Capitalization and Privatization in Bolivia: An Aproximation to an Evaluation

Barja, Gover and Urquiola, Miguel
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Gover Barja[*]
Miguel Urquiola[**]

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[*] Maestrías para el Desarrollo, Universidad Católica Boliviana, gbarja@ceibo.entelnet.bo
[**] Economics Department, Cornell University, mu26@cornell.edu

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I. Introduction and summary of findings

During the 1990's, Latin America experienced a wave of privatizations, which were an integral part of stabilization programs and a general reordering of the role of States in the regional economy. Over the past few years, these privatizations have come under increasing fire. The adverse effects ascribed to them range from an increase in utility service prices, to aggravating the recession currently affecting the region. In short, they are sharing in criticism directed at the entire liberalization process.

In this context, accurate knowledge as to the real consequences of privatization is of real value, but while there is research on some of its economic effects, there is less information on its broader "social" consequences. The goal of this study is to try to fill in some of these gaps as they concern the case of Bolivia.

The paper first describes the privatization process, placing emphasis on the particularities of the *capitalization*[1] mechanism that was used for this purpose, and the regulatory framework introduced as its essential complement.[2] With this background, the paper then details the changes in the industrial organization and ownership patterns in the electricity, oil and gas, telecommunications, transportation, and water industries.

The discussion then turns to these processes' economic and social consequences. In the first case, the key issues are which agents benefited from the transfer of assets, and the effects on firm-level variables like investment, profitability, and transfers to the State. With regards to social outcomes, we focus on the effects on employees and consumers. For the first, interest centers on what happened to employment and wages in the sectors affected; for the second, what occurred to access and prices for privatized utilities, and to welfare more generally.

This paper touches on all these issues, although in several cases a full treatment is not possible due to data limitations. What information is available, however, leads to the following broad conclusions (roughly in the order they appear in the text):

1) By design, capitalization and privatization generated significant transfers of assets to foreign firms. The Bolivian population was not excluded from this benefit, however, since it collectively received a 45 percent share in most of the transferred enterprises. Dividends from this ownership have been used to pay old-age benefits.
2) These processes, combined with the introduction of a regulatory framework, seem to have delivered on their central stated goal: to substantially increase investment (as well as competition in some cases) in the sectors affected.
3) These investments have been associated with significant increases in capacity and output – from improvements in utility access rates, to a ten-fold rise in gas and oil reserves within five years of the reforms.
4) Productivity also increased significantly across all sectors, in part due to employment reductions. We find, however, that these reductions were small relative to the economy as a whole. Unless the indirect effects were very large, therefore,

[1] The nature of these two processes, privatization and capitalization, is described in detail below. In terms of the amount of assets transferred, the latter was clearly the more important. In part because of this, the discussion often uses the two terms interchangeably.

[2] We emphasize that it was the combination of *privatization/capitalization*, on the one hand, and *regulation*, on the other, that were substituted for state ownership.

privatization simply cannot account for the increasing unemployment observed in recent years.

5) Tax receipts from capitalized firms appear to have increased after reform. In the current recession, however, there is pressure for further increases.

6) While most capitalized firms do report positive profits, their returns on equity have declined in recent years, particularly during the ongoing recession.

7) In the *urban* area and in terms of *connection*, the utility service expansions have not bypassed the poor. On the contrary, in many cases it is the lower income quintiles that seem to have benefited the most.

8) As far as the effects of pricing changes on households' welfare, the available information does suggest some adverse effects.

9) On balance, however, the access improvements seem to have outweighed negative price effects, resulting in greater consumer welfare in the cases of electricity and telephone services. In the case of Water the results are mixed.

10) The regulatory framework seems to have strengthened the rule of law and promoted competition and transparency in some sectors. Nevertheless, it is still necessary to strengthen the regulatory and institutional framework.

11) As elsewhere, privatization/capitalization and regulation were part and parcel of a broader restructuring of the economy. In Bolivia, privatization lagged stabilization significantly, however, so it is not associated with the earliest macroeconomic effects. Nevertheless, it clearly is part of a shift in the State's focus from productive to social sector activities.

These findings provide a brief and admittedly incomplete evaluation of privatization in Bolivia, and we emphasize that it is impossible to fully disentangle its effects from those of associated events, like the introduction of regulatory frameworks.

On the whole, our findings suggest that these reforms met with relative success. The fact remains, however, that they are not popular, at least to judge by poll results and politicians' pronouncements. In the final part of this paper we provide a few hypothesis for this, as well as some details on the political economy of these reforms.

An aspect we highlight is the popular suspicion that even if output and productivity have improved, the capitalized enterprises are being run with only the best interests of the majority (foreign) owners in mind, and that the regulatory system has been unable to adequately restrain this natural tendency.

This standard issue has gained salience in Bolivia because, as stated, the population collectively owns a 45 percent share in capitalized firms, and the dividends accruing to this ownership are used to finance old-age benefits. Because these dividends have been declining (partially due to a recession), the amounts collected have been insufficient to adequately fund benefits in the amount promised initially.

Another issue we emphasize is our impression that the government that implemented these reforms "oversold" them, promising more, on the job creation front for instance, than they could reasonably deliver. Finally, the reform's entire reputation has been hurt by a couple of high profile failures, one regarding the national airline and another a water concession in the city of Cochabamba.

None of these issues might have been salient in a healthy economic environment, but in the economic slowdown Bolivia has been experiencing since 1999, they have

significantly contributed to privatization's bad reputation. Additionally, the recent worldwide focus on corporate malfeasance has helped bring them to the forefront.

II. Capitalization/privatization: The process and its direct effects

Bolivia initiated significant economic liberalizations in 1985, primarily in an effort to tame hyperinflation and emerge from a deep recession. Despite success with these early market-friendly initiatives, the country did not engage in significant and sustained privatization until about ten years later. When it finally embarked on this process, the government employed traditional privatization in some instances, but mainly relied on *capitalization* as a mechanism for the transfer of State-owned firms.

This section first describes how these approaches differ, and how the introduction of regulatory mechanisms served as a key complement to both of them. For each of the sectors affected by this reform, the discussion also details changes in industrial organization and regulatory arrangements. Finally, this section discusses changes in ownership patterns brought about by these reforms.[3]

A. Capitalization and privatization: general overview

Under traditional privatization, the government transfers a majority of ownership in a State firm to the private sector, and has freedom over how to spend the proceeds. Under capitalization, the State transfers shares equivalent to 50 percent of the firm to the investor with the winning bid. It also yields about 45 percent to private pension fund administrators who represent the general citizenry, and who use the funds derived from this share to pay old-age benefits complementary to those stemming from individual retirement accounts.[4] The remaining 5 percent accrues to the company's employees.

By its payment, the investor gains the right to manage the firm, and commits to *investing* its capital contribution, the amount it offered for its 50 percent share, in the firm's development. It must carry this out within a specified period (typically six to eight years), agree to fulfill obligations that encompass expansion and quality goals, and operate under regulation and a long-term (typically 40 year) contract.

Under this scheme, therefore, investment is given a high priority, and the government gains no disposable income. This reflects the fact that having come relatively late in Bolivia's liberalization, capitalization was not seen as a means to cover deficits, but rather as a way to attract foreign investment and improve management in key areas of the economy.

Taken together, capitalization and privatization raised significant amounts of capital: total commitments add up to about two billion dollars, roughly equivalent to 30 percent of GDP. Capitalization accounted for most of these proceeds, however, 1.7 billion dollars, as opposed to 0.3 billion for privatization[5].

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[3] Parts of this section are drawn from Barja and Urquiola (2001). For additional information, see also Baldivia (1998) and Pierce (1997).

[4] As this suggests, a reform to the pensions system accompanied capitalization in Bolivia.

[5] While privatization started in 1992 with about 50% of its proceeds concentrated in 1999, capitalization occurred in the 1994-1997 period. Also 61% of privatization proceeds came from sectors where capitalization occurred.

B. Regulation as a complementary reform

Capitalization was complemented with reforms to each sector's industrial organization, and with a regulatory framework that by design, seeks to promote competition and efficiency.[6] The key legislation was the SIRESE[7] Law (1994), which created a regulatory system for the infrastructure sector. In essence, it defines the institutional structure, including the role of five regulatory agencies (*Superintendencias*) for the electricity, telecommunications, hydrocarbons (oil and gas), potable water, and transportation industries. Additionally, it sets up an overseeing agency responsible for system-wide coordination, appeals and evaluation; and introduces market competition as one of the guiding principles in the infrastructure sector.

Four more specific laws round out this framework: Electricity (1994), Telecommunications (1995), Hydrocarbons (1996) and Potable Water (2000). These introduced changes in each sector's industrial organization, and govern aspects related to tariff regulation, entry, service quality, and sanctions. The sector-specific regulatory agencies created as part of SIRESE administer each law.

C. Changes in industrial organization and regulatory arrangements

In addition to introducing regulatory frameworks for each sector, the laws described changed its industrial organization. This section describes the specific changes implemented in each case.

1. Electricity

Prior to reform, the electricity industry was divided into the National Interconnected System (NIS) and other independent networks, a distinction which remains today. The NIS covers the largest cities, while the other networks serve other urban and some rural areas.[8] This paper focuses on the NIS[9], where the State-owned *ENDE*[10] was active in generation and transmission. Additionally, it had some distribution activities, mainly through *ELFEC*[11] in the city of Cochabamba. *COBEE*[12], a private company, participated in generation and distribution in the cities of La Paz and Oruro. Other distribution firms or cooperatives were, *CRE*[13] in Santa Cruz, *SEPSA*[14] in Potosí

[6] For more on regulation and regulatory institutions in Bolivia, see Barja (2000) and SIRESE (2000).
[7] Sistema de Regulación Sectorial.
[8] This distinction will be used extensively. In Bolivia, the main cities are the department capitals. The three largest have populations close to one million and form the so-called central axis: Cochabamba, La Paz/El Alto, and Santa Cruz. Unlike most of its neighbors, therefore, Bolivia does not have a single dominant urban center, and has one of the lowest urban concentration ratios in the region.
[9] Which accounts for close to 90% of electricity consumption.
[10] Empresa Nacional de Electricidad.
[11] Empresa de Luz y Fuerza Electrica Cochabamba.
[12] Compañía Boliviana de Energía Eléctrica.
[13] Cooperativa Rural Eléctrica.
[14] Servicios Eléctricos de Potosí, a municipal company.

and *CESSA*[15] in Sucre. Competition existed only between *ENDE* and *COBEE*, and was limited to the direct provision of electricity to a few mining and industrial concerns.

The Electricity Law vertically separated generation, transmission, and distribution, with some firms privatized in each of these. Table 1 describes the firms that were created by privatization and capitalization, the year in which they were created, the value they were transferred for, and the buyer.

Table 1
Buyers and sale values for capitalized and privatized firms: Electricity

Firms created by the reform	Year	Privatization value (Millions of $us)	Capitali-zation value (Millions of $us)	Original buyer
Corani S.A.	1995		58.79	Dominion Energy, Inc.
Guaracachi S.A.	1995		47.13	Energy Initiatives, Inc.
Valle Hermoso S.A.	1995		33.92	Constellation Energy, Inc.
Transportadora de Electricidad S.A.	1997	39.90		Union Fenosa
Elfec S.A.	1995	50.30		EMEL, S.A.
Total		**90.20**	**139.84**	

In generation, capitalization created three firms: *Corani*, *Guaracachi* and *Valle Hermoso*, with a total value of about 140 million dollars. Each of these received part of *ENDE*'s generation activities, with the law limiting the market share each can achieve to 35 percent of the NIS market. Exclusive rights were initially granted to these companies, but by 1999 entry was liberalized and some small firms joined the market.

In transmission, network operation was passed from *ENDE* to the private *Transportadora de Electricidad*, without exclusive rights. Additionally, the Electricity Law forbids the participation of transmission firms in purchase or sale activities, and establishes open access and tariff regulation.

In distribution, several types of firms exist after the reform, all of which operate under tariff regulation and are subject to quality controls. First, there is *CRE*, a pre-existing distribution cooperative that remained as an independent regional monopoly. Second, there are pre-existing municipal distribution firms that also retained their monopolies: *CESSA* and *SEPSA*. *ELFEC*, previously a municipal company, now operates as a private firm. Finally, as stated, the private *COBEE* operated in both generation and distribution. Its divestiture from distribution produced two private local distributors, *ELECTROPAZ* (La Paz), and *ELFEO* (Oruro). For all of these distribution firms, tariff regulation consists of several average cost caps with productivity factors set using a four-year lag. Tariffs are updated every semester to allow for "pass-through" of energy cost increases.

These reforms, together with the introduction of a load dispatch coordination office, have created a wholesale electricity market that seeks to simulate competitive conditions. As a result the NIS is experiencing excess capacity since 1999.

2. Oil and gas

[15] Compañía Eléctrica Sucre, a municipal company.

Prior to reform, virtually all the hydrocarbons (oil and natural gas) industry was under the control of State-owned *YPFB*[16], a vertically integrated monopoly. Limited private participation in exploration, as well as in crude oil and natural gas production took place through joint ventures with this company.

With the capitalization process and the introduction of the Hydrocarbons Law, the priority became to remove *YPFB* from production, and to promote a natural gas export industry directed towards southern Brazil. The State intended this industry to support (through taxes and royalties) the development of other sectors of the economy, and with this goal in mind, reforms and foreign investment were focused on exploration and infrastructure. The inauguration of a pipeline to Brazil in 1999 made this vision a reality.

Further, these reforms were associated with a substantial increase in natural gas reserves. Proven and probable reserves increased from 5.69 TCF[17] in 1997, to 52.3 TCF in 2002, putting Bolivia in first place in Latin America as far as free reserves are concerned. With reserves now exceeding the Brazilian and domestic market, the Bolivian government is considering a new list of projects, including liquefied natural gas exports to the U.S. and Mexico[18], petrochemical and thermoelectric plants, and new export pipelines to Brazil, Argentina, Paraguay and Chile. [19]

As for the domestic market, a general policy of private control of all phases up to retail commercialization was adopted. Table 2 describes the firms that were created by privatization and capitalization.

Table 2
Buyers and sale values for capitalized and privatized firms: Oil and natural gas

Firms created by the reform	Year	Privatization value (Millions of $us)	Capitalization value (Millions of $us)	Original buyer
Chaco S.A.	1997		306.66	Amoco
Andina S.A.	1997		264.77	YPF-Pérez Compac-Plus Petrol
Transredes S.A.	1997		263.50	Enron-Shell
EBR S.A.	2000	102.00		Petrobras
CLHB S.A.	2000	12.05		Oil Tanking
Airport service stations	2000	11.10		Private
Total		**125.15**	**834.93**	

To implement these objectives, the Hydrocarbons Law requires that exploration, production and commercialization (upstream) be executed only by private firms in joint ventures with *YPFB* (remaining as the upstream regulator), while placing few restrictions on the export and import of petroleum products. The most important operators[20] in the

[16] Yacimientos Petrolíferos Fiscales Bolivianos.
[17] Trillion Cubic Feet.
[18] Given Bolivia's landlocked condition, at present one of the most debated issues is the choice of an export port in either Chile or Peru.
[19] An important distributional issue has arisen from the fact that most of new reserves are in the Department of Tarija (which already concentrated most exports to Brazil), which will now receive most of the royalty revenues.
[20] Representing shares of a group of firms.

upstream, in terms of the natural gas reserves they hold (by 2001 data), are: *Petrobras* (34.8%), *Maxus* (29%), *Total Exploration* (19.8%), *Andina* (5.9%) and *Chaco* (4.6%).

The 1996 Hydrocarbons law stipulates that the government is entitled to a share of the value of production which depends on whether the field in question was discovered before or after capitalization: 50% of the value of production from old fields (at wellhead), and 18% from new fields[21]. In both cases firms are also required to pay a 25% profit tax, a 25% surtax[22] and a 12.5% remittance tax.

In the downstream area, the gas and oil pipelines were transferred to the capitalized *Transredes*, without exclusive rights.[23] The administration of other pipelines (poliductos) was entrusted to the private *Oil Tanking*, with the remaining still under *YPFB* control. In refinement, most of *YPFB's* units were transferred to the private *Empresa Boliviana de Refinación* (*EBR*).[24]

In commercialization, *YPFB*'s storage terminals were transferred to *CLHB*[25] of *Oil Tanking* as well, but other private firms are also active. Bottled liquefied gas distribution plants are all private, and about 85 percent of bottling capacity continues under YPFB, but is expected to be privatized. Compressed natural gas service stations are all private, and about 15 percent of service stations for liquids continue under the State firm. Airport service stations nationwide where also transferred to the private sector. Diesel and other lubricants are imported by private firms.

Mixed ownership continues in network-based natural gas distribution: *SERGAS*[26] in Santa Cruz, *EMCOGAS*[27] in Cochabamba, *EMDIGAS*[28] in Sucre and *EMTAGAS*[29] in Tarija. *YPFB* operates in La Paz, Potosi and Oruro. These companies are expected to be fully privatized in the future.[30] Despite this activity, the network-based natural gas industry is still underdeveloped: by 2001 it included only 14,435 connections. Nevertheless, current policy is to increase this to up to 250,000 connections in the next five years, as part of an effort to change the energy consumption pattern in favor of natural gas.

Except for restrictions to vertical integration imposed on firms in gas pipeline transportation, the industry structure is flexible and determined by export market needs, although mergers and acquisitions are subject to approval. This has permitted *Petrobras*, in association with others, to integrate several of the phases directed to the natural gas exports to Brazil, at the same time as this company participates through *EBR* in refinement for the domestic market.

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[21] The 1990 Hydrocarbons Law required that all fields pay 50% in royalties, plus a profit tax.

[22] The surtax base is equal to the profit tax base minus 33% of accumulated investments and minus 45% of the value of production at each field up to a maximum of $40 million per year.

[23] According to 2000 data, *Transredes* held 100% of oil pipelines and 69.8% of gas pipelines. Other important operators in gas pipelines are *Gas Trans Boliviano* with 15.1% and *Gas Oriente Boliviano* with 9.8%, the first administers the main export pipeline to Brazil through Corumba and the latter the second export pipeline to Brazil through Cuiaba. In addition, later that year *Petrobras* iniciated construction of the San Alberto-Yabog gas pipeline and the San Alberto-OCY1 oil pipeline.

[24] Owned by the Accidental Association Petrobras Bolivia S.A.

[25] Compañía Logística de Hidrocarburos Boliviana

[26] Empresa de Servicios de Gas Santa Cruz S.A.M.

[27] Empresa Cochabambina de Gas S.A.M.

[28] Empresa Distribuidora de Gas Sucre S.A.M.

[29] Empresa Tarijeña de Gas.

[30] The first privatization attempt failed in April 2002.

Rate of return regulation (with a four year lag) is used for pipeline transportation, with a tariff structure that differentiates between domestic and export-related transportation. In natural gas network distribution, tariff regulation has not been implemented thus far. Consumer prices for all petroleum derivatives were initially calculated by starting with an international price reference, and then adding the costs of processing, transportation and commercialization -- plus an oil derivatives tax. Due to price volatility, liquefied gas, diesel oil, and gasoline are subsidized since 2000. Further, in a recent decree, the government froze all consumer prices, eliminated the refining margin, and increased the oil derivatives tax -- with the effect of lowering the price for the upstream firms.

3. Telecommunications

Prior to reforms, the telecommunications industry was divided between *ENTEL*,[31] which covered national and international long distance services, 15 cooperatives with monopolies in fixed local telephone services, and *Telecel*, a private monopoly in the cellular market. The Telecommunications Law maintained this separation until entry was liberalized at the end of 2001. Until then, *ENTEL* and the cooperatives retained exclusive rights, but the mobile market was opened to competition by allowing the entry of *ENTEL-Movil*[32] in 1996, and *Nuevatel-Viva*[33] in 2000. Table 3 presents the basic aspects of the *ENTEL* capitalization.

Table 3
Buyers and sale values for capitalized and privatized firms: Telecommunications

Firms created by the reform	Year	Privatization value (Millions of $us)	Capitalization value (Millions of $us)	Original buyer
ENTEL S.A.	1995		610.00	ETI Euro Telecom.. N.V.
Total			**610.00**	

For the period prior to entry liberalization, legislation mandated tariff regulation for firms that control more than 60 percent of a given market. This scheme had a similar structure in all areas, establishing an initial price cap for different baskets of services, adjusted for inflation and a productivity factor with a three-year lag. Further, the law stipulated annual expansion, quality, and technological goals up to 2000.

November 2001 marked the end of exclusive rights in all markets.[34] Entry occurred in the long distance market through *AES Corporation* (in association with *Cotel*), *Teledata*, a division of *COTAS, Boliviatel*, a division of *COMTECO*, *Telecel*, *Nuevatel* and *ITS*. Additionally, *Cotas-Movil* has entered the mobile market, while *Entel* has expanded its local network to business clients. Most of these companies are also aggressively entering the data transmission and internet market. Up to the end of 2001, registers show 17 firms providing public phone services, 12 firms providing pager

[31] Empresa Nacional de Telecomunicaciones, the State monopoly.
[32] A division of capitalized *ENTEL*.
[33] A joint venture between *COMTECO* (the Cochabamba cooperative) and Western Wireless International.
[34] The so-called *Decretos de la Apertura* where approved by the government a year before.

services, 40 in value added services, 33 in signal distribution, 272 in television, 572 radio stations, 13 in data transmission, 232 in radio-taxi services and 512 private nets.

Additionally, market liberalization was accompanied by a four-year restriction on mergers, acquisitions and stock swaps that account for 40% or more of total local fixed lines in service in the country by one firm (or a group of related firms). Tariff regulation continues where a firm controls more then 60 percent of a given market, and new rules are to be implemented to facilitate inter-connection agreements. A Universal Access and Service Fund has also been proposed, and would be financed mainly by operators' contribution of 3.5 percent of their annual gross income.

4. Transportation

As elsewhere, the Bolivian transportation industry is divided into air, rail, road and water segments. Thus far, capitalization and regulation have only affected the first two. Additionally, the long waited new Transportation Law has not been approved.

In the air market, prior to reform the State-owned *LAB* [35] and the private *AEROSUR*[36] competed in the main regular route domestic market. *LAB* also participated in the international market, and the national airport system was administered by the state monopoly *AASANA*.[37] *LAB* was capitalized to the Brazilian *VASP* (see Table 4), and the main three airport terminals of Viru Viru in Santa Cruz, El Alto in La Paz and J. Wilsterman in Cochabamba, were transferred to the private *SABSA*[38] as concessions. *AASANA* retains administrative control of 34 small airports, and *AEROSUR* has recently entered the international market with flights to Argentina.

In the case of rail, before reform the sector was dominated by the state monopoly *ENFE*,[39] which administered passenger and freight services in the Andean and Eastern regions. In this case, reform created two separate regional firms, *FCA*[40] and *FCO*,[41] which where then capitalized (see Table 4).

Table 4
Buyers and sale values for capitalized and privatized firms: Transportation

Firms created by the reform	Year	Privatization value (Millions of $us)	Capitalization value (Millions of $us)	Original buyer
LAB S.A. (14)	1997		47.47	VASP
FCO S.A. (15)	1996		25.85	Cruz Blanca
FCA S.A. (15)	1996		13.25	Cruz Blanca
Total			**86.57**	

[35] Lloyd Aéreo Boliviano.
[36] Compañía Boliviana de Transporte Aéreo Privado.
[37] Administración de Aeropuertos y Servicios Auxiliares a la Navegación Aérea.
[38] Servicios Aeroportuarios Bolivianos.
[39] Empresa Nacional de Ferrocarriles.
[40] Empresa Ferroviaria Andina.
[41] Empresa Ferroviaria Oriental.

The lack of a sector law has limited the regulatory activities of the Transportation Superintendence. Nevertheless, it was able to advance some actions based on existing norms and a few government decrees. In air transportation, a tariff band was placed for the regular domestic market, with the stated objective of discouraging anticompetitive practices. Some airport terminal tariffs are also regulated. In rail transportation, there are regulations concerning economic, technical and security aspects of service. In urban road transportation, maximum reference tariffs were also put in place.

5. Water

While the above sectors experienced capitalization and the introduction of regulation, the water industry has undergone limited changes and encountered significant difficulties. Only one municipal firm, *SAMAPA* (La Paz/El Alto), was transferred as a concession in 1997, to *Aguas del Illimani*.[42] Under the new model, the concession seeks to improve internal efficiency, coverage, and quality. The characteristics of the *Aguas del Illimani* contract reflect this, and the objectives established for the 1997-2001 period included: i) 100 percent access to potable water or sewerage (excluding public fountains) in the areas of Achachicala and Pampahasi, in the city of La Paz, ii) 82 percent access to potable water in the city of El Alto by 2001, of which 50 percent should be expansion connections, and 41 percent access to sewerage; and iii) compliance with long-term expansion goals. Quality norms cover aspects related to the sources of water, its quality, abundance and pressure; continuity of service, infrastructure efficiency, customer service, and emergency preparedness. Tariff regulation was established under a rate of return mechanism with a five-year regulatory lag and no productivity factors. Additionally, tariffs were set in dollar terms payable in bolivianos.[43]

The expectation was that within a short period, legislation would be in place to incorporate the remaining firms into a similar model. However, the long wait for a Potable Water and Sewerage Law (finally approved in 2000), together with significant failure in a second transfer of a municipal firm (*SEMAPA*) to *Aguas del Tunari*[44] in Cochabamba, significantly slowed change in this sector.[45]

Nevertheless, up to 2000 the Water Superintendence was able to incorporate the new regulatory regime and sign concessions with existing municipal water firms in Cochabamba, Oruro, Sucre, and Potosi -- and with existing cooperatives in Santa Cruz, Montero, Trinidad and Guayaramerin. Some features of the new Law are that municipal

[42] The main shareholder is *Lyonnaise Des Eaux*, with 35 percent.

[43] This last feature has generated wide protest from the inhabitants of El Alto.

[44] A private firm with the British *International Water* (with 55 percent) as the main shareholder.

[45] The difficulties started when *Aguas del Tunari* implemented a tariff increase that averaged 38 percent (from a minimum of –11% to a maximum of 117%). Given the reorganization of consumer categories, however, in practice the maximum increase experienced by some consumers was in the order of 300 to 500 percent, which naturally generated much opposition. In addition, the exclusive rights granted to this firm in many cases affected local interests, particularly of those who invested in private wells and distribution mechanisms. An added element was that *Aguas del Tunari* had to invest 200 million dollars in the popular *Misicuni* water provision project, 30 percent of which had to come from equity and the rest from debt. The tariff increase occurred while the company had not yet complied with the equity commitment, and the debt financing had yet to be lined up. The perception arose that the firm was trying to finance its equity from tariff increases. The so-called "water war" was the local reaction of strikes and demonstrations that ended with the expulsion of *Aguas del Tunari* from Cochabamba.

governments are responsible for the provision of water and sewerage services, a responsibility they can perform through private or municipal firms, cooperatives, civil organizations and any existing organization in rural communities. The Bolivian population is divided between areas subject to concession or not, depending whether they are financially viable. Concessions are subject to rate of return regulation with a five year regulatory lag and efficiency goals, while universal access in non-concession areas should be accomplished with government investment.

D. Further ownership effects

Capitalization transferred 50 percent of state enterprises (and their control) to foreign firms. Additionally, 45-50 percent of shares in the capitalized firms were given to the *Collective Capitalization Fund* (CCF), to be held for the benefit of the population at large. Table 5 lists the enterprises capitalized in the utilities and hydrocarbons sectors, the number of shares issued and the distribution of these, by December 2001, between the capitalizing firm (always 50 percent), the CCF (46.4 percent on average), and the employees of each enterprise (3.6 percent on average and decreasing). It bears repeating that in the second case the shares are made out to the CCF and are represented by the private pension fund administrators – they are not owned by these administrators, the State, or any individual citizen.

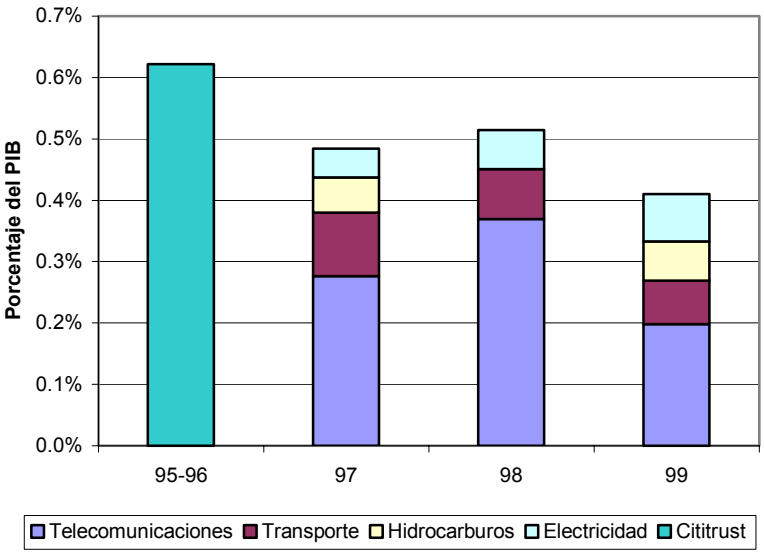
Table 5
Distribution of share ownership for the capitalized firms

Firm (Sector)	Total number of shares	% owned by the capitalizing firm	% owned by the CCF and represented by the fund admistrators	% owned by the firms' workers
Ferroviaria Oriental (Transportation)	2,296,982	50	49.91	0.09
Ferroviaria Andina (Transportation)	1,322,448	50	49.93	0.07
Valle Hermoso (Electricity)	2,927,322	50	49.87	0.13
Guaracachi (Electricity)	3,358,284	50	49.83	0.17
Corani (Electricity)	3,144,486	50	47.23	2.77
Transredes (Oil and gas)	10,048,120	50	33.55	16.45
Petrolera Chaco (Oil and gas)	16,099,320	50	48.94	1.06
Petrolera Andina (Oil and gas)	13,439,520	50	48.92	1.08
ENTEL (Telecommunications)	12,808,988	50	47.47	2.53
LAB (Transport.)	2,293,764	50	48.64	0.99
Mean		**50**	**46.42**	**3.57**

Fuente: Boletín de Pensiones 1999, Superintendencia de Pensiones, Valores y seguros.

The CCF receives the dividends due to it from its shares in the capitalized and regulated firms. Between 1997 and 1999, these dividends represented between 0.4 and 0.5 percent of GDP per year, with the most important contribution coming from the telecommunications sector, as described in figure 1.

Figure 1: Annual dividends received by the pension fund administrators from the CCF



Source: Boletín de Pensiones 2000, SPVS.

The fund has a significant social impact as a source of transfers to private citizens. These include the *Bonosol* (an old-age benefit), funeral expenses, investment in *Individual Capitalization Funds* (pension plans actually owned by individual citizens), and subsequently, the *Bolivida*. The *Bonosol*, was a cash payment equivalent to 248 dollars in 1997, directed at all citizens 65 or older – a substantial transfers given that Bolivia's GDP per capita is about 1,000 dollars.[46]. In total, 56.5 million dollars were paid to about 320,000 people.

The *Bonosol* was only paid once before the administration that implemented the capitalization process left government. Immediately a debate began on whether the CCF in fact had enough funds to continue payments at that pace. The next administration did not make payments for a period and then switched to the *Bolivida*, which began being paid in December of 2000, and consists of 60 dollars for every citizen above the age of 65. Retroactive payments for 1998 and 1999 (60 dollars per year) were also made, and by March of 2001 had benefited 150,000 individuals.

The year 2002 witnessed the return to government of the administration that originally implemented Capitalization, and hence a desire to return to the original (roughly 240 dollar) *Bonosol*. Because of the further reductions in the flow of dividends, however, the CCF now clearly does not have sufficient funds to make the promised payments. We return to this issue, including how the government plans to make up the shortfall, in section VI below.

III. Effects: Firms' performance

Capitalization and privatization entailed major changes to the industrial organization of the sectors they affected, and to the conditions under which the firms in

[46] By December 31, 1999, the CCF had also been used to acquire shares of the ICF for approximately 14.7 million, and for the payment of funeral expenses worth 2.3 million dollars.

each of them operate. In this section, we study these reforms' effects on several aspects of firm performance.

A. Investment

Investment is a key parameter in any evaluation of the capitalization process, since increasing it was one of its explicit objectives. Table 6 summarizes the sector-specific information presented earlier, but complements it with the investment activity observed in each case. The privatization values presented correspond only to the oil and gas, electricity, telecommunications and transportation sectors.

Table 6
Resources/investment generated by privatization and capitalization

Firms created by the reform	Year	Privatization value (Millions of $us)	Capitalization value (Millions of $us)	Investment as of 2001 (as % of commitment)	Company / institution in charge of investment
Oil and gas					
Chaco S.A.	1997		306.66	131.6	Chaco S.A.
Andina S.A.	1997		264.77	130.0	Andina S.A.
Transredes S.A.	1997		263.50	84.1	Transredes S.A.
EBR S.A.	2000	102.00			TGN-Investment
CLHB S.A.	2000	12.05			TGN-Investment
Airport Service Stations	2000	11.10			TGN-Investment
Electricity					
Corani S.A.	1995		58.79	85.1	Corani S.A.
Guaracachi S.A.	1995		47.13	154.3	Guaracachi S.A.
Valle Hermoso S.A.	1995		33.92	110.9	Valle Hermoso S.A.
TDE S.A.	1997	39.90			ENDE Residual
Elfec S.A.	1995	50.30			TGN-Investment
Telecommunications				(1)	
ENTEL S.A.	1995		610.00	76.9	ENTEL S.A.
Transportation				(1)	
LAB S.A.	1997		47.47	95.5	LAB S.A.
FCO S.A.	1996		25.85	129.1	FCO S.A.
FCA S.A.	1996		13.25	108.6	FCA S.A.
Total		**215.35**	**1,671.34**		

(1) Investment as of 2000 as % of commitment.

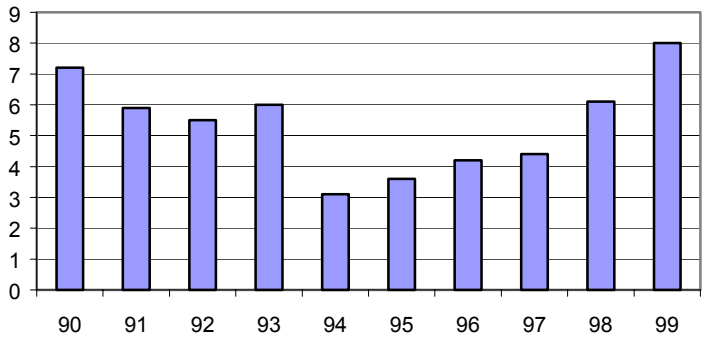
As this table illustrates, most firms have exceeded their investment commitments, and from this perspective the process seems to have delivered. Firms under concession agreements (*Aguas del Illimani,* and *SABSA*), furthermore, have also made investments in order to comply with specific contractual goals that are not registered in the table.

B. Employment and labor productivity

A frequent critique of privatization is that it leads to unemployment. In this section, we use administrative information to explore the extent to which this is true for Bolivia. As context, figure 1a shows that the economy-wide unemployment rate went up significantly after 1997, roughly doubling by 1999. Naturally, external or other

macroeconomic shocks may account for this; we postpone a discussion of these until section V. The focus in this section is simply to see if the employment changes brought about by privatization and capitalization could account for this change. Due to data restrictions, in this section we arrive only at a partial answer. Additionally, we include information on the evolution of labor productivity, and once again we first proceed through the analysis by sector.

Figure 1a: Unemployment rate in Bolivia
(As a percentage of economically active population)



1. Electricity

Table 7 presents the evolution of the employment level in each of the generation firms that make up the National Interconnected System (NIS), along with a labor productivity measure for each company. Between-firm comparisons must be made keeping in mind that these companies differ along dimensions including generation technology (thermo- or hydroelectric), and scale. The table shows that the number of employees in each firm remained more or less constant between 1995 and 1998, with some decline by 1999. Associated with increasing production, these trends have resulted in increases in labor productivity, which for the four years between 1995 and 1999, range between 14 and 100 percent.

Table 7
Employment levels and mean labor productivity in the electric (generation) sector

Firm	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
ENDE										
Number of employees	537	539	541	n/a	n/a	n/a	n/a	n/a	n/a	n/a
GWh/employee	2.38	2.66	3.12	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Corani S.A.										
Number of employees				69	68	65	67	58	48	48
GWh/ employee				6.4	8.4	10.6	9.1	12.8	16.1	17.6
Valle Hermoso S.A.										
Number of employees				60	59	60	60	62	61	46
GWh/ employee				6.7	7.3	11.5	14.3	10.3	9.5	3.0
Guaracachi S.A.										
Number of employees				72	70	71	46	68	65	63
GWh/ employee				13.9	14.4	11.7	13.8	15.9	14.2	13.3
COBEE S.A.										
Number of employees	n/a	n/a	n/a	835	285	285	279	240	228	219
GWh/ employee	n/a	n/a	n/a	n/a	3.0	3.0	3.1	3.9	4.7	5.4
TDE-Transmisión										
Number of employees						128	110	n/a	n/a	n/a
Km. Trans. Lines/ employee						15.22	17.69	n/a	n/a	n/a

Note: The data refer to December of each year. The capitalized enterprises began operations in August of 1995. COBEE in 1995 still included generation and distribution.

Table 8 presents analogous information for distribution firms.[47] As it illustrates, the distribution enterprises can be roughly split into two groups according to their size. *ELECTROPAZ*, *CRE* and *ELFEC*, which operate in the three largest cities (La Paz/Elto, Santa Cruz, and Cochabamba, respectively), and *CESSA*, *SEPSA* and *ELFEO*, which operate in smaller markets. The table reveals an overall downward trend in employment and a more consistent, increasing trend for labor productivity. In La Paz/El Alto, for instance *ELECTROPAZ* consistently reduced its employment level between 1996 and 1999, and increased its productivity by 59 percent in the same period. In Santa Cruz, *CRE* reduced personnel up to 1997 and raised its productivity by 43 percent (it increased employment in 1998, but this did not reverse the productivity increases). In Cochabamba, *ELFEC* reduced employment up to 1998, and increased its productivity by 105 percent in the same period. Two firms, *CRE* and *SEPSA*, actually increased their employment levels between 1995 and the most recent observation.

[47] Once again, between-firm comparisons must be made with caution due to differences in characteristics including network size, and market density.

Table 8
Employment levels and mean labor productivity in the electric (distribution) sector

Firm	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CRE										
Number of employees	449	510	523	509	498	490	513	473	532	525
GWh/employee	1.1	1.1	1.2	1.4	1.6	1.8	1.9	2.2	2.0	2.0
ELECTROPAZ										
Number of employees	n/a	n/a	n/a	n/a	362	281	267	257	268	266
GWh/ employee	n/a	n/a	n/a	n/a	2.1	2.9	3.2	3.5	3.4	3.4
ELFEC										
Number of employees	294	313	326	322	310	313	236	227	229	237
GWh/ employee	0.95	0.97	1.04	1.15	1.31	1.4	2.1	2.3	2.3	2.3
CESSA										
Number of employees	130	131	149	n/a	n/a	110	109	123	109	109
GWh/ employee	0.52	0.56	0.52	n/a	n/a	0.8	0.9	0.8	0.9	0.9
SEPSA										
Number of employees	92	92	94	92	91	95	96	104	102	110
GWh/ employee	0.37	0.43	0.47	0.57	0.67	0.7	0.9	0.8	0.8	0.7
ELFEO										
Number of employees	105	106	111	n/a	n/a	76	69	64	64	64
GWh/ employee	0.67	0.69	0.69	n/a	n/a	2.2	2.7	3.0	2.9	3.0

Fuente: Elaboración propia.

To summarize, both generation and distribution firms seem to, on average, have experienced relatively moderate decreases in employment levels, particularly two or three years after they initiated operations, while at the same time enjoying significant and consistent increases in labor productivity.

2. Telecommunications

Table 9 includes similar data for firms in the telecommunications sector. These are grouped according to their main line of business: long distance, cellular, or fixed line phone connections. All operators offer some additional service, such as internet connections or cable television. Nevertheless, we calculated the labor productivity indicator only with respect to the main line of business. An exception is *ENTEL*, for which we separate out cellular services. Although we do not have the necessary information to make this separation for the entire period, one can always consider total *ENTEL* employment.

Table 9
Employment and labor productivity among the main telecommunications firms

Firm	1993	1994	1995	1996	1997	1998	1999	2000
Long distance								
ENTEL[(1)]								
Total employment	1589	1694	1745	1798	2,089	1,774	1,437	1,004
Long distance minutes/employee	77	89	107	122	123	196	170	N/A

Cellular								
ENTEL movil[2]								
Total employment				N/A	N/A	N/A	N/A	225
Suscribers/employee								N/A
Telecel								
Total employment	78	88	152	155	223	247	258	298
Suscribers/employee	34	46	48	121	190	516	N/A	N/A
Local								
COTEL (La Paz)								
Total employment	868	932	976	967	932	905	904	670
Suscribers/employee	85	94	100	127	134	164	176	N/A
COTAS (Santa Cruz)								
Total employment	616	612	606	601	622	652	615	599
Suscribers/employee	94	107	121	140	164	184	212	N/A
COMTECO (Cochabamba)								
Total employment	351	427	449	490	542	578	378	368
Suscribers/employee	88	88	102	116	138	160	283	N/A

Source: Authors' own calculations.
(1) For *ENTEL*, the data from 1997 on include cellular phone service provided through ENTEL-Movil. (2) Information on subscribers, but not on employment, is available for 1996-98. ENTEL-Movil began operations at the end of 1996.

In *ENTEL*, employment peaked in 1997. *ENTEL-Movil* initiated its operations in 1996 and possibly completed hiring in 1997, which may account for the increase in the number of workers between 1996 and 1997. In the subsequent years, one observes a continuous decline at relatively large and increasing annual rates, 15 percent in 1998, and 19 and 30 percent in 1999 and 2000, respectively. Labor productivity, as measured by long distance minutes per employee continued to grow until 1998, but a decline is visible in 1999 despite falling employment levels. This reflects weakening demand for long distance services, induced by the recession and perhaps by growing internet use.

In the case of cellular services, the data record is incomplete, but one might venture that the experience of *Telecel* reflects that of both operators. *Telecel* increased its employment levels continuously up to 1996, but then reduced them in 1997, partially reacting to *ENTEL-Movil*'s entry and the onset of price competition. Increases in labor productivity also display an upward trend during this period, reaching 152 percent by 1996. *Telecel* resumed its employment increases after 1997, and its personnel count in 2000 was practically double that of 1996. In spite of this, labor productivity continued to increase, by 57 percent in 1997 and 172 percent in 1998. These positive results reflect expansion primarily due to price competition, but also to improvements in quality.

For local telephony, in all cases there is an important and consistent growth in labor productivity, reflecting increases in the number of connections. Nevertheless, some operators reduced personnel in some years, such as *COTEL* in 1995, *COTAS* in 1993-96 and 1998-99, and *COMTECO* during 1998-99.

So far, we have reviewed the electricity and telecommunications sectors, concluding that employment peaked around 1997, so that one cannot rule out that capitalization might have caused some reductions in personnel. The employment levels in these sectors are quite small, however – they account for less than six thousand jobs out of more than 1.3 million people working in the capital cities. Nonetheless, the job losses in tables 8 and 9 can account for about 3 percent of the aggregate job losses in capital cities between 1995 and 2000, so the effect, while small, is not necessarily negligible.

3. Oil and gas

We unfortunately do not have complete data for other sectors. Due to the importance of the hydrocarbons sector, however, we cover part of it in table 10. This information shows that *YPFB* did display employment decreases after the 1997 reforms, but it is important to distinguish between the upstream (exploration and production) and downstream (distribution) activities. Before reform, the number of employees in the upstream sector fluctuated around 25 percent of the total. These were substituted by the capitalized *ANDINA* and *CHACO*, which in 1998 operated with about 40 percent of the total personnel *YPFB* had in 1996. The continuing decrease in employment for *YPFB*, even beyond 1999, happened as one by one all of the activities in the downstream sector were being privatized.

Table 10
Employment levels and mean labor productivity in the oil and gas sector

Firm	1992	1993	1994	1995	1996	1997	1998	1999
YPFB								
Number of employees	5,440	5,600	4,927	4,724	4,503	2,528	1,826	954
Upstream	1,530	1,205	1,191	1,227	1,160	n/a	n/a	n/a
Downstream	3,910	4,395	3,736	3,497	3,343	n/a	n/a	n/a
BEP/total employees	3,258	3,374	4,190	4,278	4,284	n/a	n/a	n/a
ANDINA								
Number of employees						442	185	n/a
BEP day/ employee						89.7	285.0	n/a
CHACO								
Number of employees						264	298	n/a
BEP day/ employee						137.5	168.1	n/a
TRANSREDES								
Number of employees						384	408	n/a

Source: Based on Ayala (2000).

Although the Table shows the number of employees in oil and gas transportation (represented by *TRANREDES*), there is no available information for the rest of the downstream activities (industrialization, storage, distribution and commercialization).

Taken together, the evidence on employment levels suggests that capitalization was indeed associated with reductions in employment, amid increasing output and labor productivity. If one puts these effects in the context of the broader Bolivian employment picture, however, there is (incomplete) evidence that the *direct* employment losses do not account for the majority of the unemployment increases that started in 1998.

C. Profitability and flows of funds

Financial results are of course another relevant outcome, and in this section we cover issues related to the performance of State and private firms in the industries of interest. Table 11 presents descriptive statistics for the main State firms in the 1990-2001 period. One has to keep in mind that part of *YPFB* was capitalized in 1997, *ENDE* and *ENTEL* in 1995 and *ENFE* in 1996. However, except for *ENTEL* and *LAB*, residuals of

these firms remained, with privatization of parts of them occurring at a later time. If one looks at *current* expenditures over current revenues, up to their capitalization year, the data show that except for *ENDE* and *ENFE* in 1995[48], the firms considered did self-finance its operation expenditures and were capable of making short term transfers to the State, although some, like *ENDE* and *ENTEL* were in a less constrained position. When one considers total (which includes capital) expenditures over total revenues, however, in most cases the firms are in deficit, except for *YPFB* in 1995-97, *ENDE* in 1991 and 1993-94, *ENTEL* in 1992 and 1994-95. This suggests that most of the time State firms had to finance their investments through debt,[49] and that in many years there were investment shortfalls.

The size of these firms' investment can be observed as a percentage of GDP, and in relation all[50] State enterprise investment. Additionally, the table describes the magnitude of taxes, royalties and net transfers to the government, also as a percentage of GDP. In both of these areas, YPFB stands out.

During the post-capitalization period, the picture for residual firms in terms of investment and contribution to government changes substantially, as one would expect. However, it is worrisome that the other indicators worsen dramatically suggesting continuing deficits, particularly for residual *ENDE* and *ENFE*.

[48] *ENDE* was capitalized in 1995, so that its indicators for that year are not comparable with previous years.
[49] In general government firms could not obtain commercial credit, their debt was concessionary credits from bilateral or multilateral agencies with government guaranty.
[50] Infrastructure sectors, hydrocarbons, mineral and industrial.

Table 11
Cash flow statistics for government firms, 1990-01

Firms	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
YPFB												
C. Exp./C. Rev.	0.90	0.89	0.90	0.95	0.90	0.88	0.90	0.95	1.05	0.97	0.95	0.97
T. Exp./T. Rev.	1.08	1.05	1.06	1.08	1.07	0.99	0.97	0.96	1.06	0.98	0.95	0.97
I/GDP in %	2.17	2.16	1.86	1.65	1.67	0.98	0.63	0.10	0.05	0.08	0.00	0.01
T/GDP in %	7.92	8.85	7.21	6.47	5.93	5.52	5.79	3.34	3.41	3.09	-0.18	-0.30
ENDE												
C. Exp./C. Rev.	0.65	0.63	0.63	0.58	0.62	1.31	0.87	0.55	1.12	1.02	2.05	2.15
T. Exp./T. Rev.	0.94	1.14	1.43	0.95	0.82	1.16	1.64	0.82	1.35	0.69	1.39	1.54
I/GDP in %	0.32	0.55	1.01	0.53	0.33	0.52	0.32	0.09	0.03	0.01	0.00	0.01
T/GDP in %	0.06	0.07	0.02	0.15	0.19	0.73	0.16	0.04	0.00	-0.02	0.00	-0.01
ENTEL												
C. Exp./C. Rev.	0.72	0.70	0.72	0.84	0.88	0.87						
T. Exp./T. Rev.	1.23	1.04	0.89	1.15	0.98	0.93						
I/GDP in %	0.57	0.40	0.24	0.45	0.14	0.09						
T/GDP in %	0.41	0.49	0.44	0.63	0.80	0.71						
ENFE												
C. Exp./C. Rev.	0.97	0.84	0.77	0.95	0.88	1.03	0.97	2.68	2.33	6.91	1.88	4.26
T. Exp./T. Rev.	1.44	1.05	1.07	1.12	1.05	1.11	0.86	1.33	1.39	1.42	1.33	1.49
I/GDP in %	0.39	0.28	0.32	0.24	0.18	0.09	0.00	0.01	0.00	0.00	0.00	0.00
T/GDP in %	0.06	-0.10	0.12	-0.09	0.07	0.06	-0.20	-0.02	-0.01	0.00	0.00	0.00
ALL												
I/GDP in %	3.87	3.75	4.08	3.29	2.63	2.15	1.69	0.66	0.33	0.22	0.17	0.17
T/GDP in %	8.65	9.50	8.00	7.44	6.57	7.75	6.14	3.46	3.34	3.13	-0.22	-0.33

Note: C. Exp. = Current expenditures including current transfers; C. Rev = Current revenues including current transfers and operational revenues; T. Exp. = Total expenditures including current and capital expenditures; T. Rev. = Total revenues including current and capital revenues; I = Investment; T = Taxes, royalties and net transfers to government.
Source: Unidad de Programación Fiscal.

Moving on to private firms and to the 1997-2000 period, for each sector table 12 presents: i) operational costs over revenues – a rough measure of internal efficiency, and ii) the net profit over equity. In electricity generation, *Corani* and *COBEE* show better performances than *Guaracachi* and *Valle Hermoso* under both of these criteria. Recall that the first two are hydroelectric and the latter two are thermoelectric. In electricity distribution, the year 2000 shows *ELECTROPAZ* with the lowest expenditure over revenue relationship and the highest return on equity, followed by *ELFEC* and *ELFEO* overtime. The remaining firms are cooperatives (*CRE*) or have municipal participation.

Table 12
Performance indicators of main firms in regulated sectors

Sector/Company	Operational costs / Op. revenues					After tax profit / Equity				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Electricity generation										
CORANI	0.38	0.40	0.38	0.48	0.6	12.2	7.2	9.3	8.0	5.2
VALLE HERMOSO	1.02	0.90	1.02	1.01	2.5	2.6	4.8	4.7	3.7	-0.9
GUARACACHI	0.99	0.94	0.94	0.82	0.8	3.6	5.6	4.4	5.3	2.7
COBEE	0.65	0.69	0.59	0.63	0.5	11.1	7.2	11.6	9.8	14.3
TDE-Transmission			0.66	0.65	0.65			5.2	6.2	6.6
Electricity distribution										
ELECTROPAZ	0.81	0.78	0.77	0.84	0.86	11.1	10.9	14.2	14.4	6.9
CRE	0.90	0.89	0.89	0.93	0.94	6.0	6.8	3.0	2.8	2.3
ELFEC	0.82	0.83	0.83	0.92	0.95	10.1	9.1	10.3	14.2	7.2
CESSA	0.93	0.90	0.77	0.97	0.97	4.6	8.4	0.6	7.5	5.7
SEPSA	0.98	0.92	0.92	0.90	0.94	6.8	6.5	6.3	4.4	4.2
ELFEO	0.81	0.77	0.82	0.91	0.87	12.4	16.9	12.4	8.2	4.6
Oil and gas										
Andina(1)		0.92	0.91	0.75	0.00		0.7	1.3	6.1	0.0
Chaco(1)		0.76	0.54	0.38	0.37		-2.1	6.1	9.6	8.5
Transredes(2)	0.58(3)	0.57	0.61	1.60	0.87	7.3	6.0	8.3	-4.0	2.5
Telecommunications										
ENTEL	0.80	0.83	0.94			6.2	8.9	5.3		
TELECEL	0.95	0.84	N/d			-24.3	33.4	N/A		
COTEL	1.32	1.29	1.30			-30.5	-9.4	-11.0		
COTAS	0.89	0.89	0.88			1.7	0.5	0.6		
COMTECO	0.85	0.73	0.98			3.3	5.2	2.8		
Airlines and airports										
LAB	0.97	1.00	0.99	1.03		2.5	-5.8	0.4	-14.0	
AEROSUR	1.18	0.98	1.04	0.83		-19.3	1.6	-9.4	0.0	
SABSA	0.93	0.97	1.10	1.16		33.3	12.0	-15.7	-83.9	
Rail transportation										
FCA	0.85	0.85	0.93	0.86		13.6	7.3	8.7	8.2	
FCO	0.57	0.59	0.71	0.68		27.0	28.5	15.5	15.2	
Water										
Aguas del Illimani	0.86	0.85	0.84	0.64	0.65	0.9	15.0	18.4	4.9	-4.9

Source: General Superintendence.
(1) For years ending in March. (2) Includes revenues from the deferred account. (3) Corresponds to seven months of operations.

For oil and gas we only have information on *Chaco*, *Andina*, and *Transredes*. In the upstream both *Chaco* and *Andina* have increasingly improved their internal efficiency and return on equity over the years. *Transredes*, the main firm in pipeline transportation, has managed to generate annual surpluses, except for the year 2000 when it incurred a capital loss due to an oil spill.

Moving on to telecommunications, the data shows that internal efficiency in *ENTEL* and *COMTECO* deteriorated in 1999 relative to previous years. This result has determined a drop in our measure of profitability from 8.9 to 5.3 percent, and from 5.2 to 2.8 percent respectively. For *COTAS* and *COTEL* the efficiency indicator has remained stable, but *COTEL* has generated loses every year, compared to weak profits for *COTAS*. Further, *TELECEL* improved its internal efficiency between 1997-98 (there is no available information for 1999).

In the transportation sector, the data show that *LAB* managed to break even in 1999, but incurred significant losses by 2000. The company that capitalized it, *VASP*, under pressures in its home market, exited the firm in 2002, and *LAB* was taken over by Bolivian investors. *AEROSUR*, which participated in the domestic market only, produced a profit on only one of the years considered. *SABSA*, the airport terminal operator, has experienced deteriorating performance since 1997, when it had a positive margin, to 2000, when it experienced a dramatic loss.

For the years covered, rail transport presents a more positive picture. *FCA* made a 13.6 percent return on equity in 1997, although by 2000 this fell to 8.2 percent. For *FCO*, the 1997-98 profit rate fluctuated around 28 percent, and fell to 15 percent by 1999-2000. Nonetheless, it has been identified as the most profitable firm among the capitalized firms.

Finally, the table also presents performance indicators for *Aguas del Illimani*, the only privately administrated firm in the water industry. The indicators show a constant tendency toward improvement during the 1997-99 period, however, the numbers drop significantly in 2000.

VI. Effects: access and prices

As the previous sections make clear, capitalization and privatization had many of their key effects on the utilities sector. As such, some of their central social effects concern how they influenced households' access to basic services, and the prices at which they obtain them.

A. Access

Using household surveys described in appendix A, one is able to arrive at a relatively consistent picture of what happened to access in electricity, water, and phone services during the 1990's. Tables 1, 2 and 3 in Appendix B describe the questions and possible answers used to construct different definitions of access.

Using these definitions, table 13 describes the basic evolution of access to these three services in the department capitals of Bolivia. In general, these experienced little change between 1989 and 1994 (the pre-Capitalization period), and some improvement thereafter, particularly in telephone access. The exception to this comes with the second definition for water, which experiences a substantial decline between 1989 and 1994. This may be partially due to changes in the exact phrasing of questions between surveys.

Nevertheless, because these access rates refer to the departmental capitals only, it is not necessarily surprising that they decline in certain periods – Bolivia is still experiencing substantial rural to urban migration, so that in the absence of significant investment, access rates can fall due to (urban) population growth.

Table 13
Access to electricity, water, and telephone services in the department capitals of Bolivia

Service / definition	1989	1994	1999
Electricity 1	0.921	0.960	0.988
Water 1	0.769	0.807	0.921
Water 2	0.543	0.267	0.421
Telephone 1	--	0.206	0.425
Telephone 2	0.206	--	0.412
Telephone 3	--	0.258	0.311

1. Changes in connection rates

Focusing on connection rates, this section considers only access to electricity, telephone, water, and sewerage services. We ignore gas for two reasons. First, in most cities, gas for domestic consumption is distributed in bottled form. Thus, its use does not imply connection to a network, but rather reflects households' potentially temporary decision to use this fuel. Secondly, even where network distribution is available, its coverage is too small to be reliably captured using household surveys. With this caveat, table 14 illustrates the aggregate facts on the evolution of connection to basic services.

Table 14
Departmental capitals and El Alto:
Percentage of households connected to basic services, 1994-1999

Service	Percentage of households with access		
	1994 (a)	1999 (b)	% change
Electricity	95.8	98.4	2.7
Telephone	20.0	44.6	123.0
Water	80.7	92.8	15.0
Sewerage	62.6	70.9	13.3

Source: Authors' calculations.

As might be expected in light of the investment record, basic access increased for all services considered. Furthermore, for those with initially lower coverage, sewerage, water, and particularly telephone, the increases have been significant.

2. Causality: are these changes actually due to capitalization?

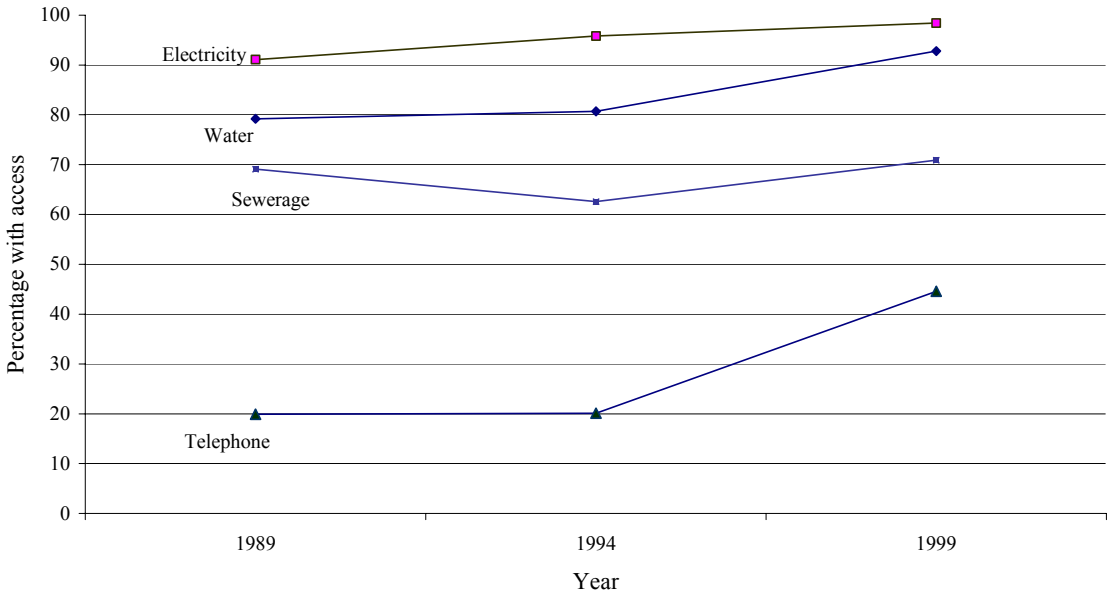
While table 14 suggests that the reforms have been associated with an expansion in access, it does not necessarily imply that these *caused* this phenomenon. Indeed, other factors such as income growth or technological change might have resulted in higher connection rates even in the absence of any liberalization.

In a strict sense, it is impossible to isolate the effects these measures had, since no counterfactual is available to assess what would have happened had none of them been in place. If this information were available, a simple comparison would reveal the effects of the reform "treatment"; in its absence, simple conclusions are not feasible. Nonetheless,

one can attempt to circumvent this problem by comparing treatment and control sectors or periods. This section presents two exercises that attempt this.

A first possibility is to observe the changes in access prior to the reform period, comparing them to those that occurred thereafter. To implement this, figure 2 displays access rates for 1989, 1994, and 1999 for each of the sectors considered.[51] In this case, the 1989-94 period serves as a control for the 1994-99 capitalization years. This comparison is enhanced because as relatively low inflation, moderate growth, and political stability prevailed during both periods.

Figure 2
Department capitals: percentage of households with access to basic services, 1989-1999



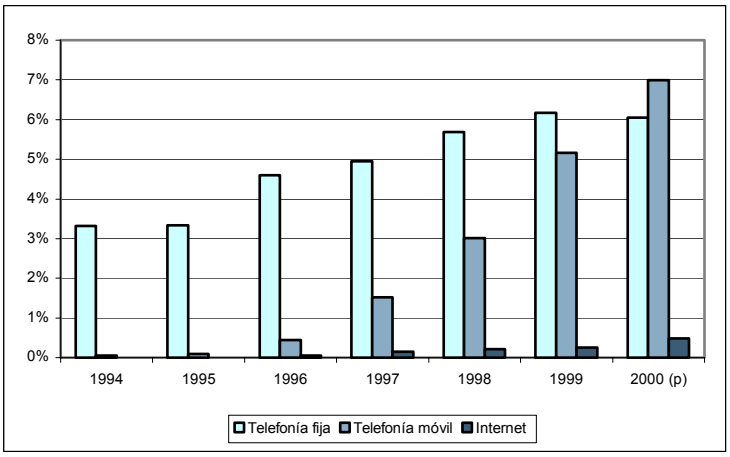
This simple evidence is generally suggestive of a positive effect for sewerage, telephone, and water services. The access rates in these sectors were either constant or decreasing between 1989 and 1994, but display significant increases after this last year. In the case of electricity, in contrast, the entire 1989-99 period suggests gradual growth in access, with no particular acceleration taking place during the second phase. In fact, figure 2 may actually underestimate a capitalization effect. This is because while the legal reforms underpinning capitalization began to take effect in 1994 and 1995, the actual investments, depending on the specific sector, did not start until 1996, 1997, or even 1998.

In the case of telephone service, these conclusions are also observed using conventional penetration data, as presented in figure 3. This further allows a distinction between fixed line, cellular and internet connections, which is not possible with the household survey data. This figure also displays stagnant performance early on, with

[51] The 1989 survey does not contain a direct question on telephone access, so households were considered connected when they declared positive expenditures on telephone service. Using the same approach in subsequent years does not qualitatively affect the conclusions that flow from Figure 1.

growth starting in 1996. From this year, mobile telephone coverage has increased rapidly, and although fixed connections have been less dynamic, the overall penetration rate essentially tripled in four years.

Figure 3: Penetration rates by technology

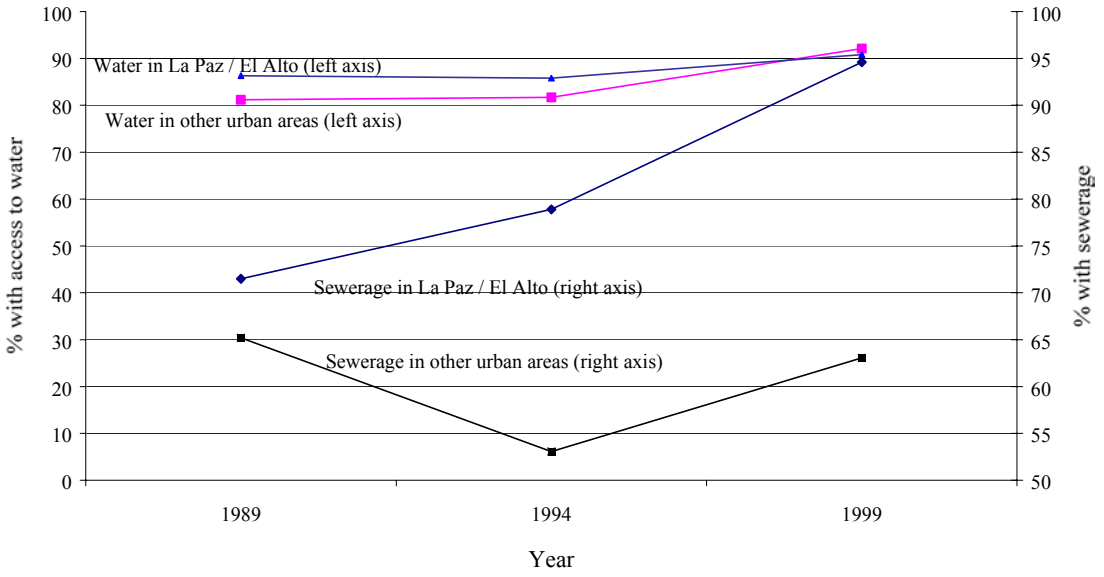


Source: Telecommunications Superintendence.

Just as it is important to consider the timing of these reforms, it is key to bear in mind that in each sector, the effects observed cannot be attributed only to capitalization. As described in section II, the relevant changes include the implementation of regulation in all these sectors, but also other liberalizations like the introduction of competition in cellular, and concessions in the case of water and sewerage.

Another way to attempt to isolate these reforms' impact is to compare cities in which they would be expected to have more consequences with those in which they might have had less of an effect. In the case of water and sewerage services, La Paz/El Alto was the only city with a sustained concession. Figure 4 presents the evidence on this case, where the expectation would be that increases in access would be larger in these than in other urban centers.

Figure 4
Water and sewerage: evolution of access rates in La Paz / El Alto and other urban areas, 1989-1999



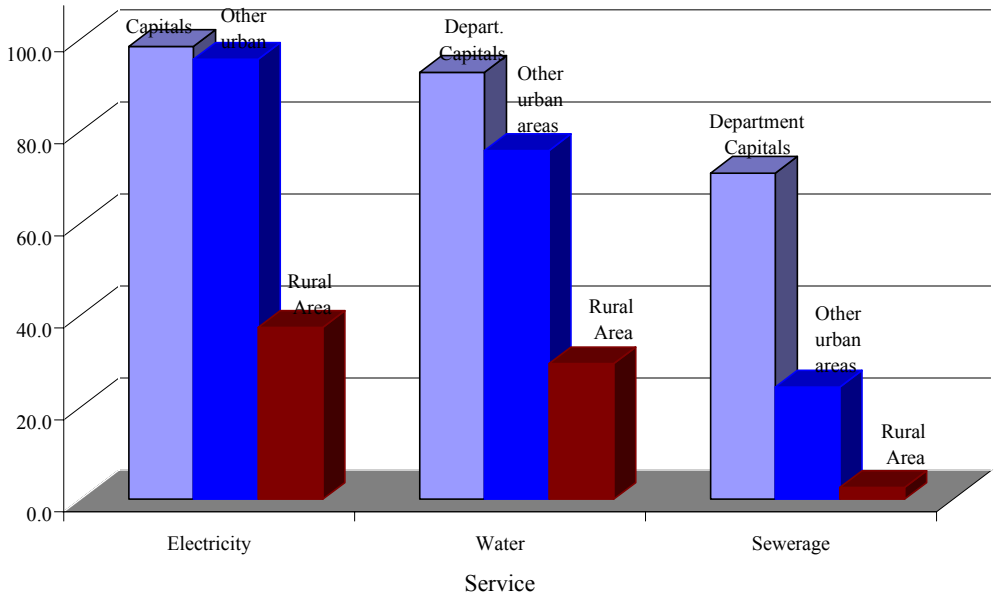
For water, there appears to be little difference between the evolution of La Paz / El Alto and other cities. If anything, coverage in these areas appears to have converged over this period. In the case of sewerage, there are significant distinctions, but these seem to arise mainly from performance that took place before 1994, when coverage rose in La Paz / El Alto but declined in all other major urban areas. In short, the evidence in this sectors is inconclusive, but does not seem to suggest a strong capitalization / privatization effect. In the cases of electricity and telephone services, the distinction between the treatment and control urban centers is also not always clear, and is omitted here for reasons of space.

In the end, none of these comparisons is conclusive, but taken together and combined with the investment levels cited, they lend support to the perception that the capitalization processes did contribute to an expansion of investment in infrastructure and access to basic services in Bolivia.

It is nonetheless relevant to note that the information presented gives a relatively optimistic picture of connection rates in Bolivia. To a large extent, this reflects that due to data limitations, the analysis concentrates only on department capitals.[52] This overstates national welfare levels because other urban areas, and the rural area in general, display lower connection rates. This is illustrated in figure 5, which shows access rates in departmental capitals, other urban areas, and rural locations. The significant differences between areas reflect substantial variation in income levels and population densities.

[52] It is also possible that household could be overstating their welfare in this dimension. As long as such misrepresentation is consistent from period to period, however, it should not affect any conclusions based on the trends.

Figure 5
Percentage of households with access to basic services in the department capitals, other urban centers, and the rural area



Over the years, there has also been an effort to extend telephone coverage to the rural area, and in fact the capitalization contract with *ENTEL* contained clauses in this regard. Table 15 shows some rural penetration data for telephone services, indicating the proportion of towns of various sizes that have some sort of service. As would be expected, this proportion increases rapidly with population. While the number of connections actually implicit in these numbers is naturally quite low, they can have substantial welfare impacts for the rural population.

Table 15: Telephone penetration in rural areas, 1999

Population Range	Number of towns	Inhabitants	Towns with telephone services	Proportion of towns with telephone service
Less then 200 hab.	5,296	647,072	11	0.2%
201 - 350	3,392	897,000	47	1.4%
351 – 1000	2,331	1,204,654	815	35.0%
1001 – 2000	276	379,261	134	48.6%
2001 – 5000	99	290,085	42	42.4%
5001 – 7500	15	88,212	10	66.7%
7501 – 10000	8	69,999	7	87.5%
Total	**11,417**	**3,576,282**	**1,066**	**9.3%**

Source: Telecommunications Superintendence.

3. Did the expansion in access bypass or benefit the poor?

The aggregate changes reviewed thus far are consistent with a number of scenarios as to the *distribution* of the gains depicted. Specifically, they are not informative as to how lower income or poor households have fared. As stated, the capitalization reforms mainly affected the department capitals. Because a majority of Bolivia's poor live in rural areas, these reforms in some sense bypassed this population.

Ajwad and Wodon (2000) make this point indirectly by studying to what extent poor municipalities (out of a total of about 300) benefit from expansions in education, health or infrastructure services. They conclude that in sewerage, electricity, and phone connections, the *non*-poor benefit more, water being the only exception. In short, if the entire capitalization process did lead to some increase in access rates, it is unlikely to have been particularly beneficial to the poor, at least from a national perspective.

Nevertheless, it is still relevant to explore whether access expansions bypassed the urban poor, since that would seem the real, and perhaps more reasonable, test as to the equity side of the capitalization process. Furthermore, the low coverage rates in the rural areas reflect inequity but also economic rationality: providing these services can be extremely expensive when population density is below some threshold level. To this end, the following figures compare how households have fared according to the (department capital) income quintiles to which they belong.

Figure 6
Department capitals: Percentage of households with access to electricity, by income quantile: 1989-1999

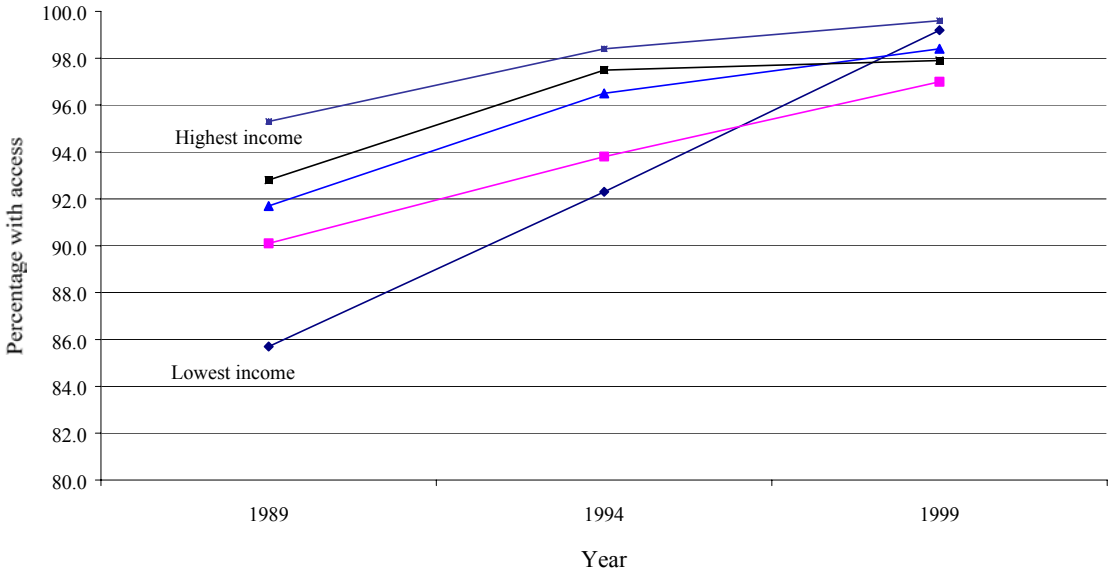


Figure 6 starts with the case of electricity, which has been the sector with the smallest improvements in access, partially reflecting favorable initial conditions. The figure displays a clear convergence: the quintiles with the lowest access levels in 1989

have been those with the greatest increases during 1989-99, an observation which also holds for 1994-99. While in 1989 households in the lowest quintile had an access rate of only 86 percent, by 1994 all five had rates exceeding 95 percent. It is surprising that by 1999 the lowest income group seems in fact to have surpassed all but the richest. In part, this may reflect sampling issues, since when all groups have high and similar access rates, these differences cease to be statistically significant.

Taking a similar approach, figure 7 reviews the experience with telephone access. The evolution here has been somewhat different from that observed in the case of electricity. As reviewed earlier, between 1989 and 1994 (the pre-capitalization period) access rates were essentially flat. Figure 7 reveals that this aggregate behavior in fact hides an increase in access for the highest income quintiles, and *declines* in connection for the lower income households, where once again, this could reflect that many rural migrants enter the cities at the bottom of the income distribution.

Figure 7
Department capitals: percentage of households that have access to telephone services, by income quintile: 1989-1999

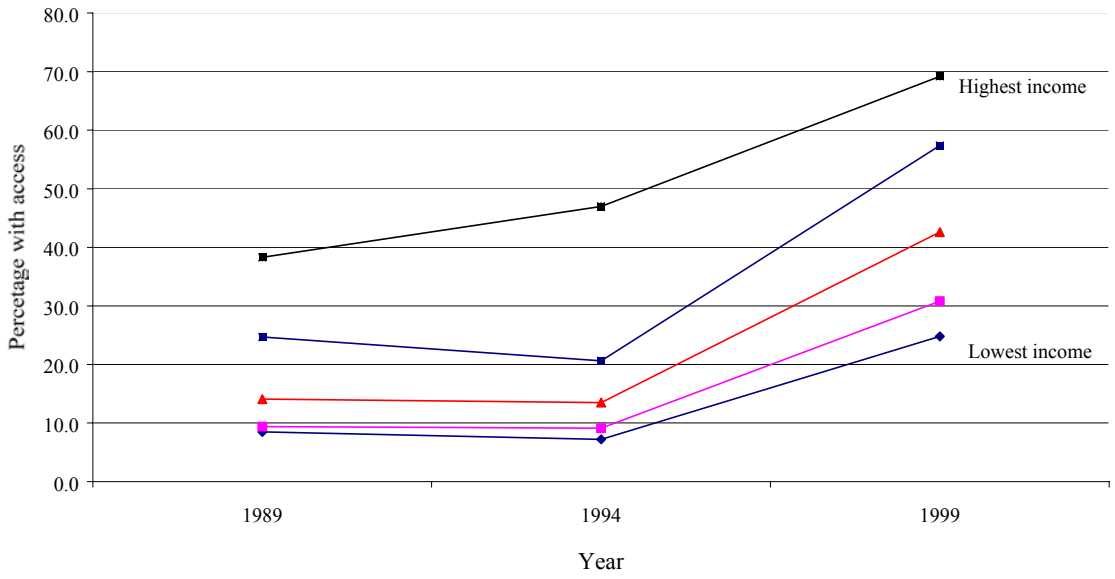
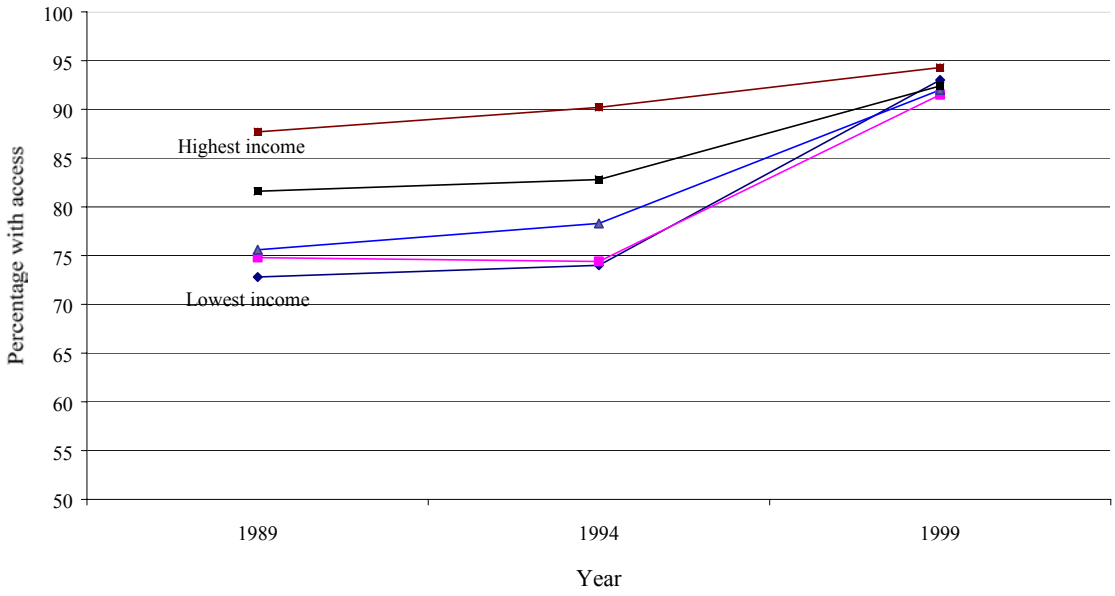


Figure 7 also shows, however, that these trends changed significantly after capitalization. Namely, between 1994 and 1999 access rates increased for all income groups. The relative gap between the two or three bottom quintiles and the richest has decreased significantly, even if the absolute difference in percentage points has remained fairly constant. In short, this simple evidence suggests that in the case of telephone access, liberalization has not merely included the poor, but may have actually reversed trends that were detrimental to them.

Moving onto the case of water, figure 8 shows an evolution not unlike that displayed by telephone services. Once again, access rates are relatively stable in the control period, but increase between 1994 and 1999. The convergence in connection

rates is more marked: by 1999 households in all quintiles have access rates above 90 percent, and the differences between them are often not statistically significant.[53]

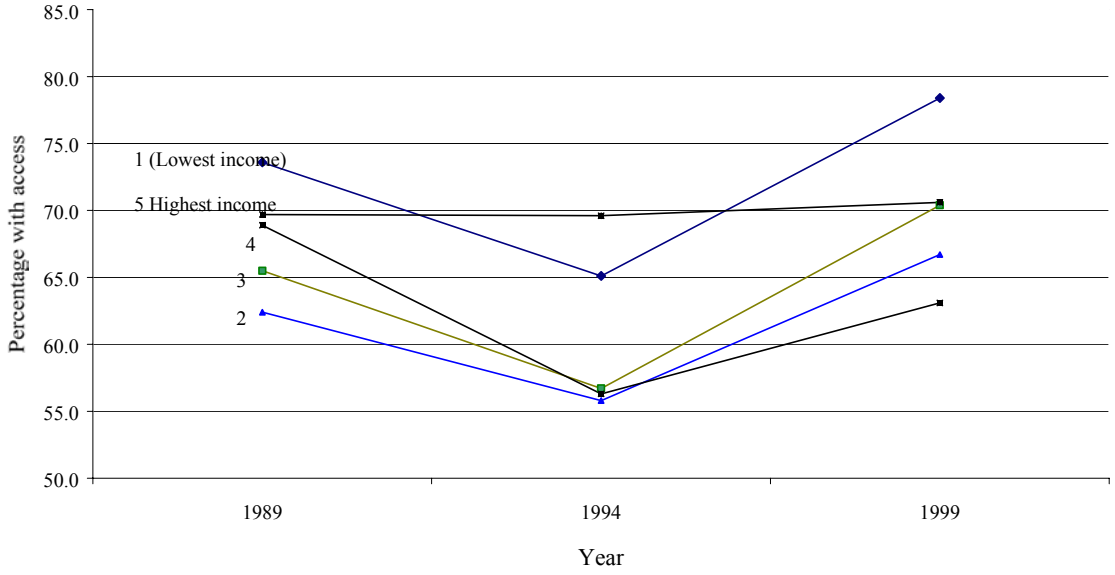
Figure 8
Departmental capitals: percentage of households with access to water services by income quintile: 1989-1999



Finally, figure 9 shows the evolution of access to sewerage. In this case the information is less consistent. A surprising observation is that in fact all surveys suggest that the situation of the lowest income quintile is better than that displayed by at least quintiles 2-4, in some sense the middle class. This may reflect measurement problems, as it is also reported in The World Bank (2000).

[53] It might seem surprising that access rates are not closer to 100 percent for the top quintiles. While this may reflect data problems, there are "good" reasons for it. In the largest cities, for instance, high-income developments are sometimes built outside the reach of water networks. These households use truck-delivered water, and despite having all the standard facilities, will not be counted as connected.

Figure 9
Departmental capitals: percentage of households with access to sewerage by income quintiles: 1989-1999



To summarize, despite data limitations, the household survey data suggests that the capitalization/regulation reforms, to the extent that they caused increases in connection rates, have not bypassed poor households, and have in some cases tended to benefit them disproportionately. This has been particularly the case for phone services, where competition has helped to reverse trends of increasing inequality.

B. Prices

There are a number of reasons to believe that prices may increase following privatization. These include:

1) *Average tariff levels can increase* due to cost recovery requirements and the need to finance quality improvements. This section shows that while average prices increased in some sectors, changes were generally not dramatic. In part, this reflects that because capitalization was not a means to raise deficit finance, there were fewer incentives for the State to build high tariffs into privatization. The concurrent implementation of a regulatory framework, and the promotion of competition may have also helped to keep price increases in check.

2) *Tariff structures may be readjusted as direct or cross-subsidies disappear*, either as an explicit policy or as a consequence of market forces. Although the data below suggest some rebalancing did take place, there are reasons to believe that in Bolivia, the incentives to rebalance were not as strong. First, some firms affected by the reforms were private already (e.g. *COBEE* in electricity). Second, where they were not private,

utilities often functioned as cooperatives, which may not have the same distributional goals as typical State enterprises. Finally, the vertical separation that some industries displayed before privatization may have meant that cross subsidies were less prevalent than in other countries. For instance, it is not uncommon for high long distance rates to subsidize low local charges. In Bolivia, the long distance state provider, *ENTEL*, was always separate from the local cooperatives

3) *As the industry becomes more formal, revenue collection and discouragement of illegal connections are likely to result in price increases*. Once again, the existence of private firms or cooperatives may have meant that there was not as much room for improvement in this regard, although the nature of our data does not allow us to observe informal connections.

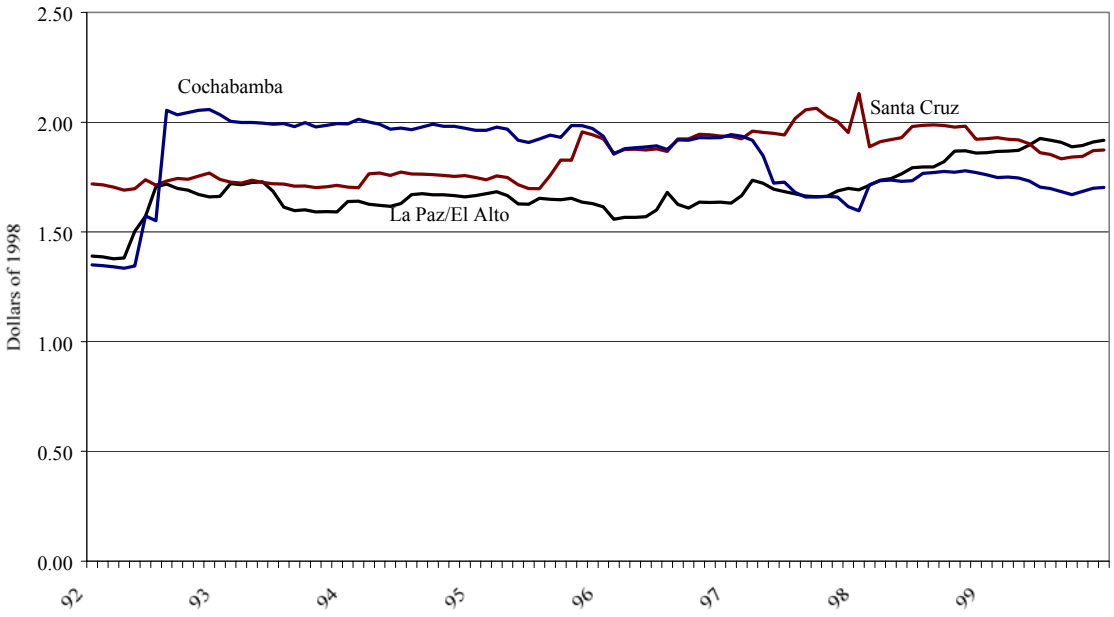
4) *Privatization may affect the availability and prices of substitutes or complements*.

Making an effort to deal with significant data limitations, this section looks at these issues in the case of electricity, water, and telephone services.

1. Electricity

Figure 10 presents the evolution of minimum electricity tariffs, up to 20 Kwh/month, in the three largest cities (for completeness, it includes data from 1992, while the reforms commenced in 1994/95). These are not average tariffs, but rather those most likely to be most relevant for low-income households. As evident, rates in Cochabamba have decreased by about 14 percent since capitalization. In contrast, prices have gone up by 15 percent in Santa Cruz, and by roughly 7 in La Paz/El Alto.

Figure 10
Tariffs for 0 - 20 Kwh in the central axis cities, 1992-1999



Regarding rebalancing, distribution is still carried out by local monopolies that may experience fewer pressures to engage in this behavior. To explore this issue and provide further evidence on average prices, table 16 shows the *mean* tariffs in cents per Kwh for the three largest distributors, distinguishing according to the type of customer. As the table shows, both the pre and post-capitalization periods have been characterized by overall real price increases for the residential sector. Nevertheless, this trend seems to be reversing, with price decreases (or zero increases) visible in Cochabamba and Santa Cruz by 1998, a behavior consistent with that displayed by minimum prices in figure 10.

Table 16
Residential rates for electric distributors in La Paz / El Alto, Cochabamba, and Santa Cruz

Year	Tariff rates			Percentage change in the residential sector			Percentage change in all sectors		
	Electropaz (La Paz / El Alto)	**Elfec** (Cbba.)	**CRE** (Santa Cruz)	**Electropaz**	**Elfec**	**CRE**	**Electropaz**	**Elfec**	**CRE**
1992	3.96	5.62	4.45	--	--	--	--	--	--
1993	4.30	5.52	4.47	8.6	-1.8	0.0	9.8	-0.6	1.4
1994	4.60	5.66	4.56	7.0	2.5	2.0	5.3	1.2	1.8
1995	4.89	6.04	4.86	6.3	6.7	6.6	5.2	5.4	5.9
1996	5.04	6.25	5.45	4.2	3.5	12.1	2.9	1.9	6.8
1997	5.34	6.31	5.71	5.9	0.9	4.8	6.3	2.6	4.4
1998	5.74	6.65	5.71	7.5	5.4	0.0	7.4	3.4	-0.4
1999	6.08	6.45	5.52	5.9	-3.0	-3.3	5.4	-1.6	-1.9

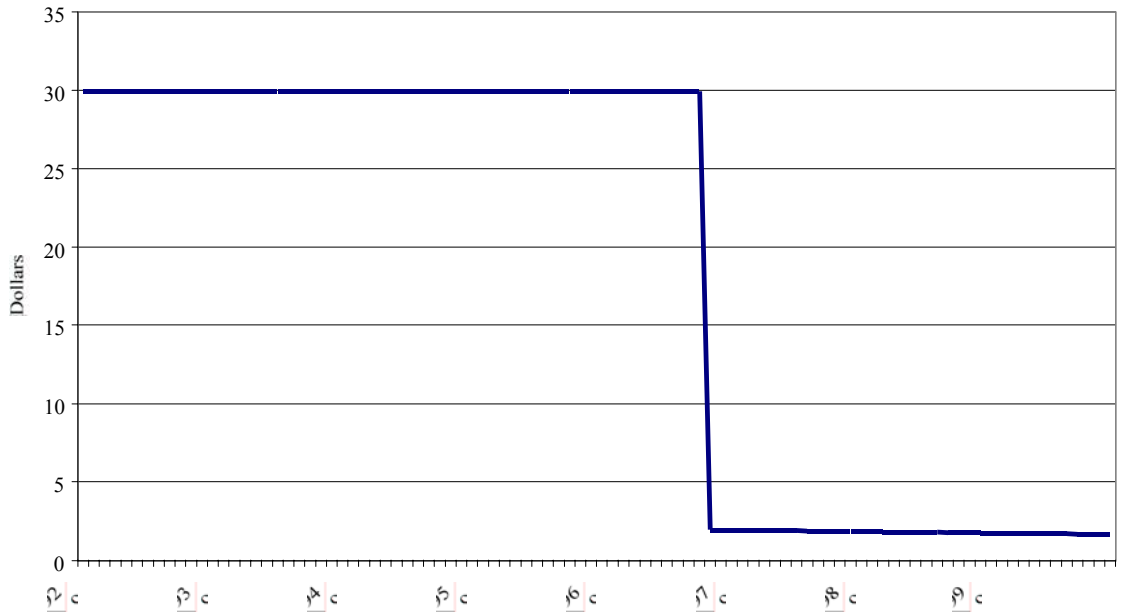
The last six columns explore the issue of rebalancing. Although the classification of customers varies between cities, the data suggest the residential sector has seen greater increases, but the differences do not always go in this direction and generally do not seem that large.

2. Telephone services

Coverage expansions have been greatest in the case of telephones, so one might expect significant price reductions in this case. These partially reflect technological innovation and the effects of competition, which as in other countries seems to have allowed privatization to create rather than destroy service alternatives. In Bolivia, this happened because prior to reform *Telecel* had a (private) monopoly in cellular services, and there is evidence that it priced accordingly.

Figures 11 and 12 show the dollar price for the standard service offered from the early 1990's to October 1996. The fixed monthly tariff of 29.9 dollars did not include free minutes, and the tariff per minute was 0.41, covering both incoming and outgoing calls. Additionally, *Telecel* charged 417 dollars for the initial connection. The entrance of capitalized *ENTEL*'s subsidiary, *ENTEL-Movil*, permitted the reductions observed. Competition was so effective that although the regulator set a price cap of $US 180 for access and $US 51 for use, both firms began charging average rates that were roughly five percent of this level.

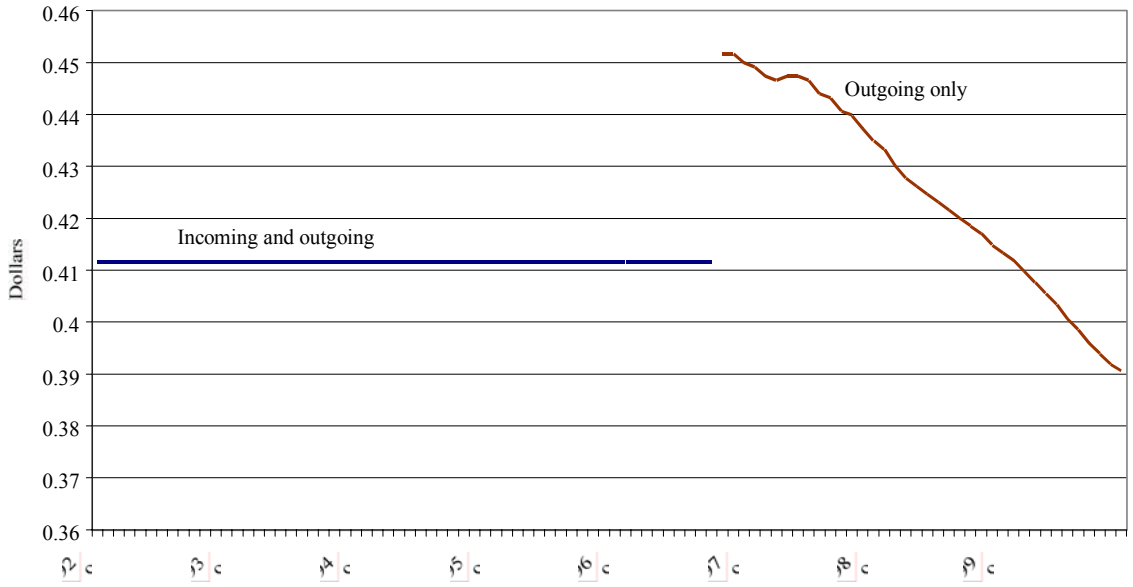
Figure 11
Minimum fixed monthly tariff with no free minutes in cellular



Figures 11 and 12 are based on *ENTEL*'s "Family Plan" and *Telecel's* "Economy Plan". Under these, connection fees for digital lines are free, the monthly fixed tariff

without free minutes dropped to 1.93 dollars in November 1996, and the tariff per minute increased to 0.45. While in the first period tariffs were set in dollars, in the second they were set in bolivianos, becoming subject to depreciation. By December 1999, the dollar value of the fixed tariff dropped to 1.67 and the per-minute tariff dropped to 0.39. Simultaneously, both ENTEL and *Telecel* introduced a variety of other plans and prepayment mechanisms, with the latter contributing to further penetration.

Figure 12
Minimum tariff per minute in cellular



These reductions, combined with the availability of low cost cellular phones dramatically lowered access prices, particularly compared to the historical performance of the local telephone cooperatives, which charge fees in excess of 1,000 dollars for a fixed connection/share. As a new operator entered the market at the end of 2000, and as all these markets where liberalized in 2001, these trends are expected to continue.

3. Water

As stated, in the case of water privatization was really a concession, and only affected La Paz/El Alto. Up to 1996, the state-owned SAMAPA operated with a complicated tariff structure that contained more than 150 categories, 15 for metered customers and 135 for the rest. Under this arrangement, consumers were not charged for the first $10m^3$, and the mean tariff was approximately \$US $0.32/m^3$.

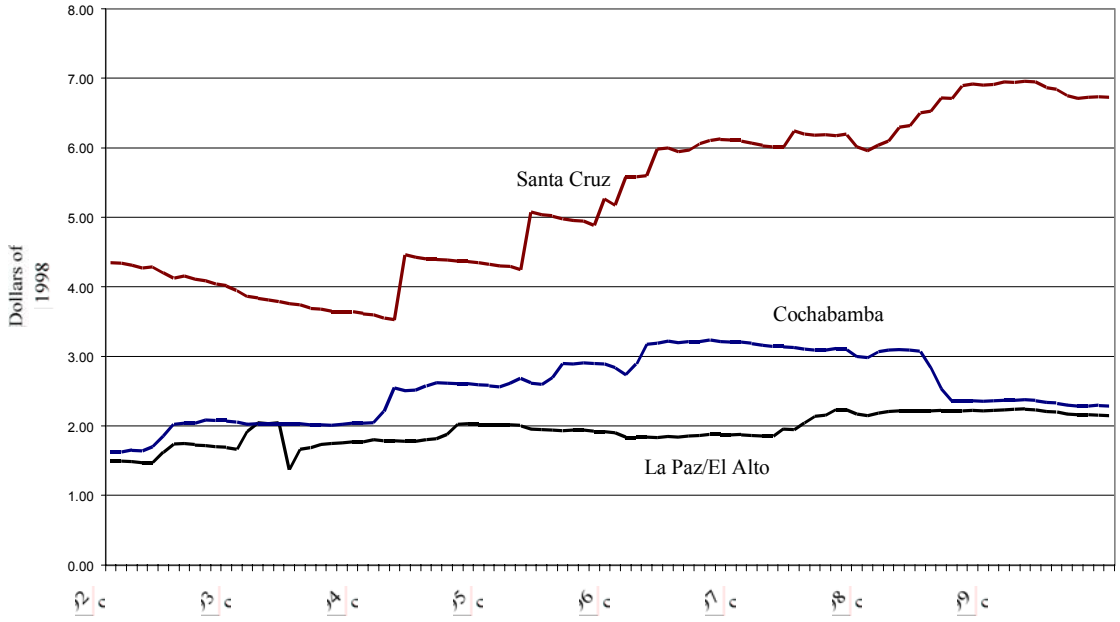
In December of 1996, the National Council of Tariffs voted to amend and simplify this arrangement. This policy was intended to become effective on December 1996, but in practice was implemented by *Aguas del Illimani* in May, 1997, along with a 19 percent increase it was granted upon taking over. The prevailing tariff structure is displayed in table 17.

Table 17
Tariff structures for SAMAPA and Aguas del Illimani

Type of consumer (m^3 / month)			Tariff ($US/$m^3$)		Percentage change
Domestic	Commercial	Industrial	SAMAPA	Aguas del Illimani	
1 to 30			0.1850	0.2214	19.7
31 to 150			0.3719	0.4428	19.1
151 to 300	1 to 20		0.5579	0.6642	19.0
301 or more	21 or more	1 or more	0.9964	1.1862	19.0

While this arrangement is relatively progressive, clearly the customers that benefited from the "free" $10m^3$ would have been hurt. Nevertheless, cross subsidies persist, and while the concession did result in higher prices, the increases are smaller than those in Santa Cruz, where no such reform took place. This is illustrated in figure 13.[54]

Figure 13
Water tariffs for 10 m3 in the central axis cities, 1992-



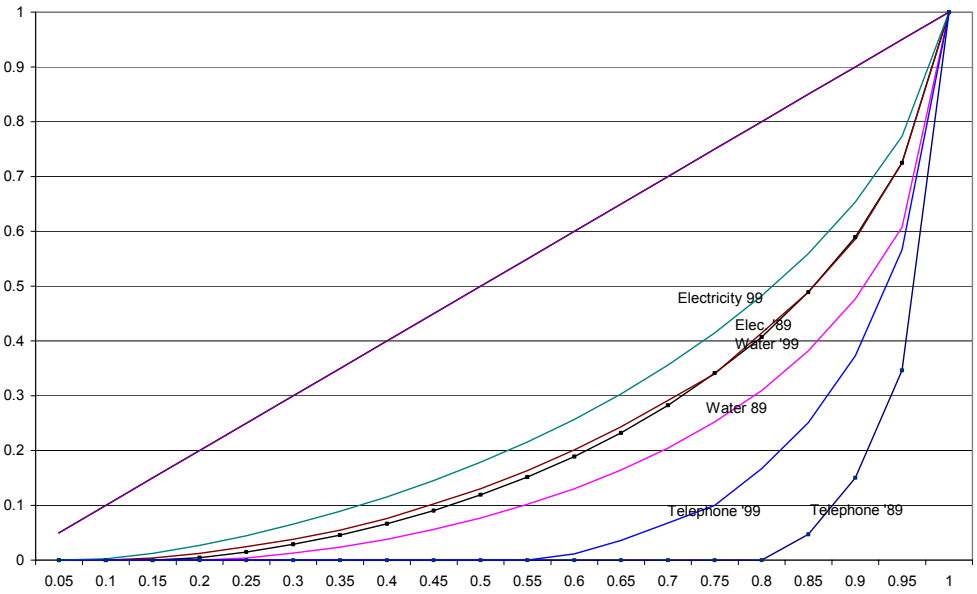
[54] Cochabamba actually experienced a decline in real tariffs during the reform period, a development not unrelated to the fact that concession was a failure in this city.

C. Consumption distribution

The household surveys also provide expenditure data for the three services considered. The most important drawback with these is that they do not include the *quantities* of different types of services consumed. This issue is most severe in the case of telephone services, where it is impossible to distinguish the type of phone service (cellular or fixed line) paid for. Even in the cases of electricity and water, however, there are limitations, since one cannot easily determine what prices each house paid.

With this caveat, Figure 14 presents expenditure Lorenz curves for each of these three services. This data shows that: i) in general, expenditure is most unequally distributed for telephone services, followed by water and electricity, and ii) within each service, the spending distribution has become more equitable over the last 10 years. This is particularly so in the case of telephone services. The major reason for this is the improvement in access, with which many households go from having zero to positive, albeit relatively small, expenditures.

Expenditure Lorenz curves for 1989 and 1999



D. Effects on welfare

In the end, the effects of privatization on households' welfare depend on how the positive effects of improvements in access balance against the negative consequences of price increases. Calculating these is methodologically demanding, and a series of assumptions must be made, especially in light of the lack of data. As part of a separate research project (see Mookherjee and Mckenzie, 2000, for which we provided calculations) we made an attempt to measure these effects. We do not include a full description of the methodology here for reasons of space.

In the case of electricity we find that even though prices rose, the overall effect on welfare was positive for all except the top income decile. For phone services we also

found positive effects, although these tended to be greatest among the middle deciles where access improvements were greatest. In water, we find that the concession in La Paz had positive net effects on welfare, particularly among lower deciles that experienced the largest improvements in access. Due the significant price increases that led to the failure to the concession in Cochabamba, there we find negative effects across the board.

E. Service quality

Aside from access and prices, consumers of course care about service quality. Here again there are data limitations, but we review the existing evidence for selected sectors. The Electricity Law (1994) introduced regulation as regards the quality of distribution[55] establishing four stages for its implementation. In a first stage (January 1996 to October 1997), the distribution firms helped establish the methodology for measurement and control of the quality indicators. In the second, trial period (November 1997 to April 1998), the distributor tested the methodology, and in the third, transition period (November 1997 to April 1998), the firms had to comply with the quality indicators established in the rules, subject to monetary penalties. In the fourth stage (May 2001 on), the distribution firm must comply with more demanding levels of the quality indicators established in the rules, with similar financial penalties for non-compliance.

Table 18 presents the admissible limits for the distribution quality indicators established in the rules. It also presents the results reached by the six distribution enterprises that are part of the NIS. The indicators are divided into three groups: commercial, technical, and product quality. The data are simple averages from two periods, November 1988 -- April 1999, and May 1999 -- October 1999. Unfortunately, these data were not collected pre-privatization.

[55] Rules for the Quality of Distribution (1995).

Table 18
Distribution quality indicators in the transition stage, 1999[1]

Quality measure	Limit allowed	CRE	ELECTRO-PAZ	ELFEC	ELFEO	CESSA	SEPSA
Commercial service quality							
Index of technical complaints among users	10	6.2	2.8	1.1	1.4	3.6	-
Index of commercial complaints among users	12	2.5	1.7	0.3	1.2	0.0	-
Index of billing quality	30	1.8	4.9	1.1	5.1	0.7	-
Index of estimated billing	25	5.4	16.4	15.6	20.0	58.5	-
Average response time -- users' technical complaints (hours)	3 hours	2.7	2.3	3.8	1.4	1.1	-
Average response time -- users' commercial complaints (hours)	48 hours	35.3	35.7	5.5	0.0	0.7	-
Technical service quality							
Average interruption frecuency per user	25 y 35[2]	5.9	3.5	3.4	3.2	7.5	4.5
Total interruption time per user (hours)	20 y 35[2]	6.9	4.2	3.1	3.6	7.0	3.3
Technical quality (percentage of cases analyzed by penalty)[3]							
Phase disequilibrium		22.4	3.3	5.3	5.6	-	8.3
High voltage supply		0.0	0.0	25.0	20.8	-	0.0
Medium voltage supply		5.5	6.4	32.5	11.1	61.1	55.9
Centers in medium and low tension		26.1	2.9	30.3	15.5	66.7	70.8
Low tension supply		28.1	6.7	62.3	25.0	75.0	56.3

Fuente: Memoria 1999, Superintendencia de Electricidad.

As this table shows, all the distribution enterprises are complying with almost all the commercial and technical quality indicators, the exceptions being *CESSA* for the index of estimated billing, and *ELFEC* for the average time to respond to technical complaints. Regarding the quality of technical production, practically all firms present cases of non-compliance and in the cases of *CESSA* and *SEPSA*, these seem rather high.

All this information can do is establish that the electricity sector has seen recent efforts to improve quality. We do not know if these levels are better than those one would have observed pre-privatization, especially since the firms themselves appear to have helped to draft the quality guidelines under which they now operate. For what it is worth, anecdotal evidence indicates that distribution problems, particularly blackouts (which may have their ultimate genesis in the generation sector), are down since capitalization, and that overall consumers are more satisfied.

In the case of telecommunications, Table 19 presents a summary of the goals for expansion, quality, and modernization, and the degree of fulfillment by operators in long distance, local, and cellular services. In each case we chose only the most relevant goals, which are summarized by the percentages accumulated for each year. Fulfillment is verified comparing the accumulated percentages, where these must be larger than or equal to the goals (the opposite case for the incidence of faults). *ENTEL* shows full compliance up to 1998.

Table 19
Performance in expansion, quality and modernization (as a cummulative percentage for each year)

SECTORS, *firms,* and goals	1997		1998		1999	
	Goal	Real	Goal	Real	Goal	Real
LONG DISTANCE						
***Entel* -- Expansion in the extended rural area**						
Number of towns connected	25	32.66	50	50.86	75	nd
Entel -- **Quality targets**						
Corrección de fallas en 3 días, Area Extendida	85	88	90	94	95	nd
Rural	60	62	65	67.5	70	nd
National long distance calls complete	55	69	60	67	65	nd
International long distance calls complete						
FIXED LINE						
***Cotel* -- Expansion goals**						
Requests satisfied w/in time limits	12,000	100	75	79	85	88
Modernization goals						
Digitalization	5	5	30	51	60	71
Metas de calidad						
Incidence of faults[(2)]	60	27	50	38	40	32
Correction of faults[(3)]	40	55.3	60	64	80	71
Completed local calls	50	58	65	84	70	82
Completed long distance calls	50	78	60	84	67	65
***Cotas* -- Expansion goals**						
Requests satisfied w/in time limits	80	98.4	90	95	90	98
Modernization goals						
Digitalization	80	96	80	100	80	100
Metas de calidad						
Incidence of faults[(2)]	40	8	40	12	30	14
Correction of faults[(3)]	55	67.9	60	98	75	99
Completed local calls	60	72	70	74	75	77
Completed long distance calls	55	99	60	74	65	1 ?
***Comteco* -- Expansion goals**						
Requests satisfied w/in time limits	70	85.6	85	98	90	90
Modernization goals						
Digitalization	20	29	60	63	80	100
Metas de calidad						
Incidence of faults[(2)]	0 ?	31	40	37	30	24
Correction of faults[(3)]	- ?	62	50	63	75	76
Completed local calls	55	85	65	88	75	95
Completed long distance calls	55	97	60	88	70	92
CELULAR						
***Entel-movil* -- Expansion goals**						
Requests satisfied w/in time limits	85	99		nd		nd
Quality goals						
Completed local calls	70	86	75	92		nd
Completed natl. long distance calls	60	86	64	92		nd
Completed internatl. long distance calls	55	86	59	92		nd
***Telecel* -- Expansion goals**						
Requests satisfied w/in time limits	85	99		nd		nd
Quality goals						
Completed local calls	70	78	75	88.3		nd
Completed natl. long distance calls	60	76	64	86.5		nd
Completed internatl. long distance calls	55	78	59	92.5		nd

Fuente: Superintendencia de Telecomunicaciones

In local phone services, the 1998 goals were achieved by the three largest cooperatives. In some cases, the goals were fulfilled easily, as in the case of the percentage of digitalization achieved by *COTAS* and *COTEL*, or the percentage of completed calls attained by *COTEL* and *COMTECO*. In other cases the objectives were just met, as in the percentage of calls completed at *COTAS*. Only the case of *COTEL* reveals incomplete goals by 1999.

In the case of cellular phone service, one sees that in all cases the operators, *ENTEL-Movil* and *Telecel,* achieved the 1998 expansion and quality goals. In fact, most of these were achieved by 1997, which in part reflects the competitive pressures in this sector. Indeed, data of the type we have here cannot really account for the fact that substantial welfare improvements may have come thanks to the mere existence of new services or substitutes like cellular telephony. To the extent that Capitalization facilitated their arrival, one can credit it with welfare consequences along this dimension as well.

V. Effects: Regulatory performance

As indicated above, the regulatory system (SIRESE) is made up of five sectoral (electricity, hydrocarbons, telecommunications, water and sewerage, and transportation) and a general Superintendence. The system is financially and administratively independent, and Superintendents are appointed by congress for five-year periods[56]. The functions that each Superintendence performs varies from sector to sector, although one can identify the most general activities as: granting rights, regulating tariffs for monopolies and oligopolies, promoting competition, monitoring operator obligations, resolving controversies among operators, imposing sanctions, hearing appeals, receiving consumer claims, supplying information on the regulated sectors, and proposing adjustments to the regulatory frameworks.

Many positive changes came from the implementation of the SIRESE, besides the obvious one of firm and market regulation. Some of these are the availability of increasingly transparent information, the strengthening of law and its procedures, and the system self evaluation and follow up done by the General Superintendence.

In terms of appeals, the system has a first instance of appeal where any operator can reject a decision made by its sectoral Superintendence. In case the decision is upheld, the operator has a second instance of appeal before the General Superintendence. Once the operator has exhausted these administrative instances, it can still appeal through the judiciary system. Up to the year 2000, Table 20 shows an accumulated number of 213 first instance appeals and 106 second instance appeals.

[56] Seven years in the case of the General Superintendent.

Table 20
Resolved first instance appeals, 1997-2000

	1997	1998	1999	2000	Total
First instance appeals by sector					
Electricity	9	14	13	41	77
Hidrocarbons	2	7	3	7	19
Water and sewerage	0	10	8	2	20
Telecommunication	26	25	16	15	82
Transportation	2	3	6	4	15
Total	39	59	46	69	213
Second instance appeals by sector					
Electricity	5	6	12	18	41
Hidrocarbons	2	6	2	3	13
Water and sewerage	0	3	3	2	8
Telecommunications	14	12	5	5	36
Transportation	1	3	2	2	8
Total	22	30	24	30	106

Source: General Superintendence.

The General Superintendence produces an annual evaluation of each sectoral Superintendence. This document regards compliance with general functions as defined by law, internal organization and use of resources, and sector performance considering the regulatory objectives.

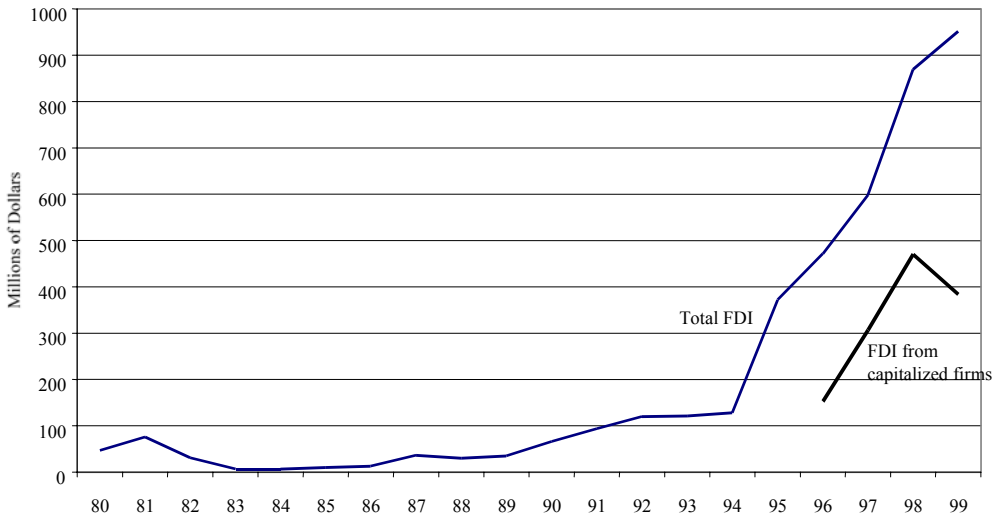
The cost of the entire regulatory system was estimated at 0.2% of GDP in 1999. This investment has brought important advances, but its return has been restrained by several issues: Instances of instability and lack of continuity of Superintendents due to political pressures, lack of a sector law in the cases of water (until 2000) and transportation, and slow approval of detailed regulations. Additionally, at times operators have lobbied the executive and legislative branches to bypass the regulatory system. Some Superintendencies have also been slow to produce transparent information, and/or lacked specialized human resources in their earlier stages.

VI. Effects: macroeconomic aspects

Capitalization also had significant impacts on macroeconomic variables, and is part of a broader transformation in the Bolivian economy. The most visible consequence in this area is the increase in foreign direct investment (FDI) since 1994, partly explained by the capitalized firms' activities, as shown in figure 14. In the external sector, this had the effect of strengthening the balance of payments accounts and enhancing their sustainability. The resilience of total FDI to the downturn that began in 1999 is an important factor in explaining why the recession in Bolivia has been less severe than that in some neighboring countries.[57]

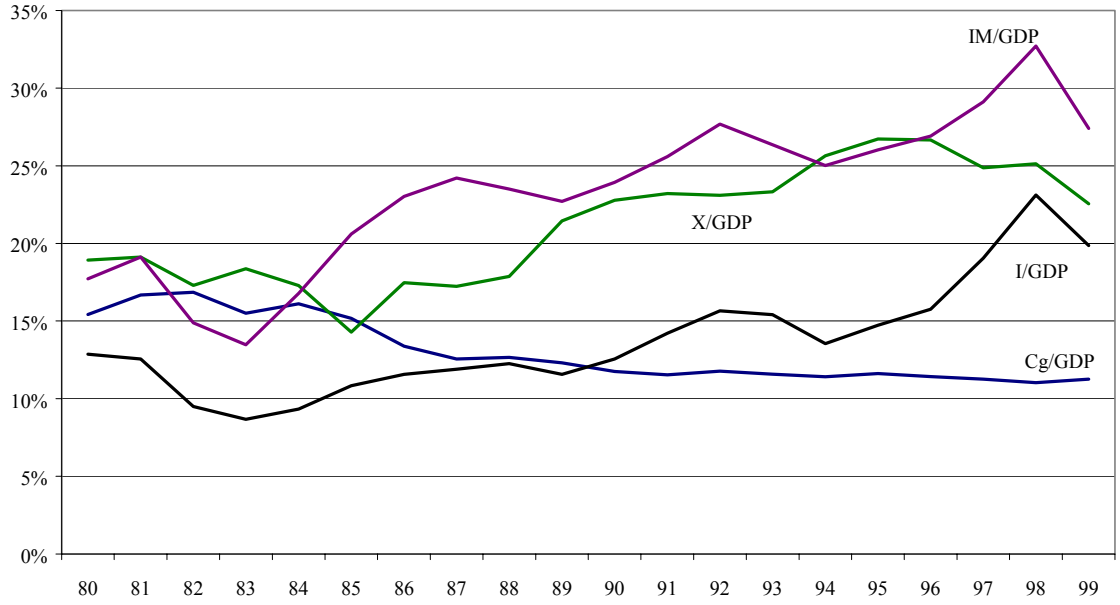
[57] Preliminary data suggests GDP growth began a very slow recovery starting in the year 2000.

Figure 14
FDI registered in the Balance of Payments



In the national accounts, FDI helped raise investment from 13.5 percent of GDP in 1994 to 19.8 in 1999 (see Figure 15). This investment was focused on several sectors: oil and natural gas, electricity, bottled gas and oil derivatives, telecommunications and transportation. As one would expect, these sectors gained importance in GDP, relative to more traditional activities like mining.

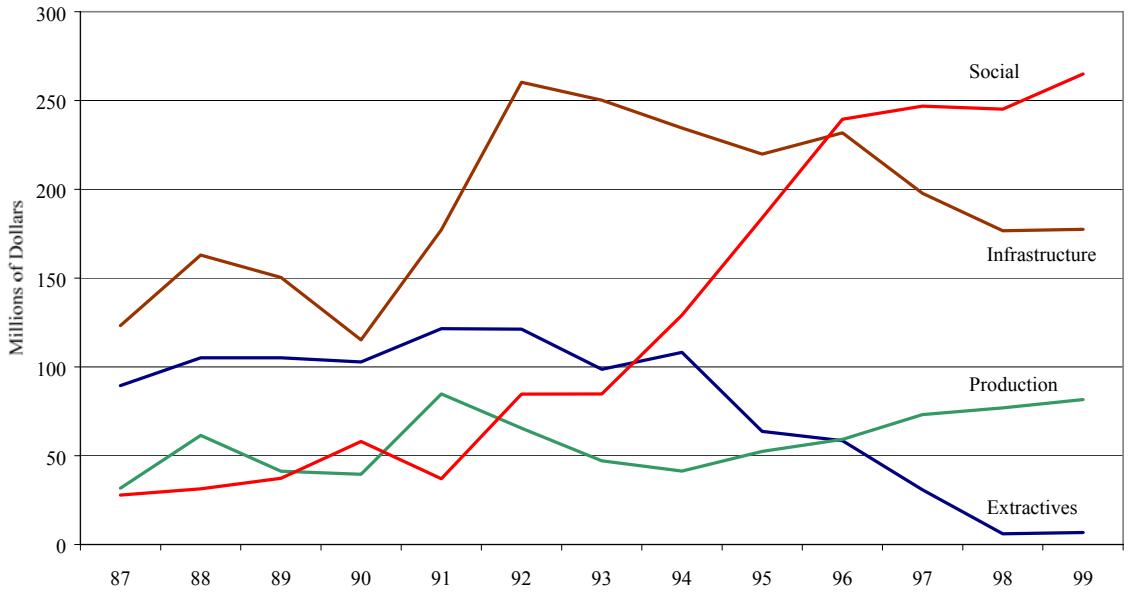
Figure 15
Main macroeconomic variables as percent of GDP



Furthermore, the decision to capitalize State firms was considered a "second generation" part of the reforms initiated in 1985, with the usual objective of leaving the private sector in charge of productive activities, in an environment of open markets and competition. The State remained responsible for regulating, administering the law, ensuring macroeconomic stability, and investing in social sectors; all of these in an environment of decentralization and greater local participation.

Figure 16 shows how the composition of public investment gradually came to reflect these priorities. Although total investment increased by only 3.4 percent, the social sectors' participation went up from 25 percent in 1994 to 50 percent in 1999. Investment in production also increased from 8.1 to 15.4 percent, largely reflecting greater support of the agricultural sector. However, investment in the production of extractives decreased from 21.1 percent in 1994 to 1.3 in 1999, mainly due to withdrawal from hydrocarbons production. The decline in infrastructure from 45.7 to 33.5 percent partially reflects withdrawal from the electricity, telecommunications, and transportation sectors.

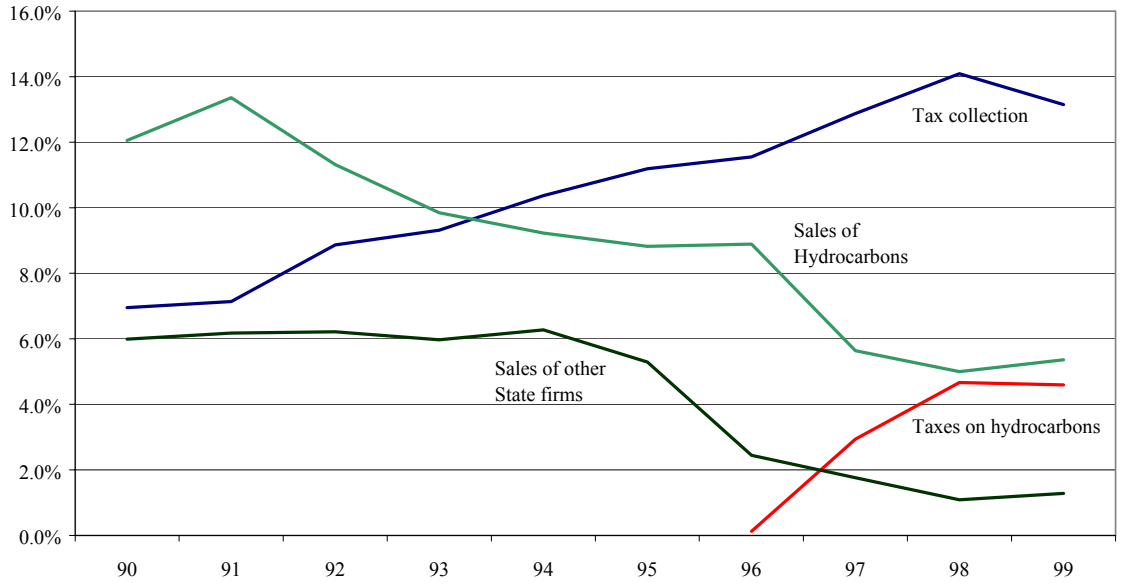
Figure 16
Structure of goverment investment



Capitalization also had an impact on the government's budget deficit. While in 1990 the (before pensions) deficit was 4.4 percent of GDP, by 1994 it decreased to 1.8 and by 1999 the government experienced a surplus of 0.2 percent. A first increase in government income in 1994 and a second increase in 1998 contributed to closing the gap. However, mainly due to pension reform the budget deficit increased again from 1997 on, reaching 3.9 percent of GDP in 1999, and even higher levels more recently.

Providing further data on public finances, Figure 18 shows that the increase in government income occurred mainly in tax collection and due to a new hydrocarbons tax, while income from the sales of hydrocarbons and its derivatives and sales from other government firms decreased substantially from 1995 on, due to reform. Additionally, the regulated sectors (crude oil, natural gas, oil derivatives, electricity, bottled gas, communications and transportation) became first in tax contributions after 1995.

Figure 17
Government income as percent of GDP



To summarize, the capitalization reforms were part of a broader restructuring of the economy that had multiple indirect effects on households. One highlight in this process is the increased importance of the social components in public expenditure, an aspect it seems to have helped bring about. In the long run, this might be more beneficial to the poor than continued investment in sometimes inefficient productive sectors.

VI. Political Economy

To complement the previous, technically-oriented discussion, in this section we describe some of the political economy of the implementation of Capitalization. We also venture some hypotheses as to why this reform has proved relatively unpopular, when by our own assessments, it might seem relatively successful.

A. The promise of Capitalization

As reviewed above, Bolivia initiated the transition from a State-led to a market-driven economy in 1985. Initially, this process focused on the liberalization of key prices and the promotion of market allocation mechanisms, with the goal of stopping hyperinflation and returning to macroeconomic stability.

The Paz Estenssoro administration (1985-89) focused on the achievement and defense of stability, strict fiscal discipline, and the onset of structural reforms. These included tax reform and a move towards independence for monetary authorities. These measures had some of the intended result, since GDP growth recovered from negative

numbers in 1985, to 3.8 percent in 1989, with an investment level of 11 percent of GDP at the end of this period.

In the next administration (Paz Zamora, 1989-93) the emphasis changed at least in principle from stability to growth, always within the general outlines of the economic model introduced in 1985. During this period, the most important initiatives were a new Investment Law (to promote domestic and especially foreign investment), the Hydrocarbons Law and Mining Code (to attract foreign investment via joint ventures with *YPFB* and *COMIBOL*) and the Privatization Law. The latter provided the framework to initiate privatizations with small State firms that were generally owned by (Public) regional development corporations. For this purpose, the government also organized an office devoted to "reordering" State enterprises, establishing their number and characteristics in preparation for eventual privatization. By 1993, growth reached 4.3 percent, with a 15.7 investment rate.

At this point the consensus was that despite having achieved stability, Bolivia needed significantly higher growth to lower poverty significantly. In the free market setting implemented, this essentially implied the need to further promote foreign direct investment. This was particularly clear to the extent that since stabilization in 1985, domestic private investment never really took off, and on average, domestic firms did not seem to have developed the capacity to compete in global markets.

Further, macroeconomic stability itself was repeatedly in question, given that various levels of government were still heavily involved in production, and that public investment was still the engine of growth. This investment, further, had to meet multiple needs such as those in electricity, water, sewerage, telecommunications, transportation, and oil exploration – let alone growing priorities in health and education. This situation, coupled with pressure from international organizations like the World Bank, made it clear that privatization was the path to follow.

The Sanchez de Lozada administration (1993-97) was perhaps the most aggressive in structural reform. Capitalization was only a part of overall changes that included significant administrative decentralization, greater local participation, and pension reform. In general, there were two emphases: 1) the transfer of productive activities to the private sector, and 2) the sharing of social area responsibilities with local jurisdictions. The first required sector-by-sector reform to establish the conditions under which the private sector would participate. The second required reform of the government itself. While the first was mostly efficiency oriented, the second was directed to distributional issues.

The Capitalization mechanism described in section II, initially promised that a 51 percent share of each firm would remain in Bolivian hands. This would accomplish a double objective: first, it would democratize business ownership; second, it would stimulate investment and generate broad-based growth. Thus, the promise was one of growth and efficiency, coupled with a sense of social equity embodied in the effort to avoid further wealth-concentration.

At the time of implementation, the promise of majority control by Bolivians at large had to be abandoned. Foreign enterprises demanded at least a 50 percent share and control of each company, and without this concession it would have been difficult to allay their fear of heavy-handed intervention. In exchange, the argument went, this guaranteed managerial and technological improvements. In addition, the fact that foreign

firms' payments would be invested (rather than go into government coffers), would promote increases in coverage rates, quality, and employment.

At least in part, this last feature seemed directed towards reducing the fear that the government, awash in "found money" would immediately spend it on social or infrastructure projects that, however well-intentioned, would not have a large impact on economic development (this even ignoring the possibility that corrupt politicians might get a hold of these resources).

B. Conflicts during the capitalization process

The approval of the Capitalization Law in March of 1994 initiated the process. This law authorized the executive power to contribute the assets of State firms to the creation of *Sociedades Anónimas Mixtas* (SAM's) or mixed enterprises. The Law authorized the transfer of portions of these firms to their workers, and to the population at large. Additionally, it allowed the government to sell new, capital increasing shares, in international auctions.

The Law's approval was feasible because the political party in government had a congressional majority thanks to a coalition with some smaller parties.[58] This majority was also key for the approval of all the other relevant laws mentioned above, which enabled the executive to then detail their application through extensive *decretos reglamentarios*. The opposition parties[59] consistently claimed that the laws promoted by the government, including the Capitalization Law, were prepared and approved without regard to any opposition or debate.

A critical aspect during this process, once the key laws had been approved, was the position of organized labor. In this area two forces came into play. On the one hand, the Central Obrera Boliviana (COB), the broadest labor organization, expressed its opposition to the whole process. On the other, the government made the decision to turn the workers into partial owners, as a way of ensuring their support.

From the start, the COB, which had been much weakened since the 1980's, rejected the idea of capitalization, arguing instead for a strengthening of the State firms' financial and managerial condition. While it stuck to this position, it was unable to stop direct contacts between the government and the workers and employee unions in the firms that were to be capitalized. While these initially stuck by the COB, one by one their respective leaders initiated direct contacts with the government, seeking to achieve the best deal for their members.

Capitalization itself began with *ENDE*, perhaps in part because its workers were not as organized as those in other state firms. In any event, they were the first to agree to partial ownership in exchange for supporting the process. *ENTEL* workers were the second group to fall in line, after negotiating an agreement by which benefits as well as job security were guaranteed. *YPFB's* capitalization was made viable in a similar way, and the workers obtained a particularly important share in *Transredes*.

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[58] The main political party in government was the Movimiento Nacionalista Revolucionario (MNR), which acted in coalition with Unión Cívica Solidaridad (UCS), Movimiento Bolivia Libre (MBL) and Movimiento Revolucionario Tupaj Katari (MRTK).

[59] Mainly the Movimiento de Izquierda Revolucionaria (MIR) and Acción Democrática Nacionalista (ADN).

In the case of *ENFE*, the government guaranteed job security for a seven-month period. In this case however, the workers obtained a relatively small ownership share. The sale price of this firm took place at a final price below book value, an outcome that the workers perhaps foresaw. The union at *LAB* was the one which most strongly opposed Capitalization. In the event, it also came around with guarantees of job security.

Industry-specific conflict rose particularly in the telecommunications sector, where the government aimed at transferring *ENTEL* (with a period of exclusivity) in the long distance market, as well as introducing competition in the local sector. However, the independent cooperatives that provided local phone services strongly opposed giving up their monopolies. The government replied asking that they at least transform into fully private firms in order to attract private investment and eventually compete in open markets. This was also rejected by the cooperatives, more so, they continued to demand a period of exclusivity in the local service. The government went along with this, but imposed price cap regulation together with expansion and quality goals.

C. Criticisms of capitalization

Not surprisingly, the capitalization process lent itself to criticism. The following issues were the focus of much debate:

1) The notion that the State enterprises to be capitalized only benefited a small group of bureaucrats and politicians – that these firms were a source of corruption and rent-seeking behavior. The workers of state enterprises rejected this idea, arguing that some of the corruption, and inefficiency in these firms had been introduced or aggravated by the free market reforms the government now wanted to carry even further.

2) The concept that Bolivians would have a majority stake in the new enterprises, one that would never be less than 51 percent. For many, this was an electoral sleight of hand, since in practice investors would not settle for less than 50 percent, plus control. The government objected to this characterization, arguing that investors in fact wanted 51 percent, but that thanks to its negotiation, they settled for less.

3) The idea that foreign management would allow technological and managerial skill transfer, reducing corruption. This affirmation caused strong reactions among the workers, since State firms (some more than others) had historically propelled modernization in different sectors. They called on the public to recall that in some cases factors exogenous to the firms, such as the 1980's debt crisis, accounted for why their sources of funding had dried up. Indeed, it was the lack of investment capital and foreign funding that was the key justification for Capitalization.

4) The possibility that State enterprises might be transferred in a "fire sale". Some observers made the point that perhaps the government created the conditions for a fire sale itself, by publicizing the poor state of some of these firms. People suspected that the government would have to absorb substantial debts, and in the case of gas and oil, investors would be rewarded with risk-free reserves.

D. Change of government

The next administration (Banzer-Quiroga, 1997-2000)[60] had made a campaign promise to revert the Capitalization process. After taking office it proposed to at least introduce some changes in the contracts, and in the functioning of the regulatory system. This created unease in the affected sectors, however, and the issue was put to rest by the World Bank's insistence that the contracts should not be affected; and the American Embassy's advocacy in favor of U.S. firms.

This forced the new administration to coexist with capitalization, a coexistence with constant criticisms of the arrangement, with key officials expressing that the government firms were given away in exchange for nothing, that their transfer limited the government's income, reducing expenditure and social investment. Additionally, it was alleged that it caused the recession that started in this time period, and accounted for the government's inability to spend the country's way out of it.

MNR, the ruling party during capitalization, now in opposition, retorted that the Capitalization process had not met all expectations in part because it did not have the necessary continuity. It argued that reform was left in the hands of people that did not understand or stimulate it. It also made the case that the recession was due to external factors, and that it in fact would have been worse had Capitalization not taken place.

Nevertheless, the MNR also admitted that the reforms had not been perfect and might require some adjustments, particularly the strengthening of laws and regulation. For instance, while capitalization/regulation may have made possible the increase in natural gas reserves from 5 to 53 TCF (potentially turning Bolivia in a regionally important exporter) some adjustments were necessary to improve the government's share and to prevent the emergence of vertical monopolies.

A. Why is capitalization not popular?

As this discussion suggests, the conception and implementation of these processes involved a fair amount of controversy and acrimony, and they themselves can be seen as an initial source of capitalization's relative unpopularity. In addition, here we venture some further hypotheses that fall in three general areas: i) unfulfilled expectations, ii) ownership and corporate governance issues, and iii) high profile failures.

The first of these arises because in our opinion Capitalization was "oversold" by the administration that implemented it, along dimensions including the employment growth it would generate, and the dividends it would eventually generate for the population at large. Performance on these fronts, while perhaps not bad, has proven disappointing given the expectations generated.

In the case of employment, for instance, intuition tells us to expect declines in employment with privatization, to the extent that we believe that all else equal, State firms may have an inefficiently large number of workers. When we find that declines were quite modest, especially in the context of the size of the whole labor force, we feel things were not so bad, especially since these firms' investment focused on capital-intensive nontradeables.

[60] Hugo Banzer was the President for four years out of the whole five-year term. He resigned due to ill health and amid significant opposition (dying before the end of this period). Jorge Quiroga, the vice-president, took over for the remaining year.

The population, however, was told to expect that Capitalization would lead to large improvements both in the quantity and quality of jobs available. In fact, the rate of employment growth during the post-Capitalization years (even those before the current recession) was not qualitatively different from that experienced in previous periods of stability, and the average voter may therefore feel disappointed.

A second set of problems highlights corporate governance issues. Here we feel that the population suspects that even if output, productivity, and consumer welfare have improved, the capitalized enterprises are being run with only the best interests of the majority (foreign) owners in mind, and that the regulatory system has been unable to adequately restrain this natural tendency.

This issue has gained particular salience with respect to ownership. The population seems to have expected that through its (roughly 45 percent) share in the capitalized enterprises, it would come to share in profits flows. In the event, the firms have not paid dividends as large as were predicted (*Transredes*, for instance, has yet to pay a dividend), and these have had a direct impact only on the old-age population. The suspicion is that the firms have found ways to transfer profits to their home countries rather than pay then out in Bolivia.

This has become a particular headache for the current Sanchez de Lozada administration (2002-2007), which has at its helm both the President and the Party who initially implemented Capitalization. One of its key campaign promises was to return the *Bonosol* (the old-age payment described above) to its initial level of about 240 dollars. Due to the low flow of dividends, however, the Common Capitalization Fund (FCC), which must pay for this benefit simply cannot afford it.

As a short-term solution, the government is implicitly forcing individuals, through their individual retirement accounts (FCI), to buy commitments from the FCC. There is much debate over this arbitrary measure, which in the extreme can be seen as a confiscation and forceful redistribution of private property by the very administration that in previous incarnations was its staunch defender.

As a medium term solution, the government is seeking to strengthen corporate governance, particularly in light of recent allegations of white-collar crime in capitalized oil enterprises. The initial proposed changes have not been well received by the business and financial communities. Of course, these problems have been accorded further salience by news of the deluge of corporate scandals in the U.S.

A further and important wrinkle on this issue arises in the case of the Gas industry. On the one hand the public is told that Bolivia's proven and expected reserves have expanded enormously since capitalization, and that this will generate great wealth for the country. On the other, they might wander if and how this wealth will ever reach them. Those who look carefully, for instance, will find that those companies in which the population owns shares, mainly *Chaco*, *Andina* and *Transredes*, are arguably no longer the central players in this industry, so that the vaunted windfall gains may in fact accrue to firms in which they have no stake.

Further, there are developments that might lead people to believe that in fact the system is evolving in a way that will result in further losses in participation. At the moment the population can be said to be gaining from royalties on gas production and what seems to be the relatively good (previously-negotiated) price of gas sold to Brazil. On the other hand, from the 1990 to the 1996 legislation, the royalty share fell from 50 to

18 percent, and in the future the gains will be smaller as "old" wells, those discovered prior to privatization, become less important.

Although these drops are to be compensated by the increase in profit taxes and the introduction of a so-called surtax, in practice these sources of revenue have not and are not expected to compensate for the reduction, except through greater production volumes. Additionally, there is a public perception that the capitalized firms are very adept at evading taxes. Recently, for instance, a prominent politician made the charge (to our knowledge left uncontested/unexplained by the capitalized firms), that the Bolivian Catholic University pays more taxes than any of the capitalized oil enterprises.

The gas industry has provided popular opinion with other examples of potential corporate malfeasance in collusion with government officials. For instance, in the negotiations with Brazil, the giant San Alberto and San Antonio fields were classified as new (hence paying substantially lower royalties), but YPFB workers insisted these had already been discovered. While the status of these fields was never entirely clarified, substantial parts of the public were left with the impression that excessive concessions had been made.

Finally a couple of high profile failures among foreign firms have introduced suspicions among the public as to the entire process. This was the case of the Brazilian airline *VASP* which failed in the administration of *LAB*. *VASP* departed amidst allegations of asset stripping and accounting fraud. Additionally, there was the case of the *Aguas del Tunari* consortium, which led to the "water war" (described above) and an end to water-related concessions.

VII. Conclusion

The 1982-85 crisis provided Bolivia with an opportunity to initiate the transition from a State-led to a market-driven economy. By 1989 it had liberated key prices in the economy, and by 1993 a Privatization Law was in place. However, the State continued to be the main investor in the economy, and remained highly dependent on foreign debt. Although the economy resumed growth, it did so at rates that would not lower poverty significantly.

The 1993-97 period became the most aggressive in structural reform in two fronts: 1) the definition of a new State-market frontier, where government firms were replaced by privatization and regulation, and 2) the definition of a new central-local frontier within the State, where local governments are given greater participation. These two definitions implied that the private sector (particularly foreign) would lead investment and growth, while the State would regulate markets and increase its efficiency in the provision of public and quasi-public goods.

Independently of the mechanism used to attract foreign direct investment (mainly capitalization), the result was the substitution of government foreign debt with foreign direct investment as the engine of growth. By the end of 1998, the economy had reached 5.3% GDP growth, but the country was hit by a series of external shock that began with the Asian crisis and continued with the Brazilian and later the Argentinian crisis. The economy was pulled into a recession that persists to date. By the end of 2002 private sector investment fell substantially, forcing a return of government (debt financed) investment as the main source of growth. Although this time in an environment were its

limited resources can only be directed towards the production of public and quasi-public goods.

The importance of this bit of history, is that any evaluation of capitalization and privatization must consider them as part of a structural reform aimed at achieving broader objectives. It also highlights the existence of two different periods under which capitalization/regulation had to perform. The first from 1994 to the end of 1998 corresponds to a period of reform implementation and initial results in an environment of stability and economic growth. The second from 1999 to present corresponds to a period of reform consolidation in an environment of economic recession.

With this context aside, it is clear that a complete evaluation of the Capitalization/privatization in Bolivia is a difficult task, and this paper admittedly provides only initial insights into this issue. At the simplest level, the key goal of capitalization seems to have been to attract foreign investment into the affected sectors, and the evidence suggests the process met with success on this dimension. In combination with regulation, additional positive outcomes would seem to include an increase in access to utilities' services and significant expansions in proven gas reserves – both outcomes which generate benefits that have not bypassed the poorer segments of society. Additionally, we find evidence of productivity increases almost across the board; and most firms have remained moderately profitable.

On the negative side, one observes employment decreases, though these are the partial flipside of the productivity increases, and in any case seem to be rather small, particularly relative to the economy as a whole. We also find evidence of price increases for utilities, although except for the case of water, they seem to be overwhelmed by increases in access.

On balance, this assessment suggests the reforms were fairly successful, but popular opinion does not seem to agree with this assessment. Here we venture that this may be due to the fact that that the government that implemented these reforms "oversold" them, promising more, on the job creation front for instance, than they could reasonably deliver. Additionally, the reform's entire reputation has been hurt by a couple of high profile failures, and by a perceived weakness in the regulatory and corporate governance frameworks in Bolivia.

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Appendix A – Household surveys

For household and individual-level data, including socio-economic characterizations, we use two rounds of *the Encuesta Integrada de Hogares* (1st and 7th round) and one of the *Encuesta Continua de Hogares* (1st round), as described in table B.

Table B
Household survey data

Data set	Year collected	Coverage	Sample size (households)
Encuesta Integrada de Hogares, 1st round	1989	Department capitals[1]	3,765
Encuesta Integrada de Hogares, 7th round	1994	Department capitals[1]	6,102
Encuesta Continua de Hogares	1999	National	1,325[2]

Note: [1] Includes the country's eight department capitals (excluding Cobija) and El Alto.
[2] For comparability, this sample refers only to the department capitals covered in 1989 and 1994.

These surveys contain the essential access and consumption information. As the telecommunications, telephone, and water reforms took place in 1995 and 1996, the 1994 survey is our "before" observation, and 1999 the "after" one. We also focus on 1989 because the 1989-1994 five year period can serve as a "control" for the 1994-99 privatization period. This comparison is aided because the country had a similar economic performance and relatively stable political structure during both periods.

For employment and wage information, we have started collecting administrative data from firms and regulatory agencies, and some results on this are featured below. In principle, the household surveys can provide complementary information, but we have concluded that this will be the case for only rather aggregated information. The reason for this is that as illustrated in the next section, the firms in the three sectors considered here (water, electricity, and telecommunications) are relatively small employers in Bolivia, and the household surveys offer very small samples to study them.

To illustrate this problem, we note that the 1999 survey asked respondents to state not only the sector but also the precise firm they worked for. In the electric sector, we did not find a single respondent that declared he or she worked for the electric firms mentioned in the section II. Rather, many of them worked in the "electric" sector, but as electricians or electric appliance vendors. In light of this, the administrative information on employment and wage levels will be valuable indeed.

Finally, we will complement these sources of data with additional administrative information on quality-related issues.

Appendix B – Access definitions and questions used

Electricity 1 -- A definition fully consistent across the three years, based on households' declaration as to whether they have an electric connection or not.
Telephone 1 -- A straightforward definition based based on households' declaration as to whether they have a telephone connection or not, available only for 1994 and 1999.
Telephone 2 -- The central criteria in this case is whether households reported positive communications expenditure, available in 1989 and 1999.
Telephone 3 -- The central criteria in this case is whether households reported positive expenditure on telephone service, available in 1994 and 1999.
Water 1 – Under this criteria, a household is considered connected if it declares it has a water connection either inside its dwelling or else within the building its dwelling is a part of. This measure is available in all three years.
Water 2 – In this case, a household is considered connected if it declares it has a water connection either inside its dwelling. This measure is available in all three years.

Table C1
Access to water, electricity and telephone services: Coding for 1989

Service	Access	Question	Possible answers	*Variable name* / coding
Water	Con-nection	How does your household supply itself with water?	*Public network:* 1. Inside the dwelling 2. Outside the dwelling but within the building that the dwelling is part of. 3. Outside the dwelling, outside the building (public faucet). 4. *Private network* *Well*: 5. Private 6. Shared 7. *River, lake, or spring* 8. *Delivery truck* 9. *Other*	***Water 1***: household is connected if responses 1 or 2 were given ***Water 2***: household is connected only if answer 1 was given
	Con-sumption	How much did your household spend last month on water?	Amount in bolivianos	***Water expenditure***
Electri-city	Con-nection	Does your household's dwelling have an electric connection?	Yes or no	***Electricity 1***: household connected if yes
	Con-sumption	How much did your household spend last month on electricity?	Amount in bolivianos	***Electricity expenditure***
Tele-phone	Con-nection	How much did your household spend last month on telephone?	Amount in bolivianos	***Telephone 2***: household connected if it reported positive expenditure on telephone service
	Con-sumption	How much did your household spend last month on telephone?	Amount in bolivianos	***Telephone expenditure***

Table C2
Access to water, electricity and telephone services: Coding for 1994

Service	Type of access	Question in the survey	Possible answers	*Variable name* / coding
Water	Con-nection	How does you household supply itself with water?	*Public or private network*: 1. Inside the dwelling 2. Outside the dwelling but within the house or building the dwelling is part of. 3. Outside the dwelling, outside the house or building (public faucet). 4. Delivery truck 5. Well 6. River, lake or spring 7. Other	***Water 1***: The household is connected if responses 1 or 2 were given ***Water 2***: The household is connected only if answer 1 was given
	Con-sumption	How much do you pay for this each month?	Amount in bolivianos	***Water expenditure***
Electri-city	Con-nection	Does your household have electric energy?	Yes or no	***Electricity 1:*** household connected if yes
	Con-sumption	How much do you pay for this each month?	Amount in bolivianos	***Electricity expenditure***
Tele-phone	Con-nection	Household equipment: Does your household have a telephone connection? In the last month, how much did you or any of the members of your household spend on communications (phone, mail service)	Yes or no Amount in bolivianos	***Telephone 1***: household connected if reports it has a telephone connection. ***Telephone 3***: household connected if it reported positive expenditure on communications
	Con-sumption	In the last month, how much did you or any of the members of your household spend on communications (phone, mail service)	Amount in bolivianos	***Telephone expenditure***

Table C3
Access to water, electricity and telephone services: Coding for 1999

Service	Type of access	Question in the survey	Possible answers	*Variable name* / coding
Water	Con-nection	What is the origin of the drinking and cooking water the household uses?	1. Network that reaches the building 2. Public faucet 3. Well with a pump 4. Well without a pump 5. River or spring 6. Lake 7. Delivery truck 8. Other	***Water 1:*** The household is connected if response 1 was given for the first question, and not otherwise ***Water 2***: The household is connected only if answer 1 is given for both questions
		In your dwelling, how is the water used to drink and cook distributed?	1. Pipe within the dwelling (reaching the bathroom or kitchen) 2. Pipe outside the dwelling but within the plot of land 3. No piped water	
	Con-sumption	In the last month, how much did you pay for potable water?	Amount in bolivianos	***Water expenditure***
Electri-city	Con-nection	Does you use electricity to illuminate your dwelling?	Yes or no	***Electricity 1:*** household connected if yes
	Con-sumption	In the last month, how much did you spend on electric service?	Amount in bolivianos	***Electricity expenditure***
Tele-phone	Con-nection	Does your household have fixed or cellular phone service?	Yes or no	***Telephone 1***: household connected if reports it has a telephone connection
		In the last month, how much did you spend on fixed or cellular phone service?	Amount in bolivianos	***Telephone 2***: household connected if it reported positive expenditure on telephone service
		In the last three months, how much did your household spend on communications (telephone, long distance, letters, packages, etc.)	Amount in bolivianos	***Telephone3***: household connected if it reported positive expenditure on communications
	Con-sumption	In the last month, how much did you spend on fixed or cellular phone service?	Amount in bolivianos	***Telephone expenditure***