

THE BENEFITS OF PRIVATIZATION: EVIDENCE FROM MEXICO

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Critics of privatization argue that the increased profitability of privatized companies comes at the expense of society. Using data from 97 percent of those non-financial firms privatized in Mexico during the period 1983-1991, we study two channels for social losses: (1) increased prices; and (2) layoffs and lower wages. Privatization is followed by a 24 percentage point increase in the mean ratio of operating income to sales as firms catch up with industry-matched control groups. We estimate that higher product prices explain 5 to 7 percent of that increase; transfers from laid-off workers, 31 to 46 percent; and productivity gains, the remainder.

I. Introduction

In the last two decades, several of countries have launched ambitious privatization programs. Despite this growing experience, we still lack empirical knowledge of some critical issues, such as: how well does privatization work in practice? Do firms become more profitable? If so, what roles do market power and increases in product prices play in explaining improvements in the performance of privatized firms? Does their increased profitability result from the expropriation of workers? How important is deregulation for the success of privatization? In this paper we seek to provide empirical answers to these questions by considering the recent Mexican privatization experience.

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Criticisms of privatization have centered on the possibility that the observed higher profitability of privatized companies has come at the expense of the rest of society through the exploitation of market power. Critics often appeal to a tradition in economics that regards state-owned enterprises (SOEs) as instruments capable of curing market failures by implementing pricing policies that take account of social marginal costs (*social view*, Shapiro and Willig, 1990). Another equally prominent argument against privatization is that workers bear the burden of restructuring through layoffs and wage cuts. In contrast, more recent economic literature has taken a much less flattering view of SOEs and a more favorable view of privatization. This literature emphasizes agency conflicts as the source of the inefficiency of SOEs (*agency view*). There are two complementary strands of the literature according to whether the critical agency conflict is with the manager or with the politician. Vickers and Yarrow (1988) argue that SOE managers may lack high-powered incentives or proper monitoring (*managerial view*). In turn, Shleifer and Vishny (1994) stress that political interference in the firm results in excessive employment, poor choices of product and location, lack of investment, and ill-defined incentives for managers (*political view*).¹ In sum, the theoretical literature points to some benefits of privatization--especially higher profitability--but also recognizes its potential costs.

The existing empirical literature has not yet effectively compared the costs and benefits of privatization. Early empirical research comparing SOEs and private firms in the same line of business, such as railroads and air transportation, found mixed evidence that the latter are more efficient (Caves, 1990, and Vining and Boardman, 1992). More recent research finds private ownership to generally be more efficient than public ownership. For example, Megginson et al. (1994) find that, in a sample of 61 international initial public offerings (IPOs), SOEs performance improves moderately following privatization.² Similarly, Donahue (1989) summarizes evidence of the lower cost involved in contracting public services to private suppliers rather than providing them in-house. Although recent work has provided some evidence on the transformation of privatized firms, it is difficult to distinguish between the *social view* and the *agency view* just by considering at effect of privatization on

¹ See also, Shapiro and Willig (1990) and López-de-Silanes et. al (1997) on the *political view*

² See also Galal et al. (1994) and World Bank (1995).

profitability. For example, while the *agency view* predicts that privatization will result in higher profits, the *social view* makes the same prediction if market power is prevalent. The main focus of the paper is upon the empirical evidence of the channels through which privatization raises profits. This evidence is necessary to distinguish between the competing views of state ownership.

Our paper contributes to the literature in three ways: by documenting the effects of privatization on seven general areas--profitability, operating efficiency, employment and wages, capital investment, taxes, output, and prices; by providing evidence for two possible ways in which gains by privatized firms may come at the expense of the rest of the society: monopolistic power and transfers from workers; and finally, by focusing on the role of deregulation in privatization, since the two often go together. Deregulation is interesting as a control since it may have a large impact on outcomes and add a confounding effect when it accompanies privatization. Deregulation is also of independent interest to the extent that it complements privatization by, for example, fostering product market competition. Vigorous product market competition may play a role in accelerating the restructuring process by facilitating the elimination of poorly managed firms (Armstrong et al., 1994). Product market competition may also speed up the depoliticization of privatized firms by increasing the costs of political intervention (Shleifer and Vishny, 1994).

To evaluate the benefits of privatization, we have collected data on substantially all non-financial firms privatized in Mexico in the period 1983-1991.³ Before privatization, the Mexican State was involved in nearly every sector of economic activity. In 1983, the government launched a privatization program which dismantled government operations in 49 different industries, as defined by four-digit S.I.C. codes. The conclusions drawn from previous research on privatization may be misleading given that the unavailability of data has, so far, confined research to the analysis of public utilities and large firms in oligopolistic markets. We believe that the

³ We exclude financial institutions (22 privatizations) for two reasons. First, the accounting ratios of financial institutions and those of manufacturing, mining and service firms are not easily comparable. Second, half of the financial institutions were privatized during 1992. Since 1993 is the only year for which we have postprivatization data, we decided to exclude all privatizations that took place on 1992 on the grounds that we wanted to allow at least two years for the impact of privatization to show up. Thus, at most we could include only half the privatized financial institutions. López-de-Silanes and Zamarripa (1995) focus exclusively on the privatization of banks in Mexico.

database we have assembled is free from the biases that may be present in incomplete samples because it includes both SOEs and a control group of privately-owned firms, spanning a wide variety of sectors and firm sizes. Our database is also unique in that it contains detailed wage data as well as product-level quantities and prices which allows us to provide more direct evidence on the validity of the competing hypotheses on privatization and, most importantly, to analyze the channels through which privatization works.

We find that privatized firms quickly bridge the preprivatization performance gap with industry-matched control groups. Privatization is followed by a 24 percentage point increase in the mean ratio of operating income to sales. Overall, we estimate that price increases are responsible for roughly 5 (7) percent of the increase in postprivatization operating income while transfers from laid-off workers contribute at most 31 (46) percent of those gains for the mean (median) firm. We attribute the fraction of the increases in operating income not accounted for by higher prices and layoffs (equal to 64 (47) percent of the change in operating-income-to-sales for the mean (median) firm) to productivity gains. Our estimate of productivity gains may be too optimistic if there are other quantitatively important channels for transferring value from society to privatized firms. It is important to note, however, that transfers from society to the firm are partially offset by taxes which absorb a little over half the gains in operating income. Our data supports models that emphasize the inefficiency of SOEs, in particular those that highlight their reliance on excessive employment, but does not support models that emphasize the role of market power.

Finally, this paper presents the first empirical estimates of the importance of the interaction between privatization and deregulation. We find that deregulation --particularly the removal of price/quantity controls and trade barriers-- is associated with faster convergence to industry benchmarks. Though governments often spend substantial energies in restructuring to-be-privatized firms and in designing optimal auction rules. López-de-Silanes (1997) shows that these efforts often destroy value. Together with our evidence, these results support the benefits of privatization policies that stress speed and facilitate product market competition.

Section II describes the Mexican privatization program and the data. Section III presents the basic empirical

results on the effects of privatization. Section IV looks at the role of market power in explaining the observed changes in performance. Section V examines the role of transfers from workers to shareholders. Regression results on the role of deregulation are presented in Section VI. Section VII concludes.

II. The Sample

A. *The Mexican Privatization Program*

The Mexican privatization program is one of the most extensive early (*i.e.*, pre-Eastern-Europe) privatization efforts in the world in terms of both size and number of companies privatized.⁴ Before the debt crisis in 1982, the Mexican state was actively involved in the economy through SOEs which were created with the intention of attaining multiple goals such as the improvement of infrastructure, import substitution, regional development, and job creation. In 1982 there were 1,155 SOEs in Mexico in nearly every sector of the economy and subsidies and transfers to SOEs equaled 12.7 percent of GDP. SOEs* output accounted for 14 percent of GDP, 4.4 percent of the country*s labor force, and 38 percent of fixed capital investment.

The state sector began to unravel in 1983, and over the next two years, the number of SOEs was greatly reduced mainly through liquidations and mergers. Privatization did not truly take off until 1985. But by June of 1992, 361 SOEs had been privatized and the number of firms remaining under state ownership had been reduced to 225. Overall, 96 percent of all assets privatized were sold during 1989-1992, under the administration of President Salinas. By 1992, the government had withdrawn from most sectors of the economy with the exception of oil, petrochemicals, and major infrastructure services such as gas, water, electricity, highways, railways and ports. The privatization of oil was never seriously considered, and the 1994 crisis halted the privatization of petrochemicals and major infrastructure services. The broad nature of the privatization program should alleviate concerns about sample selection.

The method of privatization employed in Mexico involved first price sealed-bid auctions through a fairly

⁴ See Kikeri et al. (1994) for a survey of privatization programs around the world.

homogeneous auction process, with the value of the bid determining the winner in over 98 percent of all privatized SOEs.⁵ Ninety percent of the privatization contracts were sales of control or majority holdings while the remaining 10 percent involved sales of minority stakes. The government sold 100 percent of its ownership in all but eight transactions where the government retained a minority stake which was sold at a later date. Unlike similar programs in Eastern and Western Europe, Mexican privatization was almost always accompanied by changes in senior management, with the government-appointed management team retained power only in the six firms that were sold to the SOE* s management.⁶

B. Data

Our sample is drawn from the 233 non-financial privatization *contracts* signed over the period 1983-1991.⁷ The number of privatization contracts is much smaller than the number of privatized firms because many companies were sold as members of multi-firm conglomerates. We were able to collect preprivatization firm-level data on 218 of those contracts from audited financial statements using the privatization prospectuses and other primary documents kept in the archives of the Mexican Ministry of Finance and Public Credit. Fifteen transactions, accounting for less than 1 percent of all the privatized assets, could not be included since they lacked complete financial information for the preprivatization period. Table I groups the privatization contracts in our sample according to three-digit S.I.C. industry codes. Privatized industries vary from steel conglomerates and airlines to a popular soccer team.

⁵ Mexico, unlike other nations, never resorted to public subscriptions through the stock market as a privatization mechanism. This does not mean that there are no publicly traded firms in our sample. In fact, eleven firms in our sample were already publicly traded at the time of their privatization and remained so after privatization. However, even in these eleven cases, the government chose to privatize through first-price sealed-bid auctions rather than offer new shares in the stock market. Occasionally, companies were divested under non-standard auction requirements. For example, in 64 cases of our sample, bidders were required to submit a fairly detailed investment plan. In another six cases, the government required the winner to meet all the previous contracts of the SOE. For more details on Mexico's privatization program, see López-de-Silanes (1996).

⁶ Not included in those six cases are twenty-nine joint-ventures between the state and private firms in which the government*s stake was acquired by the private partner in the joint-venture.

⁷ Eleven financial firms were sold over the period 1983-1991.

We obtained the information of the privatized firms contained in the *1994 Economic Census* from the Mexican *National Statistics Institute* (INEGI). We complemented INEGI's data with additional information collected from nine questionnaires sent in June of 1996 and from the financial reports of all publicly traded companies. Table II shows the results of our efforts to gather postprivatization data. As the table indicates, we have complete postprivatization data for 170 firms which account for 97.31 percent of the total sales, 97.17 percent of the total assets and 92.10 percent of the total employment of the sample of 218 firms at the time of privatization. Nine companies could not be included since they merged and no longer kept separate financial statements. INEGI could not find records for an additional twenty-six firms probably due to either clerical errors or incomplete census records. These unaccounted firms tend to be small. For example, unaccounted firms represent only 1.69 percent of the sales of the sample at the time of privatization. We know that none of these twenty-six firms went bankrupt since their names are not listed in *Diario de la Federación*, the official publication of the Mexican government that (among other things) announces the initiation of bankruptcy proceedings.⁸ Liquidations are a relatively rare occurrence in our sample. In fact, only thirteen firms representing 0.83 percent of the total sales of the sample at the time of privatization were liquidated.

In principle, the figures in the pre- and post-privatization samples are comparable because the audited financial statements included in the privatization prospectuses are prepared under the same accounting procedures followed by the private sector. Testing whether the data is actually compatible is difficult because SOEs typically do not publish annual reports. Fortunately, fifty firms in our sample have publicly traded securities (*i.e.*, bonds, stocks or both) and are, therefore, obliged to publish annual reports. To assess the reliability of our data, we checked pre- and post-privatization figures against the published annual reports of those firms with publicly traded securities and discovered only minor discrepancies.

Asset sales are another possible source of measurement error when comparing pre- and post-privatization data as divestitures are frequent in the postprivatization period. Since we have establishment-level data, we

⁸ We were able to contact most of these twenty six firms by telephone. Nevertheless, INEGI could not locate their census records.

avoided the difficulties created by asset sales by treating all establishments sold in the postprivatization period *as if* they were still owned by the old SOE.⁹

Ultimately we are interested in analyzing the change in performance of our sample of firms following privatization. We rely on seven broad indicators of performance: (1) profitability; (2) operating efficiency; (3) employment and wages; (4) capital investment; (5) total output; (6) prices; and (7) taxes. The appendix summarizes our data and sources. For each firm, we measure the change in any given indicator of performance by comparing its value in 1993 to its average value of the four years preceding the privatization of the firm (*i.e.*, year $t-4$ to $t-1$).¹⁰ Since our postprivatization data is limited to 1993, simple comparisons of pre- and post-privatization performance involve averaging over firms that differ in the number of years that have been operating as private entities.¹¹ We believe that this problem is not a very serious one given that it takes firms in our sample approximately two years to complete the restructuring process that follows privatization. Also, regressions in Section VI address the problems created by different privatization cohorts. We employ local currency data in all our analysis, and, whenever possible, compute ratios using nominal data in both the numerator and the denominator. We express all nominal figures in thousands of new pesos (N\$) of 1993. We use industry-matched PPI indices to adjust all product prices and the aggregate CPI index to adjust the values of all the

⁹ Specifically, obtaining data for privatized firms involved a two step procedure. First, INEGI matched the census data with the name, address, and industrial code of all the establishments owned by the SOE when it was privatized. Second, INEGI searched for *new* establishments owned by the privatized SOE using unique identifying numbers assigned to each firm at the time of the census.

¹⁰ We used the average value of the four years preceding privatization as the benchmark to reduce measurement error. Since measurement error could result from a variety of sources, it is unclear how it would bias the results. On one hand, relying on the last-available preprivatization data may understate the gains from privatization since the Mexican government often tried to restructure firms before their privatization to increase their attractiveness. On the other hand, relying on the last-available preprivatization data may overstate the gains from privatization if, for example, government officials tampered with financial records to benefit friendly parties in the auction. In this case, using four-year averages would mitigate the bias since any tampering with financial records is likely to have been confined to the period that follows the announcement of the SOE's privatization, which is roughly two years (see discussion in Section III.C). In practice, measurement error is probably not large for financial data since our reported results are robust to the use of different preprivatization benchmarks (see, for example, Figures II and III). In contrast, employment changes are sensitive to the choice of preprivatization benchmark (see Figure I and the discussion in Section III).

¹¹ The mean (median) firm in our sample had been privatized 4.25 (4) years earlier.

remaining nominal quantities. The choice of deflator is not irrelevant since the CPI series shows higher inflation than the PPI series over the sample period. Therefore, the use of the CPI index imparts a conservative bias against finding significant increases in sales, earnings, fixed assets, wages and taxes in the postprivatization period.

We calculate four profitability ratios: operating income to sales, operating income to fixed assets, net income to sales, and net income to fixed assets. The net income measure that we use excludes direct subsidies received by the firm. In other words, suppose that an SOE receives \$1 from the Treasury and that its losses from the sale of goods and services is \$1. In such a case, we report a loss of \$1 as our net income number. We ignore all indirect subsidies since sufficient data to quantify them is not available. Net income--but not operating income--is affected by the changes in leverage that often accompany privatization. Evaluating changes in operating-income offers a superior measure of efficiency gains whereas evaluating changes in net-income provides a useful summary statistic of the full impact of privatization on the performance of SOEs. The two profitability ratios that are scaled by fixed assets (PPE) may possibly less reliable than those that are scaled by sales because the rules on how to adjust the value of PPE for past inflation were changed in 1991.

We also examine four indicators of operating efficiency to capture changes in the ability of firms to extract output from any given level of inputs. We compute cost-per-unit --defined as the ratio of cost of labor and intermediate inputs to sales--, log of sales per unit of PPE, and the log of sales per employee. Finally, we look at the ratio of operating income to employment.

The next set of indicators deals with labor. Some of the recent public controversy about privatization (e.g., in England) has focused on the rapid rise of executive compensation relative to non-executive pay. The most effective way to address these distribution issues with our data is by comparing outcomes for blue and white-collar workers. Overall, we have good employment data but, unfortunately, only 60 percent of the firms report detailed preprivatization wage data. We analyze three indicators of employment: the log of total employment, the log of blue-collar employment and the log of white-collar employment. Similarly, we compute three wage

indicators paralleling our employment measures: the average real wage per worker, the average real wage of a blue-collar worker and the average real wage of a white-collar worker.

We assess the impact of privatization on capital formation by examining both the stock of fixed assets and at the level of investment. Specifically, we examine the logs of fixed assets and of fixed assets per employee. We also look at the ratio of investment to fixed assets. Finally, we compute the ratios of investment over sales and investment per employee.

Since privatization is often motivated by the need to reduce the burden imposed by SOEs on public finances, we consider taxes as a variable through which to examine privatization's social impact. We define net taxes as corporate income taxes paid net of direct subsidies and consider their level, as well as the ratio of net taxes to sales.

Finally, we examine the behavior of output and prices. Output is defined simply as the log of total sales expressed in real terms. To analyze the behavior of prices, we compute a *Paasche* price index for each firm which measures the change in prices in the postprivatization period.¹² Our data includes the physical quantities as well as the nominal value of the sales by line of product. For each firm, we compute line-of-business prices by dividing the nominal value of sales by the physical quantity of goods sold for each line of business. In order to isolate changes in relative prices, for each firm and for each line of business, we find an appropriate control group among the 61 sectors that have official PPI statistics available and report on the firm-level price index's postprivatization behavior, relative to its control group.

Whenever possible we control for macroeconomic and industry factors by computing the same indicators used to describe the performance of privatized firms for a control-sample of private firms with the same three-digit S.I.C. code. We use economy-wide aggregates, if available, for those firms for which we cannot find a

$$\sum_{i=1}^n P_{i,post} * q_{i,post} / \sum_{i=1}^n P_{i,pre} * q_{i,post}$$

¹² For each firm we compute a *Paasche* index of prices as follows: where i indexes the n products sold by the firm, $q_{i,post}$ is the quantity of product i sold in the postprivatization period, and $p_{i,post}$ and $p_{i,pre}$ are, respectively, the (real) price of product i in the post- and pre-privatization periods.

matched industry sample. As a rule, we form control groups based on data gathered from the financial reports of all non-SOEs that trade on the Mexican stock market. Whenever stock market data is available, the procedure used to compute industry-adjusted statistics is straightforward: for each year, we use firm-level data for all non-SOEs that trade on the Mexican stock market in order to compute analogs to the performance indicators that we use to describe the behavior of privatized firms.¹³ Then we compute industry-adjusted indicators for each year by taking the difference between the value of the indicator for each SOE and the average of its industry analog across all firms in the SOE*s control group. The only cases in which our control groups are not based on publicly traded firms is when performance indicators require data on wages and employment since labor data is not available for firms in the stock market. We measure changes in employment against trends in the same industry (*i.e.*, same three-digit S.I.C. code) for all firms in the country. In the case of sales-per-employee we compute our industry benchmark using three-digit level S.I.C. data from the sales and employment data for the sample of manufacturing firms reported in the *Monthly Survey of Manufacturing Firms*. However, 19 firms (mostly in the service and mining sectors) lack suitable industry-control groups, and so we use the average sales-per-employee ratio of the manufacturing sector as control. Similarly, control groups for wages are given by three-digit S.I.C. code sectors for all manufacturing firms (86 observations). Since we are unable to find statistics on wages in the mining and service sectors during the required time periods, we use an index of economy-wide real wages per employee for firms in the mining and service sectors (15 observations). Finally, operating-income-per-employee and investment-per-employee analogs are unavailable on even an economy-wide level and, therefore, we do not report on them.

III. Basic Results

A. Raw Data

¹³ In the case of eleven firms we are unable to find suitable industry-control groups. For these firms, we use the average of all publicly traded firms as the benchmark. Telmex, the phone company, which had no privately-owned counterpart in the preprivatization period is an example of such company. The industry-adjusted results presented in the paper (*i.e.*, Tables IV and IX) are unchanged if these eleven firms are excluded from the sample.

Our basic results are presented in Table III. Several interesting results are immediately noticeable. The SOEs in our sample are highly unprofitable in the preprivatization period. For example, the mean operating-income-to-sales ratio is -15.46 percent. Profitability increases significantly after privatization according to all four indicators. The mean (median) change in profitability from the preprivatization average to 1993 ranges from a low of 24.1 (12.1) percentage points for operating-income-to-sales to a high of 40.0 (14.5) percentage points for net-income-to-sales.¹⁴ All t-statistics and z-statistics are significant at one percent. These sharp increases in profitability are greater than previous findings of the literature. For example, Megginson et al. (1994) report that, in the three years following privatization, the cumulative mean (median) change in the net-income-to-sales ratio in their sample of international IPOs is 7.5 (4.2) percentage points.

Large increases in operating efficiency underpin these gains in profitability. The average (median) cost-per-unit plummets 21.49 (16.76) percentage points. At the same time, the average (median) sales-to-PPE rises 64.64 (23.85) percent and both average and median sales-per-employee nearly double. The impact on the bottom line of the higher level of sales-per-employee is dramatic: average (median) operating-income-per-employee rises from N\$1.67 (-N\$0.68) to N\$54.17 (N\$14.41). Once again, all changes are significant at the 1 percent level.

Employment cuts are a big part of the story. The numbers of both white and blue-collar workers employed are nearly halved. The mean (median) number of white-collar workers falls by 53.5 (46.3) percent while the mean (median) number of blue-collar workers falls by 53.4 (60.9) percent. As dramatic as these figures are, they still underestimate the layoffs experienced by privatized firms. Recall that the preprivatization figures that we report are based on the average number of employees over the four years that precede actual privatization. However, as Figure I shows, the level of employment was steadily falling throughout the preprivatization period.¹⁵

¹⁴ Recall from Table II that 13 firms were liquidated in the postprivatization period and are, therefore, excluded from our sample. However, our results would not change much if the liquidated firms were included in the sample because they are so few. For example, the mean change in net-income-to sales drops from 39.9 percentage points to 32.2 percentage points if we make the extreme assumption that liquidated firms lost all their assets (ie, $\text{net income}_{1993} = -\text{assets}_{\text{preprivatization}}$) in 1993 and add them to the sample.

¹⁵ Employment appears to have peaked at t-4 based on the sample of 45 firms that have employment data going back further than t-4.

Most likely, the preprivatization fall in employment is the result of the government's efforts to revamp the firms before divesting them. In fact, using only those observations for which we have complete employment data for all four preprivatization years (117), we find that the mean (median) number of workers falls 16.53 (4.19) percent between t-4 and t-1 and a further 62.36 (64.74) percent between t-1 and 1993, where t is the year of privatization.¹⁶ These findings on labor cuts suggest that transfers from workers to shareholders play a role in the success of privatization. However, we will postpone the analysis of these issues until Section V.

Ex-ante we did not expect to see large changes in investment given that, on average, half of the installed capacity was idle in the year before privatization.¹⁷ However, privatized firms may still have reasons to undertake investments if the SOE's capital equipment is obsolete or geared to produce goods that do not have a market. The data confirms the initial presumption that privatized firm investment is low. The stock of fixed assets is mostly unchanged (its mean and median move in opposite directions). However, our investment indicators--which may be less susceptible to measurement error--point towards a moderate increase in the rate of capital accumulation. The mean (median) investment-to-sales rises from 2.99 (0.22) percent to 4.49 (1.25) percent. The investment-to-PPE ratio exhibits comparable increases: its mean (median) rises from 2.44 (0.40) percent to 7.18 (2.56) percent. Fixed-assets-per-employee increase as a result of the large cuts in employment: the average (median) fixed-assets-per-employee rise 19.79 (50.36) percent. However, note that only the change in median $\text{Log}(\text{PPE}/\text{Employee})$ is statistically significant (at 10 percent).¹⁸

Perhaps the most surprising finding of this section is that privatized firms are able to increase their sales despite more than halving their workforce and increasing their stock of capital modestly at best. In fact, the

¹⁶ In contrast with our finding of sharp cuts in employment, Megginson et al. find employment roughly 5 percent larger three years after privatization than at the time of divestiture. Megginson's finding stands at odds with labor's reluctance to embrace privatization. We do not know what explains the discrepancy between our result and theirs. It is possible that Megginson's sample of international IPOs represent a self-selected sample of those SOEs with the highest growth opportunities.

¹⁷ We do not report capacity utilization in Table III since it is not available for 1993.

¹⁸ A branch of the literature (see, for example, Laffont and Tirole, 1993) emphasizes that the fear that the state may expropriate assets of the firm that have alternative social uses is the main source of inefficiencies in SOEs as it results in under-investment. We find no evidence that under-investment by SOEs was an important factor of inefficiency in Mexico.

growth in (real) sales is nothing short of spectacular as the mean (median) sales rise 54.28 (68.16) percent. Note, however, that some of the observed output gains may reflect redistribution away from customers that obtained the SOE's output at very low prices because of corruption or sheer incompetency. For example, in Mexico, water and electricity (none of them included in our sample) are known to suffer from high levels of outright theft of the firm's output by consumers with "illegal" connections. Unfortunately, we have no way to quantify the importance of this factor in our sample. Accordingly, we may overstate the social gains that result from privatization.

The behavior of prices is also of considerable interest. The mean (median) increase in the firm's real prices is only 1.31 percent (1.27 percent).¹⁹ Product-level information on prices is available for approximately one half of the sample (83 observations). The most frequent obstacle to computing the price index is the inconsistency of reporting units between the pre- and post-privatization periods. In six cases, changes in product lines prevent us from calculating the price index. It is not obvious which types of biases may be present in the sub-sample of firms with usable product-level information on prices. The sub-sample seems to be biased towards larger, more visible, firms since the percentage of oligopolistic and monopolistic firms --as defined in Section IV-- in the sub-sample with product-level data is greater than in the original sample. However, the behavior of firms with and without price data is statistically indistinguishable for all the indicators considered on Table III.

One way to gauge the contribution of price hikes to the observed change in profitability is to compare the observed percentage-points increase in operating-income-to-sales to that which would take place if privatized firms had increased output but left prices unchanged (in real terms) at preprivatization levels.²⁰ Specifically, we

¹⁹ As a robustness check, we also computed a *Laspayres* index of prices which shows a mean (median) increase in real prices of 1.21 (1.27) percent.

²⁰ This counter-factual is not intended to capture what would have happened to prices had the firm not been privatized, but rather to isolate the contribution of changes in relative prices as a factor behind the observed gains in profitability. We can only speculate with regards to what would have happened to output prices had firms not been privatized. However, it is quite likely that output prices would have risen in real terms had privatization not taken place given the dismal profitability of SOEs and the inability of the Mexican State to continue subsidizing their losses. If this were true, it would be erroneous to attribute all of the increase in output prices to privatization as some price increases would also have taken place under State management.

define $Sales_{1993}$ and $Cost_{1993}$, respectively, as sales and operating costs in the postprivatization period and B as the increase in real prices, and compute the following measure for the contribution of price increases to higher profitability:

(1)
$$\frac{Sales_{1993} - Cost_{1993}}{Sales_{1993}} = \frac{Sales_{1993} - Cost_{1993}}{Sales_{1993}} + \frac{B \cdot Cost_{1993}}{Sales_{1993}}$$

Our results suggest that price increases account for a gain of 1.24 (0.9) percentage points in the ratio of operating income to sales. Accordingly, price increases explain 5.09 percent (=1.24/24.36) of the observed change in mean operating-income-to-sales and 7.41 percent (=0.9/12.14) of the change in the observed median operating-income-to-sales.²¹

Finally, responding to politicians* prayers, privatized firms become significant tax contributors. The average firm moves from receiving a small subsidy before privatization to paying N\$25,675 (approximately, US\$ 8.3 million) in 1993. The tax-to-sales ratio tells a similar story: the mean (median) tax rises from -4.62 (0.00) percent of preprivatization sales to 8.39 (7.63) percent of postprivatization sales. The large increases in tax revenues partially offset the social losses suffered by consumers and workers. We postpone discussion of the magnitude of this effects until the conclusion.

B. Industry-Adjusted Data

During the early 1990s, the Mexican economy expanded rapidly and experienced great sectoral transformations (see, for example, Lustig, 1992). Therefore, one may wonder whether the rapid sales growth

²¹ The corresponding figures for the sub-sample of 52 firms with price and wage data are 5.70 percent (=1.35/23.68) and 0 percent (=0/10.28). The differences with the full sample are not statistically significant.

and large increases in profits in privatized firms are manifestations of these macroeconomic and industry factors. To isolate the role of privatization, we present industry-adjusted ratios in Table IV.

Table IV allows us to rule out these factors as the driving forces behind the large increases in postprivatization sales. The table shows that growth in sales remains very strong even relative to industry: the mean (median) industry-adjusted growth in sales is 43.24 (48.91) percent. Improvements in overall industry conditions can account for only about one-fifth of the average growth in sales (*i.e.*, 11.0 percentage points out of a total of 54.3).

The key finding that emerges from the industry-adjusted ratios is that in 1993 the profitability of an average SOE is very similar (and in fact, statistically indistinguishable) from that of its private sector peers despite having previously underperformed this control group by as much as 23 to 40 percentage points (depending upon the benchmark ratio chosen). Figure II illustrates this point by showing the behavior of the median operating-income-to-sales ratio through time for both the sample of SOEs and the control group of publicly traded firms. This figure shows a fairly consistent gap between the private and public sector median operating-income-to-sales ratio during the preprivatization period. By 1993, privatized firms had completely closed the gap and, indeed, surpassed the control group by 1.78 percentage points. Operating efficiency is the mirror image of the gain in profitability (see Figure III). In 1993, unit costs of privatized firms were identical to those of the control group although they were, on average, 18.27 percentage points higher in the preprivatization period.

Another finding of Table IV is that privatization is not followed by the burst of investment government officials frequently hope for. In 1993, the mean (median) ratio of investment-to-sales of privatized firms is 3.58 (5.8) percentage points lower than that of the control group. In contrast, SOEs* investment behavior matched that of the control group during the preprivatization period. Lastly, controlling for industry factors explains a non-trivial fraction of the employment cuts. Relative to industry benchmarks the mean (median) employment of privatized firms falls by roughly 35 (34) percent.

C. *Robustness and Interpretation of the Results*

One of our main findings is that the profitability of privatized firms increases dramatically in the postprivatization period. In this sub-section, we address a number of issues relating to the robustness of our results and provide intuition for the large changes documented in the previous two sub-sections.

An immediate concern is that the large gains in profitability we observe in the postprivatization period may result from “creative” accounting performed by government bureaucrats, rather than creative entrepreneurship. Bluntly, there is a concern that the accounting records of soon-to-be-privatized firms may have overstated their losses to lower their sale price and enrich government officials and their associates (*“the cooked-book hypothesis”*). Undoubtedly, Mexico has a serious corruption problem. However, the privatization process appears to have been run in a clean manner. Financial records were audited by reputable accounting firms and bids were submitted in sealed envelopes and opened in the presence of all participants, a judge, and (more importantly) in front of video cameras. To our knowledge, there have never been allegations that corruption took the form postulated by the cooked-book hypothesis. The observers we spoke to believe that sweet deals are much more likely the result of bidding rules that excluded foreigners rather than edited books. Nevertheless, to examine the relevance of the cooked-book hypothesis we performed a variety of tests that we report below.

First, books may be more vulnerable to cooking after the intention to privatize the firm has been announced than before the announcement. Since the privatization announcement normally took place at $t-2$, we re-computed all our results using the average of $t-4$ and $t-3$ as the preprivatization benchmark period. The results on profitability are largely unchanged as hinted by Figure II. Second, cooking the books may require time. This suggests breaking the sample in two groups according to whether the length of each privatization process (where time is measured from the date of the first internal memo regarding the firm’s privatization to the date of the final sale) is above or below the median length. The results do not show that firms that spend longer in the privatization process experience larger increases in profitability as predicted by the cooked-books hypothesis. Third, cooking the books may require the acquiescence of the management in place. In 32 cases, the

management of to-be-privatized firms was replaced by pro-privatization reformers whose job was to run the firm until its sale. Reformers, in contrast with the politically-appointed managers they replaced, typically had a background in professional management. Arguably, cooking the books should have been easier under the old guard than under new management. However, we found no evidence that firms that retained the old management during the privatization process experienced larger gains in profitability in the postprivatization period. Fourth, cooking the books may be easier if it can be done inconspicuously. If this is true, cooking the books should occur less often when there are multiple bidders than in cases where there is only one buyer. There is no evidence, however, that firms sold in uncontested privatizations experienced larger gains in profitability in the postprivatization period. Fifth, in a different version of the cooked-books hypothesis, firms may cook the books to obtain larger subsidies from the State. Controlling for the level of profitability in the preprivatization period, there is no evidence that firms that received larger subsidies experienced larger gains in profitability in the postprivatization period. Finally, the most powerful evidence against the cooked-books hypothesis comes from the analysis of the annual reports of the fifty SOEs that were required to publish audited annual reports because they had publicly traded securities and, therefore, could not have possibly edited their accounting records after the privatization decision was announced. In contrast with the predictions of the cooked-books hypothesis, we find no evidence that the gains in profitability of firms with publicly traded securities are smaller than those of the remaining sample.

To gain insight into what explains the large gains in profitability in the postprivatization period, we asked CEOs and CFOs of 90 of the firms in our sample to fill in a questionnaire. Seventy four replied; 13 firms had changed owners in the postprivatization period and we were unable to locate their original buyers; 3 firms refused to answer. Fortunately, the postprivatization performance of the respondents is very similar to that of the entire

sample.²² They were asked to rate the importance of twelve factors as explanations for the gains in profitability on a scale from 1 to 5. Their answers are presented on Table V, which shows a high level of consensus among the respondents about five key factors. Half of the respondents assigned the maximum score to the introduction of new production processes (MaxScore=50 percent). Respondents also agree on the importance of three factors emphasized by the political view: (1) firing old managers and directors (MaxScore=43.24 percent); (2) resizing the labor force (31.08 percent); and (3) changes in the organization of labor (MaxScore=35.14 percent). Finally, 25.68 percent of the respondents attributed the maximum score to the improvements in the quality of existing products as an explanation for the improved performance of firms. In contrast with the predictions of the *managerial view*, only 2.70 percent of the respondents thought that better incentives for managers and directors played a key role. Other non-key explanations of the improved performance of firms included improved access to the capital markets, changes in the distribution network, introducing new products, lowering the costs of inputs and restructuring suppliers.

The findings in this section are easily summarized: sales increase quickly in the postprivatization period although the stock of fixed assets remains basically unchanged and the number of workers falls sharply. This increased efficiency coupled with higher level of sales translates into large gains in profitability. The industry-adjusted ratios suggest that privatized firms are “catching up” to the profitability and operating efficiency of their peers in the private sector. A key question is whether the higher profit level is the result of enhanced productivity or of higher markups. We turn to the role of market power in the next section for further analysis.

IV. The Role of Market Power

In this section we assess market power’s role in explaining the success of privatized firms. First, we analyze

²² Surveyed firms differ from the rest of the sample in the behavior of two of the indicators in Table III: (1) the mean reduction in cost per unit is 0.2729 for surveyed firms against 0.1671 for the rest of the sample (significant at 10 percent); and (2) the median increase in net taxes/sales is 0.0845 for surveyed firms and 0.0648 for the rest of the sample (significant at 10 percent). All other indicators exhibit statistically undistinguishable behavior for both samples.

changes in profitability for firms grouped on the basis of market power. Second, we analyze the behavior of product-level prices for a sub-sample of firms for which we have such data.

We classify firms as operating in competitive or non-competitive industries based on the description of the industry provided in the privatization prospectus. Specifically, a firm is classified as non-competitive if it operates in a sector deemed as either monopolistic or oligopolistic by the financial consultants who prepared the privatization prospectus and as competitive otherwise.²³ The results are presented on Table VI. Note, that as expected, profitability is higher in non-competitive than in competitive sectors both before and after privatization. However, median changes in both operating income ratios (*i.e.*, operating-income-to-sales and operating income-to-PPE) are higher in competitive industries than in non-competitive ones. Focusing on operating-income-to-sales yields the most favorable comparison for the competitive sector: the median operating-income-to-sales ratio increases by 14.57 percentage points compared with 8.45 in the non-competitive sector (note that the difference is not statistically significant). This data does not support the view that market power is the driving force behind the results of our previous two tables.

In contrast, both net-income-to-sales and net-income-to-PPE rise more in the non-competitive sector than in the competitive one. For example, the median net-income-to-sales rises by 20.78 percentage points in the competitive sector versus 35.40 percentage points in the non-competitive sector. However, the margin by which the non-competitive sector outpaces the competitive one drops to 3.27 percentage points if we look at net-income-to-PPE. Neither of the differences in median changes in our net-income ratios are statistically significant.

By construction, three factors can account for the conflicting behavior of operating-income and net-income: taxes, extraordinary items, and interest expense. We can rule out taxes as the explanation since the increase in taxes paid is larger for non-competitive firms than competitive firms. Changes in leverage is a more promising

²³ We examined the robustness of the results in this section using two additional definitions of market power. First, we classified firms as *competitive* if they faced at least 10 competitors in their main line of business (defined at the four-digit SIC level) and as *non-competitive* otherwise. Second, we classified firms as *competitive* when their market share of the industry output (also defined at the four-digit SIC level) was smaller than 10 percent and as *non-competitive* otherwise. Results are qualitatively similar in both cases. Footnotes 26 and 27 note where results differ.

explanation. Megginson et al. (1994) show that newly privatized firms cut their debt levels, perhaps because their debt is no longer backed by the implicit guarantee of the state. We conjecture--but lack the data to test--that firms in oligopolistic and monopolistic sectors, perhaps due to their greater preprivatization access to government-backed capital, exhibit greater reductions in leverage in the postprivatization period than firms in competitive ones. Finally, it is also possible that the net income of SOEs was unduly depressed by preprivatization restructuring charges. The bottom line is that operating-income, which is unaffected by changes in leverage, is a better gauge of the impact of market power on profits than net-income, which is affected by changes in leverage. In any event, differences in the changes in profitability measured in either way are not statistically significant.

Perhaps not surprisingly, price increases are larger in the non-competitive than in the competitive sector.²⁴ The median cumulative increase in the prices of the firms in the non-competitive sector is 5.94 percent higher than the growth of the industry-matched PPI index over the postprivatization period. Prices in the competitive sector are roughly unchanged. The median price falls by 0.28 percent in real terms in the postprivatization period. As a result, prices in the non-competitive sector rise 6.21 percent relative to prices in the competitive sector (the difference is statistically significant at the 10 percent level).²⁵

The *social view* not only calls for larger gains in profitability in the non-competitive than in the competitive sector but for lower growth in output, employment and investment. Table VI shows little evidence supporting these additional predictions of the social view. In fact, there is evidence that employment falls *less* (significant at 5 percent) and that the stock of capital increases *more* (significant at 10 percent) in the non-competitive sector than in the competitive one. There is also evidence that the non-competitive sector achieved *larger* reductions

²⁴ Other things being equal, the political model predicts that the level of political interference in the firm will decline with the level of product market competition since the cost of political interference rises with market competition. In practice, however, the political benefits associated with interfering in some competitive sectors --such as food and consumer goods-- may result in large distortions. We are unable to test the predictions of the political model for the competitive and non-competitive sectors because the task requires knowledge of the political payoffs of interfering in the various sectors of the economy.

²⁵ Differences in the behavior of prices of the competitive and non-competitive sectors are not statistically significant under the objective definitions of market power described in footnote 24.

in cost-per-unit than the competitive one (significant at 1 percent). Finally, it is interesting to note that output growth is similar in both sectors contrary to the predictions of the social view.²⁶

To summarize, the evidence thus far is not consistent with the view that monopoly power plays an important role in explaining the increased profitability of privatized firms. We find no evidence to support the view that the improved profitability is unique to the non-competitive sector. In fact, we cannot reject the hypothesis that both the competitive and non-competitive sectors experience identical improvements in profitability. We find evidence of only modest increases in the real prices charged by firms in the non-competitive sector. Perhaps more interestingly, the restructuring of the non-competitive sector is as serious as the restructuring of the competitive sector. Specifically, the evidence is inconsistent with the social view's prediction that restructuring in the non-competitive sector would be limited to hiking prices and laying off employees.

V. The Role of Transfers from Workers to Shareholders

So far our discussion has focused on market power. In this section, however, we consider if cuts in labor costs, which often are a large fraction of total costs, can explain the large gains in profitability that we documented in previous sections (*redistribution hypothesis*). Savings in labor costs could be expected if the wages paid by SOEs exceed the marginal product of labor. Such savings can take a variety of forms including wage cuts, reductions in benefits and layoffs. In this section we try to quantify the contribution of layoffs and wage cuts to the observed changes in profitability.

Examining changes in real wages is a natural way to test competing hypotheses regarding the channels through which privatization works. The *redistribution hypothesis* links postprivatization gains in profitability to transfers from workers to shareholders, as wages fall from the excessive levels induced by income-redistribution goals. *Political models* of state ownership also imply that SOE workers are overpaid, but unlike redistribution models, they lack strong predictions regarding the behavior of wages in the postprivatization period. This

²⁶ Differences in the behavior of employment and costs are not statistically significant when using the objective definitions of market power described in footnote 24.

ambiguity stems from the fact that workers may be overpaid in different ways. For example, in many countries jobs in the public sector are desirable not because the absolute level of wages is high but because they require a minimum amount of effort allowing public employees to hold multiple jobs. In such countries, it would not be surprising to find that wages rise in the postprivatization period as workers are required to increase their effort level. In contrast, workers of SOEs may be overpaid relative to the wages of their peers in the private sector. In this scenario, the political model predicts that wages should fall in the postprivatization period unless workers are able to capture a large fraction of the efficiency gains that result from the de-politicization of the firm. Therefore, the predictions of *political models* regarding changes in real wage are ambiguous.²⁷

Contrary to the predictions of the *redistribution hypothesis*, real wages increase substantially for the 101 firms in our sample for which data is available (Table VII). The mean (median) real wage per worker increases from N\$15,074 (N\$9,995) in the preprivatization period to N\$27,079 (N\$22,481) in 1993. These large increases in real wages of the privatized firms in our sample are all the more surprising because overall real wages throughout Mexico stagnated during our sample period. Interestingly, gains by blue-collar workers are larger than gains by white-collar workers. The mean (median) index of industry-adjusted blue-collar wages rises from 100 (100) during the preprivatization period to 265.61 (222.43) in 1993 in real terms. Over the same period, however, the mean (median) index of industry-adjusted white-collar workers rises from 100 (100) to 177.97 (147.92) in real terms.

All the competing hypothesis regarding SOEs that we have discussed so far in this section (*i.e.*, the *redistribution and political views*), agree in predicting that layoffs will take place in the postprivatization period. Section III has already documented large cuts in employment. Thus, the fraction of the observed changes in profitability that can be attributed to layoffs is the issue that remains to be addressed. To provide an estimate of the cost savings due to layoffs we make the extreme assumption that the marginal product of all fired workers is zero and ask the counterfactual question of how much lower would profits had been if all the fired workers

²⁷ The managerial view is silent on the behavior of wages and employment. *Ex-ante* there is no reason to think that bad incentives for managers of SOEs are more likely to result in too much employment rather than too little.

had been retained by the firm at their old wage. Specifically, we compute savings due to layoffs as follows:

(2)

where $Wage_{pre}$ is the average wage in the four years that precede privatization; L_{pre} is the average number of employees in the four years that precede the privatization; L_{1993} is the level of employment in 1993; and $Sales_{1993}$ are net sales in 1993.

As it turns out, savings due to layoffs are not as large as the dramatic employment cuts might have suggested for two reasons: (1) total wages represent only 23.38 percent of sales in the preprivatization period as wages tend to be low in Mexico; and (2) labor costs are spread over a much wider base since sales increase by 60 percent on average. The mean (median) savings from layoffs represent 6.80 (4.45) percent of sales in 1993. In contrast, the mean (median) operating-income-to-sales increases 22.12 (9.59) percentage points from -15.30 percent to 6.82 percent (-2.51 percent to 7.08 percent) for the sample of firms that have data on wages.²⁸ Accordingly, savings due to layoffs account for roughly 31 to 46 percent of the observed gains in profitability. Note that our methodology overstates the contribution of layoffs since we are implicitly assuming that laid-off workers had zero productivity. For example, mean savings due to layoffs drop to 3.4 percent of sales if we assume that laid-off workers are half as productive as those retained by the firm. Similarly, our methodology overstates losses to workers to the extent that they valued leisure and/or found alternative employment.

The large increase in real wages that we document in this section deserves further attention. One concern is that wage increases may mirror changes in the composition of the workforce. In our sample, new hires are probably too small to account for large changes in the composition of the workforce.²⁹ Large employment

²⁸ The average savings due to layoffs for the sample of 52 firms that have price and wage data is 29.72 percent ($=7.04/23.69$) and the median savings are 42.41 percent ($=4.36/10.28$). Savings due to layoffs for this sub-sample are not statistically different from those of the full sample.

²⁹ Employees hired in the postprivatization period represent 13 percent of 1993 employment by the median firm.

declines are a more serious concern as they may create the appearance of wage increases if firms disproportionately fire low-wage workers after privatization. To examine fully the role of changes in the composition of labor in the postprivatization period requires detailed wage data on laid-off employees which we do not have. However, we can test the robustness of our findings on wage gains to the impact of large reductions in employment by examining the behavior of wages in the sub-sample of firms that increased their employment in the postprivatization period. Panel B of Table VII describes the wages paid by these 20 firms. Firms in this sample also experience gains in operating income over sales of roughly 24 percentage points. More interestingly, firms that expand their employment levels increase the average real wages per worker by 105.9 percent (from N\$12,727 to N\$26,203). In contrast, Panel A shows that the corresponding number for the whole sample is 79.6 percent (from N\$15,074 to N\$27,079). We conclude that wage increases are not driven by sharp reductions in employment.

To test the robustness of our finding, we asked the 74 privatized firms in our survey whether they had increased worker compensation and why.³⁰ Almost all respondents increased real wages in the postprivatization period. More importantly, those that increased real wages also increased total compensation. This is important because our database lacks information on total compensation and we worried that the large gains in real wages may mask offsetting reductions in benefits. For example, 87.5 percent of the surveyed firms increased real wages and 88.89 percent increased total compensation for blue-collar workers in the postprivatization period.³¹

Table VIII presents the answers provided by the sub-sample of surveyed firms that increased total compensation of both blue- and white-collar workers to the question of what motivated them to increase (real) worker*s pay (59 firms). Respondents were asked to rate on a scale of 1 to 5 the importance of different factors as explanations of the increased wages in the postprivatization period.³² Note first what does not explain changes

³⁰ This is the same sample of firms that we use in Section III.C.

³¹ The corresponding figures for white-collar workers are 84.93 percent and 86.49 percent, respectively.

³² The mean (median) increase in real wages per worker by those surveyed firms with wage data (32 firms) is N\$ 13,626 (N\$ 13,431) against N\$ 10,789 (N\$ 11,810) for the rest of the sample (69 firms). The differences are not statistically significant.

in compensation. Only 8.47 percent of surveyed firms assigned the maximum score to increases in the number of hours as a factor behind changes in compensation. In contrast, surveyed firms attributed the changes in compensation to increased productivity (MaxScore=74.58 percent). Improvements in the supervision of workers (MaxScore=47.46 percent), matching the conditions offered by similar firms (MaxScore=39.90 percent) and hiring more qualified workers and employees (MaxScore=33.90 percent) were also listed as important reasons behind the observed changes in compensation.

At first sight, the importance of productivity gains as a motive for increasing wages does not square well with standard economic models in which wages are determined by the opportunity cost of workers and firm-level productivity plays little or no role. In informal follow-up conversations with surveyed CEOs and CFOs we found a consensus on what explains wage increases in the postprivatization period. The essential element of the respondents' explanation was that SOE jobs were desirable not because they paid well, but rather that they required little effort. In fact, wages tended to be lower in SOEs than in privately-owned firms. For example, only 14.28 percent of the respondents thought that the preprivatization wages of low-skill blue-collar workers paid by their firms were higher than those paid to comparable workers in the private sector whereas 51.43 percent of them thought they were lower.³³ After privatization, employers quickly moved to dismiss workers who would not live by the new rules of the game and retained the productive ones. This change required improved supervision of workers and employees (reason #2). It also meant that new hires came from a different pool than those that were hired under state management (reason #3). We confirmed with those surveyed our previous hypothesis that new hires represented a very small fraction of total employment. The importance of new hires as an explanation for wage increases is not that they were hired at a higher wage and thus mechanically drove up the average wage paid by privatized firms, but rather that firms retained the most productive workers and offered them conditions similar to both those prevailing in the private sector and those offered to new hires

³³ The corresponding numbers for other groups of workers are as follows: 16.67 percent and 54.17 percent for high-skill-blue-collar workers; 23.61 percent and 48.61 percent for low-skill-white-collar workers; and 17.57 percent and 45.95 percent for high-skill-white-collar worker.

(reason # 4). It is in this sense of increased worker effort that respondents believe that gains in worker productivity explain higher wages (reason # 1).

To summarize, the old saying that under communism workers pretended to work and the state pretended to pay them also describes SOEs in Mexico fairly well. Real wages experience large increases in the postprivatization period probably because those workers that are retained are required to work and paid accordingly. Overall, the high level of labor redundancy in the preprivatization period, the observed increases in real wages, and the productivity gains in the postprivatization period are consistent with the *political view*. In contrast, the data is not consistent with the prediction of the *redistribution hypothesis* that wages should decline, or at best, stagnate. That is not to say that transfers from workers to shareholders do not play a role in explaining the success of privatization. On the contrary, savings due to layoffs account for at most one-third of the mean change in profitability that takes place in the postprivatization period. We cannot say whether workers as a group suffered as a result of privatization since the answer depends on the postprivatization wage received by fired workers in their new occupations and on the weight given to the gains in income of the workers that were not fired.

VI. Privatization and Restructuring: Regression Analysis

In this section we analyze the role that market power and deregulation play in determining privatization outcomes, as measured by our performance ratios. The results presented in Table VI are consistent with the view that market power is not an important factor in explaining the increased profitability of privatized firms. Regressions, however, may shed new light on the role of market power because Table VI does not take into account the length of time that the firm has been privately owned, for example. As it turns out, firms in non-competitive sectors were, on average, privatized later and may have had less time to restructure.

The role of regulation is the second issue that we want to address. Previous research on regulation in connection with privatization has focused almost exclusively on the regulation of natural monopolies and public

utilities. Rather than focus on natural monopolies, we are interested in deregulation as a potential complement to privatization for the oligopolistic but structurally competitive industries that dominate our sample (the telephone monopoly is the only public utility in our sample). We loosely define the word deregulation to mean the removal of distortionary regulations. There are two ways in which deregulation complements privatization through the promotion of product market competition. At the most basic level, product market competition provides a tool to weed out the least efficient firms. The exit of inefficient firms may take very long if regulation inhibits new entry or makes exit costly. Deregulation may also complement privatization by raising the cost of political intervention in the privatized firm. Whereas an inefficient monopoly can squander its rents without endangering its existence, an inefficient firm in a competitive industry would have to receive a subsidy in order to stay afloat. In fact, competition often is restricted precisely because it raises the costs of political influence. The reverse side of this argument is that politicians may threaten to remove distortionary regulation in order to coerce firms to comply to their wishes (e.g., banks may be induced to allocate credit to sectors favored by politicians).

In Mexico, as in many other countries, privatization was coupled with deregulation policies aimed at increasing the role of market forces in the economy. In 1983, the beginning of our sample period, price controls were almost universal. Imports were severely restricted and, with a few exceptions for necessities, operated on an import license basis. Limits on foreign direct investment (FDI) were pervasive: foreign majority ownership of local firms was ruled out and many sectors were placed off-limits to foreigners. Over the course of our sample period, regulations were relaxed as a result of both an ideological shift and of government efforts to join GATT, NAFTA and the OECD.

The evolution of deregulation in Mexico can be traced through our sample as well. In 1983, all firms in our sample were sheltered from foreign imports by quotas and import licenses. Without exception, the prices of the goods they sold were set by the government who, in twenty-three cases also set output quotas. Finally, foreigners were excluded from participating in all the sectors in which the SOEs in our sample operated. The regulatory environment was quite different at the end of our sample period. Restrictions on prices and quantities

had been lifted for 114 firms in our sample (68 percent of all observations), trade barriers were removed in 111 cases (65 percent of all observations), and foreign majority ownership was allowed in 131 cases (77 percent of all observations).

Chemicals, mining and air transportation are examples of sectors that remained restricted for foreigners in 1993. Trade barriers were found in the automobile, auto parts, milk and sugar industries. Finally, price controls were common for food products, such as canned fish, sugar and sodas. In practice, price/quantity controls often co-existed with trade barriers (the correlation is 0.62, significant at the 1 percent level). Price and quantity controls were associated with fewer restrictions on foreign ownership (the correlation is -0.32, also significant at the 1 percent level). Perhaps surprisingly, there is almost no correlation (-0.02) between restrictions on trade and restrictions on foreign direct investment.

We measure restructuring by evaluating changes in the industry-adjusted performance ratios presented on Table IV. We are interested in asking questions such as: Do firms in oligopolistic sectors catch up faster to firms in the same industry than firms in competitive sectors? Can deregulation complement privatization by speeding the convergence of newly privatized firms to industry benchmarks? In practice, our industry control groups are often formed by publicly-traded firms, resulting in rough industry benchmarks. We believe that industry-adjusted changes, albeit imperfect, are superior to raw changes as measures of restructuring.

To analyze the impact of deregulation, we define three variables: (1) a dummy variable that has a value of one if the price or quantity of the goods produced by the firm was set by the state in 1993, as price/quantity controls can distort the optimal output choice and may facilitate the continuation of political interference in the firm; (2) a dummy that takes value of one if barriers to foreign trade, such as import quotas or licenses, sheltered the privatized firm in 1993, as free trade increases competition in the final product market and allows for a richer variety of intermediate inputs; and (3) a dummy variable that takes the value of one if foreign ownership could not exceed 49 percent in 1993, as restructuring requires physical and human capital and foreigners may act as suppliers of both of them in Mexico.

We include several control variables in all our regressions. First, we control for year of privatization by including time-effects for each of the nine privatization cohorts. Second, we include controls for various company characteristics, such as: (1) a dummy variable that takes value of one if the firm produces nontradeable goods; (2) the number of strikes experienced by the SOE in the five years preceding privatization, as a measure of the strength of the union; (3) a dummy variable equal to one if the buyer is an outsider to the industry; and (4) the level of the appropriate industry-adjusted ratio in the year before privatization, as a measure of the scope for catching-up.

The results presented in Table IX show that the four-year average of the preprivatization gap with the private sector is the most important of all our control variables. The estimated coefficient on the gap in profitability with the private sector for both the operating-income-to-sales, the net-income-to-sales, and the cost-per-unit regressions is not statistically different from -1. These estimates should be interpreted with caution since measurement error in the performance indicators in 1993 could bias the coefficient on the preprivatization gap towards -1. Nevertheless, these findings broadly confirm the convergence result documented in Table IV. They show that by 1993 privatized firms mean-revert fully to the average profitability of the industry in which they operate. The results are consistent with the view that a large portion of the restructuring that we observe in the postprivatization period represents catching-up with more efficient peers in the private sector. The other interesting result regarding our control variables is that bad labor relations, as proxied by the number of strikes in the preprivatization period, slow down restructuring.

The next issue we want to focus on is the role of the industry structure in postprivatization outcomes. To save space, we present only results based on regressions that include a dummy variable that takes the value of one if the privatization prospectus describes the industry as either monopolistic or oligopolistic and zero otherwise. Results are similar if we classify firms into groups based on either the number of firms in the industry or the market share of the privatized firm. The second and third columns of Table IX, show that although both operating-income-to-sales and net-income-to-sales increase slightly more in the non-competitive sector than in

the competitive one (by 2.40 and 3.77 percentage points, respectively), the difference is not statistically significant (the t-statistics are 0.39 and 0.41, respectively). The table also shows that while the investment activity and productivity growth of firms in the non-competitive sector match those of firms in the competitive sector, non-competitive firms undergo (statistically significantly) larger increases in sales and smaller reductions in employment than competitive ones.

To summarize our results on market power thus far, the data simply does not support the view that firms in the non-competitive sector need only raise prices and lower quantities in order to increase their postprivatization profitability. Moreover there is no evidence indicating that market power plays a role in explaining the large changes in observed profitability. Rather, as attested by productivity growth, all privatized firms undergo substantial restructuring and there is no evidence suggesting that firms in non-competitive sectors do any less of it.

The complementary nature of privatization and deregulation is the last issue we want to focus on. We do not include all three regulation variables simultaneously because trade barriers and price/quantity controls are highly correlated. Instead, we report results based on including FDI and price/quantity controls and briefly discuss results based on including FDI and trade barriers (not shown). The results of the first specification in Table IX support the view that deregulation is associated with better postprivatization performance. For example, controlling prices/quantities has a large negative impact on *changes* in profitability as it subtracts 11.54 percentage points to mean changes in operating-income-to-sales and 21.26 percentage points to mean changes in net-income-to-sales (both of these changes are statistically significant). The negative impact of price/quantity controls is not only confined to profitability changes. More importantly, price and quantity controls are also associated with smaller gains in operating efficiency. This can be seen in the form of smaller reductions in cost-per-unit and slower growth in labor productivity. These price and quantity restrictions are also associated with smaller reductions in employment and lower levels of investment. Not surprisingly, controlled prices are associated with higher growth in sales as lower prices stimulate sales.

Liberalizing foreign investment has a much weaker impact on restructuring. The only statistically significant result is that there is an association between restrictions on FDI and higher industry-adjusted investment-to-fixed-assets ratios. Moreover, restrictions on FDI have no effect on unadjusted-investment-to-fixed-assets ratios (we do not report the results of regressions on unadjusted ratios). A possible reason why FDI-restrictions facilitate catching up with the private sector is that firms that operate in FDI restricted sectors have low investment-to-fixed-assets. Restrictions on FDI are also associated with lower increases in industry-adjusted costs-per-unit. This last result is obtained although FDI restrictions are associated with larger changes in costs-per-unit at the firm level (again, we do not report the unadjusted regressions), suggesting that FDI facilitates catching up by lowering the industry benchmark.

We also tested--but do not report--an alternative specification of the regression presented in Table IX that substitutes price/quantity restrictions for trade barriers. The results of the second specification are very similar to those of the first, which may not be surprising given the high correlation between price/quantity restrictions and trade barriers. The only noteworthy difference between the first and second specifications is that cost-per-unit is 19.6 percentage points higher in sectors with trade barriers than those without. This last result suggests that eliminating of trade barriers speeds up restructuring not only by eliminating distortions from the product market but also by improving the choice of intermediate inputs.

The findings of this section can be summarized as follows: the observed changes in the performance of privatized firms are the result of catching-up and not of the exploitation of market power. Deregulation -- particularly the removal of price/quantity controls and trade barriers-- is associated with faster convergence to industry benchmarks. Our results remain tentative to the extent that limits on data availability make our control groups somewhat coarse.

VII. Conclusion

Using comprehensive data from Mexico, we find evidence of large increases in profitability of firms

following privatization. The average operating-income-to-sales rises by 24 percentage points in the postprivatization period. The interesting question is what fraction of increased profits in the postprivatization period comes from improved incentives and the depoliticization of the firm (the *political view* of privatization), and what fraction of those profits comes at the expense of the rest of the society (the *social view* of privatization). In this paper we have focused on the two likely sources for social losses: (1) increased prices as firms capitalize on their market power; and (2) layoffs and lower wages as firms seek to renegotiate generous labor contracts.

Contrary to the predictions of the market power hypothesis, price increases in the postprivatization period are very modest. We estimate that price increases are responsible for roughly 5 (7) percent of the increase in postprivatization profitability for the mean (median) firm. Our estimate of the contribution of price increases is biased upwards if, as argued by survey respondents, privatized firms improved the quality of their output. Our various attempts to tease out the differences in postprivatization outcomes between the competitive and non-competitive sector show that their behavior is remarkably similar. Specifically, contrary to the predictions of the market power hypothesis, the non-competitive sector does not experience larger increases in profitability, lower growth in sales and employment, and lower investment than the competitive one as oligopolies shrink the scale of their operations to maximize profits.

Consistent with both the political and social views, transfers from laid-off workers are an important source of increased profitability. They represent up to 31 (46) percent of the gains in operating income for the mean (median) firm under the quite extreme assumption of zero marginal product for laid-off workers. Two findings of the paper tilt the balance in favor of the political view over the social view. First, the evidence suggests that before privatization SOEs operated with high levels of excess employment; the output of privatized firms actually expanded dramatically despite large cuts in employment and stagnant levels of investment. Second, there is no evidence that preprivatization wages exceeded market levels as a result of income-redistribution or of policies to cure failures in the labor market (which would have motivated privatized firms to cut employment). In fact,

wages tended to be lower in SOEs than in comparable privately-owned firms and rose sharply in the postprivatization period. Jobs in SOEs were coveted because they required little effort and not because they paid well. After privatization, employers shed excess labor and increased wages of retained employees in exchange for increased worker effort. Layoffs appear to be the consequence of excess employment by SOEs rather than the need to roll back generous labor contracts.

Improved incentives for managers –the channel emphasized by some agency models of privatization-- probably played a minor role. Survey respondents ranked enhanced incentives as the least important contributing factor to postprivatization improvements in the operating efficiency of their firms. In contrast, survey respondents believed that the introduction of new production processes and the firing of the old management are the two most important success factors.

We also ask whether the gains of privatization were large relative to the losses suffered by consumers and workers. In our data, the large increase in tax revenue dwarfs the losses suffered by consumers as a result of higher prices. For example, a transfer equivalent to 1.62 percent of the increase in net tax revenues would have allowed consumers to buy the preprivatization consumption bundle at the new (higher) postprivatization prices.³⁴ Evaluating the social losses that resulted from layoffs is more difficult since some job losses were probably inevitable given the high level of excess capacity (both employees and physical capital) under which SOEs operated before they were sold. There is also the usual caveat that it is impossible to assess whether the social gains from privatization were large enough to offset job losses without knowing the fate of laid-off employees and making assumptions about the weight that their loss receives in the social welfare function.

The following calculation, however, suggests that the additional revenue received by the government as a result of privatization was probably large enough to --at least in principle-- offset social losses that result from layoffs. The increased government revenue includes the US\$60 million raised by the average privatization

³⁴ The 1.62 percent figure is the result of evaluating $B * \text{Sales}_{\text{pre}} / \Delta \text{Taxes}$ at the sample mean, where B is the percent change in real prices in the postprivatization period, $\text{Sales}_{\text{pre}}$ is the sample mean level of Sales in the preprivatization period, and ΔTaxes is the increase in net taxes in the postprivatization period.

auction. Government revenues were further boosted by increased tax collections. The present value of the increased tax collections is roughly US\$57 million per average firm under the assumption that the US\$8.5 million in higher taxes that we find in our sample can be treated as a perpetuity and discounted at a 15 percent rate. The additional revenues that resulted from privatization would have been enough to give US\$212,727 to each of the 550 laid-off workers from the average firm --a large sum given that the annual preprivatization income of an average SOE worker was US\$4,800.

To what extent do our results generalize outside of Mexico? The answer rests on two factors: (1) initial conditions of SOEs; and (2) the privatization process itself. The large gains in profitability that took place in Mexico mirror the appalling state of SOEs before privatization. Compared to the cross-country sample of publicly-traded privatized firms of Megginson et al. (1994), the poor preprivatization performance of Mexican SOEs is the salient feature of our data. For example, compared to the sample in Megginson et al. (1994), Mexican firms have significantly larger losses in the preprivatization period (–15.5 percent vs profits of 5.51 percent, respectively) but roughly similar levels of profitability in the postprivatization period (8.7 percent vs 8 percent, respectively). Such low levels of operating efficiency by SOEs may be typical in many developing countries and transition economies, but may have been overlooked by previous research that relies on the more narrow samples of publicly traded firms.

Consistent with the observation that the existing literature may underestimate the impact of broad privatization programs, Frydman et al. (1999) find that outsider privatization has a dramatic impact on growth in sales for a large sample of Eastern European firms. Specifically, they find that privatization to outsiders adds 15 percentage points to the annual growth rate in sales in the postprivatization period relative to a control group of SOEs. In contrast, they find that privatization to insiders adds only 3.5 percentage points to the annual growth rate in sales in the postprivatization period relative to a control group of SOEs. The findings in Frydman et al. (1999) are part of a larger literature that ties the success of privatization in Eastern Europe to replacing old government bureaucrats by fresh human capital (see, for example, Barberis et al. 1996). This evidence suggests that the

open-bidding format employed in Mexican privatizations may have played a role in the success of the program, since it facilitated the transfer of SOE assets to qualified buyers. While political constraints made it necessary to offer preferential treatment to insiders in Eastern Europe to gain critical support for the privatization process, the strong central government of Mexico was able to avoid this difficulty by selling SOEs to the highest bidder.

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Figure I
Mean total employment of privatized firms

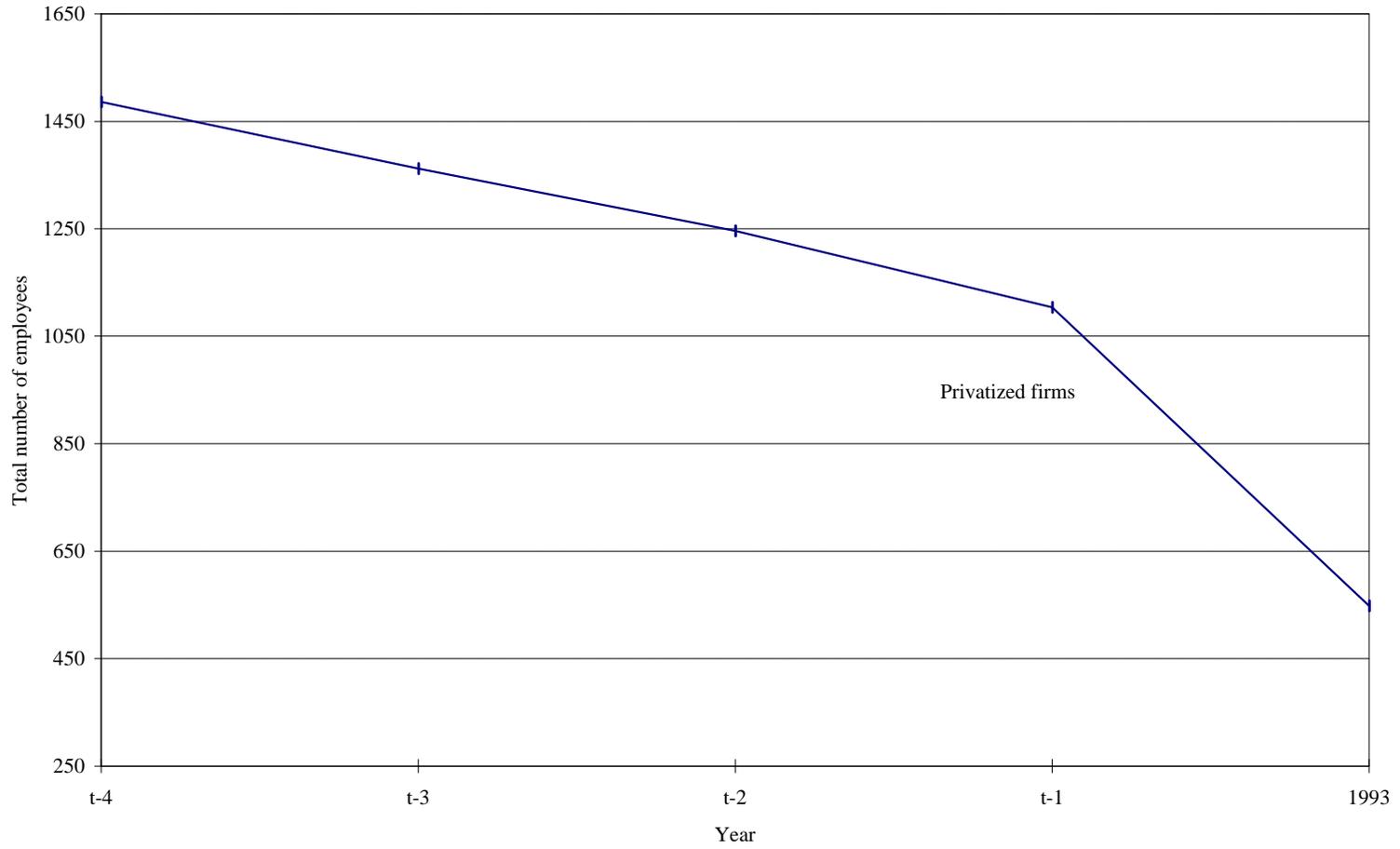


Figure II
Firms in the stock market vs. privatized firms
Median ratio of operating income to sales

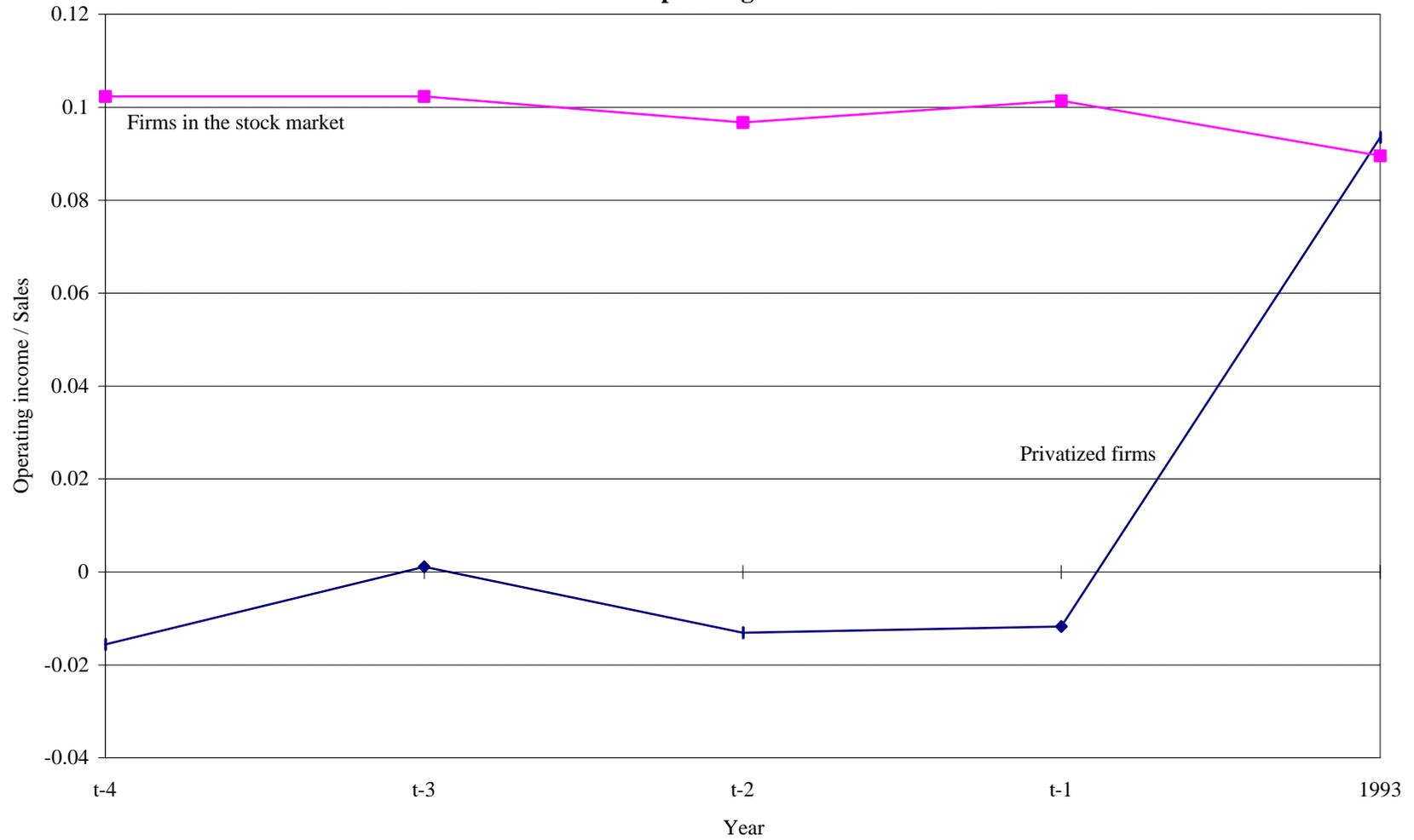
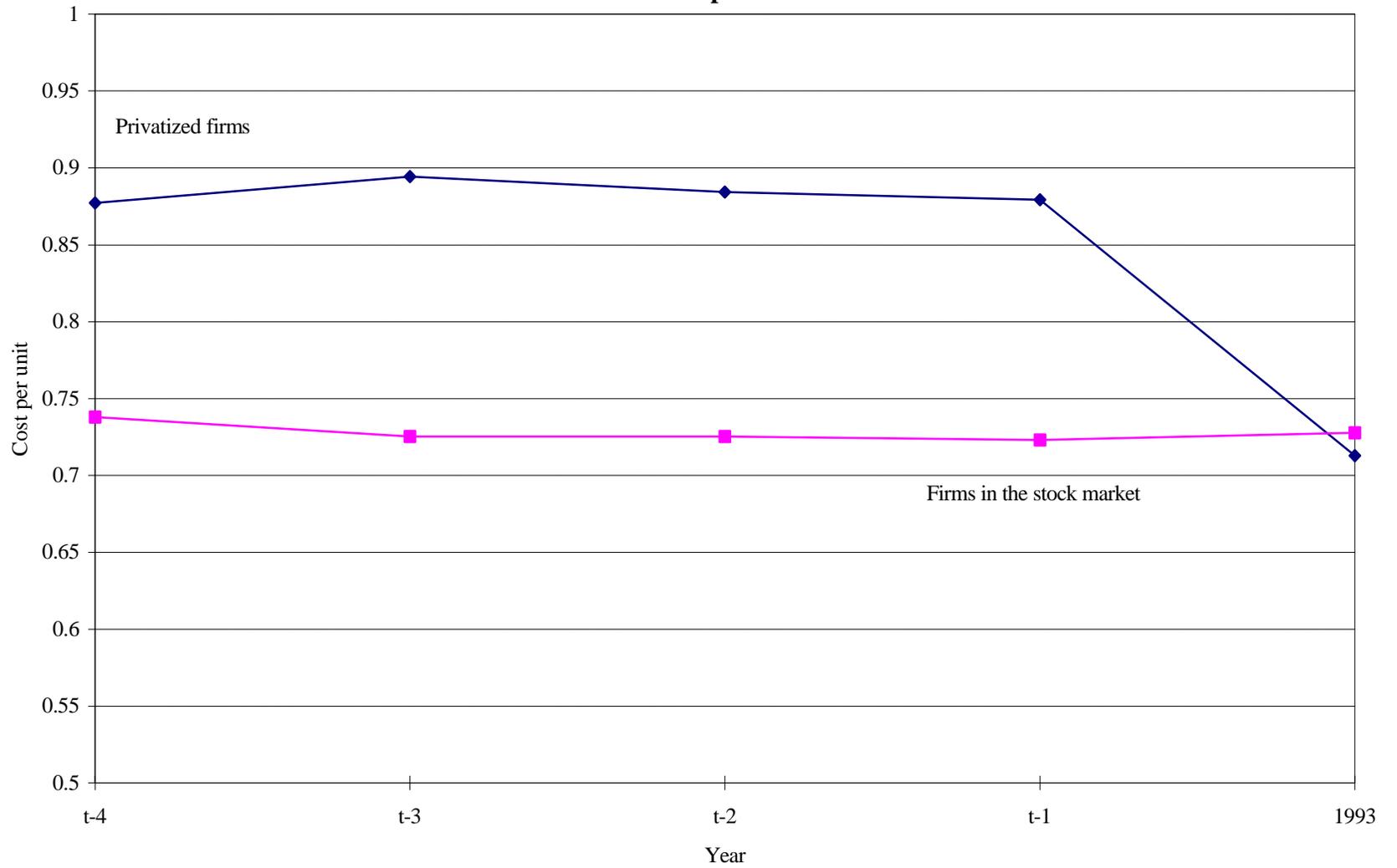


Table I
Privatization contracts according to industry classification

Figure III
Firms in the stock market vs. privatized firms
Median cost per unit



Industry	Number of contracts	Percentage of assets of the sample	Percentage of labor of the sample
<i>I. Mining</i>			
Mining of metallic minerals	6	0.0853	0.0389
Mining of non-metallic minerals	6	0.0083	0.0105
<i>II. Manufacturing</i>			
Milk products	4	0.0015	0.0145
Fruits and vegetables	4	0.0003	0.0025
Canned fish and seafood	12	0.0060	0.0191
Grains and oils	9	0.0105	0.0209
Sugar mills	44	0.0510	0.1699
Animal foods	8	0.0016	0.0034
Beverages	2	0.0005	0.0033
Tobacco products	3	0.0020	0.0110
Textiles, clothing and leather	7	0.0061	0.0145
Wood and wood products	2	0.0005	0.0020
Paper and printing	5	0.0104	0.0241
Chemicals, oil products and plastic	23	0.0659	0.0376
Non-metallic mineral products	9	0.0084	0.0145
Basic metals and derivative products	22	0.2224	0.1672
Heavy machinery and equipment	7	0.0040	0.0086
Electronics, machinery and equipment	6	0.0130	0.0292
Automotive industry	15	0.0284	0.0469
Transportation equipment	2	0.0028	0.0109
<i>III. Services</i>			
Hotels and restaurants	8	0.0054	0.0231
Land and sea transportation	4	0.0233	0.0021
Air transportation	3	0.0819	0.1053
Communications	1	0.3590	0.2178
Real estate and professional services	4	0.0017	0.0018
Recreation and entertainment services	2	0.0000	0.0004
Total	218	1.00	1.00

This table classifies privatization contracts across industries. The table indicates for each industry: (1) the number of contracts signed; (2) the ratio of the preprivatization value of the industry's total assets to the total preprivatization value of all the assets in the sample; and (3) the ratio of the industry's preprivatization total employment to the total preprivatization employment of all the firms in the sample.

Table II
Observations in the sample

	Number	Percentage of sales	Percentage of assets	Percentage of employment
Firms in our sample	170	97.31	97.17	92.10
Merged and no longer keep independent accounting records	9	0.17	0.35	0.48
Firms not found due to incomplete census records, name changes, etc.	26	1.69	1.56	5.22
Liquidated firms	13	0.83	0.92	2.20
All Privatized Firms (1983-1991)	218	100	100	100

This table breaks all non-financial firms privatized in Mexico between 1983 and 1991 into four groups. For each group we provide: (1) the number of firms; (2) the percentage of preprivatization sales in the total; (3) the percentage of preprivatization assets in the total; and (4) the percentage of preprivatization employment in the total.

Table III
Changes in performance for the sample of privatized firms

Variable	N	Mean before Median before	Mean after Median after	T-statistic for change in mean	Z-statistic for change in median
<i>I. Profitability</i>					
Operating income / sales	170	-0.1546 -0.0273	0.0865 0.0935	5.43 ^a	5.62 ^a
Operating income / PPE	170	-0.1053 -0.0142	0.2397 0.1305	4.38 ^a	5.18 ^a
Net income / sales	170	-0.3632 -0.0142	0.0364 0.1305	4.84 ^a	6.48 ^a
Net income / PPE	170	-0.2176 -0.0728	0.0537 0.0839	2.59 ^a	5.82 ^a
<i>II. Operating efficiency</i>					
Cost per unit	170	0.9166 0.8805	0.7017 0.7129	-6.68 ^a	-6.95 ^a
Log (sales / PPE)	170	0.0570 0.1680	0.7034 0.4065	4.25 ^a	3.64 ^a
Log (sales / employees)	169	4.3674 4.2054	5.4204 5.1963	8.33 ^a	8.35 ^a
Operating income / employees	169	1.6709 -0.6826	54.1750 14.4131	6.36 ^a	5.36 ^a
<i>III. Labor</i>					
Log (employees)	169	6.1655 6.2976	5.5166 5.7301	-4.37 ^a	-4.35 ^a
Log (blue collar workers)	168	5.8222 5.9558	5.2878 5.3471	-3.62 ^a	-3.62 ^a
Log (white collar workers)	169	4.8367 4.7875	4.3015 4.3241	-4.17 ^a	-4.36 ^a
<i>IV. Assets and investment</i>					
Log (PPE)	170	10.5194 10.4582	10.2395 10.5497	-1.17	0.34
Investment / sales	170	0.0299 0.0022	0.0449 0.0125	1.77 ^c	4.13 ^a
Investment / employees	169	3.1655 0.1335	10.3074 2.7184	4.69 ^a	5.96 ^a
Investment / PPE	170	0.0244 0.0040	0.0718 0.0256	4.50 ^a	5.36 ^a
Log (PPE / employees)	169	4.4645 4.2978	4.6624 4.8014	1.15	1.86 ^c
<i>V. Output</i>					
Log (sales)	170	10.4746 10.4168	11.0174 11.0984	3.25 ^a	3.74 ^a
<i>VI. Prices</i>					
Index of real prices (Paasche)	83	100.00 100.00	101.31 101.27	0.31	0.72
<i>VII. Net taxes</i>					
Net taxes / sales	170	-0.0462 0.0000	0.0839 0.0763	6.95 ^a	10.80 ^a
Net taxes	170	-760.24 0.0000	25,684.12 2,162.80	2.21 ^b	10.94 ^a

This table presents raw results for the sample of 170 privatized firms. The table presents, for each empirical proxy, the number of usable observations, the mean and the median values before privatization and after privatization (in 1993). We report t-statistics and z-statistics (Wilcoxon rank sum) as our test for significance for the change in mean and median values, respectively. Definitions for each variable can be found in the Appendix.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table IV
Industry-adjusted changes in performance for the sample of privatized firms

Variable	N	Mean before Median before	Mean after Median after	T-statistic for change in mean	Z-statistic for change in median
<i>I. Profitability</i>					
Operating income / sales	168	-0.2975 -0.1353	0.0289 0.0178	4.35 ^a	7.15 ^a
Operating income / PPE	168	-0.2336 -0.1471	0.0914 0.0021	4.12 ^a	4.87 ^a
Net income / sales	168	-0.4036 -0.1720	0.0108 0.0401	4.69 ^a	6.99 ^a
Net income / PPE	168	-0.2686 -0.1494	-0.0162 0.0242	2.41 ^a	5.76 ^a
<i>II. Operating efficiency</i>					
Cost per unit	168	0.1827 0.1423	-0.0021 -0.0105	-5.68 ^a	-5.63 ^a
Log (sales / employees)	166	-1.1836 -1.3133	-0.2679 -0.4299	6.47 ^a	6.85 ^a
Log (sales/PPE)	168	-0.2850 -0.1640	0.1834 0.0374	3.11 ^a	2.35 ^b
<i>III. Labor</i>					
Index of total employees	169	100 100	64.65 65.63	-12.48 ^a	-9.29 ^a
Index of blue collar workers	168	100 100	63.22 67.39	-11.73 ^a	-9.08 ^a
Index of white collar workers	169	100 100	67.79 68.41	-11.12 ^a	-7.05 ^a
<i>IV. Assets and investment</i>					
Investment / sales	168	0.0116 -0.0085	-0.0358 -0.0580	-5.41 ^a	-10.26 ^a
Investment / PPE	168	-0.0037 -0.0127	-0.0365 -0.0630	-2.89 ^a	-7.76 ^a
<i>V. Output</i>					
Log (sales)	170	-2.1189 -2.2166	-1.6865 -1.7275	1.91 ^a	2.70 ^a
<i>VI. Net taxes</i>					
Net taxes / sales	168	-0.0944 -0.0168	0.0665 0.0589	4.08 ^a	10.18 ^a
Net taxes	168	-766.70 -8.5112	25,522.28 2,079.71	2.19 ^b	10.53 ^a

This table presents industry-adjusted results for the sample of 170 privatized firms. We form (three-digit S.I.C. code level) industry control groups using all private firms trading in the Mexican Stock Market. For each privatized SOE and for each year, we compute industry-adjusted indicators by taking the difference between the value of the indicator for the SOE and its industry control group. We use economy-wide aggregates, if available, for those firms for which we cannot find a matched industry sample. The appendix provides more details for each individual measure. The table presents, for each empirical proxy, the number of usable observations, the mean and the median values before privatization and after privatization (in 1993). We report t-statistics and z-statistics (Wilcoxon rank sum) as our test for significance for the change in mean and median values, respectively. Definitions for each variable can be found in the Appendix.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table V
What explains the increased profitability and performance after privatization?

<i>Reasons explaining increased performance:</i>	N	Percent of respondents assigning:		Median	Mean	Standard error	T-statistics of the test of difference in means between:	
		Maximum score	Minimum score				the next reason	two reasons below
1. Introduction of new production processes	74	50.00	4.05	4.5	4.2162	0.1206	0.67 (1 vs. 2)	1.96 ^c (1 vs. 3)
2. Firing old managers and directors	74	43.24	1.35	4	4.0946	0.1204	1.12 (2 vs. 3)	0.88 (2 vs. 4)
3. Changes in the organization of labor	74	35.14	2.70	4	3.8919	0.1241	-0.49 (3 vs. 4)	1.37 (3 vs. 5)
4. Resizing the labor force	74	31.08	1.35	4	3.9595	0.1026	1.96 ^c (4 vs. 5)	4.48 ^a (4 vs. 6)
5. Improvements in the quality of existing products	74	25.68	6.76	4	3.6487	0.1339	3.03 ^a (5 vs. 6)	3.69 ^a (5 vs. 7)
6. Access to capital markets	74	22.97	21.62	3	3.0405	0.1715	0.50 (6 vs. 7)	1.24 (6 vs. 8)
7. Lower cost of inputs	74	22.97	21.62	3	2.9460	0.1720	0.94 (7 vs. 8)	-0.39 (7 vs. 9)
8. Introduction of new products	74	17.57	22.97	3	2.7703	0.1638	-1.16 (8 vs. 9)	1.90 ^c (8 vs. 10)
9. Changes in the distribution network	74	12.16	20.27	3	3.0270	0.1551	2.96 ^a (9 vs. 10)	5.45 ^a (9 vs. 11)
10. Restructuring of suppliers	74	9.46	39.19	2	2.4189	0.1598	2.19 ^b (10 vs. 11)	-1.01 (10 vs. 12)
11. Changes in the collective labor contract	74	4.05	37.84	2	2.0270	0.1201	-3.77 ^a (11 vs. 12)	-----
12. Improved incentives for managers and directors	74	2.70	20.27	3	2.5946	0.1318	-----	-----

Results from a faxed questionnaire sent to a random sample of over half (90) of the 170 privatized firms. The questionnaire was answered by either the CEO or the CFO of the privatized firm. This table tabulates the responses to the question in the questionnaire which read: "Please indicate the relative importance of the following concepts in explaining the change in profitability and performance of your firm after privatization." The respondents were asked to rate in a scale from 1(not important) to 5 (very important) the relative importance of 12 different reasons. The different reasons that explain profitability are shown ranked according to the percentage of respondents assigning each category the maximum score possible. Respondents could also answer "do not know" if they did not have enough information to provide an answer or provide alternative explanations. Only four of such alternative reasons were given, each by a different firm: (1) continuity in strategy; (2) increased productivity; (3) employees' commitment to the firm; and (4) independent technology.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table VI
Comparison of performance changes in competitive versus non-competitive industries

Variable	<i>Competitive according to prospectus</i>				<i>Non-competitive according to prospectus</i>				<i>Competitive vs. non-competitive</i>	
	N	Median before	Median after	Median change	N	Median before	Median after	Median change	Difference in median change	Z-stat of difference in median change
<i>I. Profitability</i>										
Operating income / sales	134	-0.0537	0.0884	0.1457 ^a	32	0.0397	0.1306	0.0845 ^c	0.0612	0.30
Operating income / PPE	133	-0.0396	0.1265	0.1745 ^a	32	0.0509	0.1460	0.1382 ^c	0.0363	0.75
Net income / sales	131	-0.1449	0.0635	0.2078 ^a	32	-0.0518	0.1257	0.3540 ^a	-0.1462	-1.37
Net income / PPE	131	-0.1036	0.0809	0.2155 ^a	32	-0.0198	0.1127	0.2482 ^a	-0.0327	-0.96
<i>II. Operating efficiency</i>										
Cost per unit	134	0.8878	0.7244	-0.1296 ^a	32	0.8291	0.6130	-0.2362 ^a	0.1066	2.52 ^a
Log (sales / employees)	136	4.1798	5.1461	0.9858 ^a	32	4.5099	5.9394	0.8353 ^a	0.1505	0.75
Log (sales / PPE)	134	0.2186	0.6075	0.5132 ^a	32	-0.3804	-0.0382	0.3810 ^c	0.1322	0.22
Operating income / employees	135	-1.5385	14.398	19.161 ^a	33	6.8468	24.812	30.989 ^b	-11.828	-0.93
<i>III. Labor</i>										
Log (employees)	136	6.3122	5.6699	-0.4592 ^a	33	6.2260	5.9349	-0.1864	-0.2728	-2.09 ^b
Log (blue collar workers)	136	6.0235	5.3706	-0.4365 ^a	33	5.6348	5.3471	-0.2339	-0.2026	-1.50
Log (white collar workers)	136	4.7095	4.2905	-0.4443 ^a	33	5.1998	4.9715	-0.1540	-0.2903	-2.77 ^a
<i>IV. Assets and investment</i>										
Log (PPE)	134	10.365	10.214	-0.0755	32	10.812	11.486	0.2342	-0.3097	-1.65 ^c
Investment / sales	133	0.0013	0.0094	0.0055 ^a	32	0.0099	0.0247	0.0109	-0.0054	-0.48
Investment / PPE	133	0.0017	0.0217	0.0144 ^a	32	0.0107	0.0374	0.0180 ^b	-0.0036	-0.57
Log (PPE / employees)	135	4.2471	4.7520	0.2874	33	4.4545	5.4488	0.4939 ^c	-0.2065	-1.08
<i>V. Output</i>										
Log (sales)	135	10.392	10.968	0.5622 ^a	33	10.858	11.751	0.7776 ^c	-0.2154	-1.49
<i>VI. Prices</i>										
Real price index (Paasche)	67	100.00	99.72	-0.2768	16	100.00	105.94	5.9355 ^c	-6.2123	-1.74 ^c
<i>VII. Net taxes</i>										
Net taxes / sales	133	0.0000	0.0586	0.0668 ^a	33	0.0000	0.0992	0.0940 ^a	-0.0272	-1.46
Net taxes	135	0.0000	1.603.3	1.922.4 ^a	33	0.0000	6.826.3	8.947.8 ^a	-7.025.4	-3.05 ^a

This table classifies firms as participating in a competitive or non-competitive sector based on the description of the industry provided by the financial consultant in the privatization prospectus of the firm. For both group of firms, the table presents median values before and after privatization and the z-statistics for the test of change in medians. The last two columns of the table show the difference in median change across groups and the corresponding z-statistic. Definitions for each variable can be found in the Appendix.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table VII
The role of transfers from workers

Variable	N	Mean Before (Median)	Mean in 1993 (Median)	t-stat for change (Z-test)
<i>Panel A: All firms with available wage data</i>				
Operating income / sales	101	-0.1530 -0.0251	0.0682 0.0708	4.23 ^a 4.16 ^a
Real wages per worker	101	N\$15,074 N\$9,995	N\$27,079 N\$22,481	5.42 ^a 6.05 ^a
Index of industry-adjusted real wages per worker	101	100 100	209.30 198.96	8.32 ^a 6.47 ^a
Real wages per blue collar worker	101	N\$9,525 N\$6,791	N\$22,425 N\$16,851	5.72 ^a 7.45 ^a
Index of industry-adjusted real blue collar wages	101	100 100	265.61 222.43	8.76 ^a 7.04 ^a
Real wages per white collar worker	101	N\$27,992 N\$18,892	N\$44,301 N\$37,964	4.13 ^a 5.17 ^a
Index of industry-adjusted white collar wages	101	100 100	177.97 147.92	6.08 ^a 4.84 ^a
Total wages / sales	101	0.2338 0.1506	0.1441 0.1143	-3.14 ^a -2.93 ^a
Log(Employees)	101	6.4405 6.4708	5.8944 5.9269	-2.95 ^a -2.99 ^a
<i>Panel B: Firms with available wage data that increased the number of workers after privatization</i>				
Operating income / sales	20	-0.2099 -0.0468	0.0342 0.0952	2.17 ^b 2.08 ^b
Real wages per worker	20	N\$12,727 N\$9,473	N\$26,203 N\$19,936	2.32 ^b 2.62 ^a
Real wages per blue collar worker	20	N\$8,679 N\$6,834	N\$19,608 N\$14,361	2.65 ^a 3.28 ^a
Real wages per white collar worker	20	N\$22,003 N\$15,010	N\$52,038 N\$37,602	2.06 ^b 3.25 ^a
Total wages / sales	20	0.2892 0.1438	0.2121 0.1702	-0.82 0.03
Log(Employees)	20	6.2785 6.3966	6.6788 6.7440	0.98 1.76 ^c

The table presents data for all workers, blue collar and white collar workers and shows real wages per worker and the index of industry-adjusted real wages per worker for all three groups. The table is divided in two panels. Panel A contains statistics for all 101 firms with available wage data. Panel B describes the wage behavior for the sub-sample of firms that increased the number of employees after privatization. We report t-statistics and z-statistics (Wilcoxon rank sum) as our test for significance for the change in mean and median values, respectively. Definitions for each variable can be found in the Appendix.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table VIII
What explains the increase in total compensation of workers after privatization?
(Sub-sample of firms which answered they had increased blue-collar and white-collar total compensation)

<i>Reasons of increased total compensation of workers:</i>	N	Percent of respondents assigning:			Mean	Standard error	t-statistics of the test of difference in means between:	
		Maximum score	Minimum score	Median			the next reason	two reasons below
1. Increased productivity	59	74.58	0.00	5	4.6949	0.0686	4.91 ^a (1 vs. 2)	5.06 ^a (1 vs. 3)
2. Improved supervision of workers and employees	59	47.46	0.00	4	4.0000	0.1276	-0.27 (2 vs. 3)	0.41 (2 vs. 4)
3. Hiring more qualified workers and employees	59	39.90	5.08	4	4.0339	0.1094	0.64 (3 vs. 4)	9.27 ^a (3 vs. 5)
4. Match the conditions offered by similar firms	59	33.90	0.00	4	3.9153	0.1261	6.02 ^a (4 vs. 5)	-----
5. Increased number of hours worked	59	8.47	42.37	2	2.3729	0.1541	-----	-----

Results from a faxed questionnaire sent to a random sample of over half (90) of the 170 privatized firms. The questionnaire was answered by either the CEO or the CFO of the privatized firm. This table tabulates the responses to the question in the questionnaire which read: "Please indicate the relative importance of the following concepts in explaining the increase in total compensation of workers in your firm after privatization." The respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the relative importance of 5 different reasons. Respondents could also answer "do not know" if they did not have enough information to provide an answer. They could also provide other alternative explanations. Only two of such alternative reasons were given, each by a different firm: (1) the existence of a "productivity contract" with the workers; and (2) flexible wages. The table only includes the answers of those firms that had increased both total compensation of blue-collar and of white-collar employees after privatization. The different reasons that explain increased total compensation of workers after privatization are shown ranked according to the percentage of respondents assigning each category the maximum score possible.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Table IX
Regression results

<i>Dependent variables:</i>							
<i>Independent Variables:</i>	Adj \hat{I} OI/S	Adj \hat{I} NI/S	Adj \hat{I} C/S	Adj \hat{I} S/L	Adj \hat{I} L	Adj I/PPE	Adj \hat{I} S
Monopoly or oligopoly	0.0240 (0.0623)	0.0377 (0.0912)	0.0321 (0.0476)	-0.2023 (0.2474)	0.0987 ^b (0.0491)	-0.0184 (0.0295)	0.7583 ^a (0.2455)
Price / quantity controlled	-0.1154 ^b (0.0499)	-0.2126 ^a (0.0673)	0.1679 ^a (0.0419)	-0.3347 ^b (0.1707)	0.0661 ^c (0.0395)	-0.0385 ^b (0.0186)	0.4368 ^a (0.1665)
FDI restricted	0.0611 (0.0534)	0.0178 (0.0750)	-0.0591 (0.0399)	0.1799 (0.2056)	-0.0364 (0.0378)	0.0818 ^b (0.0380)	-0.1409 (0.2020)
Revenue privatization	0.0415 (0.0690)	0.0381 (0.1036)	0.0149 (0.0589)	-0.1038 (0.3481)	-0.0643 (0.0766)	0.0348 (0.0500)	-0.0554 (0.3288)
Outside buyer	0.0085 (0.1773)	0.0961 (0.2622)	0.0089 (0.1281)	-0.6394 ^c (0.3710)	-0.0333 (0.0708)	-0.0345 (0.0436)	-0.7967 ^b (0.3980)
Non-traded good	0.0750 (0.0929)	0.0436 (0.1180)	-0.1144 ^c (0.0616)	-0.1071 (0.2804)	0.0549 (0.0419)	0.0354 (0.0386)	0.1997 (0.2543)
Number of strikes	-0.1961 (0.0149)	-0.0378 ^b (0.0188)	0.0106 (0.0096)	-0.0405 (0.0417)	0.0021 (0.0114)	-0.0030 (0.0068)	-0.0215 (0.0526)
Adj OI/S _{ore}	-1.0658 ^a (0.0613)	---	---	---	---	---	---
Adj NI/S _{ore}	---	-0.9978 ^a (0.0620)	---	---	---	---	---
Adj RC/S _{pre}	---	---	-0.9607 ^a (0.0764)	---	---	---	---
Adj S/L _{pre}	---	---	---	-0.3920 ^a (0.0806)	---	---	---
Adj \hat{I} L _{pre}	---	---	---	---	-1.0872 ^b (0.4385)	---	---
I/PPE _{pre}	---	---	---	---	---	-0.3652 (0.3244)	---
Adj sales _{pre}	---	---	---	---	---	---	-0.1702 ^a (0.0547)
Constant	0.0595 ^a (0.0208)	0.0665 ^a (0.0206)	0.0055 (0.0307)	1.7247 ^a (0.0928)	-0.4564 ^a (0.0313)	-0.0269 ^a (0.0082)	-0.0835 (0.0541)
Number of observations	163	160	163	138	164	162	165
Adj. R ²	0.5926	0.6179	0.4673	0.1700	0.2039	0.1143	0.1665

The table reports results from OLS regressions for the cross-section of 170 privatized firms. All regressions include--but we do not report-- eight dummies for privatization cohorts. White (1980) error-corrected standard errors are reported in parenthesis. The dependent variables are: (1) Adj \hat{I} OI/S --the change in the industry-adjusted operating-income-to-sales ratio; (2) Adj \hat{I} NI/S --the change in the industry-adjusted net-income-to-sales ratio; (3) Adj \hat{I} C/S --the change in the industry-adjusted costs-per-unit; (4) Adj \hat{I} S/L --the change in the industry-adjusted sales-to-labor ratio; (5) Adj \hat{I} L --the growth in employment relative to the industry; (6) Adj I/PPE --the industry-adjusted investment-to-fixed-assets ratio; and (7) Adj \hat{I} S --the industry-adjusted growth in sales. The independent variables are: (1) Monopoly or oligopoly --a dummy variable that takes value of one if the prospectus describes the industry in which the firm operates as monopolistic or oligopolistic and zero otherwise; (2) Price / quantity controlled --a dummy that takes value of one if price of the firm's output or its quantity is controlled by the government and zero otherwise; (3) FDI restricted --a dummy variable that takes value of one if foreigners are not allowed to own majority stakes in the sector in which the firm operates and zero otherwise; (4) Revenue privatization- a dummy that takes value of one if the state owned a non-control package before the transaction took place and zero otherwise; (5) Outside buyer --a dummy variable that takes value of one if the SOE is sold to a buyer with no experience in the same three-digit level SIC classification and zero otherwise; (6) Non-traded good -- a dummy variable that takes value of one if it is not possible to trade internationally the firm's output and zero otherwise; (7) Number of strikes --the total number of strikes in the five years that precede privatization; and (8) the four-year preprivatization average of the relevant dependent variable.

^a Significant at 1 percent. ^b Significant at 5 percent. ^c Significant at 10 percent.

Appendix

Description of the variables used in tables III through VII

Variable	Description
Operating income / sales	The ratio of operating income to sales. Operating income is equal to sales minus operating expenses, minus cost of sales, and minus depreciation.. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.
Operating income / PPE	The ratio of operating income to property, plant and equipment (PPE). Operating income is equal to sales minus operating expenses, minus cost of sales, and minus depreciation.. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation.
Net income / sales	The ratio of net income to sales. Net income is equal to operating income minus interest expenses and net taxes paid, as well as the cost of any extraordinary items. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.
Net income / PPE	The ratio of net income to property, plant and equipment (PPE). Net income is equal to operating income minus interest expenses and net taxes paid, as well as the cost of any extraordinary items. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation.
Cost per unit	The ratio of cost of sales to net sales. Cost of sales is equal to the direct expense involved in the production of a good (or provision of a service). This includes raw material expenditure plus total compensation paid to blue-collar workers. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.
Log (sales/ PPE)	The log of the ratio of sales to property, plant and equipment (PPE). Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation.
Log (sales/employees)	The log of the ratio of sales to total number of employees. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts. Employees corresponds to the total number of workers (paid and unpaid) who depend directly on the company.
Operating income / employees	The ratio of operating income to total number of employees. Operating income is equal to sales minus operating expenses, minus cost of sales, and minus depreciation. Employees corresponds to the total number of workers (paid and unpaid) who depend directly on the company.
Log (employees)	The log of the total number of employees. Employees corresponds to the total number of workers (paid and unpaid) who depend directly on the company. They receive, in general, either salary or wage payments on a regular schedule and work at least 15 hours a week. A minimal number of these workers do not receive a regular salary. This number includes all workers on strike, as well as workers who still report to officials of the company despite different work locations, and workers on sick-leave or vacation. It does not include individuals who are retired or working on commission.
Log (white collar workers)	The log of the total number of white-collar workers. White-collar workers perform skilled labor and administrative tasks for modest to high salaries. They are individuals involved in sales, administration, and management.
Log (blue collar workers)	The log of the total number of blue-collar workers. Blue-collar workers perform un- or semi-skilled labor for modest to low wages. They perform tasks directly related to the (mass) production process or menial services. Typically, they are factory-line or maintenance workers.
Log (PPE)	The log of Property Plant and Equipment. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation.
Investment / sales	The ratio of investment to sales. Investment is equal to the value of expenditure to acquire property, equipment, and other capital assets that produce revenue. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts. The total number of workers (paid and unpaid) who depend directly on the companies.

Variable	Description
Investment / employees	The ratio of Investment to total number of employees. Investment is equal to the value of expenditure to acquire property, equipment, and other capital assets that produce revenue. Employees corresponds to the total number of workers (paid and unpaid) who depend directly on the company.
Investment / PPE	The ratio of investment to PPE. Investment is equal to the value of expenditure to acquire property, equipment, and other capital assets that produce revenue. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation.
Log (PPE /employees)	The log of the ratio of PPE to total number of employees. Property, plant and equipment is equal to the value of a company's fixed assets adjusted for inflation. Employees corresponds to the total number of workers (paid and unpaid) who depend directly on the company.
Log (sales)	The log of sales. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.
Index of real prices (Paasche)	The <i>Paasche</i> price index is the ratio (expressed as a percentage) of the total value in the given year of the quantity of each commodity produced in the given year to what would have been the total value of these quantities in the base year. In order to isolate changes in relative prices, for each firm and for each of the firm's line of business, we find an appropriate control group among the 61 sectors that have official Producer Price Index statistics and report the postprivatization behavior of the firm-level price index relative to its control group.
Net taxes / sales	The ratio of net taxes to sales. Net taxes are equal to corporate income taxes paid net of direct subsidies received during the fiscal year. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.
Net taxes	Net taxes paid are equal to corporate income taxes paid net of direct subsidies received during the fiscal year.
Index of total employees.	For each firm, the index takes value of 100 for the preprivatization period. The 1993 value is computed by augmenting the preprivatization value by the difference between the cumulative growth rate of employment of the firm and the cumulative growth rate of employment of the control group in the postprivatization period relative to the average employment in the four years that preceded privatization. Industry control groups are given by three-digit-SIC code sectors for all manufacturing firms and an index of economy-wide total employment for firms in the mining and the service sectors. A similar procedure is used for the calculation of the index of blue collar workers and the index of white collar workers.
Real wages per worker	Real average wages paid per worker in each firm. The Consumer Price Index was used as a deflator to calculate real wages. A similar procedure is used for the calculation of real wages per blue collar and per white collar worker.
Index of industry-adjusted real wages per worker	For each firm, the index takes value of 100 for the preprivatization period. The 1993 value is computed by augmenting the preprivatization value by the difference between the cumulative growth rate of real wages per worker of the firm and the cumulative growth rate of real wages per worker of the control group in the postprivatization period relative to the average real wage per worker in the four years that preceded privatization. Industry control groups are given by three-digit-SIC code sectors for all manufacturing firms and an index of economy-wide real wages per worker for firms in the mining and the service sectors. A similar procedure is used for the calculation of the index of industry-adjusted real wages per blue collar and the index of industry-adjusted real wages per white collar worker.
Total wages / sales	The ratio of the total wages paid by the firm to the sales of the firm. Total wages is equal to the total wage bill paid by the firm to blue and white collar employees. Sales are equal to the total value of products and services sold, nationally and internationally, minus sales returns and discounts.

This table describes the quantitative variables collected for the 170 non-financial firms privatized in Mexico in the period 1983-1991 and used to measure the performance of privatized firms. The first column gives the name of the variable or the ratio. The second column describes the item. Sources: The preprivatization data comes from the original privatization files and prospectuses from the Mexican Ministry of Finance and Public Credit (SHCP). For each firm, we compute the preprivatization value of each variable or ratio by averaging its value in the four years that preceded the privatization of the firm. The postprivatization data comes from the *1994 Economic Census* from the Mexican *National Statistics Institute* (INEGI) and refer to 1993 data for each firm. When necessary, industry adjustments are made

to various variables and ratios with the use of: (1) financial data of publicly traded firms in the Mexican stock market; (2) INEGI's Monthly Survey of Industry; and (3) the Producer Price Index at the sector level.