Bolder Divestment Not Better Performance Contracts are the Solution for India's Public Sector

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Abstract

This paper analyses the performance of India's Public Sector Undertakings (PSU's) using measures of labor and overall efficiency and productivity indicators as opposed to financial returns. Using methods that correct for selection bias the results show that performance contracts do not improve firm efficiency but disinvestment has a very strong positive effect on firm efficiency. Disinvestment improves labor productivity and efficiency, which is not surprising, but it also improves overall efficiency. India should pursue much bolder privatization even of PSU's which claim to be making operational profits – such as Air India - as privatization improves overall firm efficiency and unlocks capital for use elsewhere – especially in public infrastructure and reduces the possibility of political interference in their functioning in future.

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Figures and Tables:

1. Introduction

Since the 1980's, the number of public sector undertakings has remained between 213 and 241, with some ups and downs. Of these 7 largest PSU's are called Maha Ratna's, 17 are called Nav Ratna's and some 73 are given the title of Mini Ratna's. The remainder have no classification as such. About half of them are in manufacturing and mining and the rest are in service sector – transport, telecommunications, financial services etc (service sector PSU's are about 106 while, non-service are 129). This is the hangover of India's socialistic legacy from the Nehru - Gandhi days.

The combined assets of all PSU's was around 35% of GDP in 1990 but by 2016 had declined to just over 20% of GDP (Figure 1). Over the same period the sales to GDP ratio declined from 20% of GDP in 1990 to about 16% of GDP in 2016: a much smaller decline indicating that the sales to asset ratio (also sometimes referred to as the turnover ratio) increased from 0.5 in 1990 to around 0.8 in 2016.   Value added created by PSU's as a share of GDP and the ratio of PSU employment to total organized employment in the economy declined from around 8% of GDP in 1990 to under 5% of GDP. Post the 1991 liberalization although the number of PSU's has remained more or less the same, their share in the economy measured by value added, employment and sales has declined, as the private sector has expanded faster. This is a pattern we see in several other countries with state capitalism such as in Brazil and China, where also the share of state enterprises has been declining.

Figure 1: Value Added, Sales and Employment in Public Sector Undertakings (PSU's) 1990-2016
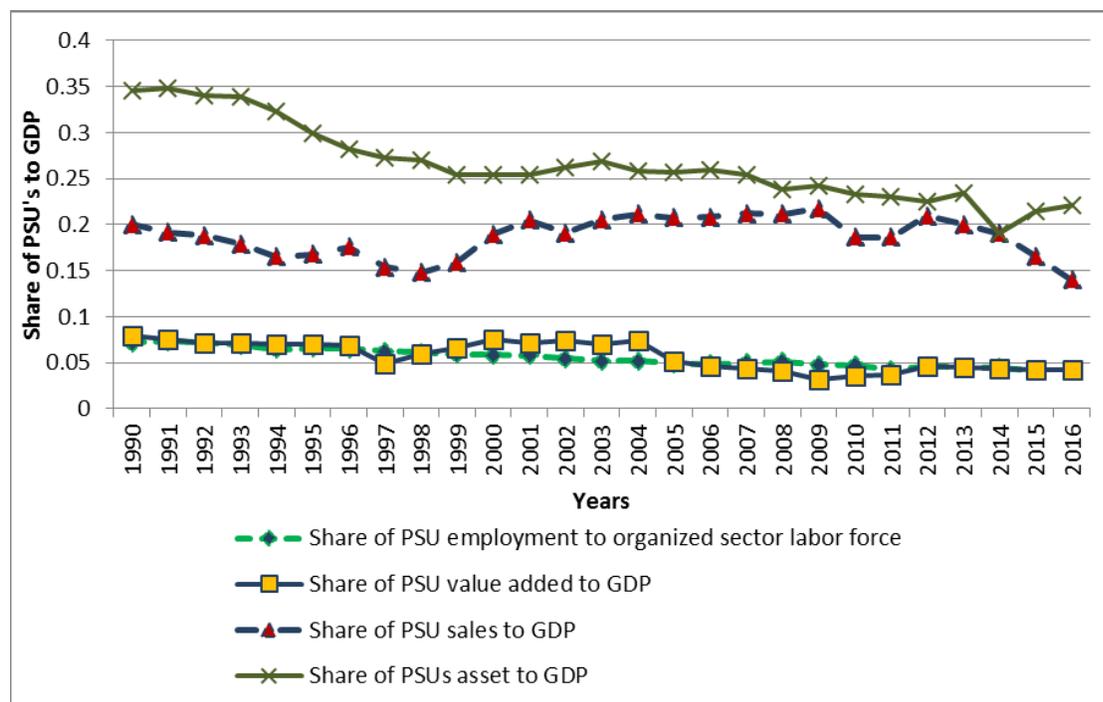

The economic reforms of 1991, dismantled the "license-raj" but left the PSU's more or less intact. Vigorous efforts were made to try and improve their performance through

performance contracts called Memorandum of Understandings (MOU's) with some success as the number of loss makers declined. But yet with still a third of the PSU's making substantial losses.

A brief attempt was made under the NDA 1 government from 1999-2004 to begin dismantling this legacy with strategic disinvestment (privatization) with some success, but met with considerable opposition from vested interests and labor unions. Subsequent UPA government's tried to further improve the performance of these companies through better performance contracts and bringing more PSU's into the Ratna classification. The number of MOU's increased rapidly in the early 1990's from 4 in 1988-89 to over 100 by 1994-95. A second big jump came in the late 2000's and the number of MOU's jumped to 197 by 2009-10 and to 215 by 2015-16, with only 20 PSU's now remaining without performance contracts (Figure 2).

Figure 2: Growth of Public Sector Undertakings and Performance Contracts 1998-2016
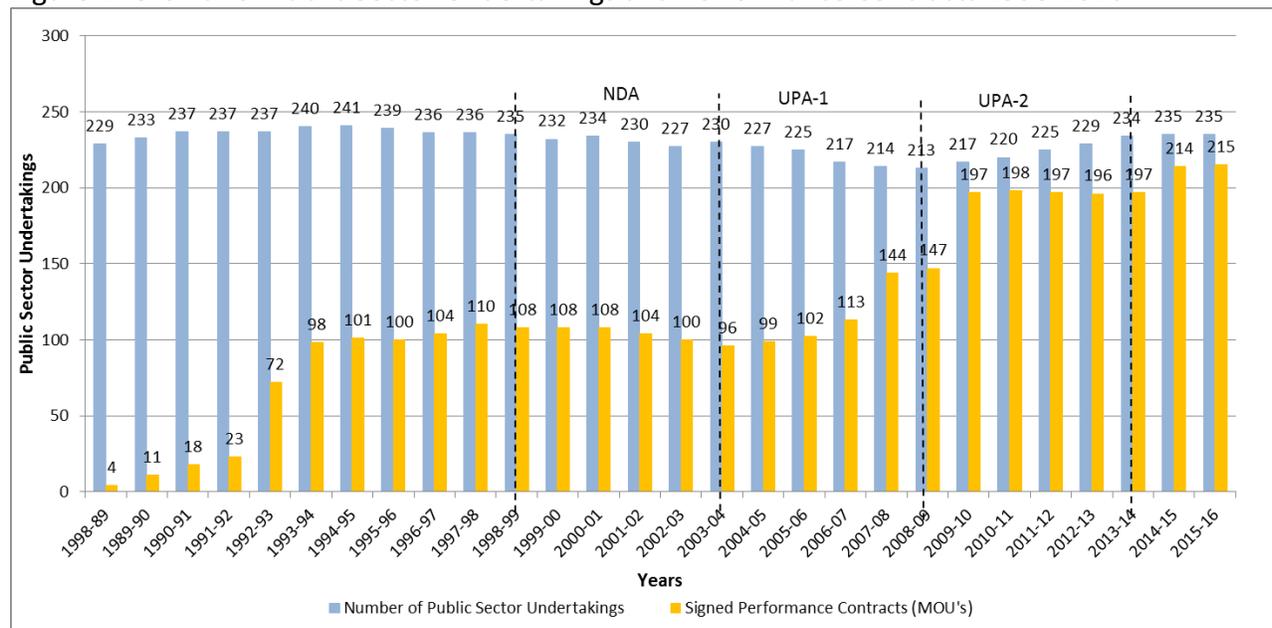
Source: Public Enterprise Survey, 1988-89 to 2015-16

The Ministry of Disinvestment was created in 1999 and the objective of disinvestment under it was not just to raise revenue but also improve efficiency. Over 30 companies were either fully privatized or 50 per cent of their stock divested[2], including one of India's most successful privatization initiatives — the sale of Maruti to Suzuki was completed during this period. But opposition came even from within the NDA government and the bureaucracy as the control over PSU's meant jobs, patronage and the ability to make money through PSU contracts. What is surprising is that while the NDA government was aggressively pursuing privatization, some new PSU's were also created.

The UPA 1 government which came to power in 2004, dependent on the communists, did not try to privatize PSUs – although, a few were shut down. UPA 2 brought back disinvestment with the intent to raise revenue, and the share of private equity in total equity in

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[2] (Bombay Stock Exchange Disinvestments Database, March 2015)

all PSU's combined jumped from around 4% in 2008-09 to over 10% by 2015-16 (Figure 3). Over one third of the PSU's had some private equity in them.

Figure 3: Progress on Dis-investment (Partial Privatization) 1990-2016
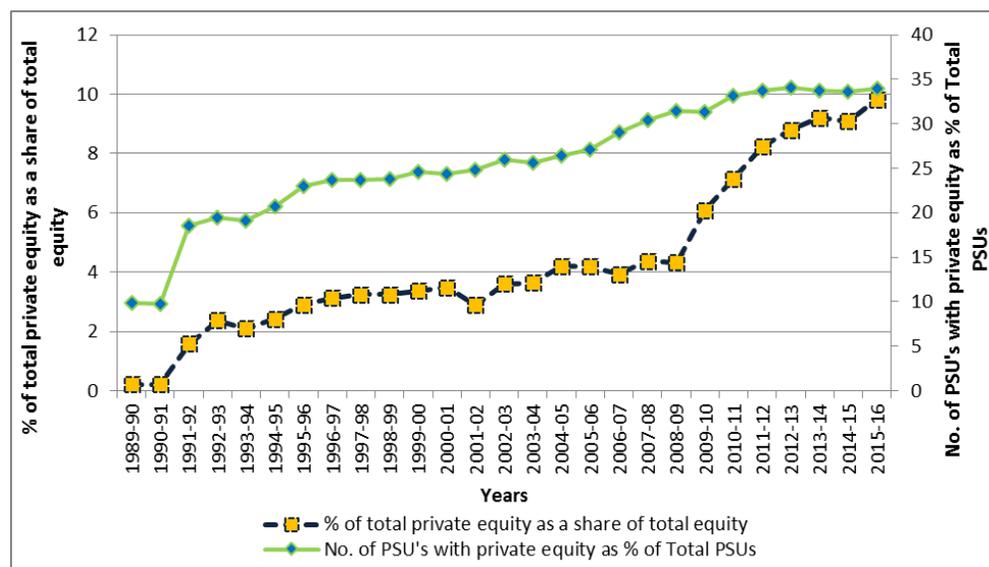
The UPA government also encouraged restructuring of state-owned firms by creating the Bureau for Restructuring of Public Firms. A National Investment Fund was also created to collect disinvestment receipts, with the idea that it would be strategically deployed rather than used as part of budget receipts. Following fiscal pressures after the 2009 crisis, the criterion was gradually relaxed until the fund, for all practical purposes, became part of the budget. With the arrival of the NDA government again in 2014 there was an expectation that the disinvestment pursued quite aggressively by NDA1 would be taken up again and while not much has happened in the first two years so far there are signals that more effort will be made in the remainder of its term – especially with the decision to sell Air-India.

Almost half the PSU's were making losses in the 1990's, but with the period of high growth from 2002-3 onwards, the number of loss-making PSU's declined to about a quarter (Figure 4). But since then and especially once growth slowed down after 2012 the share of loss makers has increased again to almost one-third of the total. Profitability of the PSU's – measured here by profits over total sales has also increased from an abysmal level of 2% in 1990-91 to around 3% by 2000-01, then peaked at almost 9 % between 2003-4 and 2006-7 and has since fallen to between 5-6%. How much of the improved performance is due to MOU's and how much is due to partial privatization will be explored further in the later sections of the paper. We will also explore whether there are differences in performance due to hard budget constraints as well as the degree of competitiveness in the industry in which the PSU is operating.

Figure 4: Trends in Profits and Losses in the Indian PSUs 1990-91 to 2015-16
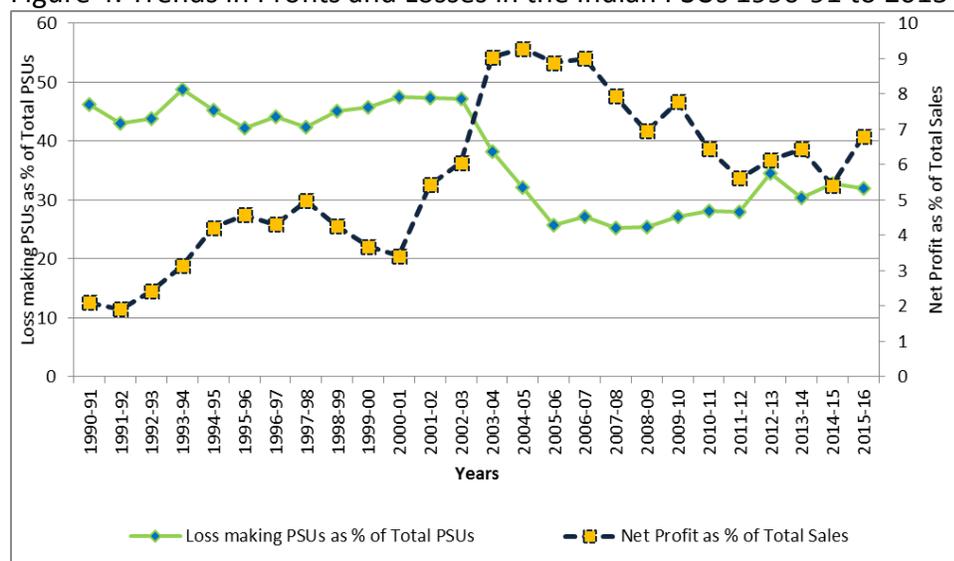
Source: PSU Surveys 1998-99 to 2015-16.

2. Earlier Studies of PSU Performance in India and Proposed Approach

There are a vast number of studies on privatization around the world with mixed results. Many of them show that privatization improves labor productivity and even profitability but not necessarily overall efficiency and productivity. A comprehensive survey of this literature (Megginson and Netter, 2001) concluded that divested (fully and partially privatized) firms almost always become more profitable and more efficient. An OECD survey soon thereafter also came to the same conclusion. Subsequent surveys (Muhlenkamp, 2013) have questioned these findings and shown that the previous survey suffered from flaws. It questions whether privatization leads to greater efficiency and argue that public and private sector firms perform the same when subject to competition and better regulation. Some have argued that many of the studies suffer from methodological flaws as the gains from privatization maybe due to selection bias – as better performing PSU's maybe privatized first. The most recent survey by UNDP's Global Centre for Public Service Excellence (GSCPE, 2017), shows that privatization is likely to lead to positive results in markets with greater competition and better regulation. This is more likely in developed countries but not so in middle income and developing economies, where the results of privatization are more mixed.

There are a large number of studies that try and discuss the performance of PSU's in the Indian context. But very few of these use rigorous techniques and are therefore largely descriptive (Arun and Nixson, 2000; Mathur, 2010; Nagaraj, 2005 and Trivedi, 1990). Among the most prominent rigorous studies, (Gupta, 2006 and 2011) showed that disinvestment (even the sale of minority shares) had a positive effect on PSU financial performance, ostensibly because new owners injected greater commercial drive, which helped improve profitability. But this result has been challenged by recent studies as it did not factor in the effect of performance contracts - MOU's. More recent studies (Gunasekar and Sarkar, 2014) show that when PSUs with and without MoUs are considered, much of the financial performance

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improvement – earlier attributed to privatization is due to the performance effect of MOU's. The positive effect of privatization disappears once the MOU performance effect is taken into account. So a policy of selling a minority stake (up to 49 per cent) as a disinvestment measure is unlikely to have any positive effect on financial performance.

In another recent paper (Jain, 2016) uses technical efficiency as the performance variable, instead of financial rates of return. She applies a stochastic frontier analysis technique to generate technical efficiency by industry and by firm and then examines the impact of disinvestment and the ideology of the state government in which the enterprise is located as well as whether the state government belongs to a political party that is different from the central government. The results indicate that disinvestment - even partial disinvestment - has a strong positive effect on firm performance. The political ideology of the state government as well as whether the state government and the central government belong to different parties has a significant effect on performance. Her results are however dependent on the credibility of the method used to calculate technical efficiency.

In a previous paper (Chhibber and Gupta, 2017) had analyzed the performance of India's 235 public sector undertakings (PSU's) using firm level data over the period 1990-2015 from the Public Enterprise Survey (time series panel data set) that paper looked into factors that explain the financial performance – return on capital (ROC) and return on assets (ROA) of these PSU's. The results showed that MOU's have had a positive impact on PSU performance by increasing their return on capital (ROC). This result holds mainly for the non-service sector (manufacturing, mining) but less so for service sector firms. In the case of service sector firms, partial privatization (share sales) had a positive impact on performance, making them ideal candidates for more aggressive disinvestment. The results also show that larger PSU's –Maharatna's appear to perform better on financial indicators than smaller PSU's and even better than private firms of similar size.

When the UPA government came back to power in 2004, they were not in favor of strategic disinvestment (privatization). They instead shifted attention instead to improving the performance contracts (MOU's). The National Council of Applied Economic Research (NCAER) was asked to conduct a study on improving the MOU system and recommended two broad shifts (Venkatesan, 2008). The first was to shift from simple financial measures of performance to more productivity based measures. Value added per sales was introduced as a proxy for TFP and Profits before Taxes, Interest and Depreciation (PBITA) per employee was introduced as another measure. The second was to shift from static to dynamic variables: which were seen as improving the long term sustainability of the company. These included, quality (ISO certification, HRD (employee training and motivation), R&D, extent of globalization (joint ventures, exports and strategic alliances).

Another set of changes were brought about in 2008 with the recommendations of Ashok Chandra Committee. It suggested that target setting process in an enterprise must be based on its past 5 year performance record. Focus was provided on the working of Task Force and its strengthened role. Based on the Management Development Institute's report, sector specific formats for MoUs were developed - (Manufacturing and Mining Sectors, Trading and Consulting Sectors, Social Sector, Financial Sector and Sick enterprises). Two additional

enterprise specific parameters were introduced like physical production, globalization, capital expenditure, expansion plans, economy measures to cut costs etc.

It is useful therefore to see how CPSE's have performed on various productivity indicators, including the two PBITDA per employee and Value added per sales (VAS) used in the reformed MOU contracts. In addition to PBIDTA per employee we also use value added per employee (VAE) as a measure of labor productivity. In addition to value added per sales (VAS), which were introduced in the MOU measure, we also examine value added per assets (VAA), value added per capital (VAC) as measures of efficient use of assets and capital and the turnover ratio measured by net sales to assets (NSA) as a measure of operational efficiency.

NSE and VAE have increased five-fold and four-fold respectively between 1990 and 2015 (Figure 5). On an annual average basis this translates to a 2.0 % per annum for VAE against overall labor productivity growth of 5.2% for the labor force as a whole of the Indian economy. The increase in VAE was very rapid initially increasing from Rs 400 per employee per hour in 1989-90 prices to Rs 1600/- in 2003-04, fell sharply after that before recovering back to Rs 1600/- per employee by 2015-16. Labor productivity in PSU's increased considerably slower than average labor productivity growth of around 5.2 % for the economy as a whole (including low productivity sector such as agriculture) over the same period.

Value –added per net sales and Value Added per asset has fluctuated around 0.2 over the entire period 1990 to 2016 (Figure 6); going up to 0.3 in 1997-98 and staying there upto 2003-04. But then fell below 0.2 and have averaged 0.2 in the last five years up to 2015-16. Value added per net sales is considered a measure of total factor productivity in the MOU performance appraisal system and has on average been lower in the last decade compared to the previous decade. But what has really happened is that net sales have risen much faster than value added as PSU's have tried to expand their market share.

Figure 5: Net Sales and Value Added per Employee in PSU's 1990-2016
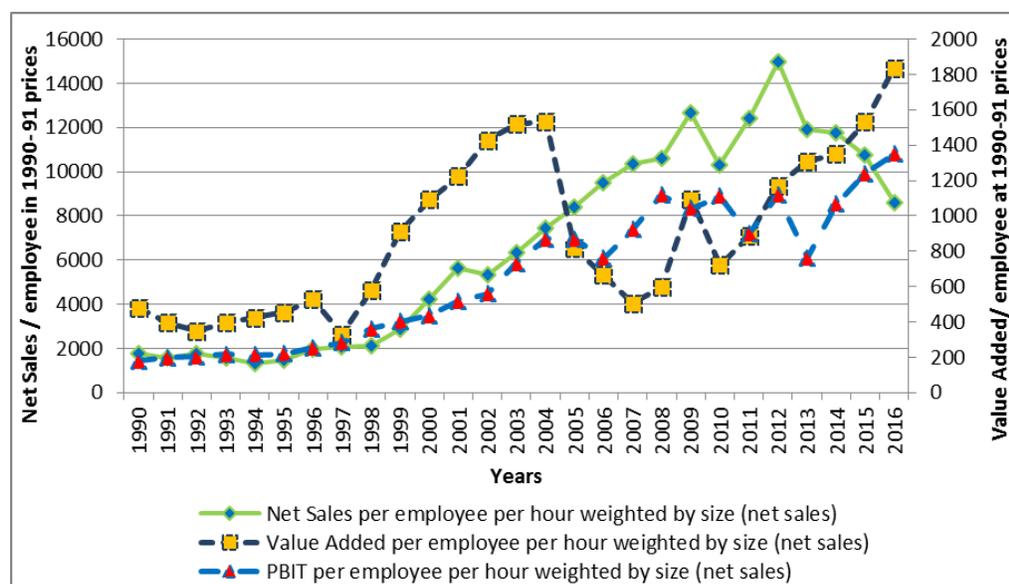
Source: Public Enterprise Survey 1990-91 to 2015-16

Figure 6: Value Added per Capital and per Asset and Net Sales per Asset: 1990-2016
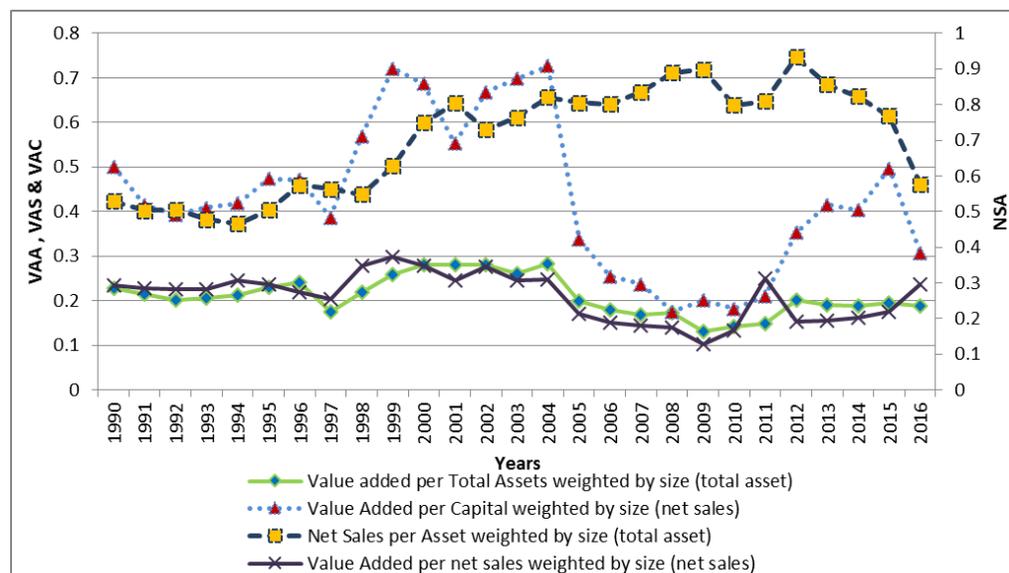
Source: Public Enterprise Surveys 1990-2016.

3. The Model and Approach Used

The nature of the industry, the size of the PSU, how well the economy is doing and other factors such as a hard budget constraint and the performance contracts can affect the performance of the PSU's. Some PSU's have soft budget constraints per se, some are given soft loans under various dispensations which allow them to have a soft budget as these loans are frequently rolled over. PSU's that are more export –oriented may also have better performance as they face greater external competition as against those that sell in a more protected domestic market – although lately India has become more open so even PSU's selling largely into the domestic market face more competition from imports.

In order to get a better understanding of the effect of various factors on PSU productivity performance the paper estimates a model over the period 1990 – 2015 using panel data assembled through the Public Enterprise Surveys which each PSU is required to file every year.

The model estimated for this paper is as follows:

$$Y_{it} = \alpha_G + \eta_I + \beta' X_{it} + \eta' P_{it} + \gamma' Z_{it} + \varepsilon_{it}$$

Where,

Y_{it} - represents the productivity performance variable, PBITE, VAE, NSA, VAA, VAC for firm 'i' at time 't'

α_G - represents the group effects for Type-1, Type -2 and Type-3 PSUs

η_I – represents industry fixed effects

X_{it} – represents the variables for showing before and after effect of a performance contract MOU and partial privatization (disinvestment).

P_{it} – represents the preparation effects – the actions taken to qualify for an MOU and disinvestments.

Z_{it} – represents the control variables

ε_{it} – represents the error term

Type-1 includes firms which neither have management autonomy nor are partially privatized, Type-2 includes firms which signed MOU with the government and, Type-3 includes firms which got partially privatized and signed MOU.

Control Variables:
SOFTLN -Ratio of loans borrowed by PSU from the central government to total loans borrowed, lagged by one year.

LASSET – Log of total assets, which is a size effect

EXINT - Ratio of exports to total sales

DEPINT - Ratio of depreciation expenditure to total sales

GRGDP $_{constant\ price}$ – Growth Rate of GDP at constant prices.

Industry effects - Industry dummies, one dummy for each of the 22 industry groups, taking the value 1 for a particular industry and zero otherwise

α_2 - Dummy variable that takes value 1 for Type-2 PSUs and zero otherwise

α_3 - Dummy variable that takes value 1 for Type-3 PSUs and zero otherwise

These are included to control for selection bias as the first of these dummies measure the average difference between firms with no MOU or disinvestment and the second captures the difference between firms with MOU but no disinvestment with those that had disinvestment.

Performance Contract Variables are:

MOU - Dummy variable that takes the value 1 in period '*t+1*' if the firms had signed a MOU in year '*t*'; and the value is zero, otherwise

mouprep0 - Dummy variable that takes value 1 for the year PSU signed MOU and zero otherwise

mouprep1 - Dummy variable that takes the value 1 for year 't-1' if the firms signed MOU in

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year '*t*' and zero otherwise

mouprep2 - Dummy variable that takes the value 1 for year 't-2' if the firms signed MOU in year '*t*' and zero otherwise

mouprep3 - Dummy variable that takes the value 1 for year '*t-3*' if the firms signed MOU in year '*t*' and zero otherwise.

Partial Privatization Variables are:

ppvt_dummy – Dummy variable that takes the value 1 for PSU in time 't' and thereafter if the firm gets partially privatized in year 't' and zero otherwise

ppvt_shr - Share of private equity to the PSU total equity

ppvt_prep1 – Dummy variable that takes value 1 for year 't-1' if the PSU became partially privatized in year 't' and zero otherwise

ppvt_prep2 – Dummy variable that takes value 1 for year 't-2' if the PSU became partially privatized in year 't' and zero otherwise

ppvt_prep3 – Dummy variable that takes value 1 for year 't-3' if the PSU became partially privatized in year 't' and zero otherwise

Table 1 shows the sample description of the sub samples of PSUs to study the differential impact of 'MOU signed with the government'.

Table 1: Description of Sample used in the analysis by type of PSUs

	Sample Observations					
	Type-1	*Type-2*		*Type-3*		
Sample Type	No Reform *Regime 1*	Pre-MOU *Regime 1*	Post-MOU *Regime 2*	Pre-MOU *Regime 1*	Post MOU-Pre-PPVT *Regime 2*	Post-PPVT *Regime 3*
S1	√	√	√	√	√	-
S2	-	√	√	√	√	-
S3	-	√	√	-	-	-
S4	√	√	√	√	√	√
S5	-	√	√	√	√	√
S6	-	-	-	√	√	√

Initially, we are using S1 where we include all the observations of type-1 and type-2 and type-3 pre-privatization,

$$Y_{it} = \alpha_2 + \alpha_3 + \eta_l + \beta_1 MOU_{it} + \eta' P_{it} + \gamma' Z_{it} + \varepsilon_{it} \tag{1}$$

The second estimation is done using S2 which excludes type-1 PSU focusing only on the firms which have an MOU and had share sales. It consists of type-2 and type-3 observations pre-privatization only.

$$Y_{it} = \alpha_3 + \eta_I + \beta_1 MOU_{it} + \eta' \, P_{it} + \gamma' \, Z_{it} + \varepsilon_{it} \qquad (2)$$

The third estimation is done using S3 by taking type-2 firms only i.e. those with MOU's but excludes those that had share sales.

$$Y_{it} = \eta_I + \beta_1 MOU_{it} + \eta' \, P_{it} + \gamma' \, Z_{it} + \varepsilon_{it} \qquad (3)$$

The fourth estimation is done using S4 by taking all the three types; type-1, type-2 and type-3 to show the impact of partial privatization on the entire sample of firm-year observations. Given that all partially privatized PSUs were also under MOU, the coefficient of the partial privatization variable that is PPVT_DUMMY and PPVT_SHR captures its incremental effect over and above of MOU.

$$Y_{it} = \alpha_2 + \alpha_3 + \eta_I + \beta_1 MOU_{it} + \beta_2 PPVT\_DUMMY/\, PPVT\_SHR_{it} + \eta' \, P_{it} + \gamma' \, Z_{it} + \varepsilon_{it} \qquad (4)$$

The fifth estimation is done using S5 which excludes type-1 PSUs focusing only on the firms which have an MOU and had share sales. It consists of type-2 and type-3 observations including post-privatization of type-3.

$$Y_{it} = \alpha_3 + \eta_I + \beta_1 MOU_{it} + \beta_2 PPVT\_DUMMY/\, PPVT\_SHR_{it} + \eta' \, P_{it} + \gamma' \, Z_{it} + \varepsilon_{it} \qquad (5)$$

The sixth estimation done using S6 is similar to S2, to conduct the before and after study of only type-3 PSUs, those who signed the MOU and partially privatized and compare their performance before and after partial privatization.

$$Y_{it} = \eta_I + \beta_1 MOU_{it} + \beta_2 PPVT\_DUMMY/\, PPVT\_SHR_{it} + \eta' \, P_{it} + \gamma' \, Z_{it} + \varepsilon_{it} \qquad (6)$$

4. Empirical Findings and Implications

Using the latest PSU survey data, we have estimated the equations (1), (2), and (3) for the period 1990-2015 with value added per employee (VAE) as the dependent variable.

Value Added per Employee (VAE) is often used measure of labor productivity. Performance contracts MOU has no significant effect on VAE (Table 2a). Firm size LASSET has a significantly positive effect on VAE. Soft loans have a positive effect on labor productivity – presumably as these funds are used to buy new equipment and/or for labor training.

In contrast to performance contracts disinvestment – whether measured by privatization dummy (ppvt_dummy) or by the private share in equity has a strong and very significantly positive effect on VAE (Table 2b & 2c). In fact when a privatization dummy is used the benefits of a decision to divest starts three years prior to the actual divestment. Firm size

also has a strong positive effect on value added per employee. In the case of S3 firms export orientation also has a positive effect on VAE.

The coefficients of the dummy variable α_2 for Type 2 firms which signed an MOU are negative but insignificant which suggests Type 1 firms have on average the same VAE compared to Type 2 firms. The coefficient for the dummy variable α_3, which control for group effects of firms that had some privatization, is negative and highly significant. This shows that on average VAE is lower for Type 3 firms compared to Type 2 firms. These variables were introduced to remove selection bias.

In the MOU rating system the variable used to assess labor productivity is not VAE but instead it is Profits before Taxes, Interest and Depreciation per Employee (PBITE). The results for the regression of PBITE are in Appendix 1 and they confirm the same findings. MOU has no significant effect on PBITE (Table A1 a), but disinvestment and private equity (Table A1 b and c) show very strong and significant effects on PBITE. Firm size and GDP growth also have a positive effect of PBITE. Surprisingly soft loans have in some cases a positive effect on PBITE. This could come from two sources: soft loans are used for capital equipment purchases which improves labor productivity or they are used for skills development which would also increase PBITE.

Table 2a: Regression for Value Added per Employee (VAE) 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.2258045***	-0.2223916***	-0.2585025***	-0.2460657***	-0.2363382***	-0.2247423***
mou_prep0		-0.0278763**		-0.0260053*		-0.022787
mou_prep1		-0.0133997		-0.0116697		-0.0101831
mou_prep2		-0.0262621		-0.0244716		-0.019113
mou_prep3		-0.0405593**		-0.0391663*		-0.0267375
MOU	-0.0103466	-0.0152996	-0.0101205	-0.0146697	-0.0128594	-0.0159353
SOFTLN	0.0164172	0.0168321	0.0211019*	0.0212305*	0.0257695**	0.0252534**
LASSET	0.1444896***	0.1398684***	0.1538821***	0.1490752***	0.1452213***	0.1407979***
EXINT	0.000213	0.0002221	0.0051774	0.0052701	0.0012675	0.0013905
DEPINT	0.0000615	0.0000753	-0.0080143	-0.0073881	-0.0067736	-0.0061886
GRGDP constant price	-0.0008827	-0.0004893	-0.0011652	-0.0007507	-0.0022307	-0.0018954
α_2	-0.0131572	-0.0040889	NA	NA	NA	NA
α_3	-0.13802***	-0.1220562**	-0.1279139***	-0.1211764***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.342	0.346	0.3453	0.349	0.3748	0.3786
No. of Observations	2536	2536	2401	2401	2121	2121

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 2b: Regression for Value Added per Employee (VAE) Disinvestment Effect 1 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.2410661***	-0.2303463***	-0.286218***	-0.2718267***	-0.8713268***	-0.8644863***
ppvt_dummy	0.1594198***	0.2739901***	0.1567953***	0.269816***	0.0926618***	0.1735557***
ppvt_prep1		0.1890245***		0.1863496***		0.1275967***
ppvt_prep2		0.1857151***		0.1833557***		0.1234164***
ppvt_prep3		0.0734235***		0.0717535*		0.0123478
mou_prep0	-0.019572	-0.0229785	-0.0186553	-0.0219736	0.0108952	-0.0033748
mou_prep1	0.0023797	0.0003994	0.0039184	0.0020352	0.0710983	0.066326
mou_prep2	-0.015233	-0.0157661	-0.0128534	-0.013406	-0.0086199	-0.0120891
mou_prep3	-0.032179	-0.0274962	-0.030239	-0.0256122	-0.0845523	-0.0612194
MOU	-0.0140878	-0.0149253	-0.0137239	-0.0144676	-0.0016068	-0.0044511
SOFTLN	0.0138858	0.0137378	0.0182893	0.0181099	-0.0283872	-0.0309465
LASSET	0.161761***	0.1563224***	0.1725626***	0.1669571***	0.3551607***	0.3327858***
EXINT	0.0003078	0.0002872	0.0108614*	0.009557	0.2291217***	0.206119***
DEPINT	-0.0002997	-0.0002538	-0.0009594	-0.0008678	0.0002163	0.0002107
GRGDP constant price	-0.0020222	-0.002253	-0.0024062	-0.0026422*	-0.0054282	-0.0060932
$\alpha 2$	-0.0224055	-0.0191119	NA	NA	NA	NA
$\alpha 3$	-0.2238862***	-0.3130697***	-0.2024044***	-0.2930852***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3542	0.3507	0.355	0.3519	0.3898	0.386
No. of Observations	3044	3044	2909	2909	826	826

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 2c: Regression for Value Added per Employee (VAE) Disinvestment Effect 2 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.2291219***	-0.2270638***	-0.2809798***	-0.2787635***	-0.7803***	-0.7466797***
ppvt_shr	0.4819101***	0.5057038***	0.4814733***	0.5066897***	0.4047398***	0.4886218***
ppvt_prep1		0.0360848		0.0368605		0.0556799
ppvt_prep2		0.0372015		0.0380235		0.059116
ppvt_prep3		-0.0426033		-0.0419697		-0.0443217
mou_prep0	-0.0275489*	-0.0304743**	-0.0264404*	-0.0293759*	-0.0150768	-0.0368187
mou_prep1	-0.0074839	-0.0084549	-0.0057297	-0.0067089	0.0299319	0.0157313
mou_prep2	-0.0255762	-0.0270358	-0.0231265	-0.0245941	-0.0605596	-0.0824371
mou_prep3	-0.0360797	-0.0358677	-0.0341664	-0.0339175	-0.1120478	-0.1093088
MOU	-0.0187982	-0.0193988	-0.0182247	-0.0188196	-0.0140436	-0.0198361
SOFTLN	0.0133763	0.0123373	0.0168880	0.0157818	-0.0283479	-0.0322337
LASSET	0.1588993***	0.1581833***	0.1689318***	0.1682546***	0.3295223***	0.3148682***
EXINT	0.0003197	0.0003205	0.0118556*	0.0117549*	0.2336744***	0.2245043***
DEPINT	-0.0001433	-0.0001116	-0.0006297	-0.0005641	0.0002479	0.0002953
GRGDP constant price	-0.0020436	-0.0020895	-0.0023879	-0.0024376	0.0003644	-0.0057559
$\alpha 2$	-0.0306418	-0.030413	NA	NA	NA	NA
$\alpha 3$	-0.1445915***	-0.1475657***	-0.115329***	-0.1186918***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3692	0.3689	0.3686	0.3682	0.4049	0.4076
No. of Observations	3037	3037	2903	2903	826	826

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

The results for value added per employee (VAE) as a measure of labor productivity or (PBITE) suggest that introduction of performance contracts (MOU) have no significant effect on them. However, disinvestment has a very significant and positive impact on them. This result is not surprising as many studies find that privatization increases labor productivity, as firms retrench labor and invest in capital after privatization. In the case of Indian PSU's, retrenchment is not so easy so the result is largely due to more efficient use of labor through restructuring and also possibly due to new investment in equipment from the proceeds of the disinvestment: some of which are retained by the PSU and some passed back to the budget.

Having established that privatization improves labor productivity we turn next to value added per capital VAC (a measure of productive use of capital) and value added per assets VAA (a measure of productive use of assets – which include land and other assets).

Table 3a: Regression for Value Added per Capital (VAC) MOU Effect 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.1696551*	0.1681746*	0.2940761***	0.2929685***	0.3002602***	0.2962975***
mou_prep0		-0.0037613		-0.0026975		0.0033147
mou_prep1		0.0033147		0.0029524		0.0104903
mou_prep2		0.0154563		0.0147798		0.024276
mou_prep3		-0.0516154*		-0.0523843*		-0.0485762
MOU	-0.0127381	-0.0132915	-0.0128295	-0.0133533	-0.0128998	-0.0122389
SOFTLN	0.0074943	0.0082519	0.0060238	0.0068344	0.0028195	0.0034297
LASSET	0.0283787**	0.0284637**	0.0271776**	0.0272151**	0.024462*	0.0254699*
EXINT	0.0002233	0.0002255	0.0001624	0.0001643	0.0001616	0.00016
DEPINT	-0.0012406	-0.0012429	-0.0128936	-0.0129855	-0.0121612	-0.0124492
GRGDP constant price	-0.0059252***	-0.0057353***	-0.0056466**	-0.005431**	-0.0064354***	-0.0062863**
α2	0.1235755*	0.1240748*	NA	NA	NA	NA
α3	0.2710186***	0.2711567***	0.1544437***	0.1541158***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.1156	0.1159	0.1054	0.1058	0.1265	0.1271
No. of Observations	2568	2568	2427	2427	2118	2118

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 3a shows that performance contracts MOU have no positive impact on value added per unit of capital (VAC). Disinvestment as measured by privatization dummy in Table 3b & 3c has a very significant and positive impact on VAC –especially once the privatization preparation dummies are also introduced. But when private equity share is used as the disinvestment variable it has no significant effect on VAC.

Table 3b: Regression for Value Added per Capital (VAC) Disinvestment Effect 1 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.2376224***	0.2423529***	0.4134831***	0.4200107***	0.8559085***	0.8603492***
ppvt_dummy	0.0308124	0.0755507**	0.0307148	0.074858**	0.0622297**	0.1099457***
ppvt_prep1		0.0841775*		0.0833077*		0.0896645**
ppvt_prep2		0.0897114**		0.0884838**		0.0856125**
ppvt_prep3		-0.0154792		-0.0163902		-0.0252378
mou_prep0	-0.006373	-0.008942	-0.0066344	-0.0091981	-0.0402375	-0.0536965
mou_prep1	-0.0003795	-0.0007656	-0.0008993	-0.0012755	-0.0543675	-0.0565279
mou_prep2	0.00352	0.0030238	0.0031117	0.0026169	-0.1241481	-0.1273287*
mou_prep3	-0.0577806*	-0.0556911*	-0.0580139*	-0.0559515	-0.1109501	-0.0935009
MOU	-0.0157053	-0.0158019	-0.0159319	-0.0160309	-0.0518427	-0.0539618
SOFTLN	-0.0107062	-0.0100621	-0.0143004	-0.0136296	-0.0239393	-0.021393
LASSET	-0.0158306	-0.0179637	-0.0188504	-0.0210102*	-0.1127556***	-0.1247056***
EXINT	0.0002636	0.0002649	0.000266	0.0002675	0.2777707***	0.2623968***
DEPINT	-0.0012329	-0.0012008	-0.0016217	-0.0015605	-0.0018209	-0.0018118
GRGDP constant price	-0.007601***	-0.0078021***	-0.0074548***	-0.00766***	-0.0096395**	-0.0103441***
$\alpha2$	0.1698472***	0.1715388***	NA	NA	NA	NA
$\alpha3$	0.2819899***	0.2472693***	0.1152893**	0.0793587	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.134	0.1359	0.1232	0.1249	0.2966	0.2989
No. of Observations	3104	3104	2963	2963	889	889

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 3c: Regression for Value Added per Capital (VAC) Disinvestment Effect 2 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.2498616***	0.2514431***	0.4388936***	0.4404136***	0.7696668***	0.7764581***
ppvt_shr	-0.1172725	-0.1099987	-0.1113951	-0.1041454	-0.0901177	-0.0807926
ppvt_prep1		0.0154597		0.0157762		0.0113205
ppvt_prep2		0.0225189		0.0224531		0.0132735
ppvt_prep3		-0.063712		-0.0639547		-0.0784216
mou_prep0	-0.017343	-0.019261	-0.0175515	-0.0194822	-0.0642439	-0.0695861
mou_prep1	-0.0093783	-0.0090615	-0.0097787	-0.0094651	-0.0773891	-0.0703042
mou_prep2	-0.0020394	-0.0030186	-0.0024968	-0.0034763	-0.1439003*	-0.1470565*
mou_prep3	-0.0604468*	-0.0604699*	-0.0606239*	-0.060649*	-0.1188389	-0.1174509
MOU	-0.0262288	-0.0259134	-0.0264213	-0.0261161	-0.0688614*	-0.0646987
SOFTLN	-0.0166632	-0.0171762	-0.0205068	-0.0210318	-0.0403302	-0.0438438
LASSET	-0.0143203	-0.0143711	-0.0176559	-0.0177116	-0.0679489**	-0.066495**
EXINT	0.0006039	0.0006049	0.0006948	0.000696	0.2849175***	0.2834066***
DEPINT	-0.0012204	-0.0012021	-0.0016079	-0.0015715	-0.0016327	-0.0016212
GRGDP constant price	-0.0078698***	-0.0079771***	-0.0077788***	-0.0078896***	-0.0102562***	-0.0106921***
$\alpha2$	0.1818865***	0.1817683***	NA	NA	NA	NA
$\alpha3$	0.2951396***	0.2944019***	0.1156574**	0.1150371**	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.134	0.135	0.1236	0.1246	0.3022	0.3048
No. of Observations	3062	3062	2923	2923	889	889

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

MOU have a negative effect on value added per assets (VAA) (Table 4a). Firm size LASSET and GDP growth also have a surprising negative effect on VAA. Larger firms have higher labor productivity – presumably since they use more capital but have lower value added per asset.

Table 4a: Regression for Value Added per Asset (VAA) MOU Effect 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.0936028	0.0952819	0.2574034***	0.2659574***	0.2581818***	0.262715***
mou_prep0		-0.0175408		-0.0176365		-0.0121414
mou_prep1		-0.0146687		-0.0154325		-0.008323
mou_prep2		-0.0226129		-0.0238348		-0.0145553
mou_prep3		-0.0432859*		-0.0445908**		-0.0353317
MOU	-0.0211249	-0.0253886*	-0.020817	-0.0252154*	-0.0226571	-0.0252766
SOFTLN	0.0112711	0.0121075	0.0047442	0.0055124	0.0147281	0.0151082
LASSET	-0.0337779***	-0.0369017***	-0.0373183***	-0.0408755***	-0.0344595***	-0.0364265***
EXINT	0.0001944	0.0002032	0.0001151	0.0001242	0.0001125	0.0001186
DEPINT	-0.0006203	-0.0006199	-0.0143479	-0.0143934	-0.0138563	-0.0139164
GRGDP constant price	-0.0065352***	-0.0061493***	-0.0058853***	-0.0054484***	-0.0070295***	-0.0066907***
$\alpha 2$	0.1598485***	0.1660002***	NA	NA	NA	NA
$\alpha 3$	0.2957047***	0.3059543***	0.1492176***	0.1536461***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.1726	0.1721	0.1598	0.159	0.1798	0.1794
No. of Observations	2677	2677	2540	2540	2240	2240

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Disinvestment on the other hand has a very positive effect on VAA whether we measure disinvestment by a dummy variable for the year of disinvestment (ppvt_dummy) or whether we measure it by the share of private equity in total equity (ppvt_shr). The positive effect of disinvestment starts at least two years prior to the actual disinvestment as the variable ppvt_prior are positive and significant two years before the actual disinvestment. In this latter case the effect of performance contract MOU remains negative. Firm size and the capital intensity of the firm measured by the share of depreciation in total assets are also negative.

Table 4b: Regression for Value Added per Asset (VAA) Disinvestment Effect 1 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.1302193**	0.1355729**	0.3229232***	0.3306753***	0.547848***	0.547375***
ppvt_dummy	0.0364425**	0.1026553***	0.0372656**	0.10265***	0.0582224***	0.1334707***
ppvt_prep1		0.1184834***		0.1172944***		0.1262605***
ppvt_prep2		0.1109643***		0.1090175***		0.1123936***
ppvt_prep3		0.056133		0.0554201		0.0534209
mou_prep0	-0.0140366	-0.016015	-0.0143358	-0.0162856	-0.0181689	-0.0302529
mou_prep1	-0.0115423	-0.0128845	-0.0123172	-0.0136472	-0.0222858	-0.0314619
mou_prep2	-0.024386	-0.0241876	-0.024951	-0.0247419	-0.0840862	-0.0826154
mou_prep3	-0.043374*	-0.0403814*	-0.0440091**	-0.0410532*	-0.099198	-0.0723331
MOU	-0.0225206	-0.0233803	-0.0224855	-0.0233556	-0.0246282	-0.0311409
SOFTLN	0.0011931	0.0026271	-0.0049472	-0.0035431	-0.0249063	-0.0165305
LASSET	-0.057936***	-0.0610423***	-0.0623323***	-0.0655174***	-0.1051901***	-0.1260956***
EXINT	0.0002051	0.0002067	0.0001852	0.0001871	0.1551243***	0.1323275***
DEPINT	-0.0032213***	-0.0031857***	-0.0062682***	-0.0062065***	-0.0062254***	-0.0062509***
GRGDP constant price	-0.0070121***	-0.0071642***	-0.006522***	-0.0066718***	-0.0072779***	-0.0077778***
α2	0.1860889***	0.1883246***	NA	NA	NA	NA
α3	0.2885252***	0.236355***	0.1152371***	0.0615614*	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.188	0.1909	0.1666	0.1692	0.2889	0.2966
No. of Observations	3216	3216	3079	3079	891	891

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 4c: Regression for Value Added per Asset (VAA) Disinvestment Effect 2 (1990-2015)

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.1447084**	0.1456418**	0.345059***	0.3453838***	0.542859***	0.547195***
ppvt_shr	0.0641623	0.101087*	0.070399	0.1074417**	0.1158683	0.1805307**
ppvt_prep1		0.0528313*		0.0523872*		0.0559589**
ppvt_prep2		0.0450971		0.0438982		0.0473373*
ppvt_prep3		0.0058589		0.0055349		0.0001588
mou_prep0	-0.0206096	-0.0237299	-0.0209546	-0.0240064	-0.0357061	-0.0517509
mou_prep1	-0.0105858	-0.0129954	-0.0114421	-0.0138001	-0.0448145	-0.0591699
mou_prep2	-0.0212065	-0.022768	-0.021972	-0.0235043	-0.1079723**	-0.1211985**
mou_prep3	-0.0445613*	-0.044073*	-0.0452137	-0.0447388**	-0.1105816	-0.1069119
MOU	-0.0286192**	-0.0304762**	-0.0286174**	-0.0304408**	-0.0351891	-0.0431302
SOFTLN	-0.0005734	-0.0009167	-0.0070470	-0.0074458	-0.0305259	-0.0311
LASSET	-0.0608828***	-0.0609205***	-0.0656539***	-0.0657862***	-0.0952227***	-0.1002045***
EXINT	0.000612*	0.0006132*	0.0006631*	0.0006645*	0.1613791***	0.1551633***
DEPINT	-0.0031999***	-0.0031547***	-0.0062303***	-0.0061448***	-0.0061107***	-0.0060583***
GRGDP constant price	-0.0073797***	-0.0074278***	-0.0069162***	-0.0069596***	-0.0076605***	-0.0081229***
α2	0.1926512***	0.1918575***	NA	NA	NA	NA
α3	0.300978***	0.2934732***	0.1216123***	0.1151829***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.2011	0.2039	0.1795	0.1823	0.2959	0.3037
No. of Observations	3170	3170	3035	3035	891	891

Source: Author's calculation using data from Public Enterprise Survey (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Bigger firms were seen to have higher returns on capital (ROC) and return on assets (ROA) in our earlier paper (Chhibber and Gupta, 2017). Bigger firms also have higher labor productivity measured by VAE and NSPE. But on value added per asset (VAA) size has a negative effect- so bigger firms have lower value added per asset – the efficiency variable, although they have higher financial profitability measured by ROC or ROA.

The coefficients of the dummy variable α_2 for Type 2 firms which signed an MOU are positive which suggests Type 1 firms have on average lower VAA compared to Type 2 firms. The coefficient for the dummy variable α_3, which control for group effects of firms that had some privatization is also positive and highly significant. This shows that on average VAA is higher for Type 3 firms compared to Type 2 firms. These variables were introduced to remove selection bias.

The productivity measure used in MOU contracts is Net sales per Assets (NSA). Neither MOU nor disinvestment has any effect on NSA (See Table Appendix A2 a,b,c). The MOU system looks at this variable as a measure of total productivity. There is a positive effect of MOU preparation on NSA one year prior to signing the MOU contract, but no positive effect of the MOU itself. Similarly there is no positive effect of disinvestment or private equity share.

5. Conclusions

In this paper the focus is on policy variables and factors affecting the efficiency and productivity of India's PSUs using various measures of value added. In an earlier paper in which the focus was on financial rates of return both performance contracts and disinvestment were seen to be important policy variables. In this paper, value added per employee is used as a measure of labour productivity and value added per capital and value added per asset to measure productive use of capital and assets. The model used ensures correction for self-selection. The results show that MOU – performance contracts - have no positive and sometimes negative effect on performance. On the other hand, disinvestment measured by a privatization dummy in the year of disinvestment and the share of private equity has a very positive effect on these productivity measures.

The results provide very clear support for disinvestment as opposed to performance contracts to improve the performance of PSU's. The paper shows that a bolder roadmap for gradually getting the government out of the business of business, must be prepared with a hard look at the real economic benefits from some of the profit-making state-owned firms as well. The question to be asked is, are these firms locking up scarce capital to provide employment for a few, or can they become strategic world-class companies? The recent decision to sell Air India is one such bold decision. The argument that Air India is profitable and is only in trouble because of past debt is not relevant, as the issue is not profitability but efficient and productive use of assets.

Such a bold approach to transferring state-owned assets with generally low return towards public social infrastructure is a win-win idea. Especially because the private sector will improve efficiency. The second gain is it will unlock funds for building badly-needed social infrastructure—roads, power transmission lines, sewage systems, irrigation systems, railways and urban infrastructure. This will also help draw in private investment, including FDI.

If the Modi government wants to leave behind a lasting transformation of the economy, getting the government out of business and laying a foundation for rapid growth by accelerating India's infrastructure plans is the way forward. Develop a 10-year plan to divest at least 50% of PSU assets, shift the proceeds into the strategic investment fund and reap the rewards. The business of the government is public infrastructure, not public companies. Transforming public assets into public infrastructure would be a lasting reform.

Appendix 1

Table A1 a: Regression of Profit per employee PBITE: MOU Effect 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0488213***	-0.0485195***	-0.060269***	-0.060332***	-0.053716***	0.0536021***
mou_prep0		-0.0018876		-0.0016777		-0.0015103
mou_prep1		0.0017496		0.0020064		0.0012175
mou_prep2		0.0027785		0.0029805		0.0022573
mou_prep3		0.0019449		0.0020692		0.0024198
MOU	0.0020685	0.0021915	0.0021684	0.0023449	0.0038599	0.0040085
SOFTLN	0.0037054	0.0035981	0.0046868*	0.0045688*	0.0065742***	0.0064477**
LASSET	0.0290198***	0.0291105***	0.0301024***	0.0302269***	0.0283847***	0.0284338***
EXINT	-0.0000463	-0.0000462	-0.0000483	-0.0000483	-0.0004285	-0.0004249
DEPINT	-0.0001699	-0.000166	-0.0016752	-0.0016725	-0.0010799	-0.0010759
GRGDP constant price	0.0008697***	0.0008311***	0.0008885***	0.0008471***	0.000489	0.0004506
α2	-0.0087311	-0.0089852	NA	NA	NA	NA
α3	-0.0100185	-0.010297	-0.0000757	-0.0001321	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3621	0.3627	0.3608	0.3616	0.3371	0.338
No. of Observations	2494	2494	2382	2382	2109	2109

Table A1 b: regression of Profit per employee PBITE: Disinvestment Effect 1990-2015

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0497016***	-0.0470262***	-0.0622348***	-0.0586421***	-0.1271457*	-0.1277131**
ppvt_dummy	0.0206093***	0.0512653***	0.0203473***	0.0509132***	0.0180066***	0.0517278***
ppvt_prep1		0.0434136***		0.0432095***		0.0443699***
ppvt_prep2		0.0510933***		0.0509710***		0.0487238***
ppvt_prep3		0.0333249***		0.0332905***		0.0323411***
mou_prep0	0.0006567	-0.0000306	0.0008313	0.0001477	0.0140215	0.0108168
mou_prep1	0.0048063	0.0040275	0.0050173	0.0042396	0.0272919***	0.0234467**
mou_prep2	0.0047994	0.0045454	0.0049954	0.0047394	0.0281892***	0.0279871*
mou_prep3	0.0030479	0.0040416	0.003194	0.0041868	0.0140978	0.0258256
MOU	0.0036285	0.0036215	0.0037736	0.0037682	0.0078785	0.0071773
SOFTLN	0.0049558*	0.0050446**	0.0059384**	0.0060124**	-0.0049785	-0.0037427
LASSET	0.0307119***	0.0292217***	0.0318142***	0.0303227***	0.0492228***	0.0397577***
EXINT	0.0000491	0.0000560	0.0000458	0.0000525	0.0166279**	0.006494
DEPINT	-0.0000659	-0.0000266	-0.0003951	-0.0002911	0.0004501	0.0004471
GRGDP constant price	0.0006029**	0.0005651*	0.0006011*	0.0005631*	0.0009677	0.0008842
α2	-0.0097938	-0.0088792	NA	NA	NA	NA
α3	-0.0275913*	-0.0517851***	-0.0162853*	-0.0412804***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3655	0.3574	0.363	0.3551	0.4114	0.41
No. of Observations	3003	3003	2891	2891	823	823

Table A1 c: Regression of Profit per employee PBITE: Disinv. Equity Effect 1990-2015

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.049563***	-0.0492968***	-0.0624953***	-0.0622938***	-0.1305658*	-0.1273478**
ppvt_shr	0.0345123***	0.0476687***	0.0339446***	0.0474441***	0.0227529	0.0506688**
ppvt_prep1		0.0089619		0.0090177		0.0136691*
ppvt_prep2		0.0177808***		0.0179079***		0.0204358***
ppvt_prep3		0.0081723		0.0083184		0.0093219
mou_prep0	-0.0013456	-0.0022239	-0.00115402	-0.0020252	0.0074353	0.0017507
mou_prep1	0.0026575	0.0017462	0.0028889	0.0019819	0.0192736**	0.0123238
mou_prep2	0.0033161	0.0026081	0.0035237	0.0028163	0.0190569	0.0114386
mou_prep3	0.0023691	0.0024551	0.0025175	0.0026118	0.0080175	0.0082289
MOU	0.0020758	0.0017847	0.0022333	0.0019502	0.0038822	0.0017587
SOFTLN	0.0043464*	0.0041072	0.0052551*	0.0050169*	-0.0068813	-0.0071334
LASSET	0.0308255***	0.0306409***	0.0318903***	0.0317399***	0.0531725***	0.0501637***
EXINT	0.0000394	0.0000369	0.0000361	0.0000335	0.0188503**	0.0162859**
DEPINT	-0.0000385	-0.0000065	-0.0003306	-0.0002512	0.0005718	0.0006135
GRGDP constant price	0.0005932**	0.0005924**	0.0005922*	0.0005907*	0.0008915	0.0008201
α2	-0.0102749	-0.010264	NA	NA	NA	NA
α3	-0.0158821	-0.0178554	-0.0041424	-0.0061393	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3738	0.3755	0.3707	0.3722	0.411	0.4143
No. of Observations	2996	2996	2885	2885	823	823

Table A2 a: Regression of Net Sales per Asset NSA : MOU Effect 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0778318	-0.0841925	0.2414035***	0.2238071***	0.2325462**	0.2179235**
mou_prep0		0.0342454		0.031213		0.0253188
mou_prep1		0.0693915**		0.0627434**		0.0760236**
mou_prep2		0.0596431		0.0525321		0.0517689
mou_prep3		-0.0331437		-0.0413912		-0.0412098
MOU	0.037619	0.0469386	0.0376819	0.0459432	0.0454429	0.0524885
SOFTLN	-0.0265396***	-0.027519***	-0.0315772***	-0.032442***	-0.0314789***	-0.032047***
LASSET	0.0493997***	0.0558878***	0.039915**	0.0459765***	0.042642**	0.047849**
EXINT	0.0049475***	0.0049194***	0.0048362***	0.0048142***	0.0048509***	0.0048269***
DEPINT	-0.5857075***	-0.5929298***	-0.4015608***	-0.4118654***	-0.4339293***	-0.4466922***
GRGDP constant price	-0.0090304***	-0.0094283***	-0.0067662**	-0.0070905**	-0.0078074**	-0.0081759**
α2	0.3166829***	0.3039589***	NA	NA	NA	NA
α3	0.3744554***	0.3513739***	0.0813052	0.071706	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3059	0.3083	0.2799	0.2829	0.2215	0.2242
No. of Observations	2450	2498	2394	2394	2116	2116

Table A2 b: Regression of Net Sales per Asset NSA: Disinvestment Effect 1990-2015

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0477931	-0.0493768	0.2813197***	0.2802666***	0.5961918***	0.6070038***
ppvt_dummy	-0.0182894	-0.0383937	-0.0174319	-0.0344395	-0.0102624	-0.0198939
ppvt_prep1		-0.0113147		-0.0058318		0.0099794
ppvt_prep2		-0.0549655		-0.0507538		-0.0523477
ppvt_prep3		-0.0183175		-0.0140665		0.0056306
mou_prep0	0.0229926	0.0238935	0.0230186	0.0238446	0.0140096	0.0194082
mou_prep1	0.0559019*	0.0567871*	0.0531871*	0.0539571*	-0.0466966	-0.0434762
mou_prep2	0.0526152	0.0536557	0.0485705	0.0495913	0.0591827	0.0746881
mou_prep3	-0.0328668	-0.0335931	-0.0374276	-0.0380686	0.1082868	0.103318
MOU	0.0342919	0.0336942	0.0348416	0.0341338	-0.0320472	-0.0369400
SOFTLN	-0.0283794***	-0.0284721***	-0.0334877***	-0.0335483***	-0.0207928	-0.0209323
LASSET	0.0331947**	0.033768**	0.0232361	0.0235491	-0.0126074	-0.0151043
EXINT	0.0049073***	0.004907***	0.0048535***	0.0048535***	0.1484919***	0.1523373***
DEPINT	-0.5117946***	-0.5130727***	-0.4189519***	-0.4204516***	-0.3967591***	-0.3995624***
GRGDP constant price	-0.009095***	-0.0090133***	-0.007287***	-0.0072048***	-0.007168*	-0.0067555*
α2	0.3192122***	0.3189849***	NA	NA	NA	NA
α3	0.3870582***	0.4042451***	0.085259	0.1001182	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3388	0.3386	0.3145	0.3142	0.6285	0.6264
No. of Observations	3018	3018	2914	2914	847	847

Table A2 c: Regression of Net Sales per Asset NSA: Disinv. Equity Effect 1990-2015

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0494298	-0.0492358	0.2810973***	0.28186***	0.5846825***	0.5788744***
ppvt_shr	-0.0829410	-0.0966819	-0.0911922	-0.1051321	-0.1036763	-0.1317875
ppvt_prep1		0.0061338		0.0075405		0.0099332
ppvt_prep2		-0.0384613		-0.0382242		-0.0534861
ppvt_prep3		-0.0048905		-0.0035353		0.007167
mou_prep0	0.0225896	0.0240135	0.0223372	0.0236662	0.0115092	0.0225526
mou_prep1	0.0610004**	0.0624161**	0.0579958**	0.0592973**	-0.0462331	-0.035749
mou_prep2	0.0536756	0.0553087	0.0495781	0.0511624	0.0635889	0.0877245
mou_prep3	-0.0328612	-0.0329307	-0.0374986	-0.0375944	0.1082935	0.1100395
MOU	0.0344011	0.0341379	0.0346215	0.0342274	-0.0354112	-0.0368660
SOFTLN	-0.0283597***	-0.0284094***	-0.0334673***	-0.0334948***	-0.0196423	-0.0216681
LASSET	0.0332173**	0.0329428**	0.02359	0.0232057	-0.0083524	-0.0057743
EXINT	0.0049068***	0.0049068***	0.0048527***	0.004853***	0.1454276***	0.1502838***
DEPINT	-0.512355***	-0.5134093***	-0.4197038***	-0.4210379***	-0.3988728***	-0.400285***
GRGDP constant price	-0.0090885***	-0.0090393***	-0.0072606***	-0.0072045***	-0.0070323*	-0.0066868*
α2	0.3214638***	0.321662***	NA	NA	NA	NA
α3	0.3811892***	0.3841711***	0.0777127	0.0804364	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.3371	0.3367	0.3125	0.312	0.6277	0.6283
No. of Observations	3013	3013	2909	2909	847	847

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