The Distributive Impact of Privatization in Latin America: Evidence from Four Countries

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The supposed failure of privatization in Latin America has recently become the source of street riots, protest demonstrations, and adverse news coverage. Riots in Arequipa, Peru, erupted in June 2002 following the announcement of a proposal to privatize power plants, while Cochabamba, Bolivia, witnessed a so-called water war in April 2000. Antiprivatization protests also occurred recently in Ecuador and Paraguay, while water privatizations in Lima and Rio de Janeiro had to be cancelled owing to popular opposition.[1] Street protests by antiglobalization activists have included privatization as a prime target, on the grounds that national values should not be overtaken by the profit calculus of global capitalism. News articles highlight popular objections to private enterprise making a profit on basic services such as water, the failure of water privatization in Bolivia, and problems with quality, price increases, and large-scale employee layoffs.[2] In response to popular opposition, the National Assembly in Nicaragua passed a law forbidding the privatization of any enterprise related to the provision of water services (a law later vetoed by the country's president). These adverse opinions are not restricted to a handful of protesters. Latinobarometer opinion polls for 2000 show that a clear majority disapprove of the privatization process, a pattern that is uniform across countries, age, gender, and socioeconomic class. The

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This paper is an overview of a research project commissioned by the Poverty and Inequality Unit of the Inter-American Development Bank in 2001 and sponsored further by the Institute of Public Policy and Development Studies of the Universidad de las Américas—Puebla. We are grateful to both these institutions for funding the research and providing logistical support. Research papers were written for four countries: Huberto Ennis and Santiago Pinto (2002) on Argentina; Gover Barja, David McKenzie, and Miguel Urquiola (2002) on Bolivia; Luis-Felipe López-Calva and Juan Rosellón (2002) on Mexico; and Samuel Freije and Luis Rivas (2002) on Nicaragua. This paper provides the methodology for their work and summarizes their findings. We thank Nora Lustig, Omar Arias, Máximo Torero, and John Nellis for their support and helpful comments and discussants Gonzalo Castañeda and Jaime Saavedra for their penetrating comments on an earlier version of this paper.

1. See "Turmoil in Latin America Threatens Decades of Reform," *Boston Globe*, p. A12, 18 August 2002; William Finnegan, "Letter from Bolivia: Leasing the Rain," *New Yorker,* 8 April 2002; Democracy Center, "Bechtel versus Bolivia: The Water Rate Hikes by Bechtel's Bolivian Company, Aguas del Tunari. The Real Numbers," (www.democracyctr.org/bechtel/waterbills/waterbills-global.htmw [20 August 2002]).

2. See "As Multinational Runs the Taps, Anger Rises over Water for Profit," *New York Times*, 26 August 2002.

opinions appear to be becoming increasingly adverse over time, with disapproval ratings higher in 2001 than in 2000, and higher in 2000 than in 1998 (see table A1 in appendix A).[3]

Yet the evaluation of privatizations by economists tends to be typically favorable.[4] The criteria for evaluation typically include profitability, labor productivity, firm growth, and market valuation. Part of the discrepancy may arise from the fact that most of the empirical studies pertain to transition countries in Eastern Europe and the former Soviet Union, while the public disaffection seems pronounced in Latin America. A large part, however, stems from the difference in criteria used in evaluation. Increases in profitability and efficiency can come at the expense of customers, workers, and other social groups as a result of increased prices, lower levels of employment, longer work hours, worsening service conditions, and neglect of environmental effects.[5] A more comprehensive welfare evaluation of privatization clearly must incorporate the effects on consumers and workers in addition to firm profitability. Particular attention needs to be devoted to effects on inequality and poverty, which underlie perceptions of unfairness among critics of privatization and which may have functional effects on economic efficiency in the long run via effects on human capital investment, entrepreneurship, crime, and governance.[6]

This paper provides an overview of the results of a project that evaluates the distributive impact of privatization in four Latin America countries. The aim of the project was to estimate the effects of privatization on customers and workers, based on existing household and employment surveys. Four countries of varying size and per capita income were chosen for the study: two large, middle-income countries (Argentina and Mexico) and two small, poor countries (Bolivia and Nicaragua). This paper provides an overview of the methodology and results of the individual country papers, which contain further details concerning the privatization process and data sources used for each specific country.[7] All four countries have undergone significant privatization since the late 1980s, and they have similar data sources that permit the application of a common methodology. The Nicaraguan case,

3. See also "An Alarm Call for Latin America's Democrats," *Economist*, 26 July 2001.

4. For instance, see the survey of empirical studies on privatization in Megginson and Netter (2001).

5. La Porta and López-de-Silanes (1999) estimate the fraction of increased profitability of privatized Mexican enterprises that can be attributed to losses suffered by consumers at 5 percent and transfers from laid-off workers at 31 percent, with productivity gains accounting for the remainder.

6. For an exposition of the efficiency effects of lower inequality, see Aghion, Caroli, and García-Peñalosa (1999); Bardhan, Bowles, and Gintis (2000).

7. See Ennis and Pinto (2002) for Argentina; Barja, McKenzie, and Urquiola (2002) for Bolivia; López-Calva and Rosellón (2002) for Mexico; and Freije and Rivas (2002) for Nicaragua.

however, was qualitatively different from the other three countries, in that large parts of the economy (including agriculture) were privatized as part of the transition from a socialist economy, while utilities that remained in the state sector throughout the 1990s were exposed to greater liberalization.

The most significant component of the project focused on privatized utilities (primarily electricity, telecommunications, water, and gas), and it estimates the effects of changes in price and access on the welfare of households located in different expenditure categories.[8] First and second order approximations to consumer surplus changes were calculated on the basis of estimated budget shares and price elasticities. Each individual paper devotes particular attention to valuing gains in access by different groups. Some data were available concerning quality attributes, but they were not rich enough to be incorporated into the welfare calculations. The paper explains the methodology employed in more detail below, before presenting the main results.

The second component of the project documents the effects on workers, especially the extent of employment changes that accompanied privatization and the possible impact on wage levels and earnings inequality. The country papers assess changes in employment relative to overall levels of employment and unemployment in the economy. Upper-bound estimates of the extent to which earnings inequality may have increased as a result of the layoffs are estimated on the basis of employment surveys for Argentina and Mexico.[9] These are based on the assumption that those who lost their jobs have subsequently failed to find any employment. The rotating panel feature of the Mexican employment surveys permits López-Calva and Rosellón to explore the validity of this assumption, by tracking those who lost their jobs for one subsequent year. Finally, effects on wage rates, working conditions, and wage inequality for employed workers are discussed in the context of Argentina and Nicaragua.[10]

The third component gathers facts concerning the fiscal impact of the privatization. Here, one can only speculate about possible implications for public debt, budget deficits, and social spending, short of any attempt to simulate a structural macroeconomic model. Nevertheless, these facts do help to put into perspective some of the wider implications of privatization.

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8. In the case of Nicaragua, this exercise is carried out only for the electricity sector, which saw the entry of a number of private firms in the late 1990s while the main state firms were being prepared for privatization.

9. Ennis and Pinto (2002); López-Calva and Rosellón (2002).

10. Ennis and Pinto (2002); Freije and Rivas (2002).

It is important to qualify the inference that can be drawn from the results, owing to severe data limitations. The privatizations were very far from constituting a natural experiment. Instead, they were part of a wider set of market-oriented reforms such as trade liberalization, fiscal reform, macroeconomic stabilization, and changes in regulatory institutions. Some sectors, such as telecommunications, witnessed significant technological change, with the introduction of new products and a reduction in costs of traditional services. Most of these countries underwent significant macroeconomic changes that affected all sectors of the economy. It is almost futile to try to assess the effect of privatization per se, which would require predictions of how the industries would have performed had they not been privatized, while all the other changes occurred. Consequently, it is only feasible to calculate the effect of observed changes before and after privatization, while comparing the effects in the privatized sectors with other sectors to control for macroeconomic changes in the economy.

Other limitations in the nature of the household surveys include lack of information concerning service quality or the prices paid by the household. We therefore use data from the firms or regulators concerning price and quality and are forced to assume that all households were sold the same product at the same price. Take-up decisions are also not directly recorded, so access had to be estimated indirectly from availability of the service in the same building or neighborhood, in combination with reported expenditures by households. On the employment side, little is known about the consequences of layoffs on income distribution, owing to lack of data on the subsequent earnings experience of laid-off workers or on other forms of transfers (such as unemployment assistance or transfers from friends and family) that may have cushioned the income impact of layoffs. Accordingly, only upper bounds to income losses can be computed, by assuming that laid-off workers lost their incomes entirely thereafter.

We can only gauge the short-run impact of most of these privatizations, although experience suggests that the impact three or four years after privatization can be very different from the immediate impact one or two years out.[11] Environmental effects are not incorporated. Finally, the data do not permit any assessment of the distributive changes resulting from the change in ownership per se (for example, through changes in value of

11. This will become evident in some of the evidence concerning employment changes. In the context of the Bangladesh jute mills privatized in the 1980s, Bhaskar, Gupta, and Khan (2002) find that the employment impact fifteen years hence differs markedly from that for the first few years following privatization. Specifically, the employment difference between the privatized and nonprivatized mills found by Bhaskar and Khan (1995) for the first six or seven years disappears entirely in the longer time horizon.

these firms subsequent to the privatization) or their impact on nonprivatized parts of the economy (via changes in prices or competition). Our assessment of the distributive impact must therefore be viewed as a rough approximation to some of the first-order effects of privatization on the bottom half of the distribution, assuming that the changes in prices, access, or employment levels that occurred at the time of the privatization could be attributed to that process itself.

The next section provides a brief overview of the privatization process in the four countries. The paper then deals with the effects on consumers and workers and subsequently discusses the fiscal implications. We then explore possible sources for the divergence between our analysis of privatization and popular perceptions, and the final section concludes.

1. The Privatization Process: A Brief Description

This section briefly outlines the main elements of the privatization process in the four countries that are described in the respective country papers, which can be consulted for additional details. Table 1 summarizes the main features of the process.

[table 1 here]

In Argentina, a wide range of state-owned enterprises were privatized starting in 1989 and continuing through the early 1990s. These include the main utilities (telecommunications, electricity, water, gas, and air and rail transport), petrochemicals, tankers, natural gas, defense (navigation), and a range of services, including insurance and grain control. The method of privatization involved inviting bids from a set of prequalified international bidders. Approximately U.S.$23 billion was realized from the proceeds over the period 1990–97, of which U.S.$10 billion was used to retire outstanding public debt. Macroeconomic stabilization and improved efficiency were the important objectives of the process, which was carried out as part of a wider program of fiscal contraction, debt reduction, and trade liberalization. Many of the privatized firms represented joint ventures between a foreign-owned firm and a domestic firm, subject to equity participation rules for foreigners. The process included a complicated system of transferring debts from the state-owned enterprise to the new private entities, as well as a voluntary retirement program negotiated with unions in the large privatizations (such as the

railways), which was funded by the World Bank. In the telecommunications and electricity privatizations, 10 percent of the shares were allocated to workers in these enterprises. The total fraction of the economy's labor force in the state sector prior to the privatization was approximately 2 percent.

Bolivia privatized the principal utilities between 1995 and 1997: electricity, telecommunications, transport, and water, as well as oil and gas. The novel feature of the process was the widespread use of capitalization as an alternative to traditional methods of privatization. Capitalization involved allocating shares equivalent to 50 percent of the firm's value to the investor with the winning bid, 45 percent to an old-age welfare and pension fund, and the remaining 5 percent to the firm's employees. Investors gained the right to manage the firm, but they had to commit to investing their capital contribution (that is, what it offered for its 50 percent share) over a six- to eight-year period, besides conforming to expansion and quality targets laid down by regulators. Under this scheme, therefore, the government gained no disposable income at all, with the privatization proceeds earmarked mostly for investment and social spending. Of the U.S.$2 billion realized from the privatizations—amounting to 30 percent of gross domestic product (GDP)—approximately U.S.$1.6 billion was realized from capitalization, with the remainder from traditional privatizations. Concessions were a third method used, most notably in the case of water.

In electricity, the Bolivian officials separated the processes of generation and transmission. Three privatized firms were created in 1995 in the generation sector, realizing U.S.$140 million. These firms were subject to a 35 percent limit on market shares. The sector was further liberalized in 1999, and two new private firms entered. In transmission, two private firms were created in 1997 in a process realizing U.S.$90 million. These firms were subject to tariff regulations and quality controls. In oil and gas, three private firms were capitalized in 1997 at a value of U.S.$834 million. The discovery of new reserves subsequently multiplied previous reserves almost ten times between 1997 and 2000, and three more firms were privatized in 2000, realizing U.S.$125 million. These oil and gas firms are primarily oriented toward exporting to Brazil, so the privatizations in this sector are unlikely to have had much impact on domestic consumers. In telecommunications, the state monopoly firm ENTEL was capitalized in 1995 at a value of U.S.$610 million; entry was further liberalized in 2001. In transportation, the rail and air sectors were capitalized to the tune of U.S.$90 million in 1996–97. In all of these sectors, the private firms are subject to regulatory controls, and most appear to have

fulfilled their investment targets by mid-2000. Attempts to privatize water encountered greater difficulties, resulting in the proliferation of concessions for administration of state assets. Only one municipal firm was transferred to the private sector in 1997. A second attempted transfer of a municipal firm (in Cochabamba) failed. The Bolivian government was slow to develop the necessary legal framework in this sector, and the required legislation was finally approved only in 2000. Concession contracts were signed with existing municipal water firms in a number of cities; the contracts include a number of stipulations for expansion, internal efficiency, and quality goals. Tariff regulation was established under a rate-of-return mechanism with a five year regulatory lag, designed to permit the firm to comply with its contractual obligations.

Mexico undertook large-scale privatization of state-owned enterprises in a wide range of industries, including mining, manufacturing, and services. The first phase of the process lasted from 1982–88, while the second and more significant phase took place in 1988–94 during the Salinas administration. From 1982 to 1994, the number of state-owned enterprises fell from 1,155 to 219. Although a larger number of state-owned enterprises were privatized during the first phase, most of the large firms were privatized in the second phase. Approximately 96 percent of all assets privatized during 1982–94 were concentrated in the second phase. By 1992, almost the entire state-owned sector had been privatized, excluding oil, petrochemicals, gas, water, electricity, highways, railways, and ports. The telephone sector was privatized in 1990. Most of the utilities were privatized in a third phase, which started in 1994. Water and natural gas were privatized over the period 1993–98. The 1990s also witnessed ongoing privatization efforts in civil aviation and banks. The method of privatization in over 90 percent of the cases involved the sale of control rights or majority stakes through a first-price, sealed-bid auction. The proceeds during 1989–94 amounted to $23 billion and were used mainly to repay public debt. In the third phase (1994–2000), they amounted to $10 billion. The state-owned sector, which accounted for 4.4 percent of the labor force in 1982, shrank to 2 percent in the 1990s, such that the overall scale of the privatization process amounted to approximately 2.0–2.5 percent of the labor force. The largest employment implications arose in the railways, which halved employment from 46,000 in 1995 to 23,000 after privatization. La Porta and López-de-Silanes estimate that at most about 30 percent of the improved profitability of enterprises privatized in the second phase arose from the job layoffs.[12]

12. La Porta and López-de-Silanes (1999).

Nicaragua experienced a qualitatively different process of privatization, since it encompassed the transition from a socialist, war-ravaged economy. The first phase, 1991–96, involved divestment of state-owned enterprises in a large number of areas such as farming, fishing, industry, forestry, mining, commerce, trade, transport, construction, and tourism. A parallel process of allowing private participation in banking commenced in 1991, with closure or privatization of state-owned banks occurring between 1994 and 2000. The second phase, which commenced in 1995 and is still in process, included utilities and involved both entry of private firms and the awarding of concessions. Private participation has been allowed in electricity since 1997 and in telephones since 1995. A comprehensive reform package that was intended to lead to full privatization of utilities was implemented between 1995 and 1998, and privatization was slated for electricity distribution in 2000, telephones in 2001, and energy in 2002. Unfortunately, our data do not cover 2000 or later, so our analysis on the consumer side is restricted to estimating the effect of liberalization—rather than privatization—in the electricity sector. In the area of wage employment, however, we are able to provide a more detailed, economywide analysis of the impact of the privatization process on wage distribution, whereas analysis in the other countries is restricted to the utilities sector.

A total of 343 enterprises had been divested in Nicaragua by 1998. Aside from liquidation, three different methods of reorganization were used: mergers with existing firms (principally other state-owned enterprises), restitution to previous owners, and sale or lease. These accounted for 25 percent, 28 percent, and 36 percent of the proceeds, respectively, in 1991–96. The allocation of shares destined 13 percent to workers and 1.5 percent to war veterans. Use of the proceeds was characterized by a lack of fiscal transparency. Although the proceeds amounted to 2.5 percent of GDP every year during the first phase, they did not accrue to the government budget. Part of the proceeds were used to retire outstanding commercial debts of the concerned enterprises, and part to cover administrative expenses of CORNAP (the state agency responsible for implementing the privatizations). Many of the sales involved the transfer of credit and liabilities, creating further lack of transparency. The proceeds of the electricity privatization in 2000–02, in contrast, were large (approximately 4.9 percent of GDP in 2000) and relatively transparent (60 percent accrued to the government budget, while the rest was used to retire debt or settle tax arrears).

2. Evaluating the Welfare Impact on Consumers

Privatization of infrastructure can have a direct impact on consumers by altering their access to the network, the price they pay for the service, and the quality of the service received. Privatization may also have indirect consumer effects if it causes changes in the prices of substitute goods, which we do not attempt to measure here. This section describes the data available for examining the consumer impact, details the impact of privatization on access, price, and quality, and finally calculates the value or cost of these changes for consumers and the resulting consequences for poverty and inequality.

2.1 Data

Household surveys of income and expenditure from each of the four countries studied were used to measure the consumer impact of privatizing utilities.[13] These surveys enable measurement of access to electricity, water, and telephone at the household level, either through a direct question as to whether the household has a connection to the service or through observation of whether the household has positive expenditure on the service. The surveys report total household expenditure on each service, with no specific price information, so prices are obtained from a variety of other sources. Furthermore, only two surveys are available for Argentina and Nicaragua, and not many more for Mexico.[14] This severely restricts the extent to which the country studies could determine whether changes occurring over the privatization period differ from long-term trends. The surveys in Mexico and Nicaragua are nationwide, while only urban areas are surveyed in Argentina (Greater Buenos Aires) and Bolivia (nine departmental capitals and El Alto).

13. The surveys are the *Encuesta Nacional de Gastos de los Hogares (ENGH)* in Argentina for 1985–86 and 1996–97; the *Encuesta Integrada de Hogares (EIH)* for 1992, 1993, and 1994 and the *Encuesta Continua de Hogares (ECH)* for 1999 in Bolivia; the *Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH)* in Mexico for 1984, 1992, 1998, and 2000; and the *Encuesta Nacional de Hogares sobre Medición de Niveles de Vida (EMNV)* in Nicaragua for 1993 and 1998.

2.2 Access

There are several reasons to expect that access to utility services will improve with privatization. First, long waiting lists, such as a 2.5 year wait for a new phone connection in Mexico in 1990, are often testament to unsatisfied demand under public ownership. Second, many privatization agreements include government-mandated expansion of the network or universal service obligations. For example, Estache, Foster, and Wodon note that the Bolivian government awarded the water concession in La Paz and El Alto on the basis of bids for the number of new connections to be offered at a predetermined tariff level, while the water concession awarded in Greater Buenos Aires incorporated connection targets intended to increase coverage from 70 percent to 100 percent by the end of the contract period.[15] Finally, private firms may be more apt to innovate and develop new means to reduce the costs of network expansion.[16]

Table 2 shows that in all cases, privatization resulted in increases in access to infrastructure. A limitation of the household surveys is that for the most part, they only provide detail as to whether a given household uses a given service, not whether they have the option of connecting to the network if they so desire. For water and electricity in Bolivia, Mexico, and Nicaragua, the surveys directly consider physical usage of the service, while access to these services in Argentina and to telephone services in Bolivia and Mexico is determined by whether the household has positive telecommunications expenditure. The 1996–97 household expenditure survey in Argentina does provide this information, however, and average take-up is found to be 99.88 percent for electricity and 97.39 percent for water.[17] Relying on what the household is actually observed to be using to determine access should therefore represent a reasonable approximation. A further caveat is that the surveys do not provide information on illegal connections, so that we may be overestimating increases in access if some users merely switch from illegal to legal connections.[18]

[table 2 here]

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14. Surveys were taken more frequently in Bolivia, but the format and design vary somewhat in the years immediately following and preceding privatization.

15. Estache, Foster, and Wodon (2002).

16. See the examples given in Estache, Foster, and Wodon (2002, pp. 40–43).

17. Take-up rates among the poorest decile were 99.4 percent for electricity and 92.5 percent for water.

The distributional impact of this expansion in access depends heavily on initial levels of access. In general, expansion of the water and electricity networks tends to benefit the poor the most, since coverage of the richer deciles is already high. In Nicaragua, however, access to electricity was much lower to begin with than in either Bolivia or Argentina, such that the expansion of access benefited the top half of the per capita expenditure distribution more than the poor. In contrast, access to telephones has traditionally been quite low in Latin America, and the expansion in access has therefore been directed mainly toward the middle and top of the distribution. Some of the increase in access to telephony is due to the rapid expansion of cellular services, although the surveys do not distinguish the two types of service. The introduction of competition in cellular services was particularly important for access in Bolivia, because local fixed-line phone cooperatives charge individuals U.S.$1200–1500 for the fixed line, which is more than Bolivia's per capita income. The entrance of ENTEL-Móvil into cellular in 1996 prompted a price war with the incumbent firm, Telecel, and led to cellular access charges falling below U.S.$10. Cellular penetration increased from 0.27 subscribers per 100 inhabitants in 1996 to 6.96 per 100 in 2000, overtaking fixed-line penetration.[19]

Existing trends generally make it hard to determine exactly how much of the increases in access resulted from privatization. Table 3 separates increases in access from existing trends in Bolivia by comparing changes in access to water in La Paz and El Alto, where a private concession was put in place in 1997, with the country's other main cities of Santa Cruz and Cochabamba, which remained public. Access increased in both areas between 1992 and 1994, and again between 1994 and 1999. The difference-in-difference estimate, which compares the change in La Paz and El Alto with the change in the nonprivatized areas, is negative over the period 1992–94, showing that access was growing faster in the other cities, but was positive after the privatization. The resulting triple difference (the annual growth in La Paz and El Alto relative to other cities over 1994–99, less the relative annual growth over 1992–94) is positive for all but the bottom quintile, suggesting that privatization increased access to water relative both to the existing trend and to nonprivatized areas.[20] In Argentina, Galiani, Gertler, and

18. Nevertheless, a formal connection can be less hazardous to health, and it can be used by households as evidence of an address for obtaining state benefits, such that the switch from illegal to legal connection is of some benefit to households (see Estache, Foster, and Wodon, 2002, pp. 22–23, for further discussion).

19. Penetration rates are from ITU (2001).

20. Of course, since 100 percent is the maximum for access, growth rates in access should fall over time as access approaches full coverage. The triple difference should therefore give a lower bound of the privatization effect.

Schargrodsky use surveys from 1991 and 1997 to calculate the difference-in-difference for access to water between the privatized and nonprivatized areas; they find an increase in access in privatized municipalities.[21]

[table 3 here]

Privatization carries many potential public benefits beyond the private benefits of access to water, electricity, and telephones. Telecommunications services benefit from network externalities, whereby the value of having a telephone depends on how many other people are connected to the system. Expansion of access to telephones therefore benefits existing users as well as new users. Access to telephones can also foster trade networks and provide remote areas with enhanced connection to society. Expansion of access to electricity can have positive environmental implications if new users switch from burning wood and fossil fuels. Access to water can provide public health benefits by limiting the spread of disease. In Argentina, Galiani, Gertler, and Schargrodsky find that child mortality fell by five to nine percent in areas that privatized water, owing to a reduction in infectious and parasitic diseases.[22] While these public benefits and externalities are difficult to measure and are not included in our valuation of the consumer impact of privatization, they should be acknowledged when assessing the overall benefits of privatizing utility services.

2.3 Prices

The popular perception is that privatization tends to drive up the prices faced by consumers. The public enterprise may have been making a loss, such that the private owner has to raise prices to cover costs. Cross-subsidization of prices is also prevalent before privatization. In electricity, Millan, Lora, and Micco find that industrial users in Latin America were subsidizing residential customers prior to privatization, while in telecommunications, high long-distance rates often subsidize local calls.[23] Tariff rebalancing then serves to increase the prices paid by residential and poorer customers. On the other hand, there are reasons to expect that privatization may lower prices. Birdsall and Nellis note that if private management is more efficient, lower prices

21. Galiani, Gertler, and Schargrodsky (2002).
22. Galiani, Gertler, and Schargrodsky (2002).
23. Millan, Lora, and Micco (2001).

may result.[24] The net result often depends on the amount of competition and regulation the private firm faces. Price changes will also depend on whether the government awards the privatization contract on the basis of the highest bid (thereby maximizing government revenue) or on the lowest tariff bid (which results in lower consumer prices but less government revenue).

The household surveys used in this study do not collect information on the prices paid by individual households for infrastructure services, but only their expenditure. Consequently, the studies had to use aggregate price indexes at the city, state, or national level to assess the changes in prices after privatization.[25] Table 4 summarizes the overall price changes for the privatized industries considered in this study. The reported changes are clearly sensitive to the base year chosen; our approach is to use the prices prevailing in the same years as our surveys. In particular, the studies generally avoid basing these price changes on prices from years of high macroeconomic instability, such as 1995 in Mexico (the peso crisis) or 1988–89 in Argentina (hyperinflation). Further context is provided through figures detailing the evolution of prices. Figure 1 details the evolution of telephone and electricity prices in Argentina, figures 2 and 3 show electricity and water prices by city in Bolivia, and figure 4 depicts price indexes for a variety of telephone services in Mexico.

[table 4 and figures 1, 2, 3, and 4 here]

In the ten cases studied, prices fell in five and increased in the other five. Electricity prices increased in two out of the three countries with reforms. The price decrease in Argentina possibly reflected the fact that prior prices were high by international standards and privatization caused an increase in competition in electricity generation. Delfino and Casarin find electricity prices increased in Argentina, using only post-privatization price data through 1999.[26] Ennis and Pinto argue against using 1999 as a comparison point because of the deflation and macroeconomic instability beginning in Argentina at that time; they use 1996 instead.[27] Furthermore, Ennis and Pinto compare the price in 1996 with a preprivatization year, 1986, unlike Delfino and Casarin. We discuss the sensitivity of Ennis and Pinto's results to alternate measures of the price change when we evaluate the overall poverty and inequality impacts.

24. Birdsall and Nellis (2002).

25. Price information, unless noted otherwise, was provided by the national statistics agencies in Argentina (INDEC) and Bolivia (INE) and by the Banco de México in Mexico.

26. Delfino and Casarin (2001).

Telecommunications prices fell, on average, in Argentina and Bolivia, but rose in Mexico.[28] Regulatory problems and lack of competition prevented all prices from going down in Mexico, although connection charges fell by 75 percent between 1991 and 1998 and the prices of national and international long-distance calls fell by more than twenty percent after the introduction of competition in 1995. However, residential subscription rates increased 48 percent between 1992 and 1998, and local call per unit rates also rose. The increase in local call costs and reduction in long distance resulted from a requirement that Telmex remove cross-subsidies before the introduction of competition in long distance in 1997. An overall 8 percent decline in telephone prices in Bolivia masks a doubling of the minimum tariff in the city of Santa Cruz, where the local operative moved quickly to raise rates before price regulation was implemented.

The water concession in Buenos Aires lowered prices, and the addition of a universal service fixed fee to all users allowed the concessionaire to reduce access fees to one tenth of the previous level.[29] The successful water concession in La Paz and El Alto resulted in water prices increasing less than elsewhere in Bolivia. However, a second concession issued to Aguas de Tunari for the city of Cochabamba in 1999 resulted in tariffs increasing by an average of 43 percent for poor consumers, with some consumers experiencing a more than doubling of their bills.[30] Strikes and demonstrations resulted, followed by the declaration of martial law and eventual expulsion of the private firm. Heavily subsidized water prices in Mexico resulted in water prices increasing 9 percent in privatized areas relative to areas without privatization.

Thus although prices did increase in some instances, they decreased in many others following privatization. While technological advances (particularly in telecommunications) may be partially responsible for these decreases, the experience in Mexico suggests that such gains will not be realized without an appropriate regulatory framework.

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27. Ennis and Pinto (2002). The paper justifies their choice of comparison years and cites research by Urbiztondo, Artana, and Navajas (1998) that supports their assertion that prices fell.

28. In the case of Argentina, figure 1 shows that prices increased in 1990 in the run-up to privatization, but that this was followed by real price decreases.

29. Galiani, Gertler, and Schargrodsky (2002).

30. See Democracy Center, "Bechtel versus Bolivia: The Water Rate Hikes by Bechtel's Bolivian Company, Aguas del Tunari. The Real Numbers," (www.democracyctr.org/bechtel/waterbills/waterbills-global.htmw [20 August 2002]).

2.4 Quality

Estache, Foster, and Wodon remark that consumer concern with the low quality of service from state-owned utilities, especially in terms of service rationing and supply interruptions, is one of the reasons given for privatization.[31] Figure 5 graphs results from a 1992 consumer poll in Mexico City. A strong negative correlation of –0.55 is found between public support for privatization or private supply of a service and the perceived quality of that service. A 1991 poll in Buenos Aires found that 75 percent of respondents expected the quality of telephone service to improve with privatization, although over half of these thought the improvement would take three to five years to occur.[32]

[figure 5 here]

Improvements in service quality were not only expected with privatization, but in some cases mandated by the government as part of the conditions for sale of the public enterprise. For example, the privatization of electricity in Bolivia was accompanied by regulations that established a system for measuring quality, set out dates by which firms had to comply with the quality indicators, and determined financial penalties in the event of noncompliance.

The household expenditure surveys used in this study do not collect information on the quality of infrastructure services consumed, and information from other sources is scarce. In particular, preprivatization quality indicators are mostly unavailable for the countries studied here. This lack of data means it is not possible to formally measure the value to consumers of changes in quality.

Table 5 reports the changes in quality for which data are available. Privatization is seen to generally be followed by an improvement in quality, with less faults, better quality telephone lines, and shorter waiting times for service. In Mexico the waiting time for a telephone connection fell from 2.5 years in 1990, the year of privatization, to 72 days in 1995 and 30 days in 1997. Not all consumers agree that quality improved: a 1992 GEO poll indicates that 36 percent of Mexicans thought telephone service had worsened with privatization, while

31. Estache, Foster, and Wodon (2002).
32. The EQUAS Poll (LI034), February 1991, obtained from the Roper Center Latin American Databank.

a 1993 poll finds that one in four Mexicans wanted to jail the telephone company management because of poor service.[33] Nevertheless, the available data do indicate general improvements in quality following privatization.

[table 5 here]

2.5 Welfare Impact of Changes

The above discussion shows that privatization improved access to infrastructure, but had a mixed impact on prices, with both price increases and decreases observed. This section presents a methodology for valuing the joint effect of price and access changes on consumers.

Deaton shows that the simple, nonparametric estimation of Engel curves can be used to describe the average welfare effects of price changes on consumption.[34] Since essentially all consumers do not privately produce electricity, water, or telephone services, the budget shares of these services provide a first-order approximation of the relative welfare effect of a change in their price. Let x_0 be a household's initial total expenditure per capita, w_{j0} be their initial budget share on service j, p_j be the price of service j, and U be the household's utility. Banks, Blundell, and Lewbel then show that the first-order approximation to the change in utility is[35]

(1) $$\frac{\Delta U}{x_0} = -\left(\Delta \log p_j\right) w_{j0}$$. [comp: center all equations]

A change in the price of a service will have the greatest impact on consumers who devote a larger share of their total budget to that service. The approximation in equation 1 provides an upper bound on the loss to consumers of a price rise (or lower bound on the gain from a fall in price), as it assumes that consumers do not adjust the quantity they consume of a service when its price changes.[36] Banks, Blundell, and Lewbel therefore

33. GEO (1992). On the 1993 poll, see "Mexico Phone Monopoly at end of the line," *Houston Chronicle,* 13 August 1996.

34. Deaton (1989).

35. Banks, Blundell, and Lewbel (1996).

36. The assumption that quantity is fixed is made by Waddams Price and Hancock (1998), who analyze utility privatizations in the United Kingdom.

provide a second-order approximation to the change in welfare, which does allow some quantity response to the price change:[37]

$$(2) \qquad \frac{\Delta U}{x_0} = -\left(\Delta \log p_j\right) w_{j0}\left(1 + \frac{\Delta \log p_j}{2}\frac{\partial \log w_j}{\partial \log p_j}\right).$$

Computation of equation 2 requires estimating the elasticity, $\partial \log w_j / \partial \log p_j$. This term is estimated by γ_{jj}/w_{j0}, where the coefficient γ_{jj} is obtained from estimation of the Engel equation for household h.

$$(3) \qquad w_{hj} = \alpha_j + \sum_{i=1}^{k} \gamma_{ij} \log p_i + \beta_j \log \frac{x_h}{n_h} + \phi_j \left(\log \frac{x_h}{n_h}\right)^2 + \lambda_j' Z_h .$$

Here, n_h is the number of members in household h, Z_h contains other demographic control variables, and p_i for $i \neq j$ is the price of good i. In much of our empirical work, the time periods and cross-sectional information are insufficient to allow the prices of substitute goods to be included. This lack of sufficient price variation also precludes estimating a complete demand system to calculate welfare changes, as Wolak does.[38]

These first- and second-order approximations can be used to measure the change in welfare arising from price changes associated with privatization for consumers who had access to the privatized service both before and after privatization.[39] For consumers who do not have access either before or after privatization, there is no direct welfare change of a change in the price of the privatized good, and if privatization causes a change in the price of substitute goods, this can also be valued using the first- and second-order approximations. This leaves the group of consumers who gained access to the service following privatization.[40] To value their change in welfare from privatization, we use the concept of a virtual price that was pioneered by Neary and Roberts to examine household behavior under rationing.[41] In our context, the virtual price of the privatized service is the lowest price under which a household would have chosen to consume zero units of the service prior to privatization if they had had access to the service in question. Given this virtual price, the welfare change from privatization is then

37. Banks, Blundell, and Lewbel (1996).

38. Wolak (1996).

39. The approach could also be easily modified to incorporate welfare gains from quality improvements by using quality-adjusted prices, if sufficient data on quality were available.

40. We make the empirically plausible assumption that no consumers lost access to the service as a result of privatization. Prices may have risen enough that some users now choose to consume zero quantity, but the option of paying for the privatized service remains.

calculated using equations 1 and 2, with the change in price being from the virtual price to the post-privatization price and using the post-privatization expenditure share, w_{j1}, and total expenditure, x_1, in place of their preprivatization counterparts as reference points.[42]

The virtual price, p_v, is obtained from the estimated Engel equation 3 as the price for which the estimated expenditure share is zero. This virtual price will differ across households according to their total expenditure and demographic characteristics—some households are more able or willing to pay for access to the utility service than others. A potential concern is that equation 3 is only estimated for households that have access to the service, so it will result in inconsistent parameter estimates if omitted variables correlated with access also influence demand patterns. We therefore carry out Heckman's two-step selection correction, first using a probit to estimate the probability of access and then adding the inverse Mills ratio obtained from this step to equation 3.[43]

The method outlined above could be applied directly in the case of Nicaragua to assess welfare changes from privatizing electricity, since the 1998 LSMS survey from this country enables one to tell whether a given household had access both in 1993 and 1998.[44] The three other country studies are faced with the complication that the household surveys are repeated cross-sections, rather than a panel. This means that a given household is interviewed only once, either prior to or after the privatization of services, and so it is only possible to identify whether the household has access in the year of the survey. Appendix B outlines how the method described thus far is adapted to calculate welfare changes when the surveys contain a different sample of individuals each year.

The budget share allocated to each infrastructure category provides a first-order approximation of which households are most affected by price changes. Table 6 gives mean budget shares by expenditure per capita decile. The mean budget shares capture the joint effect of differences in access across groups (those with no access have zero budget share) and income elasticities across those with access. The result is that not all budget shares decrease with total expenditure. Taking mean budget shares only across households with access, we find that water and electricity are necessities (that is, budget shares decline as income increases) in Argentina, Bolivia, and Mexico, while telephone services are a luxury in Bolivia but a necessity in Argentina and Mexico. Price

41. Neary and Roberts (1980).

42. A change in access has no value if one uses the preprivatization reference point, since the expenditure share w_{j0} is zero in this case.

43. Heckman (1979).

44. The 1998 LSMS survey asks whether electricity service has been installed since 1993.

changes in water and electricity will therefore tend to have the greatest impact on the poor, except in Nicaragua, where low access to electricity means that less of the poor are subject to price changes. In contrast, as telephone services constitute a higher fraction of the total budget of richer households, telephone price changes will affect the upper deciles more than they will for the poor. In most cases, however, each infrastructure service constitutes only 1–3 percent of the total household budget, so even large price changes should not have dramatic effects.

[table 6 here]

The joint welfare effect of access changes and price changes obtained by the various country studies (except Mexico) is presented in tables 7, 8, and 9, using the methodology outlined above in equations 1 through 3. For electricity reform in Nicaragua, table 7 presents the effects separately for households that always had access and households that gained access. The increase in price clearly had a negative impact on households that already had access, although as budget shares allocated to electricity are low, the welfare loss to these households is less than one percent of their per capita expenditure. In contrast, the value of gaining access can be much larger, reaching 16 percent of per capita expenditure for the lowest deciles. The overall effect on a decile therefore depends on the number of households who gain access relative to those with existing access. In Nicaragua, deciles 2 through 6 experienced small gains in welfare, while the other deciles saw small welfare losses. In Bolivia (table 8), Barja, McKenzie, and Urquiola estimate that the welfare increase from gaining access to electricity exceeded one hundred percent for the lowest deciles.[45] Thus although prices rose, the overall effect was positive for all but the top decile.

[tables 7, 8, and 9 here]

Since prices fell in Argentina, Ennis and Pinto find that the welfare effects were positive for all deciles for both electricity and telephone (see table 9).[46] Electricity privatization benefited the poorer deciles relatively more, with an average effect of 2–3 percent of per capita expenditure for the lowest three deciles, whereas telephone privatization had the most benefit for the middle class. As mentioned previously, Delfino and Casarin suggest that electricity prices rose rather than fell with privatization.[47] Using Ennis and Pinto's results, we estimate what the increase in price would need to be to generate a negative overall welfare impact, given the increase in access that

45. Barja, McKenzie, and Urquiola (2002).
46. Ennis and Pinto (2002).
47. Delfino and Casarin (2001).

took place.[48] Prices would need to have risen 32 percent for the welfare impact to be negative for the first decile, and price rises of over 60 percent would be necessary for the second and third deciles to have overall negative welfare effects. Delfino and Casarin report a 38 percent increase in prices for the poor and a 10 percent decrease in price for consumers with consumption above 150KwH, which must be seen as a maximum possible price increase stemming from privatization because of the deflation in 1998–99. Such a price increase would still imply overall positive welfare effects for the top nine deciles and a welfare loss of 0.01 percent of per capita expenditure for the poorest decile. Thus the welfare impact is most likely positive, on average.

The benefits of telephone privatization were also highest among the middle class in Bolivia, as increases in access were greatest for this group, with deciles 5 to 7 receiving overall gains of 5–6 percent of per capita expenditure (see table 8). For the water concession in La Paz and El Alto, we present results under two scenarios: the first assumes that all of the increases in access are due to privatization, while the second only values the increase in access in La Paz and El Alto relative to other main cities. The effect is positive in both cases, but lower under the second scenario. The benefits of water privatization are relatively larger for the poorer deciles in Bolivia, since increases in access were greatest for this decile. The poorest decile benefited by 7 percent of per capita expenditure from the increase in access, although perhaps only a gain of 1.5 percent is attributable to privatization.

The failed concession in Cochabamba, Bolivia, resulted in large increases in average water tariffs. Prices for the poorest consumers, for whom water usage consisted of only an indoor toilet and outside water tap, rose 43 percent on average. The middle class experienced average price increases of 57 percent and commercial users experienced price increases of 59 percent.[49] The short-lived nature of the privatization meant that the expansions in the water-network agreed on under the concession contract were not realized, and consumers clearly experienced immediate welfare losses from these price increases. Nevertheless, our estimates of the average welfare losses are not nearly as large as press reports suggest: Finnegan reports in the *New Yorker* that "ordinary workers now had water bills that amounted to a quarter of their monthly income."[50] In contrast, in table 8, our estimated average cost of a 43 percent price rise is at most one percent of per capita household expenditure. The

48. Ennis and Pinto (2002).

49. See Democracy Center, "Bechtel versus Bolivia: The Water Rate Hikes by Bechtel's Bolivian Company, Aguas del Tunari. The Real Numbers," (www.democracyctr.org/bechtel/waterbills/waterbills-global.htmw [20 August 2002]).

maximum expenditure share on water observed in Cochabamba in the 1999 household survey was 10.5 percent, with an average expenditure share of 1.6 percent and with the 95th percentile at 5.4 percent. For most households, then, expenditure shares were simply too low for even a doubling of price to result in the water bill reaching a quarter of income. The numbers reported in the press represent the maximum possible impact on a very limited number of consumers, whereas the average consumer had much smaller welfare losses.

2.6 Poverty and Inequality

The consumer welfare changes are a household-level money metric of the change in welfare if one assumes there are no income effects.[51] To evaluate the impact of privatization on inequality, the country studies first calculate the preprivatization Gini coefficient and Atkinson inequality indices. They then take the preprivatization household per capita expenditures, for each household add the estimated per capita change in consumer welfare, and recalculate the inequality measures taking account of the consumer impact of privatization. The use of repeated cross-sectional surveys again entails complications associated with not being able to identify the specific households that gained access to the privatized service; appendix C details the adjustments needed with this data.

One popular approach to poverty measurement is that of unified basic needs measures, which are based directly on the availability of and access to certain essential services.[52] Access to piped water and electricity are often included in these essential services, in which case the increases in access detailed in table 2 would directly improve poverty measures.

Other measures of poverty are based on household income or expenditure. With these measures, the same approach as for inequality can be used to evaluate the consumer impact of privatization on poverty. The Foster, Greer, and Thorbecke poverty measures are calculated before privatization and then again after adjusting for welfare changes, according to the following formula:[53]

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50. William Finnegan, "Letter from Bolivia: Leasing the Rain," *New Yorker,* 8 April 2002.
51. Banks, Blundell, and Lewbel (1996).
52. See World Bank (1996), for example.
53. Foster, Greer, and Thorbecke (1984).

$$(4) \qquad P_\alpha = \frac{1}{N}\sum_{i=1}^{N}\left(1-\frac{x_i}{z}\right)^\alpha 1(x_i \le z),$$

where z is the poverty line, x_i is household expenditure per capita for household i, N is the total number of households, and the parameter α is zero for a headcount measure of poverty, one for the poverty gap ratio, and two for a poverty measure that is sensitive to the distribution among the poor.

The overall results of the effects of privatization on inequality and poverty among consumers obtained by the different countries (except Mexico) are given in table 10. The privatizations of electricity and telephones in Argentina reduced inequality by a very small amount and reduced headcount measures of poverty by 1.0–1.5 percent. The poor in Argentina benefited from both increases in access to utilities and a reduction in prices. Privatization of electricity and water in Bolivia had very similar effects, reducing inequality slightly and poverty by 1.0–1.5 percent. The failed water privatization in Cochabamba is estimated to have increased poverty by two percent and to have had little impact on inequality. The privatization of telephone services in Bolivia had a larger effect, namely, to increase inequality because the increases in access were largest for the middle deciles. However, the privatization is estimated to have resulted in five to six percent fewer households falling below the poverty line. Bolivia has a very high level of poverty, and even households in the fifth and sixth deciles lie below the poverty line.[54] The electricity reforms in Nicaragua had essentially no impact on poverty and inequality, with the increases in price counteracting the improvements in access.

[table 10 here]

The overall findings that emerge from table 10 are, first, that privatization generally has a very small effect on inequality, with the change in the Gini coefficient from privatization being 0.02 or less. Second, in all but one of the cases examined here, privatization either reduced poverty or had no effect on it. That is, the popular perception that privatization is responsible for large increases in inequality and is particularly harsh on the poor is not borne out by the cases considered here.

54. The poverty line used is taken from World Bank (1996); it is an overall urban poverty line of 219.9 Bolivianos per person per month in August 1993. Use of city-specific poverty lines is likely to reduce the measured headcount poverty to around 0.52–0.54, but this change would have little effect on the counterfactual comparisons.

3. Effects on Workers

For a representative worker of any given category (defined, for instance, by skill, sector of employment, age, and gender), the economic rent or surplus would depend on the wage rate and levels of employment applicable to that category. An evaluation of the implications of privatization on income distribution must therefore include effects on wage rates and employment. The latter would ideally include job layoffs, changes in hours worked, and changes in tenure (that is, the duration of employment relationships, which would affect the level of economic insecurity, search costs, and investments in firm-specific relationships). The distributive impact of privatization requires us to assess effects on both (a) average levels of these variables across the entire population of workers, insofar as this pertains to the functional distribution of income between labor and capital, and (b) the distribution of these impacts across different categories of workers, in order to assess the effect on earnings distributions. The data used for these evaluations is based on either employment or household surveys, which are subject to severe limitations. Our assessment of wage-employment effects is therefore piecemeal in nature, whereby the available data on different dimensions are evaluated separately at different levels of precision. In particular, the data do not permit any comprehensive assessment of the distributional impact across different categories or income classes analogous to our analysis on the consumer side.

3.1 Employment Effects

The main issue here concerns the impact of privatization on job layoffs. These are typically widely advertised and involve large income changes for those laid off, at least in the short run. Direct data on layoffs are not available for any of the privatized enterprises. Instead, the authors of the country studies collected data on employment levels directly from most of the privatized utilities in Argentina, Bolivia, and Mexico: these data are supplemented by household and employment surveys for select years at different stages of the privatization process. The discussion in this section therefore excludes Nicaragua, where the very large number of privatized enterprises precluded collecting data on firm-level employment levels.

We assume that all employment reductions correspond to layoffs, as we only observe net changes in employment and are unable to distinguish quits or voluntary retirements from layoffs, or determine if larger layoffs are offset somewhat by new hires. We thus use the terms employment reductions and layoffs interchangeably. In what follows, we summarize the evidence from the country studies concerning employment reductions following the privatization, both in absolute numbers and relative to preexisting levels of employment in these enterprises. One can also estimate the significance of layoffs relative to the overall labor force in the economy and to changes in unemployment occurring at that time. Upper bounds to the impact of the layoffs on inequality and poverty are available in the case of Argentina; such estimates may become available later for some of the other countries, as well.

In Argentina, Ennis and Pinto report that the privatized enterprises were subject to a very significant number of job losses: employment fell by about 75 percent, down from 223,000 jobs to 73,000 between 1987–90 and 1997.[55] Most of these losses were concentrated in the greater Buenos Aires area, where the total labor force is approximately 4.2 million. Since the privatized enterprises tended to be quite capital-intensive, the proportion of the labor force that was affected was not very high, on the order of no more than 2 percent of the aggregate labor force (and 3.5 percent of the labor force in the greater Buenos Aires area).

The 1990s were a period of rising unemployment in Argentina, with the urban unemployment rate growing from 7.6 percent in 1989 to 9.6 percent in 1993 and 17.4 percent in 1995, and falling somewhat thereafter to 14.9 percent in 1997. The 150,000 jobs eliminated by the privatized enterprises in the utilities (electricity, natural gas, water, telecommunications, airlines, and railways) and oil between 1987–90 and 1997 are estimated to have constituted 13 percent of the increased unemployment in the economy. This substantially exceeds the proportion of the economywide labor force originally employed in this sector (7 percent for private and public enterprises combined during 1987–90). Hence, the employment cutbacks in the privatized enterprises were greater than those occurring elsewhere in the economy, suggesting that the privatization process itself increased unemployment over and above the effect of general macroeconomic shocks to the economy.

Most of the cutbacks were concentrated in the railway industry, where employment fell from 92,000 jobs in 1987–90 to 17,000 in 1997, which alone accounted for 6.6 percent of the increased unemployment in the

55. Ennis and Pinto (2002).

economy during this period. The cutbacks were far smaller in the other sectors: 2.57 percent of the increased unemployment is accounted for by cutbacks in the oil sector, and less than 1.5 percent in each of the other sectors. Electricity, telecommunications, water, and gas together generated only 3.6 percent of the added unemployment.

The effect of the layoffs on income distribution cannot be estimated without knowing the subsequent job experience of the laid-off workers or of the nature of unemployment benefits. Ennis and Pinto use employment surveys to estimate an upper bound to the impact of these job reductions by assuming that all laid-off workers earned zero income. Alternatively, this can be interpreted as the short-run impact if most of the laid-off workers were unemployed in the year of the privatization with no fiscal assistance in the form of severance packages or unemployment benefits. For 1989—the year immediately preceding privatization—replacing actual incomes reported by a randomly selected set of workers in the privatized sectors (whose proportion equals the proportion of job contractions in those sectors) increased the Gini coefficient of the earnings distribution from 0.5375 to 0.5545, that is, by about 3 percent. Not surprisingly, the effect on the proportion below the poverty line is somewhat larger: it increased from 29.47 percent to 31.95 percent, or about 8 percent.[56]

Some of the workers who lost jobs in the privatized enterprises might subsequently have been rehired elsewhere in the private sector. There are numerous anecdotal reports of employees in the vertically integrated state-owned enterprises who left at the time of privatization to join smaller private enterprises that entered into subcontracting relationships with the privatized enterprises. A lower bound to the extent of such rehiring can be estimated by focusing only on employment in the sectors in which privatization occurred (that is, ignoring laid-off employees who may have found new jobs in other sectors). The employment surveys allow Ennis and Pinto to estimate the proportion of the Argentine labor force accounted for by the sectors in which privatization occurred over successive years (aggregating across public and private enterprises).[57] This proportion declined from 7.32 percent in 1989 to 5.14 percent in 1992, owing to contractions in both the state-owned enterprises (from 1.95 percent to 0.58 percent) and the private sector (from 5.37 percent to 4.56 percent). After this, however, private sector employment grew to almost 7 percent in 1994, and it stayed at that level during 1996 and 1997. The share of these sectors in the economywide labor force thus recovered to nearly its former level (7.06 percent in 1997 versus 7.32 percent in 1989). This suggests that the overall employment contractions in the privatized sectors over

[56] Ennis and Pinto (2002).

a longer time horizon (four years after privatization, rather than two) were similar to those occurring in other sectors of the economy. In other words, after controlling for macroeconomic changes, expanded employment in the private sector eventually absorbed most of the workers laid off in the privatized enterprises.[58] Under this interpretation, the income losses arising from the layoffs were transitory, lasting a maximum of three years following the privatization. The inequality effects on long-run income distribution therefore seem negligible, as even the 3 percent increase in the Gini calculated for the year of the privatization would largely disappear by 1994.

An analysis of the distribution of the employment reductions in the privatized enterprises by skill level reveals that the cutbacks were greater for less skilled employees, but the extent to which this was so seems similar to the changes in skill bias occurring in other sectors of the economy. Tenure declined disproportionately in the privatized sector, however, with duration of employment declining almost 70 percent between 1989–95 (from an average of 194 months to 57 months), as opposed to a decline from an average of 96 months to 70 months for the labor force at large. Average hours worked increased, which reflects the general trend in these sectors for privately employed workers to work more, on average, than employees of state-owned enterprises (55 hours per week versus about 45 hours).

In Bolivia the extent of privatization was much narrower than Argentina, as described earlier in the paper. Information about the employment effects of the water concessions was unavailable, so Barja, McKenzie, and Urquiola focus on the electricity and telecommunications privatizations.[59] These two sectors represented less than 0.5 percent of the economy's labor force prior to the privatization (approximately 5,800 jobs out of 1.3 million employed in the capital cities). They are thus unlikely to have exerted a significant impact on economywide employment or wage levels.

Within the privatized enterprises, employment levels contracted. In electricity generation, the state firm ENDE split into three privatized enterprises, besides leaving an ENDE residual. While data for the residual firm are unavailable, the three privatized enterprises together employed 180 workers, as against 540 workers in ENDE prior to the privatization. In electricity transmission, data limitations prevent us from obtaining a complete

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57. Ennis and Pinto (2002).

58. The rise in private sector employment could also have been accounted for employees shifting in from other sectors or new entrants to the labor force, rather than reemployment of workers displaced from the public sector.

picture, but we establish an upper bound of job losses to the tune of 15–20 percent between 1995 and 1997. In telecommunications, employment in the long-distance segment of ENTEL rose from 1,745 in 1995 to over 2,000 in 1997 (which probably reflects the growth of the new cellular business), and fell steadily thereafter to about 1,000 by 2000. In the local segment, the number of jobs dropped from about 2,000 in 1995–96 to 1,600 in 2000. The aggregate change in these two sectors was a drop of about 1,700 jobs, implying a job contraction rate of about 30 percent within the privatized enterprises in the five years following privatization.

As a fraction of the total labor force in the capital cities, the job losses in these two sectors seem miniscule: about 0.13 percent, or one out of every 1,000 jobs. This stands in contrast to Argentina, where the job losses amounted to 3.5 percent of the labor force in the greater Buenos Aires area, or thirty-five out of every 1,000 jobs. What about the significance of the job losses as a proportion of changes in unemployment? Data on unemployment rates in the economy as a whole reveal a rise from 3 percent in 1995 to 4.43 percent in 1997, and then to 7.5 percent in 2000. Assuming that the unemployment rates in the capital cities was similar to that in the rest of the economy (an assumption which is borne out for the last year, 1995, for which data on unemployment rates in capital cities are available) and using the estimated size of the labor force in the capital cities (1.3 million in 1995), Barja, McKenzie, and Urquiola estimate 58,000 job losses in the economy as a whole between 1995 and 2000.[60] The job losses in the electricity and telecommunications sectors thus amounted to approximately 3 percent of the aggregate job losses in the capital cities. This is comparable to the corresponding contributions of these two sectors in Argentina, and it is substantially higher than the proportion of the labor force originally accounted for by these sectors. In other words, privatization per se seems to have had an employment contracting effect even after correcting for overall macroeconomic shocks to the economy, but this effect was quite small—just as in the case of Argentina.

No further details are available about the likely effect of these layoffs on income distribution, tenure, hours worked, or skill distribution of the workforce. The relatively small scale of the employment cutbacks in these sectors relative to the rest of the economy suggests that these effects are unlikely to be significant.

The impact of privatization on employment in Mexico is intermediate between Argentina and Bolivia. López-Calva and Rosellón report that state-owned enterprises employed over 4 percent of the economy's

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59. Barja, McKenzie, and Urquiola (2002).

workforce in 1983 when privatization started; this dropped to slightly below 2 percent by 1993–94.[61] The fraction of the labor force involved in enterprises undergoing privatization in the first two phases was thus on the order of 2 percent of the entire workforce. The fraction of the workforce laid off in these enterprises during these two phases was around 50 percent, according to firm-based surveys reported in La Porta and López-de-Silanes for both white-collar and blue-collar workers.[62] The employment declines started prior to the actual dates of privatization and were accentuated in the subsequent two or three years. Hence the fraction of job losses occurring in a four-year window around the privatizations amounted to about 1 percent of the economy's work force, or ten jobs out of every 1,000 compared with one in Bolivia and thirty-five in Argentina.

In contrast to the other two countries, however, unemployment in the economy as a whole fell during the first two phases of privatization. The open (urban) unemployment rate decreased from 5 percent in 1985 to 4 percent in 1994. If this rate is applied to the entire economy, it is comparable to the rate of job loss in the privatized enterprises, suggesting that in the absence of privatization the drop in the unemployment rate would have doubled.

The rotating panel feature of the employment surveys in Mexico permits López-Calva and Rosellón to follow the job experience of the workers who were laid off from the state-owned enterprises for one subsequent year.[63] Approximately 45–50 percent of those laid off found jobs within the same sector within a year, without loss of social security or health benefits. This suggests that even the short-term impact of the job losses is approximately half the figure given above: that is, about five workers out of 1,000 were unemployed for a full year following the privatization. Furthermore, some of these remaining workers would have gone into the informal sector or self-employment, sectors whose importance grew within the labor market (together accounting for 49 percent of the labor force in 1980 and 60 percent in 1996).

To summarize the main points of the discussion above, the proportion of the labor force involved was small, ranging from a low of 0.13 percent in Bolivia to 2 percent in Argentina; the cutbacks were large within the privatized enterprises themselves, ranging between 30 percent in Bolivia to 75 percent in Argentina; and their impact on unemployment was larger than that of other sectors of the economy. In the two countries where the

60. Barja, McKenzie, and Urquiola (2002).
61. López-Calva and Rosellón (2002).
62. La Porta and López-de-Silanes (1999).

cutbacks were largest (Argentina and Mexico), a significant fraction of the laid-off workers were eventually reemployed within the same sector (45–50 percent within one year in Mexico and 80–90 percent within four years in Argentina).

3.2 Wage Effects

In Argentina, Ennis and Pinto find that average (real) wages rose by 50–60 percent in both private and public sectors between 1989-95, reflecting recovery owing to macroeconomic stabilization.[64] The impact of privatization on wages, however, depends on the difference in average wage levels in the two sectors. Public sector wage rates were higher, on average, by about 10 percent in 1989 and 16 percent in 1995. The labor reallocation created by the privatization represented a downward effect on the average wage rate for the workforce as a whole. This effect is unlikely to be significant, however, given that only 2 percent of the workforce was shifted in this manner. Moreover, average hours worked increased by about 25 percent for the workers who shifted sectors, which more than outweighed the drop in the wage rate. Consequently the effect on average wage income was positive for the representative employed worker.

The effect of the reallocation on economywide wage inequality is complicated because of two counteracting effects. On the one hand, greater wage inequality within the private sector compared with the public sector exposed the transferred workers to greater wage dispersion. On the other hand, the deviation between the average public sector wage rate and the mean wage in the economy was greater than the corresponding deviation between the average private sector wage and economywide wage rate, so the transferred workers moved closer to the economywide average.[65] The former effect dominated in the case of Argentina, irrespective of the year chosen as the base. Hence, the labor reallocation did increase wage inequality, but again the extent of this effect is unlikely to be significant given the small proportion of workers transferred across the sectors.

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63. López-Calva and Rosellón (2002).
64. Ennis and Pinto (2002).
65. The economywide variance equals the weighted sum of within-group variances, added to the variance of the two group means from the economywide mean, with the employment shares of the two sectors acting as weights. Hence, the effect of a change in the employment shares is the sum of two effects: the difference in within-group variances and the difference in variance of group means from the economywide mean.

The Gini coefficient of the wage rate fell 16 percent between 1989 and 1995. This was essentially due to a drop in inequality in both the public and private sectors. Based on the argument above, it would appear that it would have fallen even faster in the absence of privatization, but the extent of the difference caused would probably have been negligible. The fall in inequality within each sector was similar to the economywide fall: 14 and 17 percent, respectively. The within-group changes are thus likely to override the effects of the labor reallocation caused by privatization. Unfortunately, analyzing the role that privatization may have played in reducing inequality within each sector requires more detailed data on intrafirm wage distributions than are hitherto available for Argentina.

No information is available concerning the wage effects of privatization in Bolivia. In Mexico, La Porta and López-de-Silanes use intrafirm data to show that wage rates rose in privatized enterprises after privatization, mainly because of rises in worker productivity.[66] The contrast to the general stagnation of wage rates in the economy in 1983–94 is striking. Even more surprising is the fact that the rise in wage rates was significantly higher for blue-collar workers than for white-collar workers (approximately 122 percent versus 77 percent in the same period). This suggests that privatization per se reduced wage inequality within the privatized enterprises. The full impact, of course, includes the effect of the labor reallocation between public and private sectors (that is, the wage implications for those who lost their jobs in the privatized enterprises and were subsequently hired elsewhere in the private sector). The rotating panel analysis carried out by López-Calva and Rosellón indicates that those who left the privatized enterprises lost in terms of a lower wage rate when they were reemployed, but they protected their incomes by working longer hours.[67] On the other hand, most of them lost access to health and social security benefits. This must be counterbalanced against the trends in within-sector wage dispersions.

The extent of labor reallocation resulting from the privatization process was substantially larger in Nicaragua. The private sector share in the labor force rose from 77 percent to 86 percent in urban areas between 1993 and 1998 and from 89 percent to 96 percent in rural areas between 1993 and 1999. The fraction of the overall labor force reallocated is thus at least 7–9 percent, and probably even greater if the entire period of privatization is taken into account. This reflects the fact that the process involved a transition from an erstwhile socialist economy. Given the large number of privatized enterprises, it was not feasible for Freije and Rivas to

66. La Porta and López-de-Silanes (1999)

obtain intrafirm data on wages and employment.[68] They therefore rely on household surveys carried out in 1993 and 1998–99.

As is the typical pattern, the average wage in the public sector tended to be above that in the private sector, such that the labor reallocation lowered the average wage in the economy. The difference was large and growing in the rural sector: average wages in the public sector were 29 percent higher than in the private sector in 1993 and 59 percent higher in 1998. In the urban sector, the differential was 20 percent in 1999 and negligible in 1993.[69] Wage rates rose in the urban sector and fell sharply in the rural sector within both private and public employment. Hence, the privatization process is likely to have significantly accentuated the downward drift in the average rural wage.

The effect on wage inequality is particularly complicated in the case of Nicaragua, where the choice of sector, base year, and units matters. Freije and Rivas find that the ordering of variances and means in the public and private sectors depends on whether the urban or rural sector is considered, whether the base or final year is chosen for comparison, and whether the wage or the log of the wage is chosen as the unit.[70] Since the lognormal distribution is usually a better approximation than a normal distribution to distributional data, it perhaps makes sense to focus on the log of the wage rate as the relevant unit. In that case, wage dispersion is uniformly higher in private versus public employment, with the difference especially pronounced in the rural sector. This effect contributes to increased inequality stemming from the labor reallocation. On the other hand, the transferred workers moved closer to the economywide average wage, which tends to reduce inequality. In the rural sector, the balance between the two effects depends on whether base year or final year weights are chosen. If final year weights are chosen, the overall effect on rural wage inequality is negative, but it is positive if base year weights are chosen. In the urban sector, the effect is positive in both cases, but the magnitude of the effect is sensitive to choice of the base year. It is thus difficult to make any simple inference about the overall effect of the labor reallocation on wage inequality.

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67. López-Calva and Rosellón (2002).
68. Freije and Rivas (2002).
69. In fact, the arithmetic mean of the wage rate was slightly lower in the public sector, while the geometric mean was slightly higher in 1993.
70. Freije and Rivas (2002).

Wage dispersion within the public sector rose in both urban and rural areas. This was especially sharp in the urban sector, where the variance of the log wage within the public sector rose from 0.501 in 1993 to 0.736 in 1999. This seems to reflect a process of convergence of wage structures in the public sector to those in the private sector. In particular, wages paid to managerial and professional employees in the public sector saw steep increases, bringing them toward parity with private sector wages for these categories. Wages for clerical workers, salesmen, and manual workers changed little, however. It is therefore plausible that wage structures within the public sector were responding to market pressures at the upper end, causing inequality within the public sector to grow. Freije and Rivas perform a decomposition analysis of the wage structure in the two sectors following Juhn, Murphy, and Pierce; the exercise confirms the validity of this hypothesis, even after controlling for a range of worker characteristics that affect wages, such as age, gender, schooling, employment sector, and nature of position held.[71] Specifically, the convergence of public sector wage structures to the private sector at the upper end tend to explain one-third of the rise of the variance of log wages in the urban sector, a proportion that was reasonably robust across choice of inequality measure (such as generalized entropy measures or Atkinson indices corresponding to differing degrees of inequality aversion). This effect is not related to the privatization process per se, but rather to increasing market pressures on wage structures within the public sector. The dominant source of upward pressure on inequality (which far outweighs the effect of changing wage structures within the public sector) was the rise in sensitivity of market wages to worker characteristics, which is not surprising in a transition economy.[72] Compared with these changes, the contribution of the privatization process and the changes in public sector wage structures appear modest.

To summarize the experiences of the different countries (excluding Bolivia, where data are not available and where, in any case, the wage employment impact would likely be negligible), the overall labor reallocation associated with the privatization was significant in Nicaragua, but not in Argentina and Mexico; the reallocation tended to lower the average wage, since public sector wages tend to be higher, on average, than private sector wages; the effect of the reallocation on wage inequality is complicated owing to a set of opposing effects, with no

71. Freije and Rivas (2002); Juhn, Murphy, and Pierce (1993).

72. The contribution of the increased sensitivity of wages to worker characteristics typically constitutes between 130–250 percent of the change in overall wage inequality in the urban sector between 1993 and 1999, in contrast to a contribution of 33–60 percent of changed wage structures in the public sector and 16–76 percent of the labor reallocation arising from the privatization.

simple pattern emerging across different countries; these effects are likely to have been dominated by changes in wage inequality within the public and private sector; and within-sector inequality fell in Argentina during the privatization period (for reasons that are not yet well understood), within-firm inequality fell in the privatized enterprises in Mexico (partly owing to the privatization process), and within-sector inequality rose significantly in Nicaragua (probably owing to increasing market pressures associated with the transition process).

4. Fiscal Effects

Privatization can have important fiscal consequences, although their distributive impact is less visible and difficult to estimate. They could be just as important, however, as the direct impact on consumers and workers. There are at least two relevant channels of impact. First, the proceeds from the privatization can be large, and they may be used to retire public debt or reduce fiscal deficits. They can thus serve as useful accompaniments to macroeconomic stabilization programs aimed at reducing inflation and future debt burdens. The inflation tax often falls disproportionately on the poor, while reductions in debt service burdens can free up resources for social spending programs (such as old age pensions, public schooling or health clinics). Second, many state-owned enterprises incur operating losses funded by subsidies from the fiscal budget. Privatization often leads to elimination of these losses, and profitable private enterprises contribute tax revenues instead of absorbing public subsidies. We now review the evidence from the four country studies concerning these fiscal effects.

In Argentina, the privatization proceeds were considerable: U.S.$19 billion at the federal level and U.S.$4 billion at the provincial level. Of this, U.S.$10 billion was used to reduce the public debt, with U.S.$6.7 billion coming from the telecommunications privatization in 1990 and U.S.$2.7 billion from the electricity and natural gas privatization in 1992. This amounted to about one-eighth of the public debt at that time, which fell from U.S.$78.9 billion in 1990 to U.S.$69.6 billion in 1993. Interest payments on debt fell from 2.98 percent of GDP in 1989 to 1.70 percent in 1993 and 1.61 percent in 1994. Since the early 1980s, social spending programs have tended to be negatively correlated with debt service payments; following this general pattern, social spending increased by an almost equivalent amount, from 17.63 percent of GDP in 1989 to 19.24 percent in 1994. The fiscal deficit dropped from 3.8 percent of GDP in 1989 to 0.1 percent in 1994 and 0.5 percent in 1995, partly a

result of the additional U.S.$13 billion privatization proceeds in the form of cash. It is, of course, almost impossible to disentangle the specific contribution of the privatization proceeds to the general macroeconomic stabilization in the economy that occurred during this time, but they do seem to have played some part. Concerning annual fiscal transfers between enterprises and the government budget, the state-owned sector as a whole received fiscal transfers of 1.92 percent and 1.06 percent of GDP in 1989 and 1990, respectively. Some of the privatized enterprises were profitable before the privatization, however, but data concerning this lost revenue, as well as postprivatization transfers, are yet to be collected.

The Bolivian privatization process was unique insofar as the government treasury did not receive any funds from the capitalizations. The proceeds were earmarked for new investment in the companies, while 45 percent of the shares went to a collective capitalization fund devoted to retirement benefits. The dividends received by this fund amounted to 0.5 percent of GDP in 1997 and 1999, the bulk of which accrued from the telecommunications sector. The fund financed a program called Bonosol, which made cash payments equivalent to U.S.$248 per citizen above the age of 65, to approximately 320,000 people. These payments are significant compared with the country's per capita income of approximately U.S.$1,000. The payments shrunk to about U.S.$60 between 1998 and 2000, and they reached a smaller number of people (about 150,000). The total outlay on these cash payments have amounted to approximately $57 million so far. The collective capitalization fund also supported private pension accounts (through an individual capitalization fund) to the tune of $15 million, and it paid out another $23 million for funeral expenses.

Privatization proceeds in Mexico were about $23 billion between 1984 and 1993 and $10 billion in 1994–2000. These were used to retire public debt, reduce the fiscal deficit (which fell from over 15 percent of GDP in 1982–83 to 10 percent in 1984 and near zero during 1993–96), and increase social spending (which rose from 6 percent of GDP in 1990 to 9 percent in 1994 and 9.5 percent in 2000). Many of the privatized enterprises were converted from loss-making units to profit-making entities, which presumably would have reversed the nature of fiscal transfers.

Nicaragua, by contrast, exhibits a marked lack of transparency in the use of the proceeds from the first phase of privatization. These funds were equivalent to about 2.5 percent of GDP every year, but they had no fiscal implications whatsoever, including for social spending. More recent phases improved on this dimension, with the

privatization of electricity distribution raising 5 percent of GDP, 80 percent of which accrued to the government budget "below the line." While it did not reduce the fiscal deficit, it provided a potential cushion in the form of reserves that could be used in future crises. Fiscal transfers, on the other hand, were improved on many fronts. Three large companies that together contributed 1.1 percent of GDP in revenues during the early 1990s increased their contribution to 2 percent in the four years following privatization. In the two fiscal years following the CORNAP privatization, 20 percent of total revenue contribution by large firms came from newly privatized firms. In addition, the Central Bank of Nicaragua reports that during the 1980s, direct and indirect subsidies to the CORNAP enterprises (which were later privatized) amounted to 11.2 percent of GDP, the elimination of which has potentially huge fiscal implications.

5. Sources of Public Misperception

The statistical evidence presented here contrasts sharply with popular perceptions concerning the impact of privatization on the lower and middle classes in Latin America. This could partly reflect problems with the nature of the data, insofar as they miss important dimensions of the real welfare impact. It could also reflect biases in the formation of public perceptions. We now discuss these two possibilities in further detail.

As already noted, the data are subject to numerous limitations. The most important qualification concerns the ability of the data to accurately represent the impact of privatization on prices and access. This involves a counterfactual: namely, what would the price path or the evolution of access have been in the absence of privatization? Such counterfactuals are intrinsically difficult to assess, in the midst of macroeconomic changes, widespread deregulation, and trade liberalization in these economies that affected prices of utility services relative to other goods and services in the economy. Moreover, the government may have raised prices prior to the privatization to make the enterprises more attractive for private investors, which would artificially exaggerate the fall in prices following privatization. We chose surveys a few years before and after the privatization precisely for this reason, as well as to avoid periods of excessive macroeconomic instability. For instance, we chose 1985–86 as the preprivatization year in Argentina for both of these reasons. But this raises another potential problem: prices may have fallen after the preprivatization survey but before the privatization took place, in which case part

of the measured price change actually occurred before the privatization. The same problems arise with the access data: that is, some of the access changes attributed to privatization might have occurred even if privatization had not taken place, owing to the nature of technological change; this is probably the case in telecommunications, which saw the advent of cellular services. Furthermore, some of the increased access may simply reflect the fact that connections that were previously illegal were now legalized, resulting in increased expenditures by the poor rather than a genuine increase in access.

Despite these concerns, there is no clearly superior alternative for measuring the impact of privatization on prices or access given the available data. Whenever possible, the studies attempt to address the issues above. In the case of Bolivia, for example, the evolution of prices in privatized regions could be compared with that in nonprivatized regions. In both Bolivia and Nicaragua, access to electricity was measured directly rather than by whether households incurred positive expenditures on the service. Some of the data problems apply to particular sectors or countries and not to others: for example, the likelihood of measured improvements in access masking the legalization of illegal connections arises mainly in the electricity sector, and even within the electricity sector it is not an issue in Bolivia and Nicaragua, where access is measured directly. Finally, the broad conclusions appear to be similar across most sectors and countries, even given the particularities of each case.

The lack of price data at the household level means that the studies must use a single price for each service in a given region. Consequently, the distributive impacts of tariff rebalancing that usually accompanies privatization could not be incorporated. For instance, if local telephone rates rise while long-distance rates fall, this may affect different groups of the population differently, depending on their patterns of usage; we could not address this type of issue.

Another shortcoming of the analyses is that they ignore possible environmental effects of privatization. Private operators might neglect safety and health considerations, for example, or maintain public facilities more poorly. Some news articles highlight such problems, as in a *New York Times* story on the flooding of a Buenos Aires restaurant following the water privatization, possibly owing to poor maintenance of the water pipes.[73] Yet this issue can also cut both ways. Health hazards may have been reduced, for instance, if privatization led to the legalization of illegal electric connections. Galiani, Gertler and Schargrodsky find that the water privatization in

73. "As Multinational Runs the Taps, Anger Rises over Water for Profit," *New York Times*, 26 August 2002.

Argentina had a significant effect on child mortality.[74] Comparing regions and time periods with varying degrees of privatization, they find a 5–7 percent drop in mortality rates in regions that privatized their services overall compared with those that did not. The drop was highest (24 percent) for the poorest groups, and it resulted mainly from a reduction in deaths from water-borne parasitic and infectious diseases.

While data inadequacies certainly limit the inferences that can be made, the divergence between popular opinion and the results of the studies reported here could also stem from biases in the process by which popular perceptions are formed, as well as the implicit use of different standards of fairness than are customarily applied by economists. Among the many possible sources of bias, lack of adequate information is probably the most important. Popular views are shaped by extreme cases that invite media attention, while widely diffused benefits are rarely noticed. Many of the benefits accrue to a wide range of customers, each of whom may be benefiting moderately; their improved welfare is overshadowed, however, by the dramatic losses of a few workers or customers. The fiscal benefits are even more diffuse and invisible. This type of bias reflects the tension between statistical evaluation of economic outcomes and the way that mainstream views emerge on public policy issues, which Tom Schelling eloquently describes as the tension between personal and statistical lives (or, in this case, between a few personal tragedies and the widespread statistical benefits calculated by aggregating the fortunes of diverse individuals within any given income or expenditure class).

Psychological biases also tend to pervade popular opinions. First, the psychological phenomenon of loss aversion causes individuals to react more sharply to losses relative to the status quo than they do to gains. They tend to focus on the immediate short-term implications (such as job layoffs) without following through to the intermediate term (when the laid-off workers may be rehired). Second, privatization is commonly lumped together in the popular perception with other promarket reforms, such as fiscal contraction and trade liberalization, that collectively constitute the Washington consensus. Separating out the distinct roles of these different elements of policy reforms is a forbidding exercise for academic experts, let alone the common citizen. It is also difficult to isolate the effect of privatization from effects of macroeconomic shocks or other technological changes occurring in the economy, of which there were many throughout the 1990s. Such negative associations may cause citizens to overlook the benefits of privatization. Finally, there is a tension between some deeply held

74. Galiani, Gertler and Schargrodsky (2002).

ideological principles (for example, that basic needs, such as water or electricity, should not be subject to the profit calculus of multinational corporations) and the reality of how state-owned enterprises actually perform with regard to the fulfillment of these basic needs. The fact that popular discontent is most severe in the case of water privatization lends credence to this view. Suspicions that shares in public enterprises were given away to cronies of political elites or that the proceeds from privatization have not been used in the public interest probably fuelled the discontent. Finally, there is a widespread pessimism concerning the ability of market pressure, the media, and regulatory oversight to constrain private enterprises to meet the public interest, which, though realistic in some instances, is exaggerated in many others.

6. Summary and Conclusions

The country case studies summarized here principally focus on the effects of privatization on consumers, workers, and public finances. The exercises are severely constrained by the nature of the available data, and they thus represent an attempt to extract whatever inferences are possible from existing data sources. The analyses ignore effects on ownership, the environment, or other spillover and general equilibrium effects. Ownership changes may conceivably have distributive impacts and play a large role in public discussions of the fairness of the privatizations, specifically the methods of allocating and pricing shares in the privatized enterprises. However, the absence of data on ownership distribution prevents any assessment of its impact. Moreover, the ownership effects are unlikely to affect the bottom half of the income distribution. To the extent that the latter is of primary interest, the consumer and worker effects would seem to be more important.

Overall, the studies could not identify the reasons for the popular disenchantment with the privatization process on the basis of their distributive impact. The most widespread effects of privatization are on consumers of essential services provided by utility companies. A lot of the public disenchantment stems from concerns about price increases resulting from privatization. As we have shown, however, there is no clear pattern concerning price changes, with prices going down in about half the cases. More important, perhaps, is our finding that even if prices went up, their effects were outweighed by the corresponding increases in access that occurred in the bottom or lower half of the distribution. The only exception to this was the failed water concession in Cochabamba. Most

cases display no evidence of a significant increase in poverty, and we find (patchy) evidence of noticeable improvements in service quality following privatization.

In contrast, there were adverse impacts on the worker side, principally in the form of layoffs associated with the privatization. Employment contractions were significant within privatized enterprises relative to the rest of the economy, with the cutbacks ranging from 30 to 75 percent. As the privatized enterprises were typically capital intensive, however, the employment contractions were small in relation to the size of the aggregate labor force (2 percent in Argentina, 1 percent in Mexico, and 0.13 percent in Bolivia). They had a strong impact only in the case of Nicaragua, which underwent a more widespread privatization as part of its transition from a formerly socialist economy. A significant fraction of the laid-off workers seem to have found jobs in other private enterprises in the same sector of activity in Argentina and Mexico. The medium-term impact was thus much lower than the immediate impact. No simple inference could be made about the effects on wage levels and wage inequality, but the relatively small scale of the labor reallocation in Argentina, Bolivia, and Mexico makes it unlikely that these were significant. The most significant effects are likely to have arisen in Nicaragua, where at least 7–9 percent of the labor force has been reallocated throughout the urban and rural sectors. This probably had a modest downward impact on the average wage rate, and it raised wage inequality in the urban sector. However, these effects were dwarfed by increasing market pressure on wage structures within both the public and private sectors of the economy.

The fiscal impact of the reforms seems generally to have been favorable. In addition to aiding macroeconomic stabilization, the privatization process supported a shift in public spending away from expensive debt service obligations and the funding of operating losses in state-owned enterprises (which eventually subsidize middle-income workers and consumers) toward increased social spending (which directly targets the old and the poor).

In sum, the only signs of an adverse distributive impact on the bottom half of the distribution, aside from the failed Cochabamba water concession, involve a small proportion of workers who were displaced from their jobs in state-owned enterprises, and many of them probably found jobs elsewhere in the economy fairly quickly. This must be weighed against the advantages derived from lower prices, widened access for poorer consumers, enhanced service quality, and a changed structure of public finances that encompasses a variety of increased

benefits the poor. Future privatization programs can be designed specifically to minimize the adverse nature of their distributive impact. Three key steps include, first, designing regulatory institutions for the privatized enterprises that ensure that prices are kept low, that the firms operate under competitive pressure and are induced to innovate and keep costs low, and that requirements are set for service expansion, quality, and access; second, cushioning the employment impact by funding severance packages, unemployment benefits, retraining, and job search assistance for the laid-off employees; and third, using privatization proceeds in a transparent fashion to retire public debt and increase social spending. The earmarking mechanisms featured in Bolivia's capitalization process are notable in this respect.

Appendix A: Public Perception of the Results of Privatization

A common belief among the general population throughout Latin America is that the privatization of public utilities has not led to improvements in welfare. Table A1 presents the results from the 1998 and 2000 Latinobarometer poll to identify the percentage of the population that disagrees or strongly disagrees with the statement, "The privatization of state companies has been beneficial to the country." We present results for seven countries, including the four considered in this paper.

Table A1. Citizens Who Disagree That Privatization Has Been Beneficial

Percent

Country and		*Gender*		*Age in 2000*			*Education*			*Socioeconomic class*		
year of poll	*Total*	*Male*	*Female*	*20–24*	*40–44*	*60–64*	*Illiterate*	*Primary*	*Tertiary*	*Upper*	*Middle*	*Lower*
Argentina												
1998	49	49	50	47	47	51	50*	49	47	42	48	50*
2000	68	68	68	66	69	70	65*	67	61	71	68	62*
Bolivia												
1998	40	38	42	43	31	44*	36	46	30	26	44	.
2000	59	58	59	50	59	59	53	54	52	67*	57	50*
Brazil												
1998	45	46	43	45	41	31	43	49	40	39	50	29*
2000	62	59	64	67	61	58	47	71	50	54	62	20*
Chile												
1998	41	44	38	37	54	39	24*	45	37	35	43	30*
2000	58	60	56	58	61	56	46*	66	56	39	60	59*
Mexico												
1998	39	41	38	38	37	29	40	46	39	34	39	40
2000	56	57	55	54	65	59	52	60	60	56*	55	53
Nicaragua												
1998	47	47	47	48	45	63	50*	42*	37*	34	50	55
2000	52	54	50	51	62	55	40	49	55	53	48	46*
Peru												
1998	50	50	50	51	56	52	35*	57	45	36	53	62
2000	57	54	61	54	63	61	77*	68	52	43*	62	41*

Notes:

*Less than 30 observations available.

Socioeconomic Class is self-reported. Upper, Middle and Lower correspond to the respondent answering that his or her socioeconomic class is very good, average, or very bad respectively.

Appendix B: Welfare Changes with Repeated Cross-Sections

The household surveys for Argentina, Bolivia, and Mexico only provide access information for the year in which the survey was taken. Since different households were surveyed each year, it is not possible to determine exactly which households experienced a change in access to the privatized services. Evaluation of the welfare change from privatization therefore requires further approximating assumptions. Divide the sample into deciles, and let N_t^d be the total number of households sampled from decile d in time t, where $t = 0$ denotes the preprivatization period and $t = 1$ the postprivatization period. Let $A_{h,t}$ be an indicator of whether household h has access ($A_{h,t} = 1$) or not ($A_{h,t} = 0$) at time t. At time t there are F_t^d households in decile d with access to the service and I_t^d households in decile d without access. Then the expected welfare change to household h in decile d from privatization is

$$\begin{aligned} E\Delta U_h^d &= P(A_{h,0}=1, A_{h,1}=1)\Delta U(A_{h,0}=1, A_{h,1}=1) + P(A_{h,0}=0, A_{h,1}=1)\Delta U(A_{h,0}=0, A_{h,1}=1) \\ &\quad + P(A_{h,0}=0, A_{h,1}=0)\Delta U(A_{h,0}=0, A_{h,1}=0). \end{aligned} \tag{B1}$$

Here $P(.,.)$ is the probability distribution function for household h. The last term in equation B1 will be zero unless the prices of substitutes change. We assume that households with access in period 0 do not lose access in period 1. Then taking means of equation B1 across all households in decile d in time 0 gives the mean expected change in welfare in decile d:

$$E\Delta U^d = \frac{F_0^d}{N_0^d}\frac{1}{F_0^d}\sum_{h:A_{h,0}=1}\Delta U(A_{h,0}=1) + \frac{1}{N_0^d}\sum P(A_{h,0}=0, A_{h,1}=1)\Delta U(A_{h,0}=0, A_{h,1}=1). \tag{B2}$$

The first term in equation B2 is just the proportion of households that have access in period 0, multiplied by the mean change in welfare for those who do have access. The second term then needs to be estimated using the period 1 survey data. We make the simplifying assumption that within a given decile, all households with access in period 1 had equal probability of having not had access in period 0.[75] For households with access in period 1, we then have

$$P(A_{h,0}=0 \mid A_{h,1}=1) = \left(\frac{F_1^d}{N_1^d} - \frac{F_0^d}{N_0^d}\right). \tag{B3}$$

Plugging equation B3 into equation B2, replacing the second term of equation B2 with period 1 reference values, and rearranging therefore gives

$$E\Delta U^d = \frac{F_0^d}{N_0^d}\frac{1}{F_0^d}\sum_{h:A_{h,0}=1}\Delta U(A_{h,0}=1) + \left(\frac{F_1^d}{N_1^d} - \frac{F_0^d}{N_0^d}\right)\frac{F_1^d}{N_1^d}\frac{1}{F_1^d}\sum_{h:A_{h,1}=1}\Delta U(A_{h,0}=0, A_{h,1}=1). \tag{B4}$$

The second term in equation B4 is the conditional probability of having no access in period 0 given access in period 1, multiplied by the probability of access in period 1, multiplied by the mean value of gaining access for households with access in period 1. The first-order approximation of the mean decile change in welfare is therefore

$$\begin{aligned} E\Delta U^d &= -\frac{F_0^d}{N_0^d}\frac{1}{F_0^d}\sum_{h:A_{h,0}=1}(\Delta \log p_j)w_{h,j0}x_{h,0} \\ &\quad -\left(\frac{F_1^d}{N_1^d} - \frac{F_0^d}{N_0^d}\right)\frac{F_1^d}{N_1^d}\frac{1}{F_1^d}\sum_{h:A_{h,1}=1}(\log p_{j1} - \log p_{h,vj})w_{h,j1}x_{h,1}, \end{aligned} \tag{B.5}$$

and the second-order approximation to mean decile welfare change is similarly

[75]. One could compare the observable characteristics of those households within a decile that have access in period 0 to the characteristics of households with access in period 1 in order to identify dimensions along which the increase in access has occurred. This information could then be used to allow the probability of moving from no access to access to differ across households within a decile which have access in period 1. This extension is not pursued here. There are a variety of political, strategic, geographic, and economic reasons that determine where increases in access occur, which can counterbalance one another to make our assumption a reasonable approximation.

$$E\Delta U^d = -\frac{F_0^d}{N_0^d}\frac{1}{F_0^d}\sum_{h:A_{h,0}=1}(\Delta \log p_j)w_{h,j0}x_{h,0}\left(1+\frac{\Delta \log p_j}{2}\frac{\partial \log w_{h,j0}}{\partial \log p_j}\right)$$

(B6)

$$-\left(\frac{F_1^d}{N_1^d}-\frac{F_0^d}{N_0^d}\right)\frac{F_1^d}{N_1^d}\frac{1}{F_1^d}\sum_{h:A_{h,1}=1}(\log p_{j1}-\log p_{h,vj})w_{h,j1}x_{h,1}\left(1+\frac{(\log p_{j1}-\log p_{h,vj})}{2}\frac{\partial \log w_{h,j1}}{\partial \log p_j}\right).$$

Appendix C: Poverty and Inequality with Repeated Cross-Sections

For households with access prior to privatization, we can use the first- and second-order approximations to estimate the change in utility arising from the change in prices following privatization. We then take the preprivatization per capita expenditure for these households, and add the estimated change in welfare divided by household size to it, to obtain the household per capita welfare after privatization. However, we cannot tell which specific households that did not have access before privatization then gained access after privatization. Instead, as above, we use the postprivatization households with access, and calculate their mean welfare change if they did gain access. The first and second approximations of this mean welfare change are

$$E(\Delta U_h^d \mid A_{h,0}=0, A_{h,1}=1) = -\frac{1}{F_1^d}\sum_{h:A_{h,1}=1}(\log p_{j1}-\log p_{h,vj})w_{h,j1}x_{h,1}, \quad \textit{and}$$

(C1.)

$$E(\Delta U_h^d \mid A_{h,0}=0, A_{h,1}=1) = -\frac{1}{F_1^d}\sum_{h:A_{h,1}=1}(\log p_{j1}-\log p_{h,vj})w_{h,j1}x_{h,1}\left(1+\frac{\log p_{j1}-\log p_{h,vj}}{2}\frac{\partial \log w_{h,j1}}{\partial \log p_j}\right).$$

We make the simplifying assumption that all households without access in period 0 had equal chance of gaining access in period 1. We then randomly choose households without access from the preprivatization survey and add the expected welfare change from access in equation C1 divided by their household size to their preprivatization per capita expenditure. The fraction of households without access for which this is done, τ, is the conditional probability of having access in period 1, given no access in period 0, and is given by

$$\tau = \frac{\left(\frac{F_1^d}{N_1^d}-\frac{F_0^d}{N_0^d}\right)}{\left(1-\frac{F_0^d}{N_0^d}\right)}.$$

The remaining fraction, $1-\tau$, of households without access before privatization will only have a welfare change if the prices of substitutes change. Otherwise, this fraction is assigned zero welfare change.

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Table 1. Main Features of the Privatizations

Country	Period	Sector privatized	Proceeds		Labor force in SOE firms before privatization (percent)	Employment cuts (percent of total labor force)
			Billions of dollars	Percent of GDP[a]		
Argentina	1989–90	Utilities, other manufacturing, services	23	25	1.95	1.46
Bolivia	1995–97	Utilities, oil, gas	2	30	<0.5	0.13
Mexico						
Phase I	1982–88	Manufacturing, services	negligible	negligible	2	n.a.
Phase II	1988–94	Manufacturing, services	23	10	2	1
Phase III	1994–2000	Utilities	10	3	n.a.	n.a.
Nicaragua						
Phase I	1991–96	All	0.24	14	7–9	n.a.
Phase II	1996–2002[b]	Electricity, telephones, energy	0.17	5	n.a.	n.a.

Source: Ennis and Pinto (2002); Barja, McKenzie, and Urquiola (2002); López-Calva and Rosellón (2002); Freije and Rivas (2002).

n.a. Not available.

a. Proceeds are given as percentage of GDP in a midpoint year of the privatizations.

b. Liberalization of electricity in 1997; privatizations in 2000–02.

Table 2. Access to Infrastructure
Percent of households with access, by decile

		Household expenditure per capita										
Country and sector	*Year*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*Total*
Argentina (urban)												
Water and electricity[a]	1985–86	64.8	81.5	87.8	91.2	93.3	93.9	97.4	96.4	97.8	99.3	90.3
	1996–97	82.5	91.6	94.0	94.5	94.9	94.7	95.9	96.1	96.1	96.9	93.7
Telephone[a]	1985–86	18.4	26.5	33.7	43.6	47.0	49.6	61.4	67.2	75.9	82.3	50.4
	1996–97	22.8	39.6	53.5	57.7	68.5	78.2	82.7	86.7	89.8	92.9	67.2
Bolivia (urban)												
Electricity[b]	1994	89.2	93.3	93.2	94.6	96.6	97.7	98.1	98.0	98.8	99.7	96.0
	1999	98.9	95.0	97.9	96.9	100.0	100.0	100.0	100.0	99.9	100.0	98.8
Telephone[a]	1994	2.9	7.2	8.1	9.4	13.4	22.3	27.4	35.6	48.6	69.7	25.5
	1999	7.9	6.9	13.0	22.9	33.4	35.2	36.7	42.6	58.6	62.0	31.0
Water[c]	1994	64.5	68.1	74.7	73.2	76.4	83.0	85.1	91.1	91.5	95.5	80.6
	1999	89.1	82.5	89.1	89.0	87.8	95.7	98.7	97.7	95.7	97.8	92.1
Mexico (all)												
Telephone[a]	1992	2.0	3.3	5.1	5.7	10.1	14.1	19.9	26.4	39.1	60.8	18.6
	1998	3.9	6.0	9.1	12.6	15.9	21.8	28.4	37.9	54.8	72.8	26.3
Water[c]	1992	22.0	30.5	39.1	44.3	48.8	54.1	63.0	66.0	75.0	87.1	53.0
	1998	27.9	35.8	39.3	44.8	49.4	58.5	64.8	72.1	83.3	89.9	56.6
Nicaragua (all)												
Electricity[d]	1993	11.1	25.2	36.2	53.4	64.4	68.5	78.5	81.7	82.0	78.0	57.9
	1998	11.3	29.5	40.3	58.4	72.0	77.2	88.5	91.4	93.2	84.9	64.7

Source: Ennis and Pinto (2002); Barja, McKenzie, and Urquiola (2002); López-Calva and Rosellón (2002); Freije and Rivas (2002).

a. Household has access if it reports positive expenditure on the infrastructure item.

b. Household has access if the dwelling has electricity.

c. Household has access if the water network reaches the building in which the family is living.

d. The 1993 figures are obtained from a 1998 survey using a question as to whether the household has installed electricity within the past five years.

Table 3. Increased Access to Water Resulting from Privatization in Bolivia, by Region and Year
Percent

	La Paz and El Alto			*Other main cities*[a]			*Difference-in-difference*[b]		
Quintile	*1992*	*1994*	*1999*	*1992*	*1994*	*1999*	*1992–94*	*1994–99*	*Triple difference*
First	53.3	66.1	88.8	57.4	66.4	82.5	3.8	6.6	–0.6
Second	70.7	73.3	93.3	69.8	74.2	86.9	–1.8	7.4	2.4
Third	76.0	77.4	95.6	75.7	80.6	89.4	–3.5	9.5	3.6
Fourth	87.1	89.8	100.0	84.1	87.5	97.3	–0.7	0.4	0.4
Fifth	96.2	94.6	100.0	87.8	93.1	95.4	–6.9	3.1	4.1
Overall	78.1	81.7	94.4	75.6	80.3	90.7	–1.0	2.2	1.0

Source: Barja, McKenzie, and Urquiola (2002).
a. Cochabamba and Santa Cruz.
b. The difference-in-difference estimate is the change in La Paz and Alto less the change in the other main cities. The triple difference is the difference between one-fifth the double difference over 1994–99 and one-half the double difference over 1992–94.

Table 4. Price Changes Following Privatization
Real price indexes relative to consumer price index; preprivatization = 100.

	Argentina		*Bolivia*		*Mexico*		*Nicaragua*	
Sector	*Before*	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*
Telephones	100	83.9	100	91.7	100	147.9	n.a.	n.a.
Electricity	100	67.5	100	126.2	n.a.	n.a.	100	124.2
Water	100	84			100	109.2	n.a.	n.a.
La Paz and El Alto			100	89.5				
Cochabamba			100	143				

n.a. : not applicable as service was not privatized (or data after privatization is not yet available)
Sources for indexes: Argentina: water data from Galiani, Gertler, and Schargrodsky (2002, table 3); electricity prices are residential final prices from FIEL (1999); telephone is based on the communications price index from Instituto Nacional de Estadística y Censos (INDEC). Bolivia: telephone prices are the minimum fixed tariff from Instituto Nacional de Estadistica (INE); electricity prices are residential tariff rates from Superintendencia de Electricidad de Bolivia; water rates in La Paz and El Alto are the tariff for 10 cubic meters from INE; water rates in Cochabamba are R2 category rates (very poor users) from the Democracy Center. Mexico: water prices are from CONAGUA (Comisión Nacional del Agua) and PROFECO (Procuraduría Federa del Consumidor); telephone prices are residential monthly subscription charges from ITU (2001). Nicaragua: electricity prices are from Banco Central de Nicaragua (Central Bank of Nicaragua).

Table 5. Selected Quality Indicators

Country and sector	**Quality measure**	*Baseline value*	*Post-privatization value*	
Bolivia		*Legal limit of goal*	*Actual value*[a]	
Electricity	Average response time (hours) to users technical complaints	3	2.26	
	Average interruption frequency per user	25	4.7	
	Index of commercial complaints	12	1.14	
Telephone				
Long-distance	Percentage of rural towns connected	25	32.66	
	Percentage of national long-distance calls completed	55	69	
	Percentage of faults corrected within three days	85	88	
Fixed-line	*Cotas* digitalization (%)	80	96	
	Cotel digitalization (%)	5	5	
	Cotas incidence of faults (%)	40	8	
	Cotel incidence of faults (%)	60	27	
		1993	*1999*	
	Waiting list for main lines	50,000	8,000	
Mexico		*1990*	*1995*	*1997*
Telephone	Waiting time for new connection (days)	890	72	30
	Faults per 100 lines per year	6.0[b]	4.6	3.3
	Digitalization (%)	38.6[c]	88	90.1
	Number of pending connections	259,875[b]	70,798	91,367
Argentina		*1989–90*	*1994*	*1997–98*
Telephone	Digitalization (%)	13	63	100
	Lines in service	3,139,685	4,886,957	6,852,086
	Faults per 100 lines per year	42.4[c]	37.2	17.2
	Average repair waiting time (days)	11	3	n.a.
		1992–93	*1994–99*	
Water[d]	Spilled water (millions of m^3/day)	1.49	1.27	
	Average delay in attending claims (days)	180	32	

Source: Ennis and Pinto (2002); Barja, McKenzie, and Urquiola (2002); López-Calva and Rosellón (2002).; ITU (2001).

n.a. not available.

a. Electricity results are an average of results reached by five firms: CRE, ELECTROPAZ, ELFEC, ELFEO, and CESSA, in 1999. Telephone results are for 1997.

b. 1993 data, as 1990 data unavailable.

c. 1991 data, as 1990 data unavailable.

d. Argentine water measures are from Galiani, Gertler, and Schargrodsky (2002).

Table 6. Budget Shares Allotted to Infrastructure, by Decile[a]

		Expenditure per capita decile									
Country and sector	*Year*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Argentina (urban)											
Telecommunications	1985–86	0.3	0.3	0.5	0.8	0.7	0.6	1.0	0.9	1.0	1.1
	1996–97	1.8	2.2	2.3	2.6	2.4	2.7	2.5	2.6	2.3	2.2
Water and electricity	1985–86	2.3	2.6	2.6	2.9	2.3	2.6	2.4	2.3	2.0	1.8
	1996–97	4.7	4.2	3.7	3.6	3.1	2.9	2.7	2.5	2.1	1.5
Bolivia (urban)											
Telecommunications	1994	0.1	0.3	0.4	0.3	0.5	0.9	1.0	1.5	2.0	2.8
	1999	0.3	0.2	0.6	0.9	1.3	1.3	2.2	2.2	4.6	4.4
Water	1994	2.2	1.9	1.6	1.6	1.6	1.9	1.9	1.9	1.8	1.4
	1999	2.1	1.5	1.9	1.8	1.8	2.1	2.0	1.8	1.7	1.7
Electricity	1994	4.8	4.1	3.9	4.0	3.9	4.2	3.9	3.7	3.6	2.9
	1999	4.4	3.6	4.0	3.9	3.4	3.4	3.7	3.6	3.5	2.9
Mexico											
Telecommunications	1992	0.1	0.1	0.4	0.4	0.6	1.0	1.2	1.5	2.0	2.4
	1998	0.1	0.2	0.6	1.0	1.4	1.8	2.4	2.6	2.9	3.1
Water	1992	0.9	1.1	1.1	1.1	1.1	1.0	1.0	1.0	0.8	0.6
	1998	1.2	1.0	1.3	1.2	1.2	1.2	1.2	1.0	0.9	0.6
Nicaragua											
Electricity	1993	2.5	1.9	1.6	2.1	2.3	2.3	3.4	3.5	3.6	3.4
	1998	0.4	0.8	1.1	1.3	1.5	1.9	1.7	2.1	2.1	1.8

Source: Ennis and Pinto (2002); Barja, McKenzie, and Urquiola (2002); López-Calva and Rosellón (2002); Freije and Rivas (2002).

a. All households, including those without access.

Table 7. Electricity Reforms in Nicaragua: The Joint Effect of Price and Access Changes on Consumers
Percent of per capita total household expenditure

Preprivatization per capita expenditure decile	*Households with access in both periods*		*Households that gained access*		*Overall effect*	
	First-order approximation	*Second-order approximation*	*First-order approximation*	*Second-order approximation*	*First-order approximation*	*Second-order approximation*
1	–0.78	–0.76	12.99	12.66	–0.09	–0.05
2	–0.55	–0.54	15.98	16.55	–0.16	0.58
3	–0.59	–0.58	15.61	16.25	–0.24	0.47
4	–0.48	–0.46	5.38	6.29	–0.27	0.07
5	–0.43	–0.40	5.38	6.27	–0.32	0.22
6	–0.53	–0.49	3.57	4.30	–0.41	0.04
7	–0.43	–0.39	1.69	2.41	–0.37	–0.07
8	–0.50	–0.43	2.02	2.59	–0.45	–0.10
9	–0.49	–0.39	1.38	1.84	–0.45	–0.11
10	–0.49	–0.36	0.74	1.25	–0.40	–0.19

Source: Freije and Rivas (2002).

Table 8. Privatization Reforms in Bolivia: The Joint Effect of Price and Access Changes on Consumers
Percent of per capita total household expenditure

Preprivatization per capita expenditure decile	*Electricity (overall effect)*		*Telephone (overall effect)*		*Water*[a]			
					scenario 1		*scenario 2*	
	First-order approx.	*Second-order approx.*	*First-order approx.*	*Second-order approx.*	*First-order approx.*	*Second-order approx.*	*First-order approx.*	*Second-order approx.*
1	11.97	17.36	0.23	0.34	4.12	6.93	0.94	1.48
2	0.76	1.56	0.13	0.13	0.83	1.58	0.31	0.50
3	3.48	5.64	0.50	0.70	2.01	2.96	0.46	0.63
4	1.60	2.65	1.80	2.69	1.30	2.63	0.43	0.77
5	2.11	3.57	4.06	5.80	1.29	1.94	0.87	1.29
6	0.97	1.98	4.05	5.65	1.15	1.86	0.47	0.70
7	0.86	1.62	3.55	4.65	0.85	1.29	0.17	0.17
8	0.78	1.60	2.62	3.71	0.60	0.83	0.18	0.19
9	0.02	0.42	8.38	10.51	0.42	0.62	0.26	0.33
10	–0.50	–0.41	–7.44	–9.27	0.42	0.54	0.15	0.16

Source: Barja, McKenzie, and Urquiola (2002).
a. Scenarios 1 and 2 both measure the overall effect of water privatization in La Paz and El Alto. In scenario 1 we assume that all of the increase in access is due to privatization, whereas in scenario 2 we consider that only the increase in access above increases in Santa Cruz and Cochabamba is due to privatization

Table 9. Electricity and Telecommunications Reforms in Argentina: The Joint Effect of Price and Access Changes on Consumers

Percent of per capita total household expenditure[a]

Preprivatization per capita expenditure decile	*Electricity*		*Telecommunications*	
	First-order approximation	*Second-order approximation*	*First-order approximation*	*Second-order approximation*
1	3.05	3.32	0.10	0.14
2	2.22	2.48	0.29	0.37
3	1.79	2.03	0.47	0.61
4	1.71	1.94	0.47	0.59
5	1.19	1.41	0.51	0.67
6	1.29	1.51	0.66	0.86
7	1.11	1.32	0.55	0.72
8	1.08	1.29	0.45	0.63
9	0.88	1.09	0.39	0.57
10	0.81	1.02	0.36	0.52

Source: Ennis and Pinto (2002).

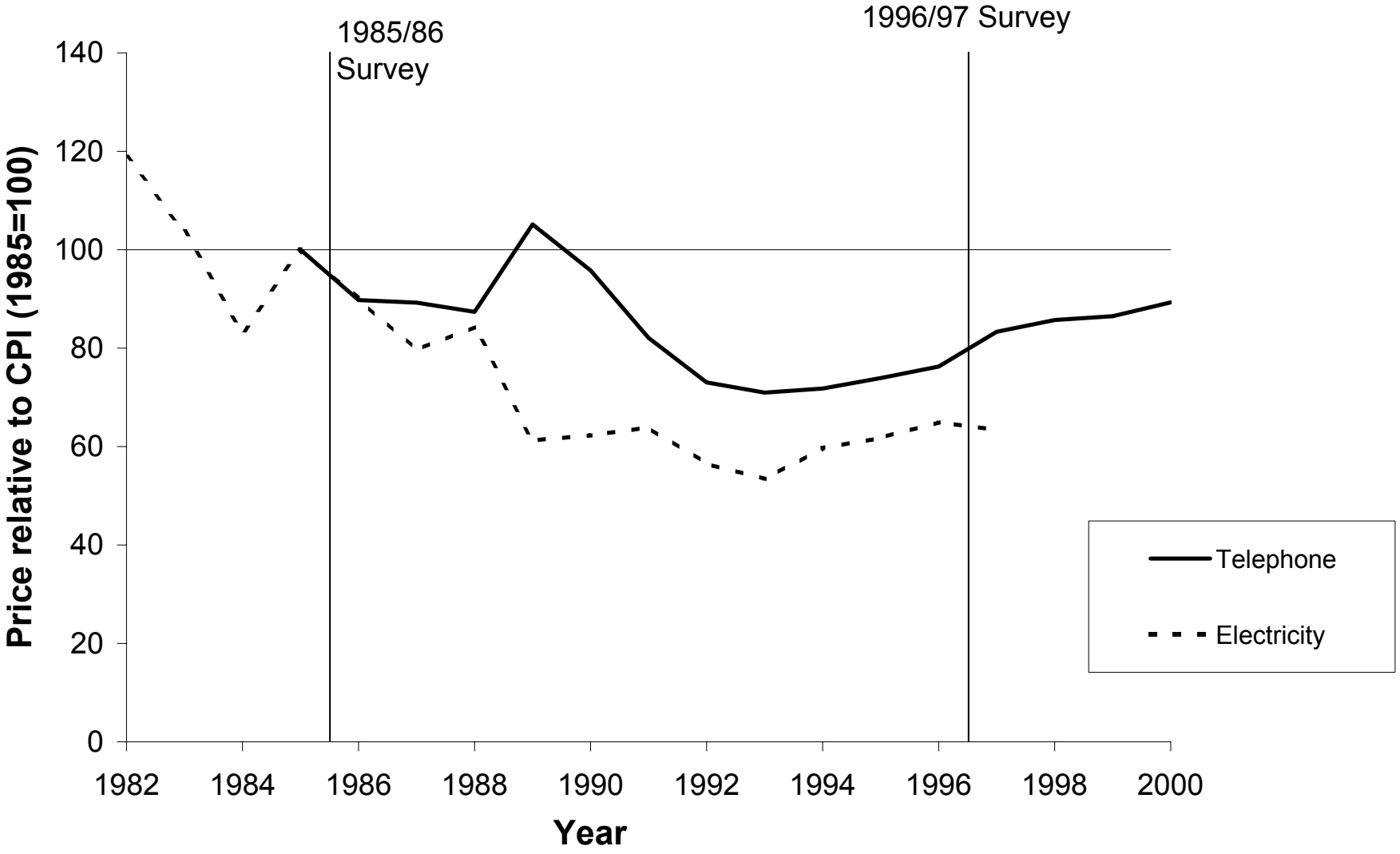
a. Overall effect in urban areas only.

Table 10. Effects of Privatization on Inequality and Poverty among Consumers

Country and measure	Actual measure prior to privatization	Estimated measure after privatization effect: Electricity First-order approx.	Electricity Second-order approx.	Telephones First-order approx.	Telephones Second-order approx.	Water[a] La Paz and El Alto First-order approx.	La Paz and El Alto Second-order approx.	Cochabamba First-order approx.	Cochabamba Second-order approx.
Argentina (urban)									
Inequality measures									
Gini Coefficient	0.400	0.396	0.396	0.396	0.396	n.a.	n.a.	n.a.	n.a.
Atkinson Indices:	0.130	0.128	0.127	0.129	0.128	n.a.	n.a.	n.a.	n.a.
A(0.5)	0.241	0.238	0.237	0.237	0.237	n.a.	n.a.	n.a.	n.a.
A(1)	0.424	0.519	0.482	0.417	0.417	n.a.	n.a.	n.a.	n.a.
A(2)									
Poverty measures									
Headcount (α=0)	0.113	0.095	0.095	0.102	0.102	n.a.	n.a.	n.a.	n.a.
Poverty Gap (α=1)	0.032	0.027	0.027	0.029	0.029	n.a.	n.a.	n.a.	n.a.
Distribution Sensitive (α=2)	0.013	0.011	0.011	0.012	0.012	n.a.	n.a.	n.a.	n.a.
Bolivia (urban)									
Inequality measures									
Gini Coefficient	0.442	0.440	0.442	0.455	0.464	0.435	0.430	0.442	0.442
Atkinson Indices - A(0.5)	0.164	0.162	0.163	0.171	0.176	0.159	0.156	0.164	0.164
A(1)	0.278	0.275	0.278	0.293	0.303	0.270	0.265	0.278	0.279
A(2)	0.660	0.652	0.649	0.641	0.641	0.652	0.647	0.660	0.660
Poverty measures									
Headcount (α=0)	0.625	0.615	0.610	0.572	0.566	0.618	0.612	0.646	0.625
Poverty Gap (α=1)	0.259	0.253	0.251	0.240	0.240	0.250	0.245	0.262	0.259
Distribution Sensitive (α=2)	0.136	0.132	0.132	0.129	0.128	0.130	0.125	0.138	0.136
Nicaragua									
Inequality measures									
Gini Coefficient	0.556	0.557	0.557	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Atkinson Indices - A(0.5)	0.265	0.266	0.266	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
A(1)	0.428	0.430	0.430	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
A(2)	0.634	0.636	0.636	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Poverty measures									
Headcount (α=0)	0.352	0.351	0.352	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Poverty Gap (α=1)	0.145	0.146	0.146	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Distribution Sensitive (α=2)	0.081	0.082	0.082	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

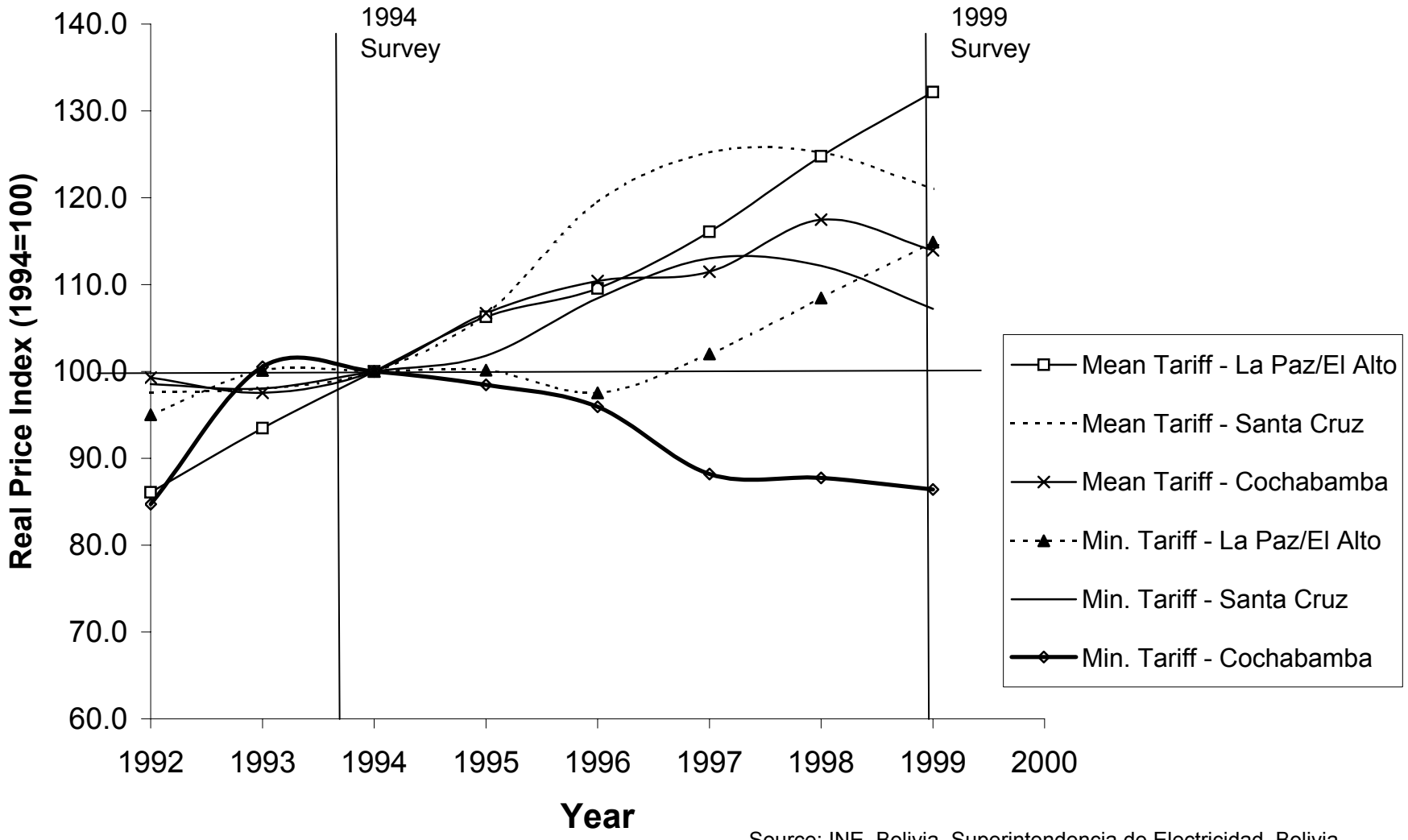
Source: Ennis and Pinto (2002); Barja, McKenzie, and Urquiola (2002); Freije and Rivas (2002).
n.a. Not available.
a. Water results are reported for Bolivia only and report separately the effect of the La Paz and El Alto privatization and the Cochabamba privatization. The La Paz and El Alto results assume that all of the increase in access is due to privatization. See Barja, McKenzie and Urquiola (2002) for results under alternate assumptions. City-level counterfactual poverty and inequality measures in Bolivia are scaled to be comparable to the overall actual urban levels in the first column.

Figure 1: Evolution of Prices in Argentina



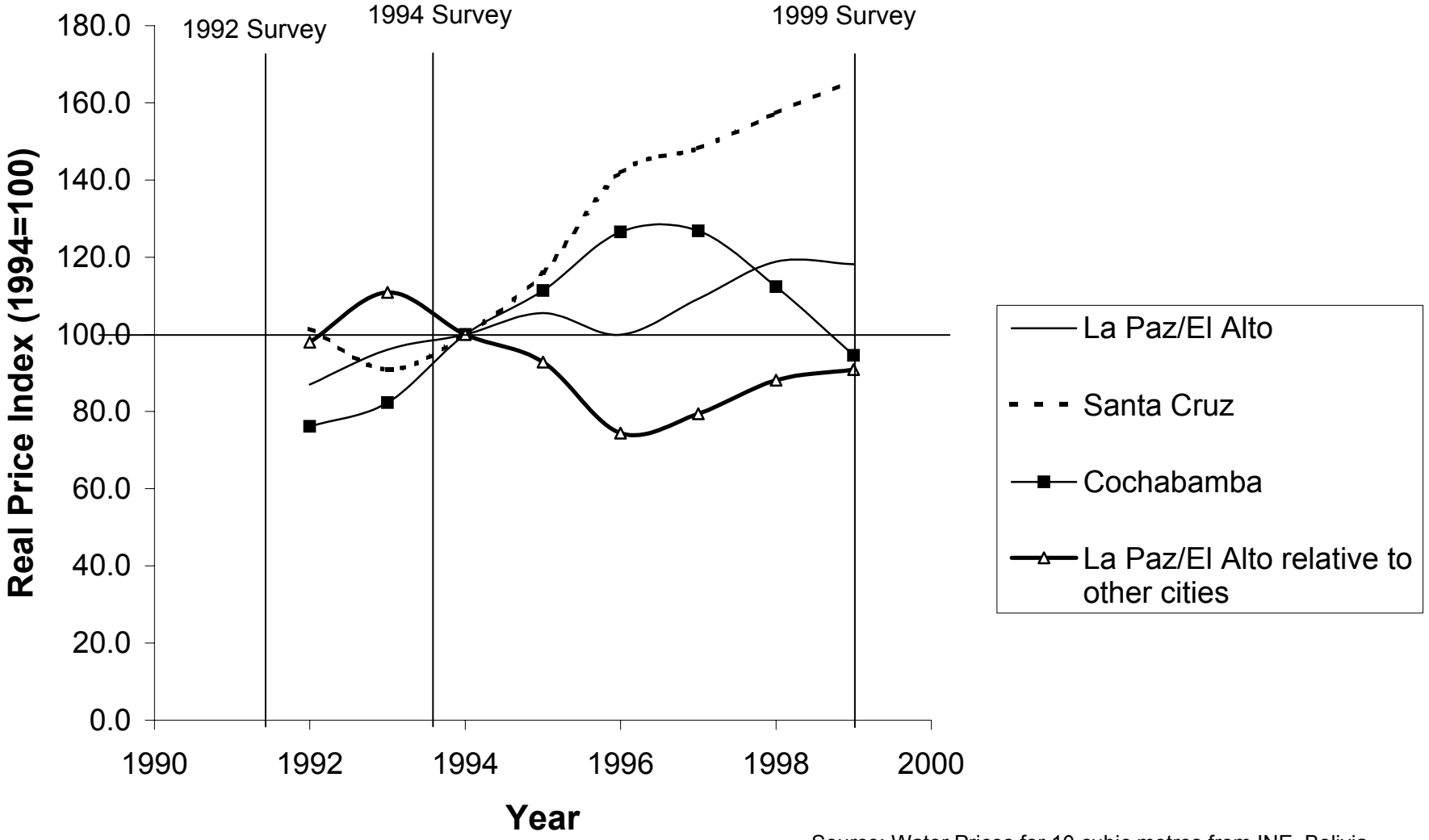
Sources: Electricity from FIEL (1999), Telephone from INDEC, CPI from INDEC

Figure 2: Electricity Prices in Bolivia 1992-99



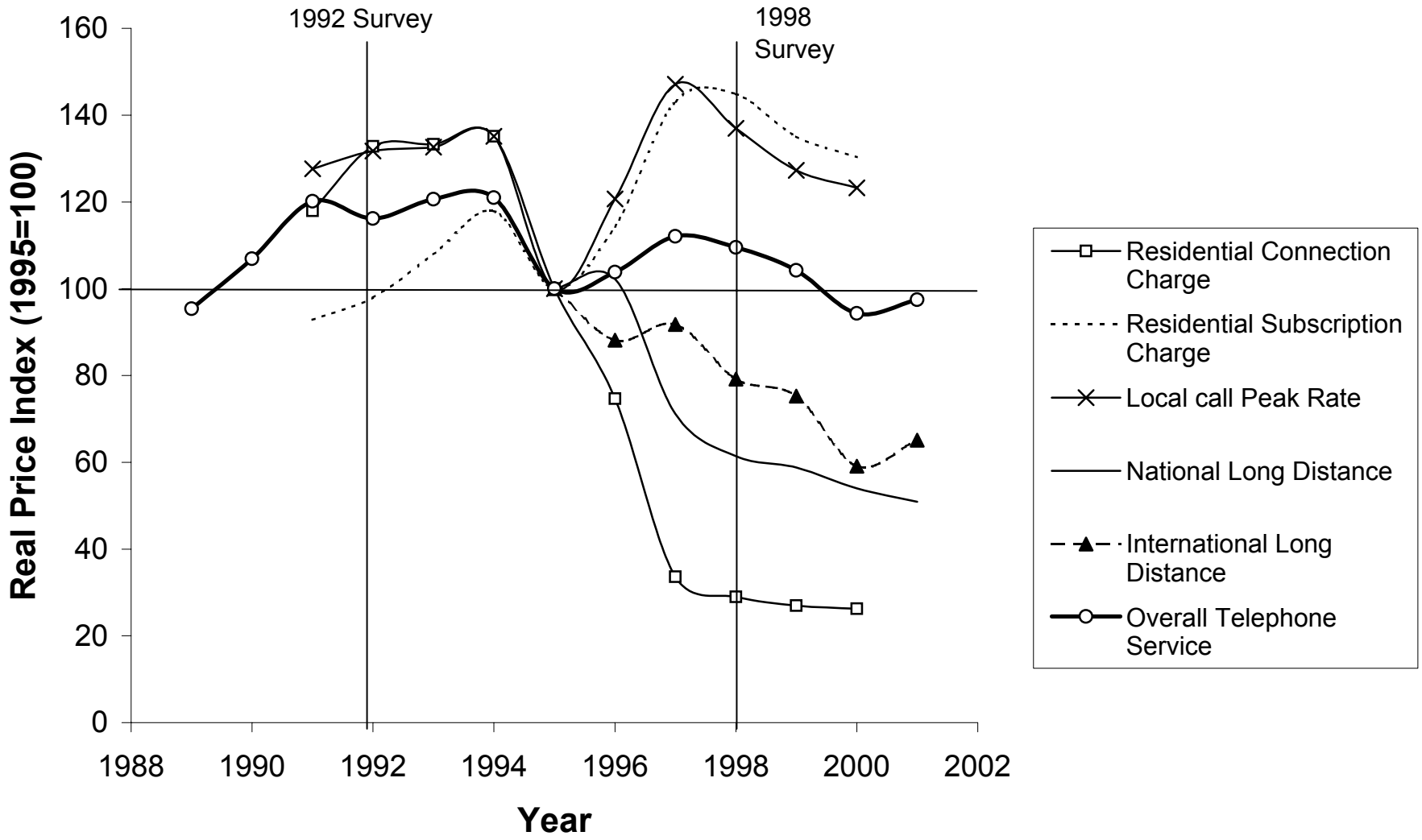
Source: INE, Bolivia, Superintendencia de Electricidad, Bolivia.

Figure 3: Water Prices in Bolivia 1992-99



Source: Water Prices for 10 cubic metres from INE, Bolivia

Figure 4: Evolution of Telephone Prices in Mexico



Sources: ITU (2001), Banco de Mexico national CPI by expenditure item

Figure 5: Support for Privatization and Perceived Service Quality - Results from a 1992 Mexican Poll