i].$$

But the effect of the infrastructure reform on welfare of individual i ($\Delta B^i/\Delta D_I^i$) is only one part of this. Rearranging the relevant terms (and distinguishing the impact of the infrastructure reform on labor income within the specific sector $-W_I^i.L_I^i-$ and elsewhere $-W_{NI}^i.L_{NI}^i-$), we have:

$$\Delta B^i/\Delta D_I^i = \Delta B^i/\Delta P_I^i \,.\, \Delta P_I^i/\Delta D_I^i + \Delta B^i/\Delta q_I^i \,.\, \Delta q_I^i/\Delta D_I^i + \alpha.\Delta B^i/\Delta Y^i \,.\, \Delta(W_I^i.L_I^i)/\Delta D_I^i \text{ (direct effects)}$$

$$+ \Delta B^i/\Delta P_{NI}^i \,.\, \Delta P_{NI}^i/\Delta D_I^i + (1-\alpha).\Delta B^i/\Delta Y^i \,.\, \Delta(W_{NI}^i.L_{NI}^i)/\Delta D_I^i \text{ (indirect effects)},$$

where (for the aggregation of the various changes affecting the welfare function):

$\Delta B^i/\Delta P_I^i$ and $\Delta B^i/\Delta q_I^i$ = share of individual i's income spent on infrastructure service (as long as quality changes are expressed as the money-equivalent of a change in price $P_I^i$),

$\Delta B^i/\Delta P_{NI}^i$ = fraction of income spent on other goods and services by individual i,

$\alpha$ and $(1-\alpha)$ = fraction of individual i's income coming from employment in sector I and NI, respectively, and

$\Delta B^i/\Delta Y^i = 1$.[5]

That is, welfare changes due to infrastructure reforms recognize direct effects (on prices, quality, wages and employment in infrastructure services, comparing changes between the two periods – zero change on users who remain without access), and indirect effects (prices –of uniform units of quality for simplification– of goods and services provided by firms who are direct or indirect users of infrastructure services, and labor income changes for their employees, affecting all citizens). While indirect effects are clearly difficult to measure and perceive by citizens in general (and too many politicians in particular), some direct effects also suffer that limitation, meaning that the actual and perceived results of an infrastructure reform will most likely diverge when too many things are changing at the same time (as is usually the case).

Thus, implementing the evaluation methodology implied by this analytical framework, aimed at properly measuring the direct and indirect welfare effects of infrastructure reforms, requires a great deal of work regarding measurement of prices, quantities and quality of services reformed (correcting hidden transfers or unsustainable situations if they exist); employment and wage information for the reformed sectors; employment, wage, price and quality estimations for other goods and services (as far as the effect upon them of changes in coverage, quality and prices for commercial and industrial users of infrastructure services), for the characteristic consumption basket of individual citizens grouped by quintiles. The credibility of the results critically depend on the transparency of the information used, as well as on the explanations behind changes in employment, prices, etc., that are due to external factors or changes in policy other than the infrastructure reform.

Following this initial framework, it then becomes clear that:

1. Users' (and citizens') perceptions will hardly (or very imperfectly) contemplate indirect effects of reforms (sometimes not even the direct ones), so actual and perceived outcomes will naturally diverge.

[5] *This assumption about the marginal utility of income of each individual i (i.e., that it equals 1) is not contradictory with a social utility function which weights differently the utility reached by each individual according to their position into the income-distribution. While the construction of such aggregated welfare function could allow for different marginal utilities across quintiles, an alternative construction could come from simply weighting more heavily the utility received by people in the lowest quintiles. In any case, we will not attempt to reach one single aggregated welfare number, but instead to compute a different welfare number for each quintile i.*

2. More so given that effects of other policy reforms and/or external conditions have impacts that are not easy to isolate from those of infrastructure reform: the changes that are observed and attributed to the infrastructure reform might be originated in other policy or environmental changes (i.e., appreciation of the currency, combined-cycle technology in the energy sector, cellular telephony, etc.).

3. Even considering direct effects, a correct evaluation has to account for full-fledged labor impacts (not only upon direct employees of the reformed firm, but also through new hiring of their input suppliers and new competitors within the reformed sector), and changes of prices and quality that are relevant for those who gained access to the infrastructure service after the reform (considering the price and quality of abandoned substitutes used before they gained access to the service reformed, and eventually the tax contributions implicit in the subsidized tariffs prior to reform).

4. The exercise is only valid if t=0 and t=1 are representative of the pre- and post-reform situations; that is, both situations have to be sustainable (and representative of pre- and post-reform situations). In the case of Argentina, for instance, this means that years 1988-1990 (hyperinflation) or 2002-2004 (contractual limbo) are not acceptable to draw any conclusions (otherwise, observing for instance the period 2001-2004 –where tariffs remained frozen even though wholesale inflation accumulated more than 150%– there would be important –but fictitious– welfare gains due to the freezing of tariffs…), that the pre-reform deficit of the state owned firms has to be computed as a hidden tariff paid by users and non-users according to the general tax structure applicable to finance any kind of public spending, and that it is necessary to be sure that investments prior to reform included at least the amortization of existing capital (for otherwise that situation would not be sustainable).

5. The indirect impacts of the infrastructure reform ($\Delta D_I$) on wage, employment and overall prices in non-infrastructure sectors depend upon tariffs and quality of infrastructure services faced by non-residential users, new investment, entry of new firms, etc., and –particularly under price-cap regulation– needs some minimum time (but also reasonable,

given public perceptions) to allow the passthrough of initial productivity gains to end users.

6. The counter-factual is unavoidable to account for the change in access / coverage due to the infrastructure reform: the change in price and quality of the additional coverage should compare with the price and quality of the replaced alternative (or the reservation price of the new service if no alternative existed), assuming an expansion path consistent with the correctly selected pre-reform period.

7. The estimation of all impacts naturally needs to compute not only changes in regulated prices and quality, but it also needs to estimate what portion of those changes are due to other reforms or external shocks.

8. The above framework does not account for new income received at the selling of a public firm, since theoretically at least –leaving aside second-order effects due to avoiding credit rationing, which the evidence of many long-time indebted developing countries shows is not quite binding except in extremely critical situations– this should not change the net wealth of the State (an old asset was sold and replaced by cash –in full or in installments– or by the reduction of public debt).

# 4. SOME ILLUSTRATIONS OF PROGRESS TO BE MADE WITH THE PROPOSED ANALYTICAL METHODOLOGY

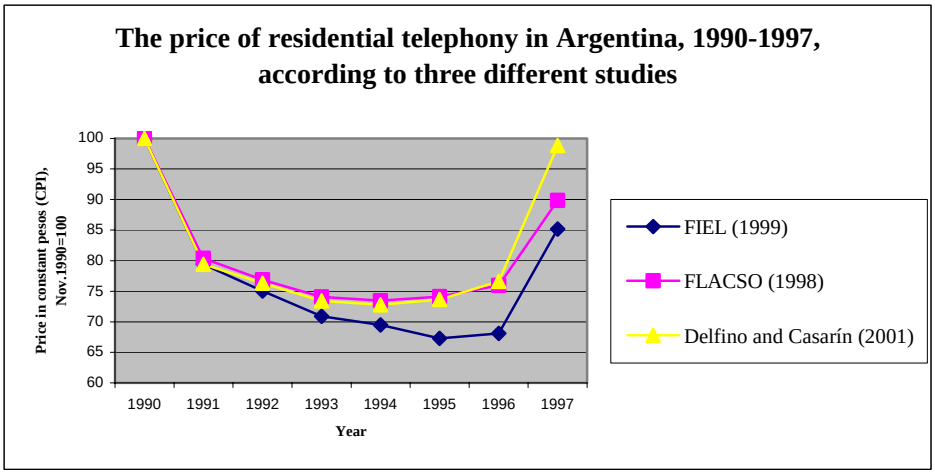
Even though various studies (Navajas (1999), Estache et al. (2000), Birsdall and Nellis (2002), Ennis and Pinto (2002), Chong and López de Silanes (2004), Wood (2004)) have recognized the need to take into account indirect effects of infrastructure reforms, carefully selecting the pre- and post-reform period, etc., they could not implement many of their recommendations and often had to rest on some strong simplifications and/or omissions. Some of those studies, furthermore, gather partial results obtained from country-specific analyses whose internal consistency and quality of data is not sufficiently scrutinized. The result of these limitations is that every study is subject to one or another type of criticisms, country-studies present different basic data, etc., blurring each single evaluation and complicating a minimum consensus among students of reforms (and, consequently, among politicians and the general public).

To illustrate some of the needed contributions to be made in Argentina, consider the following controversies or discrepancies among professional observers.

### *4.1. Discrepancies about basic post-reform prices in Argentina's telecom sector.*

Diagnosis of privatization reforms cannot reach similar conclusions if the basic indicators are incorrect, or if they refer to a period of time not reflective of pre and post-reform.

The figure below includes three sets of telecom basic price indicators for residential users in Argentina (Delfino and Casarín (2001) –D&C–, FIEL (1999) and FLACSO (1998)), expressed in constant pesos (CPI adjusted), for the first 8 years following privatization of ENTEL in November 1990.




Note: FLACSO (1998) and FIEL (1999) reflect a consumption basket of a typical residential user. Actual figures provided in nominal prices, deflated by CPI; prices from D&C (2001) are estimated from "total expenditure" in their Figure 1 and Table 2, assuming a basket including rental and 1140 pulses consumed only in local calls.

While careful scrutiny of these series shows that their differences result mostly from the way they construct the consumption basket of a typical residential user (FIEL's basket contains rental, local, domestic and international long distance calls of a typical residential user, FLACSO's includes rental, local and domestic long distance calls but neglects international calls, and D&C's includes only rental and local calls; FIEL estimates average prices for the entire country, whereas FLACSO and D&C concentrate in the Metropolitan Buenos Aires; some observations correspond to different months across time and series, etc.), such comparison will seldom be made by users of this research. Most important, though, the conclusions to be reached vary severely according to the period –1990 vs. 1996 or 1997– and the source considered.[6]

This shows the importance of transparent information of prices for each element of the services provided (rental, local calls, long-distance domestic calls, etc.), as well as of the expenditure on each one of them by the different categories of users (so that the consumption basket can be

[6] *Considering D&C, if the consumption of long distance calls was accounted for, total expenditure of a typical residential user would have decreased –as the regulated prices of long distance calls dropped continuously since privatization– and their estimates would tend to coincide with those of FLACSO and FIEL, particularly from 1997 onwards.*

properly constructed and generally accepted by all researchers). This basic task is still missing in the telecom sector of Argentina.[7]

Of course, once the correct set of prices –relevant for various types of residential users– is presented, the evaluation of the reform has to deal with many other issues that were pointed out in the general analytical framework developed in the previous section (i.e., the selection of the pre-reform year, computation of connection charges for new users, accounting for subsidies received by ENTEL prior to reform, sector specific employment effects after liberalization, accounting of indirect effects of the reform, technological progress, etc.).

When all these steps are completed, and the corresponding data (with sources and assumptions) becomes publicly available at no cost, we will have a much better and convincing picture about the impact of the privatization and reform of the telecom sector that took place in Argentina.

### *4.2. Did tariffs in the W&S concession in Metropolitan Buenos Aires Concession decrease since privatization?*

The evolution of prices for water and sewerage (W&S) in the concession of Aguas Argentinas has not been correctly accounted for by observers, in particular because the information provided by the regulator (ETOSS) is totally misleading.

Concretely, as recently as December 2003, ETOSS informed in its webpage that "Aguas Argentinas won the concession by offering a 26.9% reduction of tariffs vis-à-vis OSN's (the state-owned enterprise). In September 1994 there was a 13.5% increase. Later, since May 1998, there was another 5.31% adjustment. Therefore, the tariff for the concession is currently 12.5% lower than that of the state-owned firm". The current information posted on its webpage is more detailed than this statement, but not very different conceptually, and still misleading as we can see from the brief discussion below.

First, the information is literally incorrect since it forgets to consider the increases in connection and infrastructure charges (to be paid only by new users, of course) applied in 1994, which transform the 13.5% increase into an approximate average –including old and new users– of 15%. Second, this information omits any reference to the tariffs that were in place during the

[7] *Visiting the sector regulators' web pages (either CNC's or the Secretary of Communication's) will not help at all on this issue, as no information on prices of basic telephony is even attempted.*

1980s under OSN, as it would be mere coincidence that those tariffs in place immediately prior to reform reflected the tariffs observed during the 1980s. Third, most importantly, since approximately 60% of Aguas Argentina's income comes from services priced according to the registered characteristics of the house being served ("*catastro*"), tariff adjustments have occurred independently of the regulator's decisions, simply due to the actualization of city and provincial registers and re-categorization of houses of residential users.

Indeed, the increase in the average bill since privatization (over 30% during the first 3 years and around 65% from 1993 to 2001), most likely obeys to such actualization of the characteristics of users (cannot be due to higher consumption as metering is quite limited), and means that W&S tariffs –contrary to what ETOSS informs– increased post-privatization compared with the prices charged immediately before.[8] No doubt, the welfare computations would severely change depending on a closer analysis of the evolution of prices faced by users of W&S in the Metropolitan Buenos Aires area.

### *4.3. What is the correct pre-reform benchmark?*

As suggested in the two previous examples, the evolution of prices since the reform –as just discussed for telecom and W&S– is of relatively little importance compared with what pre-reform information is considered to be representative of the pre-reform period. In a country like Argentina, with enormous macroeconomic cycles where real variables are very unstable, the selection of the pre-reform year can provoke totally different evaluations.

The table below reflects this, working with tariff indexes reported in FIEL (1992), which are based on basic data elaborated by *Sindicatura General de la Nación* (SIGEP).

[8] *The improvement in the collection of payments in arrears increases the income per connection, but not the average bill, since a fraction of the latter might still contain consumers in arrears (in any case, the progress in collection of payments was not so important in this concession).*

**Table 2**
**Tariffs under public provision, before taxes, 1980-1991**

| | Telecom | Natural Gas | W&S | Electricity |
|---|---|---|---|---|
| 1980 | 100,0 | 100,0 | 100,0 | 100,0 |
| 1981 | 107,4 | 103,8 | 88,1 | 99,7 |
| 1982 | 73,7 | 84,6 | 53,0 | 69,5 |
| 1983 | 55,0 | 89,4 | 40,4 | 73,7 |
| 1984 | 53,8 | 78,2 | 36,5 | 70,2 |
| 1985 | 50,5 | 93,0 | 32,6 | 74,0 |
| 1986 | 50,7 | 102,0 | 51,4 | 82,1 |
| 1987 | 43,2 | 105,2 | 60,5 | 75,4 |
| 1988 | 41,7 | 88,4 | 49,6 | 76,7 |
| 1989 | 26,6 | 63,6 | 53,3 | 69,5 |
| 1990 | | 68,2 | 42,3 | 74,8 |
| 1991 | | 88,0 | 43,9 | 74,5 |
| Avg.80-89 | 60,3 | 90,8 | 56,5 | 79,1 |
| 1989/Avg.80s | 44% | 70% | 94% | 88% |
| 1991/Avg.80s | | 97% | 78% | 94% |

Note: Index 1980=100, constant values (wholesale deflacted, IPM).
Source: FIEL (1992), based on SIGEP.
ENTEL: National Teleph one Company; GAS: Natural Gas Public Company;
OSN: Water and Sewerage Company (Greater Buenos Aires Area); SE
GBA: Electricity Services for Greater Buenos Aires Area.

It is easy to see that very different evaluations result from choosing 1980 or the late 1980s as a pre-reform (sustainable) year, particularly in the case of telecom and sanitation but also in the energy sector. Indeed, the table shows that real tariffs during the 1980s followed a downward trend, which –given other obvious indications of serious and increasing internal inefficiency– was signaling an artificial and economically unsustainable situation prior to the 1990s reforms (something to be reflected in reduced levels of investment, and particularly increasing operational deficits). Of course, even this table should be reconstructed from the original data elaborated by SIGEP, as the way this basic data was aggregated (in particular since there were significant tariff rebalancing episodes in the energy sector between 1980 and 1992), the precise timing of deflation, etc., need to be spelled out in order to be judged and eventually be accepted by students for reform.

# 5. CONCLUDING REMARKS

The discussion provided in this paper was motivated by the existing discrepancies among scholars about the economic results of infrastructure reforms in developing countries, and particularly the discrepancies about professional and technical evaluations vis-à-vis a growing critical view of the average citizen in Latin American. Besides the better appraisal of existing studies and the improvement of future analysis by recognizing the various direct and indirect, overt and covert, effects of privatization, the analytical framework suggested here will allow a more careful planning of reforms by free-market oriented countries. Of course, each country and each sector have their own institutional, historical, structural and technological pre-reform conditions, highly relevant regarding the best design of infrastructure reforms (if any), but in all cases –perhaps with different weights– a very important aspect of such reforms is that their complete results be perceived correctly by society at large, something that hopefully will be paid more attention in the future.

While perceptions are surely formed by multiple factors, the most obvious recommendation for privatization oriented countries coming out from this paper is to correct unsustainable policies and hidden subsidies to state-owned firms well before selling them, so that the comparison between pre- and post-privatization performance can be better computed by all citizens, minimizing the risk of posterior (undeserved) dissatisfaction and criticisms that might lead to policy reversals. Privatization of infrastructure facilities and services should not be used as a way to deliver “bad news” about the unfeasible or unsustainable situation of public enterprises.

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**Massalin Particulares S.A.**
**Mastellone Hnos. S..**
**Medicus A. de Asistencia Médica y Científica**
**Mercado Abierto Electrónico S.A.**
**Mercado de Valores de Bs. As.**

# ESTAS EMPRESAS CREEN EN LA IMPORTANCIA DE LA INVESTIGACIÓN ECONÓMICA PRIVADA EN LA ARGENTINA

**Merchant Bankers Asociados**
**Metrogas S.A.**
**Metropolitan Life**
**Murchison S.A. Estib. y Cargas**

**Nike Argentina S.A:**
**Nobleza Piccardo S.A.I.C.F.**
**Novartis**
**Nuevo Banco Bisel S.A.**

**OCA S.A.**
**Organización Techint**
**Orígenes AFJP S.A.**
**Orlando y Cía. Sociedad de Bolsa**

**Pan American Energy LLC**
**PBBPolisur S.A.**
**Petrobras Energía S.A.**
**Philips Argentina S.A.**
**Pirelli Neumáticos SAIC.**
**Prysmian Energía Cables y Sistemas**

**Repsol-YPF S.A.**
**Roggio S.A.**

**S.A.C.E.I.F. Louis Dreyfus y Cía. Ltda.**
**San Jorge Emprendimientos S.A.**
**SC Johnson & Son de Arg. S.A.**
**Sealed Air Argentina S.A.**
**Sempra Energy International Argentina**
**Shell C.A.P.S.A.**
**Siemens S.A.**
**Sociedad Comercial del Plata S.A.**
**Sociedad Rural Argentina**
**Swift Armour S.A. Argentina**
**Telecom Argentina**
**Telecom Italia S.P.A. Sucursal Argentina**
**Telefónica de Argentina**
**Total Austral**

**Unilever de Argentina S.A.**
**Unión de Administradoras de Fondos, Jubilaciones y Pensiones**
**Vidriería Argentina S.A.**