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**Partial Privatization and
Firm Performance**

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Partial Privatization and Firm Performance

Summary

Most privatization programs begin with a period of partial privatization in which only non-controlling shares of firms are sold on the stock market. Since management control is not transferred to private owners it is widely contended that partial privatization has little impact on firm behavior. This perspective ignores the role that the stock market can play in monitoring and rewarding managerial performance even when the government remains the controlling owner. Using data on the population of Indian state-owned enterprises we find that partial privatization has a positive and highly significant impact on firm sales, profits, and labor productivity.

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Introduction

Widespread privatization in recent decades has generated a large empirical literature on the effect of ownership on firm performance. Most studies find that privatization has a positive impact on the profitability and efficiency of firms (see Megginson and Netter, 2001, for a recent survey). The firms in these studies have had a majority of their assets privatized and control rights have been transferred from the government to private owners. Surprisingly little is known about the effect of partial privatization where the government remains the controlling owner. This paper seeks to address this gap in the literature by investigating whether the performance of state-owned enterprises in India is affected by the sale of non-controlling equity stakes on the stock market.

Understanding the impact of partial privatization is important because most privatization transactions of significant size are through partial sales of equity in the stock market. In a sample of share-issue privatizations from 59 countries, Jones, Megginson, Nash, and Netter (1999) found that just 11.5% of the firms sold all of their capital and less than 30% sold more than half of their capital in the initial public offering. India's privatization program has followed a similar pattern of partial privatization through share offerings but at a particularly slow rate. In the ten years following the adoption of the privatization policy in 1991 the government has sold an average of 16% of equity in 42 firms for total revenues of \$4 billion compared to an estimated \$1 trillion raised through privatizations worldwide.

In addition to its practical importance, partial privatization is of theoretical interest because of the insight it offers into the long-standing debate over why state-owned firms perform poorly. The *political* view argues that governments pursue objectives in addition to and in conflict with profit maximization and that this political interference can distort the objectives and constraints faced by managers (Shleifer and Vishny, 1994). The *managerial* view, based on agency theory, is that state-owned firms have difficulty monitoring managers because there is neither an individual owner with strong incentives to monitor managers nor a public share price to provide information on manager actions as judged by stock market participants (Laffont and Tirole, 1993). Without information from the stock market, managerial incentive contracts

are restricted (Holmstrom and Tirole, 1993), managers lack an important public signal of their skills for the executive job market (Fama, 1980), and takeover opportunities are limited (Scharfstein, 1988 and Stein, 1988).

Full privatization makes it difficult to distinguish between the political and managerial perspectives because both ownership and control shift to the private sector at the same time. In contrast, under partial privatization the shares of the firm are traded on the stock market while the firm remains under government control and subject to political interference. Thus we are able to test the managerial perspective that inadequate information on managers is an important factor in the inefficiency of state-owned firms. India's experience is useful in this regard because it has a well-established stock market that long pre-dates privatization, and in the period we consider privatization consisted solely of the sale of minority equity stakes.

Because of its intermediary position between public and private ownership, partial privatization also offers insight into the more general question of whether financial markets can alleviate agency problems due to the separation of ownership and control. This literature considers the role of financial markets as information producers and monitors of management (see for example Grossman, 1976, Grossman and Stiglitz, 1980, Fama, 1980, Diamond and Verrechia, 1982, Holmstrom and Tirole, 1993, and Dow and Garton, 1997). Stock markets provide incentives to investors to gather information that is reflected in the share price, and this information can improve managerial incentives in a number of ways. Holmstrom and Tirole (1993) show that the share price, which contains unique information that may not be retrieved from accounting data, can be used to design more effective incentive schemes to improve performance. An observable share price can also have a beneficial impact on incentives because it serves as a signal of ability in the managerial labor market (Fama, 1980). Moreover, financial markets facilitate corporate control through takeovers, which can impose managerial discipline (Scharfstein, 1988, and Stein, 1988). However, public listings may also have an adverse impact on firm performance in private firms if there is a substantial agency cost associated with the increased dilution of ownership. In most studies of private firms it is difficult to distinguish between these confounding effects and the literature has often found evidence of a decline in

operating performance after going public (Degeorge and Zeckhauser, 1993 and Jain and Kini, 1994).

Studies of partial privatization can investigate the information effect on performance while minimizing the confounding dilution effect of going public. Unlike private firms, state-owned firms are not starting from a position where the owner has strong incentives to maximize efficiency. As a result there is no reason to assume that dilution of state ownership will increase agency costs. Partial privatization can also control for other factors that could confound the information effect such as firms undertaking “window dressing” prior to going public, or choosing to issue stock during a time of abnormally good performance (Ritter, 1991). While most studies of private firms cannot control for these effects because they only observe post-listing performance, state-owned firms are subject to stricter reporting requirements and report financial data even if they are not publicly traded.

Our data consists of accounting information on the population of non-financial firms owned by the federal (central) government of India, as well as some manufacturing and non-financial service sector firms owned by regional governments. We observe the pre- and post-privatization performance of all the firms privatized by the central government up to 1998. In all of these firms non-controlling shares were sold to financial institutions, foreign institutional investors, and the public through open auctions, public offerings, and global depository receipts in domestic and international stock markets. Since shares of these firms were traded as soon as the government sold equity we can test the managerial perspective of inefficiency in state-owned enterprises.

Our empirical strategy is to investigate whether the operating performance of firms will depend on the share of equity sold once we control for other factors that can also affect manager incentives and may be changing at the same time. We use several approaches to address the potential endogeneity of privatization. First, to minimize the possibility of simultaneity between privatization and performance we investigate the impact of the lagged share of private ownership on current performance. This also allows us to take into account that the effect of managers’ actions due to privatization are likely to appear with a lag. We estimate a

firm fixed effects specification that will address selection bias that may arise if, for example, more profitable or larger firms are selected for privatization. The specifications include firm-specific controls and year dummies to control for contemporaneous macroeconomic shocks. We then relax the assumption of strict exogeneity in the fixed effects model and estimate the dynamic GMM model developed by Arellano and Bond (1991) in which we instrument the privatization variable using instruments from within the panel. This method allows us to control for persistence in the performance measures and to investigate the effect of partial sales on the growth rates of these measures. We also control for potential dynamic selection bias using the method suggested by Frydman et al. (1999) in which the control group is restricted to firms that are likely to share similar unobserved and time-varying characteristics as the partially privatized enterprises. We find no change in the sign or significance of the reported results. We also find no evidence that firms are chosen for privatization because of unusually bad performance in the previous year, as we would then be overestimating the effect of privatization (Ashenfelter, 1978). Nor do we find evidence that the results are driven by a few profitable companies since the results do not change if we exclude the oil and gas companies which are considered the most profitable of all the state-owned firms. Finally, we find that the impact of partial privatization remains positive and statistically significant when we control for changes in competitive conditions.

The results suggest that both the level and the growth rates of profitability and labor productivity improve significantly with partial privatization. In the firm fixed effects regression we find that a 10 percentage point decrease in government ownership increases annual (log) sales and profit by 20% and 13% respectively, and the average product of labor and returns to labor by 5% and 6% respectively. These results are consistent with the prediction of the Holmstrom and Tirole (1993) model that firm performance will depend on the volume of equity sold. In their model the information contained in the stock price and hence its impact on manager incentives will improve with the liquidity of the stock. Estimating the Arellano and Bond (1991) model we find that profitability and productivity growth rates increase significantly in response to a decrease in government ownership. Since we do not find a corresponding

decline in employment the results support the hypothesis that partial privatization addresses the managerial rather than the political source of inefficiency due to government ownership.

Our results also offer insight into the debate on the relative importance of competition versus ownership for productive efficiency. Some argue that competition can shape managerial incentives better because it reduces the market share of inefficient firms and facilitates performance comparisons (Hart, 1983 and Vickers and Yarrow, 1991). On the other hand Shleifer and Vishny (1994, 1997) have argued that so long as politicians are in control public sector firms will be characterized by political interference. India’s privatization program was part of a broader set of economic reforms launched in 1991 that included two competition-enhancing policies that were of significance for state-owned firms: “dereservation”, which eliminated restrictions on entry into certain sectors that had been the exclusive domain of government firms; and “liberalization”, which eliminated restrictions on foreign equity investment. The added advantage of observing these policy changes is that we can avoid using endogenous market concentration ratios. Our results suggest that privatization and competition are not substitutes in their impact on firm performance. Moreover the effect of partial privatization remains similar and statistically significant when we control for changes in the competitive environment.

In the next section we briefly describe the main characteristics of India’s economic reforms and its state-owned enterprises. Sections 3 and 4 describe the data, results, and potential problems with the estimation strategy that we address. We conclude and discuss extensions in Section 5.

II. Background of the Indian privatization program

In response to a foreign exchange crisis in 1991, India undertook sweeping economic reforms that included deregulation and privatization. Since the Industrial Policy Resolution of 1991, which outlined the economic reforms, nearly every government’s annual budget has declared that their privatization goal is to reduce government ownership to 26 per cent of equity in all

non-strategic firms.¹ However until 1998 the federal government had sold an average of just 16 per cent of equity in 36 of 258 firms and majority stakes in none.² Euphemistically referred to as “disinvestment”, privatization has proven to be very difficult to implement. In the ten years following the launch of the privatization program the government sold minority shares through a variety of methods including auctions and public offerings in domestic markets, and through global depository receipts in international markets.³

We are particularly interested in the role of an observable stock price in affecting performance. With the exception of 2 firms, all the partially privatized firms are listed on the stock market and their shares have been traded since the month they were privatized. The remaining firms are owned by regional governments but the results do not change if these are excluded from the sample. We wish to note that none of the partially privatized firms were traded prior to privatization, and none of the firms that have not been partially privatized are publicly traded. Examining the current ownership structure of partially privatized firms, we find that privatized equity is mostly distributed between financial institutions, foreign institutional investors, and the public. From stock market records it also appears that even when shares were sold to financial institutions, trading in these shares commenced almost immediately on the domestic stock markets. It is worth noting that India has the world’s third largest investor base with over 20 million shareholders investing in about 10,000 listed companies.

Large-scale government ownership of firms in India was originally justified by concerns that the private sector would not undertake projects requiring large investments with long gestation periods. Starting in the late 1960s there was a period of rapid nationalization of firms in all sectors, so that by the mid-seventies the public sector accounted for one-fifth of GDP and two-thirds of the total fixed capital invested in the economy (Goyal, 1999). The Indian public sector consists of departmental enterprises that are run directly by government

¹Strategic firms are those in the defense, atomic energy, and railway sectors. 26% is the minimum amount of equity necessary for certain voting powers.

²Our data ends in 1998 and we observe all the firms partially privatized by the federal government until that year and 2 firms partially privatized by regional governments. Between 2000 and 2002 an additional 16 firms were approved for sale with transfer of management control.

³A controversial event of the disinvestment process was the purchase of equity in state-owned companies by other state-owned companies in 1999. Our data ends in 1998 hence we do not include these transactions in the analysis.

ministries, such as the railways, the postal service, telecommunications, irrigation, and power, and enterprises that have separate boards of directors. Firms owned by the central government account for nearly 85 per cent of the total assets of all state-owned companies. These firms are also large employers accounting for 10 per cent of the total workforce in the organized sector.⁴ Over half the enterprises owned by the federal government are loss-making and the majority of these companies perform far worse in comparison to private firms in the same industry. The economic burden of the state sector is considerable since these enterprises account for approximately 25 per cent of GDP and 43 per cent of the total capital stock in India. Quoting from government sources, privatization will "... release huge amounts of scarce public resources locked up in these enterprises for deployment in areas that are much higher on the social priority..." (Department of Disinvestment, 2001).

Prior to 1991 India had an elaborate regulatory framework popularly known as the "License Raj" that involved restrictions on who could invest, how much, in what, and where. Deregulation started in the mid-seventies but it was not until 1991 that most of these restrictions were removed. The most significant deregulatory measures affecting state-owned firms, dereservation and liberalization, were implemented in this year. Dereservation reduced the number of sectors reserved for the public sector from seventeen to four. Only arms and ammunition, atomic energy production, mining of minerals related to atomic energy, and railway transportation remain closed to the private sector.⁵ Since 1991 there have been a number of joint ventures between public sector companies in dereserved sectors and private companies such as the collaborations between Indian Oil Company and Mobil, IBP and Caltex Petroleum, and Balmer & Lawrie Freight Containers and Tectrans of Germany to name a few. Liberalization allowed for automatic approval of foreign equity up to 74 per cent in certain sectors.⁶ Exam-

⁴The total workforce in the organized sector (registered companies) was estimated at 27 million in 1997 with 20 million employed by governments and government-owned enterprises (Department of Disinvestment, 2001).

⁵The sectors reserved for the public sector that were opened to private participation are: Iron and Steel; Heavy Castings and Forgings of Iron and Steel; Heavy Plant and Machinery for Iron and Steel; Hydraulic and Steam Turbines; Coal and Lignite; Mineral Oils; Mining of Iron Ore, Manganese, Chrome, Gypsum, Sulphur, Gold and Diamonds, Copper, Lead, Zin, Tin, Molybdenum, Wolfram; Aircrafts; Air Transportation; Ship Building; Telephones and Telephone Cables; Telegraphs and Wireless Apparatus; and, the Generation and Distribution of Electricity.

⁶At the 2-digit SIC level the industries that were liberalized are: Food; Cotton and other Textiles; Textile

ples of foreign companies that entered Indian markets in response to the liberalization policy are Cogentrix, AES Transpower, Rolls Royce, Powergen, British Telecom, AT&T, Deutsche Telekom, and Nippon Telegraph.

Changes in the rules governing the competitive environment occurred at around the same time that firms were being partially privatized and could also have an effect on manager incentives (see for example Hart, 1983 and Vickers and Yarrow, 1991). We will include these two exogenous policy changes in the estimations to identify the effect of partial sales on firm performance and to investigate the relative importance of competition versus ownership.

III. Data

We observe the privatization status, industry, share of government ownership, and a range of accounting data for 341 manufacturing and service sector firms owned by the central and state governments of India. This includes 249 firms that form the population of non-financial companies owned by the central government, and 92 firms that are owned by various state governments. The firm level data was collected by the Centre for Monitoring the Indian Economy (CMIE) from company balance sheets and income statements.⁷

From the full sample we observe current sales for an unbalanced panel of 2470 firm years between 1990 and 1998. Excluding observations with missing information on lagged assets and government loans the largest available sample is 1958 firm years from 1991-1998. This data also includes 284 firm years of observations for firms owned by regional governments. In order to avoid exacerbating attrition we use an unbalanced panel.

We obtained data on privatization transactions from the Government of India, the World Bank Privatization Transactions Database, and from news sources. The information includes the fraction of equity sold by a firm, the year of sale, and the method of sale. The World Bank

Products; Basic Chemicals except Petroleum and Coal; Rubber, Plastic, Petroleum and Coal Products; Metal Products; Machinery and Equipment; Transport Equipment; Mining Services; Basic metals; Medical Equipment; Construction; and Land and Water Transportation services. We use two and three digit SIC codes to identify liberalized and dereserved sectors. Government approval is still required in the following industries: coal and lignite; petroleum; alcohol; sugar; tobacco products; defense and aerospace equipment; hazardous chemicals; and drugs and pharmaceutical products.

⁷Data from the same source was used recently by Bertrand, Mehta, and Mullainathan (2002).

data confirms that the firms sold stock either through public offerings on the domestic stock exchanges and/or through global depository receipts. There were no strategic asset sales to another company or individual between 1991 and 1998.

Since firms are not required to report employment in their income statements we obtain annual data on the number of workers from the Annual Public Enterprise Survey published by the government. However this data is not available for regional state-owned firms.

Our data has a number of advantages over other studies that consider the effects of privatization. We observe the population of non-financial public firms owned by the central government of India so sample selection is not an issue. Detailed ownership information lets us investigate the effect of variations in ownership shares (for example Frydman et al., 1999, only observe whether a firm has been privatized). Another advantage of this analysis, which is an issue of concern in the existing literature, is that the accounting standards remain the same in our data after partial privatization because the firms are still owned by the government and are subject to the same reporting requirements.

Table 1 reports the incidence of privatization and the average fraction sold in each year between 1991 and 1998.⁸ The largest number of privatizations occurred in 1992, a year after the reforms were announced, when an average of 12% of shares of 26 firms was offered on the stock market. Table 1 also reports the distribution of firms in dereserved sectors and liberalized sectors. Below we describe the principal variables used in this paper.

We investigate the effect of partial privatization on the following categories of firm performance: profitability; labor productivity; and employment. Following the literature, we use the annual values of (log) sales and (log) accounting profit as measures of profitability. Sales have also been used as a measure of productivity in other studies. Profit is measured as the income before tax from the main activity of the firm and does not include payments made by the government or government-owned development institutions to the firm. Our two measures of productivity are the (log) average product of labor (ratio of net sales to employment) and returns to labor (ratio of operating income to labor). The first variable is a standard mea-

⁸Since we investigate the impact of lagged ownership on performance we do not look at the effect of the sale that took place in 1998 because we lack data for 1999.

sure of labor productivity in the literature while the second variable is used by LaPorta and Lopez-di-Silanes (1999) among others. Finally, we also observe (log) annual employment as a dependent variable. The construction of the variables are described further in the Appendix. The explanatory variable we focus on is $PRIV_{it}$, which measures the percent of equity of firm i that is privately owned in year t .⁹ Firm-specific controls include lagged performance, lagged (log) annual assets to control for firm size, and competition policy changes. Following Bartel and Harrison (2001) we control for potential changes in political interference by the government by including as an explanatory variable the share of government financing (loans and subsidies) in total borrowing.

IV. Results

From the summary statistics presented in Table 2 it appears that partially privatized firms have higher sales, profit, labor, average product of labor, assets, and returns to labor than firms that remain under full state ownership. Table 3 presents before-after statistics of selected performance measures for the partially privatized firms. Some of these firms sold shares in more than one tranche so we define the pre and post measures as average values of the variables for the years before and after the first tranche. We find that firms experience a significant increase in annual sales and profits after partial privatization. Our results are similar to LaPorta and Lopez-di-Silanes' (1999) finding of a 24.1% increase in the average profits of Mexican firms after privatization. We note that there is also a significant decline in borrowing from government sources after partial privatization.

The before-after estimator is not reliable if there are changes in the overall state of the economy between these years or if there are changes in the life-cycle position of some of these privatized firms. Below we describe the results of a fixed effects regression with year dummies.

⁹We will investigate the effect of lagged $PRIV$ on current performance to avoid potential simultaneity problems.

A. Estimating the effect of partial private ownership

We investigate the average impact of privatization by comparing privatized firms to firms that do not sell any equity through 1991-1998 by estimating the following firm fixed effects specification:

$$y_{it} = \alpha_i + \alpha_t + PRIV_{it-1}\beta + X_{it}\delta + \varepsilon_{it}, \quad (1)$$

where y_{it} is the performance measure, the X_{it} variables are firm-specific factors that explain the outcomes, and α_t is a year effect captured by dummy variables for each year.

The specification in (1) includes a firm-specific fixed effect, α_i , which reflects fixed differences across firms that are constant but unobserved over time, year dummies that would capture contemporaneous correlation, and a random unobserved component ε_{it} that reflects unobserved shocks affecting the performance of firms.

The results from estimating equation (1) are presented in Table 4. We find that the share of equity that is private in the previous year has a positive and statistically significant impact on all the profitability and labor productivity measures. For example in column 1 we see that a 10 percentage point increase in the level of private equity would increase annual sales by 20%. The results also suggest that partial privatization does not cause the government to abandon the political objective of maintaining surplus employment. Reducing the level of government ownership has no effect on employment and borrowing from the government appears to have a negative impact on profitability. The latter result could be interpreted as evidence of political interference, however it could also be the case that financial support is directed to poorly performing firms.

Next we relax some of the assumptions of the fixed effects model. First, following Frydman et al. (1999) we account for persistence in the performance variables by including a lagged dependent variable in the specification.¹⁰ We use the dynamic GMM model developed by Arellano and Bond (1991), henceforth known as AB, and difference equation (1) to remove the

¹⁰We improve on their estimation strategy by accounting for endogeneity of the lagged dependent variable in a fixed effects specification.

fixed effect α_i , and use lagged levels of the dependent and predetermined variables and differences of the strictly exogenous variables as instruments.¹¹ Second, we treat $PRIV_{it-1}$ and the lagged share of government loans in total borrowing as predetermined variables and instrument them as well. For these instruments to be valid it should be the case that once we include the predetermined variables in the regression further lags of these variables do not explain performance growth.¹² Since we have a relatively short panel we restrict the instrument set to a maximum of 3 lags of the dependent and predetermined variables.¹³

This approach will also minimize the potential for endogeneity of the privatization variable because it is far less likely that the decision to sell or how much to sell in a given year is based on anticipated changes in performance in the future. However, the main disadvantage has to do with the use of potentially weak instruments that may not be highly correlated with the predetermined variables. In Table 5 we report the results from estimating the following AB specification:

$$\Delta y_{it} = \alpha_t + \Delta PRIV_{it-1}\beta + \Delta y_{it-1}\gamma + \Delta X_{it}\delta + \Delta \varepsilon_{it}, \quad (2)$$

which describes the effect of a change in the level of private equity on the growth rates of the performance variables. The results suggest that a change in the share of private equity has a positive and statistically significant impact on the future growth rates of sales, profit, average product, and on the change in returns to labor. There is no impact on employment growth. Consider the average firm in the sample that sells 0.4% equity between $t - 2$ and $t - 1$. Based on the results in Table 5 if this firm were to instead sell 1.4% it would increase the next period growth rate of sales by 1.7 percentage points, profit by 3.8 percentage points,

¹¹The model relies on the sequential exogeneity assumption that, conditional on the firm fixed effect, ε_{it} is not correlated with current and past values of the right hand side variables but may be correlated with future realizations of x_{it} .

¹²It is reasonable to question this assumption in the case of $PRIV_{i,t-1}$, since partial privatization in the periods prior to $t - 1$ should also have an impact on current performance. Note however that $PRIV$ in any year will measure the cumulative amount of equity sold upto and including that year. We still test the assumption by including both $\Delta PRIV_{i,t-2}$ and $\Delta PRIV_{i,t-1}$ in a fixed effects specification in differences. The coefficient of $\Delta PRIV_{i,t-2}$ is not significant for any of the dependent variables. The same result was obtained for the lagged share of government loans in total borrowing.

¹³Including all the available lags as instruments does not significantly change the magnitude or statistical significance of the coefficients.

and average productivity by 1.1 percentage points (columns 1-3).¹⁴ We report the p-values from the Sargan test of overidentifying restrictions and note that we cannot reject the null hypothesis that the instruments are valid (p-values are between 0.28 and 0.81). The tests for second order autocorrelation in the differenced residuals also support the assumption of the AB model that the residuals in the levels equation are serially uncorrelated.

From Holmstrom and Tirole (1993) we know that the informativeness of the stock price signal will depend on the liquidity of the stock. The testable prediction of their model is that performance should depend on the volume of equity sold because managers can be monitored more effectively with better information. The results appear to support this hypothesis since we find that performance will improve more the greater the share of equity sold. It would be interesting to see however if the results capture the firm's response to being listed on the stock market, which does not vary with the volume of equity sold. To test if the share of equity sold will matter once we control for the listing effect, we introduce the dummy variables below that capture the impact of the first and second listing on performance:

$$\begin{aligned}
 FIRST_{is} &= \begin{cases} 1 \forall s \geq t \text{ if firm } i \text{ first sells equity in year } t \\ 0 \text{ otherwise} \end{cases} \\
 SECOND_{js'} &= \begin{cases} 1 \forall s' \geq t \text{ if firm } j \text{ again sells equity in year } t \\ 0 \text{ otherwise} \end{cases}
 \end{aligned}$$

To save space we only report the coefficients of the listing and equity share variables in Table 6 since the control variables are the same as used in equation (1). We observe in column 1 that the initial listing has a positive and significant impact on sales and the coefficient of *PRIV* is also positive and significant, but when we control for a subsequent listing the coefficient of the fraction of equity sold is no longer significant. In contrast the coefficient of *PRIV* is positive and highly significant for profit, average product, and returns to labor when we include *SECOND*. Thus we find evidence of a listing effect on nearly all the performance measures

¹⁴We lose at least one year of observations due to first differencing and the use of lagged variables as instruments. However we replicated the fixed effects results with this smaller sample without major changes.

but the results also suggest that this effect will be stronger the higher the share of equity sold.¹⁵ None of the estimated coefficients are significant for employment and we do not report these results. We also entered the (differences of) initial and subsequent listings as additional predetermined variables in the AB specification in equation (2). The coefficient of the first difference of *PRIV* remains positive and significant for all the performance measures. The listing effects are significant for the profitability variables but not for productivity growth.¹⁶

Since none of the firms transferred management control, the principal change introduced by partial privatization is the impact on managers' incentives of the information contained in an observable share price. State-owned enterprise shares are closely monitored by the large number of business analysts and institutional and individual investors in India's stock markets. Market monitoring can affect manager incentives in a number of ways, although in this case we can probably rule out the disciplinary impact of a market for corporate control (Scharfstein, 1988) since it does not exist for state-owned firms. Stock performance is a valuable signal in the market for managerial skills and it may also be used by workers and lower level managers to monitor senior managers since all workers' outside opportunities depend on the performance of the firm (Fama, 1980). This argument is bolstered by the fact that in the decade following economic liberalization there has been a rapid growth in executive compensation in the private sector. Stock prices may also be used by the government to monitor managers more effectively.¹⁷ For example if the government is interested in raising more revenues from future equity sales it may explicitly or implicitly pressure managers to maintain share value.¹⁸ Better information and monitoring might also reduce corrupt practices by managers, like redirecting

¹⁵Note that *PRIV* is the interaction between *FIRST* and the share of private equity in the firm.

¹⁶These results are available on request.

¹⁷Compensation contracts for managers of state-owned enterprises could provide evidence of improved monitoring by the government. But the government does not release this data, also contracts would not capture job market signaling or implicit pressures from within the firm.

¹⁸This does not imply that the government no longer pursues political objectives. The main criticism of the government owner is that it has other objectives in *addition* to profit maximization. Stock prices allow the government to better monitor manager actions that improve profit performance, but this does not rule out political objectives being pursued as well. The results too suggest this since employment does not fall and the effect of partial privatization is significant when we control for government payments to firms. Moreover, it is unclear why objectives would change selectively for the partially privatized firms. A revenue maximizing government would emphasize profit maximization in all the firms since they are all future sale candidates.

output to non-paying customers (LaPorta and Lopez-di-Silanes, 1999). Thus improvement in incentives may come about through a combination of the above channels.

It could be that managers respond to other factors that also affect incentives but are not related to better information, such as a bankruptcy threat. We controlled for a potential change in budget constraints by including financial support from the government as an explanatory variable. However, Indian state-owned enterprises are rarely if ever shut down and there is no anecdotal evidence to suggest that partially privatized firms are subject to a greater bankruptcy threat. Another potential explanation is that managers respond to the threat of losing their jobs after privatization if profits decline, and not to the share price. It seems unlikely however that managers concerned about their future with the firm would not care about maintaining or improving share performance. Moreover, this explanation does not provide an unambiguous prediction because managers may also understate profits to discourage potential buyers as was true in many instances of insider privatization in Eastern Europe and Russia. However, a plausible alternative explanation for performance improvement is that manager incentives are affected by a change in competitive conditions rather than partial privatization.

B. Controlling for changes in the competitive environment

We ask if partial privatization will continue to matter once we control for changes in the competitive environment of firms. We introduce two variables to capture the effects of dereservation and liberalization: *DEREST* will equal one if the firm is in an industry that was reserved for state-owned firms and zero if it is an industry that was never reserved. *LIBT* will equal one if the firm is in an industry that removed restrictions on foreign entry and zero if it is an industry that retained barriers. Both are interacted with a time trend. An advantage of these exogenous policy changes is that they measure potential rather than actual entry and therefore are less likely to suffer from the endogeneity problems associated with measures of market concentration. In Table 7 we report the coefficients of *PRIV*, *DEREST*, and *LIBT* for the fixed effects and AB estimations. The control variables are the same as in specifications (1) and (2) and we do not report them to save space.

From the fixed effects results in the top half of Table 7 we see that the coefficient of the share of private equity remains positive and statistically significant at the 1 per cent level for all the performance measures. Dereservation appears to increase sales and profit but the coefficient is not significant for the productivity measures.¹⁹ In contrast, from the negative coefficient of the liberalization dummy it appears that sales decline in response to foreign entry. The results also suggest that competitive pressures will force firms to undertake some labor restructuring although there does not appear to be a corresponding effect on labor productivity. The AB specification is reported in the lower half of Table 7 and we find that the coefficient of $\Delta PRIV$ is positive and significant for all the performance measures (except employment). However competition does not appear to have much effect on the growth rates of the performance measures.

Clearly the effect of partial privatization on firm performance cannot be attributed to changes in the competitive environment alone. Contrary to Vickers and Yarrow (1991) the evidence suggests that competitive pressures may not be sufficient to fully address productive inefficiency. Instead the effects of competition and privatization may be complementary, so that reducing government ownership is necessary to improve productive efficiency while competitive pressures increase the allocative efficiency of firms.

C. Addressing problems in the estimation strategy

The fixed effects estimation will control for the sort of selection bias that may arise if more shares of better firms are likely to be sold. We also address potential selection bias by using lagged privatization and instrumental variables. Below we describe the results from additional robustness checks.

We investigate whether the results overestimate the impact of privatization because privatized firms experience a decline in performance prior to privatization that other firms do not, a phenomenon often referred to as “Ashenfelter’s dip” (Ashenfelter, 1978). Following Bartel and Harrison (2001) we compare the pre-privatization performance measures with those of

¹⁹We do not observe firms belonging to the sectors that are still reserved for the government (defense, atomic energy, and railways).

firms that did not change ownership and find that privatized firms do not perform differently compared to the control group prior to privatization.

Fixed effects will not address the dynamic selection bias that may arise if the government selects firms for privatization based on time-varying characteristics that are unobservable to the researcher. Frydman et al.(1999) argue that firms that are selected for privatization are likely to share similar characteristics so comparing privatized firms to a control group of firms that have also been selected for privatization but have not yet been sold should address this potential selection bias. Since privatization is distributed over several years in our data, in any given year we also observe firms privatized in later years that form the control group. The control group will also include all the firms that have been sold between 1998 (the last year of our sample) and 2001. From the results of the fixed effects regression reported in Table 8 we see that the coefficient of the *PRIV* variable is positive and highly statistically significant for all the performance measures. The positive effect on employment is surprising and may suggest that higher profits cause the firms to hire or retain more workers relative to firms that are yet to sell equity. We do not report results from estimating the AB model to save space since they are similar to Table 5.

The partial privatization process in India also causes us to believe that dynamic selection is not a major problem. The debate in policy circles and in the media emphasizes the absence of a privatization plan. A comment from an editorial in the prominent Indian business newspaper *The Economic Times* (May 2001) reflected this general perception: “The disinvestment programme of the government is completely incoherent and lacks transparency and conviction.”

The results do not change if we exclude the most profitable enterprises, the oil and gas companies that have the highest forecasted profitability among the partially privatized companies. For example in column 1 of Table 4 we find that the coefficient (standard error) of *PRIV* is .029(.004) and significant at the 1 per cent level, and it retains its sign, magnitude and significance for the other specifications as well. Similarly, we also find that the results are not driven by the firms owned by regional governments.

V. Summary and concluding comments

Most governments undertake the transfer of state-owned enterprises to the private sector through partial sales, but this method is largely dismissed as ineffectual in policy debates and its effects have been overlooked in the literature. Using fixed effects and instrumental variable regressions we find that partial privatization in which minority shares of state-owned firms become available on stock markets has a positive and highly statistically significant impact on the operating performance of firms.

Previous studies have shown that full privatization improves firm performance but offer little insight into how. Does privatization improve performance simply by eliminating political interference that forces managers to employ surplus labor and pursue other inefficient policies? Or does it also improve performance by reducing agency problems that impede management efficiency? Because partially privatized firms remain under government control it is unlikely that the performance gains in our data occur through the former mechanism. Consistent with this interpretation we find that partial privatization leads to an increase in the productivity of labor and output without layoffs. Hence, our results support the managerial view that improved management efficiency is a significant factor in why privatization improves performance.

The principal-agent literature shows how stock price information can alleviate agency problems through a number of different channels. Our data cannot identify the particular channels that are important in improving the performance of Indian state-owned enterprises. Since a large private sector coexists with the public sector in India and managers can move between the sectors, we speculate that one important role of stock markets is providing the market for executives with public information on how state-owned firms are performing. Detailed case studies may provide more insight into the role of this and other mechanisms.

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Appendix: Description of Variables used in Tables 2-8

| Variable | Description |
|--------------------------------|---|
| SALES | Annual sales generated by an enterprise from its main business activity measured by charges to customers for goods supplied and services rendered. Excludes income from activities not related to main business, such as dividends, interest, and rents in the case of industrial firms, as well as non-recurring income. |
| PROFIT | Annual excess of income over all expenditures except tax, depreciation, interest payments, rent, and extra-ordinary expenditures. Does not include extra-ordinary income and income from sources not related to main business activity. |
| LABOR | Total number of employees in a year including managerial staff. |
| ASSETS | Annual gross fixed assets which include movable and immovable assets as well as assets which are in the process of being installed. |
| AVERAGE PRODUCT OF LABOR | Ratio of sales over total employment. |
| GOVERNMENT LOANS AND SUBSIDIES | Sum of annual loans received from the central and state governments and government-owned development institutions, and subsidies given by the government. |
| TOTAL BORROWING | Total borrowings including loans from banks, institutions, debentures, other companies, tax deferrals, foreign and other borrowings. |
| GOVT LOAN/ TOT BORR | Ratio of government loans and subsidies to total borrowings. |
| RETURNS TO LABOR | Ratio of operating income to total employment. Operating income is measured as sales minus the total cost of raw materials, wages and energy costs. |
| DEREST | Dummy variable that is equal to one if the firm is in an industry that was reserved for government-owned firms until 1991, interacted with a time trend. |
| LIBT | Dummy variable that is equal to one if the firm is in an industry that removed restrictions on foreign ownership after 1991, interacted with a time trend. |
| PRIV | Variable that lies between 0 and 100 measuring the per cent of equity that is private in a firm in a given year. |
| FIRST | Dummy variable equal to one if firm has sold equity in just one tranche, either in that year or prior to that year. |
| SECOND | Dummy variable equal to one if firm has sold equity in at least two tranches, either in that year or prior to that year. |
| YEAR | Year dummies excluding 1991. |

Table 1
Partial Privatization by Year

This table reports the frequency of partial privatization between 1991 and 1998 among firms owned by the Government of India. The data is from the World Bank Privatization Database and Government of India sources and includes all privatization transactions that occurred in this period. 36 central government firms were partially privatized between 1991 and 1998 of which some are sold in several tranches. The sample also includes 2 regional government-owned firms. Standard deviations are in parentheses.

| YEAR | NUMBER OF FIRMS SOLD | AVERAGE % OF EQUITY SOLD | MAXIMUM FRACTION OF EQUITY SOLD | MINIMUM FRACTION OF EQUITY SOLD |
|------|----------------------|--------------------------|---------------------------------|---------------------------------|
| 1991 | 3 | 17.24 (19.53) | 38.84 | .12 |
| 1992 | 26 | 11.77 (7.60) | 20.10 | 1.23 |
| 1993 | 16 | 3.65 (3.66) | 10.08 | .06 |
| 1994 | 9 | 3.24 (6.08) | 17.60 | .01 |
| 1995 | 18 | 7.06 (7.69) | 23.10 | .01 |
| 1996 | 9 | 2.24 (2.86) | 9.25 | .03 |
| 1997 | 3 | 15.90 (9.06) | 26.00 | 8.50 |
| 1998 | 1 | 17.00 (0.00) | 17.00 | 17.00 |

**DISTRIBUTION OF DERESERVED FIRMS AND LIBERALIZED FIRMS
(NUMBER OF FIRM YEARS)**

| | Dereserved | Not reserved |
|------------------|------------|--------------|
| Liberalized | 160 | 278 |
| Not- liberalized | 475 | 1045 |

Table 2
Summary Statistics by Ownership Category

This table reports annual summary statistics for the population of Indian state-owned enterprises, all firms partially privatized between 1991 and 1998, and all firms that did not sell equity over this period. Units equal millions of US\$. Sales is revenues received from main activity; profit is excess of income over all costs except tax, depreciation and interest; employees are the actual number of workers; assets are gross fixed assets; average product of labor is the ratio of sales to employment; returns to labor is the ratio of operating income to employment where operating income is sales net of input costs; government loans are the sum of the total amount of loans and subsidies from the government and government-owned development institutions and total borrowing is the sum of loans from all sources. N refers to firm years for each variable and ownership category. Standard deviations are reported in parentheses

| | ALL FIRMS | PARTIALLY PRIVATIZED FIRMS | UNSOLD STATE- OWNED FIRMS |
|--------------------------------|---------------------------------|---------------------------------|---------------------------------|
| SALES | 828.32 (3316.56) N=1958 | 3907.14 (8132.71) N=234 | 410.42 (1444.68) N=1724 |
| PROFIT | 391.43 (501.88) N=1952 | 861.51 (1093.99) N=233 | 327.71 (300.66) N=1719 |
| EMPLOYEES | 9612.93 (23637.57) N=1507 | 19775.88 (33825.63) N=212 | 7949.18 (21071.61) N=1295 |
| ASSETS | 745.54 (2892.85) N=1958 | 2650.03 (6135.19) N=234 | 487.04 (1963.56) N=1724 |
| AVERAGE PRODUCT OF LABOR | .134 (.302) N=1507 | .328 (.490) N=212 | .082 (.162) N=1295 |
| RETURNS TO LABOR | .046 (.144) N=1507 | .143 (.289) N=212 | .030 (.094) N=1295 |
| GOVT LOAN / TOTAL BORROWING | .297 (.359) N=1958 | .141 (.223) N=234 | .318 (.369) N=1724 |

Table 3
Comparing Performance Before and After Partial Privatization

This table reports before-after summary statistics for all partially privatized firms between 1991 and 1998. Average values are computed for before and after the first tranche of privatization for each firm. All variables (except government loans over total borrowing) are measured in logarithms. Sales is measured as revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; employees are the actual number of workers; assets are gross fixed assets; average product of labor is the ratio of sales to employment; returns to labor is the ratio of operating income to employment where operating income is sales net of input costs; government loans are the sum of the total amount of loans and subsidies from the government and government-owned development institutions, and total borrowing is the sum of loans from all sources. Standard deviations of means are in parentheses.

| VARIABLE | AVERAGE BEFORE PRIVATIZATION | AVERAGE AFTER PRIVATIZATION | AFTER-BEFORE t-statistic of difference in means |
|-----------------------------------|---------------------------------|--------------------------------|---|
| REVENUES | | | |
| SALES | 6.293 (.193) | 6.883 (.120) | 2.173** |
| PROFIT | 6.131 (.080) | 6.357 (.050) | 2.007** |
| PRODUCTIVITY | | | |
| AVERAGE PRODUCT OF LABOR | .206 (.042) | .229 (.019) | .500 |
| ASSETS | | | |
| GROSS FIXED ASSETS | 6.250 (.231) | 6.161 (.157) | -.255 |
| FINANCING | | | |
| GOVERNMENT LOANS AND SUBSIDIES | 2.771 (.317) | 2.898 (.149) | .367 |
| TOTAL BORROWING | 4.775 (.311) | 5.351 (.154) | 1.630* |
| GOVT LOAN / TOT BORR | .194 (.035) | .136 (.014) | -1.700* |

Notes: * Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

Table 4
The Impact of Private Ownership on Firm Performance
Comparing Partially Privatized Firms to Fully State-Owned Firms (Fixed Effects)

This table reports results from firm level fixed effects (within) regressions to estimate the impact of private ownership using partially privatized firms as the treatment group and the population of firms that did not sell equity as the control group for the period 1991-1998. All the firm-specific variables are measured in logarithms except PRIV, returns to labor, and the share of government loans in total borrowing. The right hand side firm-specific variables are lagged one year. PRIV is the % of private equity; sales is measured as revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; employees are the actual number of workers; assets are gross fixed assets; average product of labor is the ratio of sales to employment; returns to labor is the ratio of operating income to employment where operating income is sales net of input costs; government loans are the sum of the total amount of loans and subsidies from the government and government-owned development institutions; and total borrowing is the sum of loans from all sources. Number of observations refers to firm years for each variable and ownership category. Standard errors are in parentheses.

| | SALES _t | PROFIT _t | AVERAGE PRODUCT _t | RETURNS TO LABOR _t | LABOR _t |
|---|--------------------|---------------------|---------------------------------|----------------------------------|--------------------|
| PRIV _{i,t-1} | .020*** (.004) | .013*** (.002) | .005*** (.000) | .006*** (.000) | .001 (.002) |
| GOVT LOAN /TOT BORR _{i,t-1} | -.119* (.067) | -.058* (.034) | .008 (.010) | .022** (.009) | .036 (.042) |
| ASSETS _{i,t-1} | .016 (.011) | -.004 (.006) | .002 (.002) | .003** (.001) | .001 (.007) |
| YEAR DUMMIES | Yes | Yes | Yes | Yes | Yes |
| Number of observations | 1958 | 1952 | 1506 | 1506 | 1522 |
| R ² | .0413 | .0506 | .1054 | .1339 | .1087 |
| Pr>F(k, NT-k) ^a | .000*** | .000*** | .000*** | .000*** | .853 |
| Pr>F ^b | .000*** | .000*** | .000*** | .000*** | .000*** |

Notes: a: Joint significance test for all coefficients, b: Joint significance test for firm fixed effects, F statistic distributed with (N, NT-N-k-1) degrees of freedom, where N equals number of firms, T equals number of years, and k is the number of RHS variables.

* Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

Table 5
The Impact of Private Ownership on Firm Performance
Comparing Partially Privatized Firms to Fully State-Owned Firms (GMM)

This table reports results from the Arellano and Bond (1991) GMM regressions to estimate the impact of private ownership with partially privatized firms as the treatment group and the population of state-owned firms that did not sell any equity as the control group for 1991-1998. All firm-specific variables are measured in logarithms except PRIV, returns to labor, and the share of government loans in total borrowing. The right hand side firm-specific variables are one year lagged differences. $\Delta y_{i,t-1}$, $\Delta \text{PRIV}_{i,t-1}$, and $\Delta \text{GOVT LOAN} / \text{TOT BORR}_{i,t-1}$ are instrumented. Instruments are lagged levels of the dependent and predetermined variables and differences of the strictly exogenous variables, up to a maximum of 3 lags. PRIV is % of private equity; sales is revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; average product of labor is the ratio of sales to employment; and returns to labor is the ratio of operating income to employment where operating income is sales net of input costs; government loans are the sum of the total amount of loans and subsidies from the government and government-owned development institutions, and total borrowing is the sum of loans from all sources. Standard errors are in parentheses.

| | ΔSALES_t | ΔPROFIT_t | $\Delta \text{AVERAGE PRODUCT}_t$ | $\Delta \text{RETURNS TO LABOR}_t$ | ΔLABOR_t |
|---|-------------------------|--------------------------|-----------------------------------|------------------------------------|-------------------------|
| $\Delta \text{PRIV}_{i,t-1}$ | .017** (.008) | .038*** (.010) | .011*** (.004) | .003*** (.001) | .005 (.007) |
| $\Delta y_{i,t-1}$ | .488*** (.131) | -.044 (.119) | .043 (.336) | .612*** (.097) | .207 (.140) |
| $\Delta \text{GOVT LOAN} / \text{TOT BORR}_{i,t-1}$ | .076 (.102) | -.126 (.080) | .008 (.013) | .008 (.007) | .025 (.024) |
| $\Delta \text{ASSETS}_{i,t-1}$ | -.001 (.008) | -.005 (.005) | .001 (.001) | .001 (.001) | .001 (.007) |
| YEAR DUMMIES | Yes | Yes | Yes | Yes | Yes |
| Number of observations | 1566 | 1556 | 951 | 946 | 962 |
| Sargan Test ^a | .429 | .806 | .275 | .311 | .495 |
| AR(1) ^b | .004*** | .245 | .532 | .006*** | .006*** |
| AR(2) ^c | .280 | .606 | .219 | -.271 | .514 |

Notes: a: Null hypothesis of the Sargan test is that the over-identifying restrictions are valid. Test statistic is distributed as $\chi^2(51)$. b: Null hypothesis of no first order autocorrelation in the differenced residuals (AB is still valid if differenced errors are AR(1)). Test statistic is distributed as standard normal. c: Null hypothesis of no second order autocorrelation in the differenced residuals (AB is not valid if differenced errors are AR(2)). Test statistic is distributed as standard normal. * Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

Table 6
Listing and Equity Effect
Comparing Partially Privatized Firms to Fully State-Owned Firms (Fixed Effects)

This table reports results from firm level fixed effects (within) regressions to control for the listing effect, with partially privatized firms as the treatment group and the population of state-owned firms that did not sell any equity as the control group for the period 1991-1998. All the firm specific variables are measured in logarithms except PRIV, FIRST, SECOND, returns to labor, and the share of government loans in total borrowing. We do not report the coefficients but all the regressions include government loans over total borrowing, log assets, and year dummies on the right hand side. The right hand side firm specific variables are lagged one year. FIRST is a dummy variable that equals one in the first year a firm sells equity and thereafter; SECOND is a dummy variable that equals one the second time a firm sells equity and thereafter; PRIV is % of private equity; sales is revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; average product of labor is the ratio of sales to employment; and returns to labor is the ratio of operating income to employment where operating income is sales net of input costs. Standard errors are in parentheses.

| | SALES _t | | PROFIT _t | | AVERAGE PRODUCT _t | | RETURNS TO LABOR _t | |
|-------------------------|--------------------|---------|---------------------|--------|---------------------------------|---------|----------------------------------|---------|
| PRIV _{i,t-1} | .009* | .004 | .010*** | .007** | .004*** | .002*** | .006*** | .006*** |
| | (.005) | (.006) | (.003) | (.003) | (.001) | (.001) | (.001) | (.001) |
| FIRST _{i,t-1} | .325*** | .311*** | .098* | .088** | .036*** | .032** | -.001 | -.001 |
| | (.101) | (.102) | (.052) | (.052) | (.014) | (.014) | (.013) | (.013) |
| SECOND _{i,t-1} | - | .184* | - | .118** | - | .050** | - | .001 |
| | | (.104) | | (.053) | | (.014) | | (.014) |

Notes: * Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

Table 7
Controlling for Changes in the Competitive Environment
Comparing Partially Privatized Firms to Fully State-Owned Firms (Fixed Effects and GMM)

This table reports results from firm level fixed effects (within) regressions to control for the effects of two competition policies, with partially privatized firms as the treatment group and the population of state-owned firms that did not sell any equity as the control group for the period 1991-1998. All the firm specific variables are measured in logarithms except PRIV, DEREST, LIBT, returns to labor, and the share of government loans in total borrowing. We do not report the coefficients but all the regressions include government loans over total borrowing, log assets, and year dummies on the right hand side. The right hand side firm specific variables are lagged one year except for the competition dummies. DEREST is a dummy variable (interacted with a time trend) that equals one if the firm is in an industry that was reserved for state-owned firms and was opened to private entry in 1991; LIBT is a dummy variable that equals one if the firm is in an industry that removed restrictions on foreign entry in 1991; PRIV is % of private equity; sales is revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; average product of labor is the ratio of sales to employment; and returns to labor is the ratio of operating income to employment where operating income is sales net of input costs. Standard errors are in parentheses.

| Fixed Effects Estimates | | | | | |
|-----------------------------|--------------------|---------------------|---------------------------------|----------------------------------|--------------------|
| | SALES _t | PROFIT _t | AVERAGE PRODUCT _t | RETURNS TO LABOR _t | LABOR _t |
| PRIV _{i,t-1} | .018*** (.004) | .012*** (.002) | .005*** (.001) | .006*** (.0004) | .003 (.002) |
| DEREST _{i,t} | .048*** (.012) | .016*** (.006) | .003 (.002) | .001 (.002) | -.022*** (.007) |
| LIBT _{i,t} | -.033*** (.010) | .003 (.005) | -.001 (.001) | -.001 (.001) | -.025*** (.006) |
| Arellano and Bond Estimates | | | | | |
| ΔPRIV _{i,t-1} | .013* (.008) | .037*** (.009) | .011*** (.004) | .003*** (.001) | .005 (.007) |
| ΔDEREST _{i,t} | .016 (.019) | .010 (.010) | -.007* (.004) | -.022* (.001) | -.017* (.011) |
| ΔLIBT _{i,t} | -.049*** (.020) | .003 (.009) | -.004 (.002) | -.001 (.001) | -.019 (.023) |

Notes: * Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

Table 8
The Impact of Private Ownership on Firm Performance
Comparing Partially Privatized Firms to Fully State-Owned Firms (Fixed Effects) Selected for Privatization as Control Group (Fixed Effects)

This table reports results from firm level fixed effects (within) regressions to control for potential dynamic selection using firms that are selected for privatization and sold equity in later years as the control group and partially privatized firms as the treatment group for the period 1991-1998. All the firm specific variables are measured in logarithms except PRIV, DEREST, LIBT, returns to labor, and the share of government loans in total borrowing. The right hand side firm specific variables are lagged one year except for the competition dummies. DEREST is a dummy variable (interacted with a time trend) that equals one if the firm is in an industry that was reserved for state-owned firms and has now been opened to private entry; LIBT is a dummy variable that equals one if the firm is in an industry that removed restrictions on foreign entry; PRIV is % of private equity; sales is revenues received from main activity; profit is excess of income over all costs except tax, depreciation, and interest; average product of labor is the ratio of sales to employment; and returns to labor is the ratio of operating income to employment where operating income is sales net of input costs. Standard errors are in parentheses.

| | SALES _t | | PROFIT _t | | AVERAGE PRODUCT _t | | RETURNS TO LABOR _t | | LABOR _t | |
|---|--------------------|--------------------|---------------------|-----------------|---------------------------------|-------------------|----------------------------------|--------------------|--------------------|--------------------|
| PRIV _{i,t-1} | .017*** (.003) | .015*** (.003) | .013*** (.002) | .013 (.002) | .004*** (.001) | .005*** (.001) | .002*** (.0003) | .002*** (.0003) | .002** (.001) | .003*** (.001) |
| GOVT LOAN /TOT BORR _{i,t-1} | -.442*** (.141) | -.387*** (.146) | .019 (.082) | .003 (.085) | .019 (.035) | .015 (.035) | .016 (.014) | .011 (.015) | .085** (.033) | .035 (.030) |
| ASSETS _{i,t-1} | .005 (.020) | .007 (.020) | .012 (.012) | .009 (.012) | .009* (.005) | .009* (.005) | .004** (.002) | .004** (.002) | .003 (.005) | .001 (.004) |
| DEREST _{i,t} | - | .029* (.017) | - | -.007 (.011) | - | -.003 (.005) | - | -.003 (.002) | - | -.028*** (.024) |
| LIBT _{i,t} | - | .007 (.019) | - | .014 (.011) | - | -.006 (.005) | - | -.002 (.002) | - | -.005 (.004) |
| Year Dummies | Yes | | Yes | | Yes | | Yes | | Yes | |
| R ² | .3143 | .3213 | .2930 | .2978 | .2679 | .2751 | .2484 | .2595 | .0723 | .2388 |
| Number of Observations | 325 | | 323 | | 290 | | 290 | | 292 | |

Notes: * Significant at the 10 per cent level, ** Significant at the 5 per cent level, *** Significant at the 1 per cent level.

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