STUDY ON IMPACT OF ENVIRONMENTAL CHANGE ON SELECTED PUBLIC SECTOR ENTERPRISES IN INDIA

Pradeep Kautish[*]

Abstract

Government policy measures adopted by many developing countries to reform the public sector enterprise performances can be classified into two broad categories in terms of decision criteria taken into consideration. The first category of reform primarily focuses on distancing the government from ownership change and control issues of these enterprises. Partial privatization or divestment falls in this category of change reform mechanism. The second category aims at improving the environmental change aspects in which these enterprises operate and function. One such reform is delegation of operational and functional autonomy to managers of publicly owned enterprises through performance contracts and reviews. Empirical evidence on the gains of privatization versus benefits of autonomy delegation from the developing countries that have undertaken these reforms in the past are yet inconclusive. The present study of India spanning over two decades of panel data with a decade of data for evaluating the post reform performance of the centrally owned enterprises, provides evidence of significant positive impact of autonomy delegation to public enterprise management on firms profitability. The study, however, does not find any evidence of significant impact of partial privatization and divestment. Further the study also finds significant impact of environmental reforms of hard-budget constraint and deregulation of sectors earlier under government domain to private participants on the profitability performance of the public enterprises in India.

Keywords: environment, administration, change, public enterprises, India.

JEL Classification: H83, M48, O38.

Introduction

In the last two decades, economic reforms undertaken by governments' world over have aimed at shrinking public deficit, significant proportion of which was attributed to poor financial performance of state owned public sectors. Reform measures were undertaken in almost all developed and emerging economies that had government ownership in some form or other. The aim was to reduce public enterprise dependence on government budgets and to provide new sources of revenue to the state in the short run. In general the reform measures can be grouped into two broad categories. The first category has consisted of reform strategies aimed at distancing the government from ownership change and control of public sector enterprises (partial or complete privatization). Such strategies find theoretical support in the

[*] Pradeep Kautish is Professor at the Faculty-Marketing Area, Jaipuria Institute of Management, 1, Bambala Institutional Area, Pratap Nagar, Sanganer, Tonk Road, Jaipur- 302033, Rajasthan, India. Phone No. 0141-2771330-33, Ext. 219. E-mail: pradeepkautish@gmail.com

arguments of property rights theorists like Alchian (1977), Alessi (1987) and public choice theorists like Levy (1987), Niskanen (1975) among others. Alchian (1977) and Alessi (1987) for instance, argue that firms under private ownership inherently perform better than publicly owned firms due to the presence of market for ownership rights wherein, owners of a private firm if dissatisfied with the managers can sell their stakes in the firm. The presence of tradable property rights in private firms help discipline the managers (agent) in maximizing shareholders (principal) wealth as compared to public ownership where such markets are virtually absent. Coupled with the absence of market monitoring mechanism, the caretakers of Public Sector Enterprises (P S E) usually politicians and government bureaucrats in Indian context are often found to use their discretionary authority and control rights over the wealth of P S Es to further their own rent seeking activities (like providing employment to people of their constituency or party workers etc.,) and in the process hamper the incentives of the P S E managers in maximizing the performance of their firms. Given the above it is argued that it is ownership 'per se' that needs to be reformed to improve the performance of the P S Es (Boycko et al., 1996; Shleifer, 1998).

The second category of reforms has been aimed at improving the environment in which the P S Es operate, rather than change the ownership of the firm partially or fully depending upon situation. Proponents of this viewpoint contest that 'ownership per se does not matter'. Instead they believe that removing the environmental imperfections and distortions in which the state owned firms operate, in particular by implementing hard-budget constraints, improving incentives to top management and by and large linking their benefits to firms performance, delegating enhanced functional and operational autonomy to top management along with introducing product market competition & capital market efficiently as private enterprises. The objective of this study is to contribute additional evidence on the benefits of ownership change versus environmental reform in public sector enterprises. To do so the study draws on the evidence of P S E reforms from India. The value of undertaking a study of P S E reforms in India lies in the fact that India is one of the countries where an entire gamut of P S E reforms has been implemented sequentially over the years that includes both ownership change and environmental reforms. Thus an Indian study can enable one to undertake an analysis of the relative impact of environmental versus ownership reform within an integrated framework. Analyzing the performance of firms that have undergone both these category of reforms at different time periods in a single framework helps us contribute to the limited evidence that exists with respect to the efficacy of these two groups of reform strategies.

Review of Literature

Empirical evidence on the impact of P S E reforms have been well documented for China and several countries of former Soviet Union including Russia, as well as Central and Eastern European countries. Coexisting with the evidence from several studies that privately owned firms perform better than public sector firms are evidence from studies that support the environmental reforms in State Owned Enterprises (S O E). However most studies examine one or other category of S O E reforms in exclusion of others and only few studies contribute evidence to the debate on benefits of ownership change versus environmental reforms. Of these studies specifically pertaining to India are Majumdar (1998b), Shirley and Xu's (1998), Boubakri, Cosset and Guedhami (2004), Sudhir Naid (2004) and Gupta (2001). While Majumdar (1998b), analyzed the influence of soft-budget constraint on efficiency performance of state-owned firms in India, Shirley and Xu's (1998) focus was on the impact of performance contracts signed by managers of state owned enterprises with their respective governments across six developing countries including India. Boubakri, Cosset and Guedhami (2004) analyze the difference in three years mean performance for pre and post partial privatization in 50 firms across 10 Asian countries including India.

Sudhir Naid (2004) using similar methodology studied the mean differences in performance of P S Es in India pre and post partial privatization. The study by Gupta (2001), that is closest in the literature to the present analysis, has focused on the impact of partial privatization on Indian centrally owned firms revenue, labor productivity and on share of government loans in the total borrowings of firms. The study however does not take account of the autonomy that was delegated to P S E managers before partially privatizing the equity shares in these P S Es. Hence the partial privatization impact analyzed could have captured the effects of delegation of autonomy to central P S Es that was not controlled for in the estimation. The present study accounts for the delegation of autonomy reform while examining the impact of partial privatization on profitability performance of the enterprise. What the present study seeks to undertake is an integrated analysis of the differential impact of the whole gamut of reforms ranging from P S Es operating environment change reforms (delegation of autonomy and soft-budget constraint impact along with de-reserving sectors for private participation) to ownership changes of partial privatization on the profitability performance of the central P S Es in a single frame work.

Research Methodology

The data for the study is sourced from 'Public Enterprises Survey', published by the Department of Public Enterprises, Ministry of Heavy Industries, Government of India. Additional data is obtained from the 'Memorandum of Understanding', published by Department of Public Enterprises, Ministry of Heavy Industry, Government of India. For special purposes some data has been taken from industrial sources and organizational websites too for the study purpose. Hence the sample consists of a decade of enterprise performance data pre and post-restructuring and partial privatization. The centrally owned public enterprises belonging to manufacturing and service sector have been considered. The sample used for the study consists of 142 firms grouped into 19 cognate groups following the cognate grouping of central P S Es in Survey of Public Enterprises, 2009 in other words whole gamut of data used is secondary data.

Of the total sample, in 86 P S Es autonomy was delegated through the MoU system to top management. Further 56 P S Es that had signed MoU in atleast one year in the sample period later underwent partial privatization of central government equity holdings. Thus the sample allows one to draw comparison between firms that have not undergone the environmental reform of autonomy delegation against the firms that have been delegated only autonomy through MoU reform with no ownership change and those that have undergone both autonomy delegation and ownership change When the disinvestment of central government equity shares ROS 51% the enterprise (3 P S Es in the sample) moves out of the domain of Central government ownership and hence is excluded from the data set from that time period. Data for all the variables for all time periods was not available hence those data points were lost where profitability variable data was not recorded for that particular year, giving an unbalanced panel with 142 firms.

Variables of Interest

Functional autonomy was delegated to Indian P S E managers through signing of Memorandum of Understanding (MoU). Under this system, individual enterprises sign MoU with its respective government ministries at the beginning of the financial year. They are then evaluated and graded at the end of the financial year against the targets set in the MoU. Some firms that did not keep with the time allotted by the contract for submission of reports were not evaluated. A priori an enterprise would not be able to predict if it is going to be evaluated or not. Hence with the signing of MoU, a firm is expected to start striving towards fulfilling its targets set in the MoU. It is hypothesized that signing of MoU by a P S E will have positive impact on its profitability performance. As pointed out by Winston (1993), under deregulation there are two opposing forces frequently at work.

Firstly the inefficiencies caused by regulation generally raise the firms costs of operation but the insulation from competition created by regulation raise the firms' revenues, especially in firms belonging to inherently highly competitive industries. Thus under deregulation though firms can reorganize their operations and may be successful in reducing their costs, the excess profits that the firms were earning under regulated environment would be dissipated in deregulated environment. Thus deregulation dummy 'De-reserve' captures the net impact of these two opposing forces on firms' profitability performance. If the hypothesis that private ownership is superior to public ownership holds, one would expect that as private ownership increases, the profitability performance of the P S Es would improve. The study captures the impact of partial privatization by introducing the percentage of equity shares disinvested by the central government in the enterprise. Further it may be that divesting higher percentage of central governments equity holdings to private parties may have varying impact on the P S Es performance. To capture the impact of soft-budget constraint on performance of P S E, the ratio of loans borrowed by individual enterprises from central government to total loans borrowed lagged by one year is taken. The variable capturing the soft-budget constraint impact ('Soft-loan') is expected to have negative impact on P S Es performance.

Performance Measures

Profitability as a yardstick of measuring P S E performance gained importance when governments world over started to feel the burden of loss making P S Es on their budget deficits. In India too, this is evident from the importance given to financial performance ratios in the MoU. 50 percent weightage was given to financial profitability in the composite score evaluation of targets set under MoU, with almost 20 percent weightage given to return on asset (ROA) ratio by almost all P S Es signing MoU's. In the analysis firms' profitability performance is measured using two accounting ratios namely, return on sales (ROS) and return on assets (ROA) as adopted in several studies in the literature (Boardman and Vining, 1989, 1992; Boubakri and Cosset, 1998; D'Souza and Megginson, 1999; Megginson et al, 1994). ROS, the profit margin capturing profitability of each rupee of sales, is calculated as profit before tax ratio of sales. ROA, a measure of the ability of the management to convert firms' capital to profits, is defined as profit before taxes as a ratio of total assets. One other profitability performance variable that is frequently used in the literature is return on equity (ROE). However, ROE cannot be calculated for firms with negative net worth, a problem that is faced by almost one fourth of total P S Es by 2001 in India. Thus by using ROA and ROS as measures of profitability performance we avoid these problems.

Control Variables

The study accounts for other firm characteristics that may also affect its performance by incorporating control variables. A description of these and their possible effects is given below:

- Export Intensity: It controls for the effects of exposure to international competition. It is defined as proportion of exports to total sales and is expected to have positive impact on P S Es performance.
- Depreciation Intensity: Defined as the ratio of depreciation expenditure to sales, it proxies for capital intensity of the company's technological process. No prediction is made regarding the sign of the variable.
- Size: To reflect the effect of unobserved factors that are related to size Ln (Asset) is introduced in the regression. As pointed out in the literature (Majumdar, 1998b; Sarkar and Sarkar, 2000), in the product market, size reflects possible entry barrier that might result from economies of scale. Size also reflects the extent of market power of a company. It is postulated to have positive impact on firm's

performance.

- List: Some of the P S Es were listed on local, national and international stock exchanges since 1994, when the National Stock Exchange, Mumbai, India was set up. As pointed out by Harvie and Naughton (2000) listing of state owned firms on stock exchanges results in long-term benefits due to imposition of greater discipline on enterprise management that result from the scrutiny that listed companies are subject to from investors. This is more so if companies are listed in stock exchanges where public disclosure requirements are more stringent, and the scrutiny from investors more rigorous. Even though the Indian stock markets are not yet fully developed, listing the P S Es on these stock exchanges would put pressure on the management of these P S Es to perform better. Hence listing is expected to have positive impact on firm's performance. This is captured by dummy variable 'List' that takes the value one for the year the firm is listed on the stock exchange. In our sample none of the P S Es were deleted. Hence the dummy once turned on for a firm remains so through out the sample period.

Empirical Estimations

In analyzing the impact of reforms on the performance of P S Es, the most likely form of selection bias that could affect the results is the problem of 'cherry picking'. As pointed out by Frydman et al., (1999) there is a possibility of 'cherry picking' arising due to certain firms being picked for adopting reform strategies (for autonomy delegation and partial privatization) because they are in some relevant sense "better" to begin with. This might be the case, for example, if reforms are politically difficult for the Government to undertake due to resistance from certain interest groups. Government in such situations wants to prove the success of its reform policies and may pick the best cherries from its garden to implement the reforms. Any analysis to study the impact of these reforms should take account of such pre-reform differences in the groups of firms. We do so in our study by accounting for the unobserved group specific fixed effects ('α_m') as given in equation (1) below:

$$\mathbf{Yit} = \alpha_m + \lambda t + \beta' X_{it} + \gamma' Z_{it} + \varepsilon_{it} \quad \mathbf{(1)}$$

Where:

Yit - refers to the performance variable for firm 'i' at time't';

Xit - refers to the variables of interest (reform variables);

Zit - refers to control variables;

β's and γ's are parameters to be estimated;

λt - refers to year effects ;

εit - refers to random component and

α_m - capture the group specific characteristics of ROS-sectional group 'm'.

In our analysis we distinguish three groups of firms based on the category of reform that they have undergone. The first group refers to P S Es that have undergone the environmental reform of autonomy delegation through the MoU system (Partial reform). The second group comprises of firms that have undergone both autonomy delegation and ownership change (Full reform) and the third group refers to those P S Es that have not undergone either of these reforms. Thus the inclusion of group effects helps us differentiate between the unobserved group specific characteristics that might have influenced the P S E to undergo reform in the first place from the impact of implementing the reform on the firm's performance. We estimate the baseline specification given above in equation (1) for the entire sample. We further examine the impact of reforms on the performance of P S Es by using different control groups in an attempt to deal with most kinds of selection bias that could potentially affect our results.

Under the baseline specification, we study the impact of the environmental reform of autonomy delegation; de-reserving monopoly industries under public sector and soft-budget constraint along with ownership change reform of partial privatization on the firms' profitability performance. The baseline specification given by equation (1) is estimated for the entire sample. We account for the possibility of the problem of 'cherry-picking' by incorporating the two group dummies 'Partial- reform' and 'Full- reform'. The dummy variable 'Partial- reform' refers to the group of P S Es that have undergone only the environmental reform of autonomy delegation through the MoU system. The 'Full- reform' dummy variable takes the value 1 for those P S Es whose top management was delegated autonomy and in later years the government equity holdings in these P S Es were partially disinvested. Thus these P S Es underwent both the environmental reform and ownership change phenomenon. Sample data analyzed is for the period 1994-1995 to 2005-05 for 142 P S Es. Of the total sample, in 86 firms autonomy was delegated to top management. Further in 56 P S Es government undertook partial privatization of its equity holdings to outside private parties. We further examine the impact of the environmental reform of autonomy delegation and ownership change through partial privatization on the performance of P S Es by changing the control groups in an attempt to deal with most kinds of selection bias that could potentially affect our results.

Impact of Autonomy Delegation Change

In estimating the impact of delegation of autonomy to firm's management, the study compares the post reform performance of 142 P S Es that were delegated autonomy with their own pre reform performance. The time period analyzed here is 1994-95 to 2004-05, the latest year for which the reform data is available. Thus the sample consists of a decade of enterprise performance data pre and post-autonomy delegation. The environmental reform of autonomy delegation is captured through a dummy variable 'Autonomy'. Soft-loans borrowed by P S Es ('Soft-loan') and industries de-reserved by government that were under public sector dominance ('De-reserve') are also introduced as reform variables in these regressions. We further truncate the sample data at firm years where the first trenches of partial privatization took place in P S Es. This enables us to study the pure impact of autonomy delegation to top managements of government owned P S Es on the profitability performance of these firms.

Incremental Impact of Partial Privatization

In analyzing the incremental impact of partial privatization, the study compares pre and post partial privatization performance of a sample of centrally owned P S Es that had undergone environmental reform of autonomy delegation. The sample consists of 142 P S Es, all of whom underwent MoU reform. In 56 of these 142 P S Es, partial privatization of central government equity holdings was undertaken in later years. The time period for the study is eleven years post 1994-95 when MoUs in the present form were first signed between P S Es and the government owners. The average impact of government equity share divestiture on P S Es performance is estimated by introducing the percentage of equity holding disinvested ('Part-pvt'). The environmental reform of autonomy delegation was undertaken by all the P S Es in this sample in one or other time period prior to disinvestment. This is accounted for in the analysis by incorporating 'Autonomy' dummy along with other environmental reform variables ('Soft-loan' and 'De-reserve').

Thus in examining the incremental impact of partial privatization, the study contributes additional evidence to the debate on benefits of adopting environmental policy reforms versus ownership change. It may also be that higher levels of disinvestments have varying impact on the firm's performance. We distinguish this from the above-analyzed average incremental impact of partial privatization ('Part-pvt') by incorporating a non- linear (quadratic) specification 'Part-pvt ' in our regression models. We test the robustness of the reform variable coefficients in all our regressions by dropping the year dummies that may be capturing part of the reform impacts as some of the reforms were implemented in one particular year for most of the P S Es in our sample data (like de-reservation that was implemented in most of the industry groups in 1994-95). All regressions are estimated after taking care of the presence of influential observations by truncating the distribution of the dependent variable at 1 percent low and 1 percent high ends of the distribution. We also correct for heteroscedasticity in all our regressions.

Empirical Estimation and Results

4.1 Descriptive Statistics

The mean and standard deviations for the performance measure along with other firm characteristics for the various groups of P S Es is given in Table (1). The first group (No Reform) refers to P S Es that have not undergone either the reform of autonomy delegation or partial privatization. The second group (Partial reform) refers to P S Es that have undergone the environmental reform of autonomy delegation through the MoU system and the third group (Full reform) refers to those P S Es that have undergone both the reform of autonomy delegation and ownership change through partial privatization. The average return on assets (ROA) for P S Es belonging to 'Full Reform' category was around 10 percent compared to lower average of around 3 percent for P S Es that underwent only 'Partial Reform' of autonomy delegation. P S Es that did not undergo any reform (No Reform) performed poorly with negative average ROA of around 8 percent. The standard deviation for ROA is also higher for the category of P S Es belonging to 'Full Reform' as compared to 'Partial Reform' and 'No Reform' category, which have similar standard deviations suggesting that P S Es belonging to 'Full Reform' category are more heterogeneous in their ROA performance. In terms of average return on sales (ROS) ratio P S Es belonging to 'Full Reform' category shows a positive average of 0.4 percent. Average ROS is negative for both 'Partial Reform' and 'No Reform' category of P S Es, with 'No Reform' category having more negative average. Standard deviation is higher for 'No Reform' category of P S Es as compared to the other categories, indicating that 'No Reform' group is more heterogeneous in its ROS performance.

Table 1: Data Summary Statistics (Period of Analysis: 1994-1995 to 2004-05)

Variable	No Reform	Partial Reform	Full Reform
ROA			
Mean	-0.08	0.03	0.13
Standard Deviation	0.23	0.18	0.31
ROS			
Mean	-0.63	-0.10	0.004
Standard Deviation	1.48	0.78	0.81
Softloan			
Mean	0.69	0.52	0.32
Standard Deviation	0.41	0.42	0.37
Exint			
Mean	0.04	0.05	0.07
Standard Deviation	0.17	0.15	0.11
Number of Enterprises	30	74	38
Number of Observatoins	89	40	73

Note: 'No Reform': Includes P S Es that did not undergo either the autonomy delegation reform or the reform of ownership change. 'Partial Reform': Includes P S Es that underwent only the reform of autonomy delegation through MoU system and no ownership change. 'Full Reform': Includes P S Es that underwent both the reform of autonomy delegation and ownership change through partial privatization.

The average ROA and ROS performance of P S Es belonging to 'Full Reform' is higher than averages for 'Partial Reform', which is higher than 'No Reform' averages. Thus there is a possibility of the problem of 'cherry picking' arising in our sample data where better performing P S Es were selected to undergo partial or full reforms. We account for this possibility of the problem of 'cherry- picking' by incorporating the two group dummies 'Partial- reform' and 'Full- reform' in our empirical specification (see Equation 1). The average loans borrowed by P S Es from their owner central government are highest for 'No Reform' category with around 68 percent. It is approximately 52 percent for 'Partial Reform' category and lower by around 20 percent for 'Full Reform' category of P S Es. Thus P S Es that have undergone both the reform of autonomy delegation and partial privatization have lower average soft budget constraint as compared to those that have undergone only autonomy delegation, who are less constrained by soft loans as compared to P S Es that have not undergone either of the reforms. While some firms borrow 100 percent of their loan amount from central government others do not depend on government loans at all (zero percent soft loans), lending heterogeneity to our sample data. This is indicated in the standard deviations of the three samples that range from 37 to 43 percent. There is not much variation in average export intensity of P S Es belonging to various categories. On an average export intensity is around 4 to 7 percent in P S Es with standard deviations ranging from 10 to 17 percent in all the three categories of P S Es.

Regression Results: Impact of Autonomy Delegation

The estimation results of the baseline specification for the entire sample using equation (1) for both the performance measures ROA (return on asset) and ROS (return on sale) is given in Table (2) below.

Table 2: Impact of Autonomy Delegation and Ownership Change (Period of Analysis: 1994-1995 to 2004-05)

Variable	ROA	ROA#	ROS	ROS#
Autonomy	0.04*	0.03*	1.27*	1.06*
Partial-Pvt[1]	0.02	0.01	-0.27	-0.03
Soft-loan	-0.07*	-0.07*	-0.74*	-0.76*
Deresve	-0.08*	-0.13*	-2.15*	-1.39*
Size	-0.01*	0.00*	* 0.00*	-0.10*
Exint	0.02**	0.02**	0.21	0.30
Dpint	-0.01*	-0.01*	-3.29*	-3.30*

List	0.02	0.01	0.30	0.03
Partial- Reform dummy $	0.03*	0.03*	0.36*	0.38*
Full- Reform dummy $	0.03*	0.03*	0.20*	0.25*
Intercept	0.06*	0.04*	1.14*	1.09*
R-Square	28	29	27	24
F-test@	0.18		8.58**	

Note: * One ,two and three asterisks denotes significance at 1, 5 and 10 percent levels respectively # denotes regression results after dropping year dummies 1 The coefficient of 'Partial-pvt' dummy is in percentage terms.

@ denotes test statistics for the equality of group dummies 'Partial-Reform dummy' and 'Full-Reform dummy' $ denotes group dummy. 'Partial-Reform dummy' that takes the value 1 through out the sample period for P S Es that have undergone only the reform of autonomy delegation and no ownership change. 'Full-Reform dummy' is turned on through out the sample for P S Es that have undergone both autonomy delegation and ownership change. These are intercept shifts that are included in the model to account for the problem of 'cherry-picking'.

'Autonomy' dummy representing the impact of delegation of autonomy to PSE managements through signing of MoU has significant positive impact on both the profitability performance measures (at 1% significance level) as seen from Table (2). The impact coefficient is approximately 0.03 percentage points for ROA while it is over 0.2 percentage point for ROS. While the evidence of positive impact of autonomy delegation on productivity performance of Chinese SOE is documented by several studies in the literature (Groves et al.,1994; Shirley and Xu,2001), the impact of performance contract on profitability performance of SOE is not found to be consistently positive (Li and Wu, 2002; Shirley and Xu, 1998). Li and Wu (2002) do not find any consistent impact of autonomy delegation (production autonomy) on return on asset performance of 680 Chinese SOE. Shirley and Xu's (1998) study of implementation of performance contracts in state owned enterprises for natural monopolies across six developing countries including India (only four centrally owned P S Es were analyzed) did not find any improvement in the post performance contract signing ROA profitability trends. The results found in the present study for Indian P S Es, favor the implementation of performance contract. Positive results evidenced in this study signify that setting of one/ few explicit objectives for the enterprise to achieve with higher weightage to profitability targets and delegating autonomy to top management for achieving these targets through MoU system helped the PSE management focus its efforts in improving the firm's profitability performance. Managers on their part to achieve commitment from the lower level managers and employees are found to link the MoU targets to internal incentive schemes for the junior managers and employees (Vithal P., 2001).

Further it may also be that with the initiation of privatization policy in some P S Es there are higher returns to be gained by the executives of better performing P S Es in the managerial job market (Gerard and Khalid, 2000), which further induces them to take advantage of the autonomy delegated to them and thus in turn improve the performance of the PSE. Further to test the hypothesis that firms' profitability improves post delegation of autonomy as compared to pre reform period we compare the post reform performance of P S Es with their own pre reform performance. In this analysis we exclude those P S Es that had not undergone the reform of autonomy delegation from our sample. In some of the P S Es that had undergone the reform of autonomy delegation to its top managements, the government equity holdings were later partially divested. Though we truncate our sample data at those firm years where the first trenches of disinvestments took place, we account for the possible problem of cherry picking by incorporating the 'Full- reform' dummy.

The dummy takes the value 1 for P S Es that underwent both the environmental reform and in later years ownership change. This is done to account for the possibility that among the P S Es that underwent the partial reform of autonomy delegation some of the P S Es were better performing (that were later picked for implementing partial privatization reform) to start with. We account for this in our analysis ('Full-reform'). The result is given in Table (3) below. Results seen in Table (3) indicate that delegating autonomy to P S Es top management significantly (at 1 % level for both performance measures) improves the profitability performance of firms. As pointed out earlier the emphasis on replacing multiple objectives of multiple principles by few clear goals for the management to achieve and providing functional and operational autonomy through MoU system help management to focus their efforts on improving the performance of the P S Es. Further we analyze the impact of ownership change that some of the P S Es underwent in the later years on the firms performance. In analyzing this we also try to evaluate the relative benefits of environmental reforms as against the reform of ownership change.

Table 3: Impact of Autonomy Delegation (Period of Analysis: 1994-1995 to 2004-05)

Variable	ROA	ROA#	ROS	ROS#
Autonomy	0.06*	0.05*	0.14*	0.09*
Soft-loan	-0.11*	-0.10*	-0.19*	-0.19*
Deresve	-0.12	-0.04*	-0.17***	-0.11*
Size	-0.02*	-0.02*	0.01**	0.001*
Exint	-0.03	-0.03	0.00	0.01
Dpint	-0.08*	-0.08*	-1.22*	-1.19*

List	-0.04	-0.05	-0.08	-0.09
Full- Reform dummy	0.02*	0.02*	0.03*	0.03*
Intercept	0.26*	0.26*	0.08	0.07***
R-Square	25	24	26	25

Note: * One, two and three asterisks denote significance at 1, 5 and 10 percent levels respectively. # denotes regression results after dropping year dummies $ denotes group dummy that takes the value 1 for all sample periods for P S Es that have undergone both autonomy delegation and ownership change reform. It is intercept shift that is included in the model to account for the problem of 'cherry-picking'.

Incremental Impact of Partial Privatization

We analyze the incremental impact of partial privatization first by estimating the baseline specification given by equation (1) for the entire sample. Here we control for the possibility of 'cherry- picking' problem by incorporating the group dummies 'Partial-reform' and 'Full- reform' as described above. The results indicate that the average impact of partial privatization of central governments equity holdings in P S Es, captured here by coefficient of 'Partial-pvt' has no significant impact on both profitability performance measures as seen in Table (2). Thus there is no evidence of average additional gains from partial privatization on both the profitability performance measures. This result for the partial privatization varies from other studies in the literature for India like Gupta (2001) and Boubakri, Cosset and Guedhami (2004). The former study as pointed out earlier does not account for the environmental reform of autonomy delegation to PSE managements in India. In our analysis explicitly accounting for autonomy delegation through MoU system with a longer time span of data. The latter study by Boubakri, Cosset and Guedhami (2004) analyze the difference in three years mean performance for pre and post partial privatization in 50 firms across 10 Asian countries including India. They find partial privatization to have significantly improved profitability, efficiency and output performance in P S Es. However, the results from my analysis are more in confirmation with Sudhir Naid (2004), who finds that partially privatizing central government equity holding significantly reduces return on sales and return on equity with no significant impact on return on assets. He attributes this decline in profitability to the increased competition and deregulation following the new economic policy of 1991 in India.

The study is similar in its methodology to Boubakri, Cosset and Guedhami (2004). Further our results are also in confirmation with experience of ownership reforms undertaken in Egypt studied by Omran (2002), who do not find any significant improvement in profitability, operating efficiency and output performance of partially or fully privatized firms in Egypt. All P S Es in whom central government equity holding was partially privatized had undergone MoU reform in some time period prior to ownership change. A better specification to analyze the pure incremental impact of partial privatization would then be to truncate the sample data (firm year) prior to first MoU that was signed between the PSE management and central government owner. Further by excluding those P S Es that did not undergo any reform (environmental or ownership reform) from the analysis we also control for some selection bias. Thus the analysis compares the performance of P S Es that underwent partial privatization against those that were the most likely candidates for ownership change (P S Es that underwent autonomy delegation reform). Results for the two performance measures ROA and ROS are given in Table (4) below.

Table 4: Incremental Impact of Partial Privatization (Period of Analysis: 1994-1995 to 2004-05)

Variable	ROA	ROA#	ROS	ROS#
Autonomy	0.04*	0.04*	0.08*	0.05*
Partial-Pvt[1]	0.09	0.08	-0.01	-0.02
Soft-loan	-0.14*	-0.11*	-0.14*	-0.14*
Deresve	-0.01	-0.03**	0.00	-0.03***
Size	-0.01	-0.01*	-0.01*	-0.01*
Exint	0.06	0.04	0.04***	0.06
Dpint	-0.15*	-0.15*	0.69*	0.70*
List	0.00	0.00	0.00	-0.02
Full- Reform dummy	0.03*	0.02*	0.02*	0.02*
Intercept	0.24*	0.23*	0.17*	0.17*
R-Square	22	25	18	19

Note: * One, two and three asterisks denotes significance at 1, 5 and 10 percent levels respectively. # denotes regression results after dropping year dummies

1 The coefficients of partial privatization ('Partial- pvt' and 'Partial-Pvt^2') are in percentage terms. $ denotes group dummy that takes the value 1 for all sample periods for P S Es that have undergone both autonomy delegation and ownership change reform. It is intercept shift that is included in the model to account for the problem of 'cherry-picking'.

Results indicate that partially divesting central governments equity holdings to other private equity holders without transferring the management of the firm to them have on an average no significant impact on the profitability performance of the P S Es. It may be that partial privatization at higher levels of government equity holdings have varying impact on the performance of the P S Es. We test for this hypothesis by incorporate a quadratic term in our analysis ('Partil-Pvt'). Results are presented in Table (5) below.

Table 5: Incremental Impact of Partial Privatization with Non-linear Specification (Period of Analysis: 1994-1995 to 2004-05)

Variable	ROA	ROA#	ROS	ROS#
Autonomy	0.04*	0.03**	0.19*	0.15*
Partial-Pvt[1]	-0.18	-0.15	-0.57	-0.46
(Partial-Pvt^2)[1]	0.01	0.01	0.01	0.01
Soft-loan	-0.13*	-0.14*	-0.28*	-0.29*
Deresve	-0.01	-0.03**	-0.04**	-0.16*
Size	-0.01*	-0.01*	0.01	0.01
Exint	0.04***	0.04	0.10**	0.11**
Dpint	-0.14*	-0.16*	-1.51*	-1.47*
List	0.00	0.01	-0.01	-0.05
Full- Reform dummy	0.02*	0.02*	0.01	0.02**
Intercept	0.27*	0.24*	0.08	0.09
R-Square	21	19	22	21

Note : * One, two and three asterisks denotes significance at 1, 5 and 10 percent levels respectively. # denotes regression results after dropping year dummies 1 The coefficients of partial privatization ('Partial- pvt' and 'Partial-Pvt^2') are in percentage terms. $ denotes group dummy that takes the value 1 for all sample periods for P S Es that have undergone both autonomy delegation and ownership change reform. It is intercept shift that is included in the model to account for the problem of 'cherry-picking'.

As seen from the coefficients of 'Partial-pvt', partially divesting equity holdings even at higher levels has no significant impact on the performance of P S Es. One recommended policy measure that may improve the enterprise performance is full privatization, with both ownership and control of the enterprise being passed on to private participants.

Similar reform policy measures adopted in several other developing and industrial countries has given positive results. However, as seen in this study, going half way and implementing privatization partially where the control over the management is still under central government, has not been effective in improving the performance of the P S Es.

Impact of Soft-loans and De-reservation

Soft-loan as hypothesized has significant negative impact on both profitability performance ratios of P S Es (significant at 1% levels for both ROA and ROS) throughout the analysis. On an average a percentage point increase in soft-loans for the entire sample of P S Es results in approximately 0.07 percentage point negative increase in ROA while it is higher by approximately 70-77 percentage point for ROS as seen in Table (2). The findings are in confirmation with Gupta (2001) who finds that soft-budget constraints have negative and significant impact on P S Es profitability performance (measured as ROS profits) in India. The results of the present study are also consistent with Estrin's (2002) survey, where he finds hard-budget constraint to have positive impact on productivity and profitability (sales growth) performance of firms, significantly so for non-CIS countries as compared to less consistent impact for Russia and the CIS states. A similar trend is witnessed with the coefficient of de-reservation. Dereserving ('De-reserve') the public sector dominated industries and opening them to private competition on an average have significant (at 1% level of significance) negative impact on both performance ratios analyzed in Table (2).

Introducing private sector competition in the industries reserved earlier for public sector investment has had a negative impact on public enterprise profitability. The above results contradict the results of Gupta (2001) who find de-reservation to have positive significant impact on sales and profits of partially privatized firms in India. However as compared to Gupta (2001) whose sample period consists of only one time period prior to de-reservation, the time horizon adopted in this study is twenty years with around ten years of data corresponding to pre-reform period. With such a large time horizon we are able to better capture the impact of de-reservation. Also we estimate several alternate specifications in our study to test for the robustness of our results. Thus the results of the present study reflects the fact that, the introduction of actual and potential competition from private sector as pointed out by Winston (1993), has eroded part of the monopoly profits that the well organized producer groups of P S Es had benefited from, being under the regulated environment shielded from private sector competition over the decades. We test the robustness of the reform variable coefficients by dropping the year dummies that may be capturing part of the reform impacts as some of the reforms were implemented in one particular year for most of the P S Es in our sample data (like de-reservation that was implemented in most of the industry groups in 1994-95). The results are given in Tables (2)-(5). Almost all the regression results remain robust to this alternate specification except de-reservation dummy in Tables (3), (4) and (5).

We find the coefficient of 'De-reserve' has significant impact on both the performance measures in all the regressions after dropping year dummy thus indicating that year dummies might have captured the de-reservation impact rendering 'De-reserve' coefficient statistically insignificant in the earlier specification. Turning to control variables, public sector firms do not seem to enjoy any economies of scale or be able to exploit their market power due to their shear size captured by 'Size' variable. On the other hand size has significant negative impact on almost all performance measures as seen in Tables (2) - (5). Increasing export intensity in firms has a positive impact on their profitability though it is significant only in some of the regressions analyzed above. Significant negative coefficient of 'DpInt' in almost all the regressions indicates that more capital intensive a firm is its profitability performance is negatively influenced while listing of P S Es ('List') on local and national stock exchanges have no significant impact on firms performance measure. This may be because most of the PSE stocks that are listed are either not traded at all or are traded in small volumes infrequently, resulting in insignificant impact on firms' performance.

Discussion and Conclusion

In contributing additional empirical evidence on the benefits of environmental reform and ownership change reform, the chapter analyzes the case study of India, where both these type of reforms have been implemented over the past decade. Indian centrally owned P S Es have undergone environmental change reforms of delegation of autonomy through signing of MoU's, de-reservation of sectors by the government that were earlier under public sector domain to private investment and hard-budget constraint where government put pressure on P S Es to live with in their budget. Further, the Government of India has also partially privatized its equity holdings in some of the enterprises that have undergone the reforms of autonomy delegation. Thus the case study of Indian PSE reforms has provided one with an opportunity to study the differential impact of both category of reforms while allowing one to draw comparisons between firms that have not undergone any reform against those that have undergone only environmental reforms of autonomy delegation and those that have undergone both ownership change (partial privatization) and environmental reforms (autonomy delegation).

In analyzing the above we try to control for the possibility of most of the selection bias that may arise due to the problem of 'cherry- picking'. We do this by incorporating group dummies that capture the average differential performance of group of P S Es that may be selected for implementing reforms (autonomy delegation and partial privatization) as they are better performing firms to start with. We also change our control groups to test the robustness of our results. The results indicate that the incremental impact of delegating autonomy to PSE management by setting performance targets and grading them for their performance through MoU system, have significant positive impact on the profitability performance of P S Es. One reason why it is so may be because of explicitly stating one/ few objectives and attaching weights to them in the individual enterprise MoU's helped managements of P S Es focus its efforts on improving the performance of the P S Es. Further delegating autonomy to management in achieving these targets through MoU system and the existence of managerial labor markets (Gerard and Khalid, 2000) act as additional incentives for the management to perform better in future business.

Soft-loans indicating the impact of soft-budget constraint as hypothesized have significant negative coefficient through out the analysis. Thus access to easy loans as argued by several in the literature in past (Bartel and Harrison, 1999; Kalirajan and Shad, 1996; Kornai, 1979 among others) results in poor performance of P S E. This result, as contended by Winston (1993), indicates that the monopoly rents that were accruing to public sector enterprises under the regulated environment where they were well insulated from private sector competition has eroded to some extent under the de-reserved environment thus adversely affecting the profitability of these firms. The incremental impact of ownership reform of partial privatization in firms that have undergone environmental reforms on an average does not seem to have any impact on the firm performance. One recommended policy measure that may improve the enterprise performance is complete privatization, with both ownership and control of the enterprise being passed on to private participants. Similar reform policy measures adopted in several other developing and industrial countries [25] has given positive results. However, as seen in this study, going half way and implementing privatization partially where the control over the management is still under central government, has not been effective in improving the performance of the P S Es.

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