International Journal of Public Sector Management

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Public Sector Undertakings: Bharat's other Ratnas

Abstract

Purpose: While national public policies such as performance contracts and disinvestment affect the dynamics of large- and medium-scale state-owned enterprises in emerging market economies, the purpose of this paper is to analyze the performance of India's public sector undertakings (PSUs) and suggest options to improve their outcomes.

Design/methodology/approach: Using firm level data on India's 235 PSUs with total assets of around $500 billion over the past two and half decades 1990-2015, the study empirically tests the effect of performance contracts, measured by memorandum of understanding (MOU) and disinvestment, measured by private equity share, on PSUs performance indicator such as return on capital (ROC). Data were collected from the Public Enterprises Survey Reports released by the Department of Public Enterprises under India's Ministry of Heavy Industries and Public Enterprises, Department of Disinvestment, BSE, and Capitaline database. By controlling firm, industry and macro level factors in regression models, the results were presented in several aspects like service sector, non-service sector, and individual and joint effects.

Findings: Empirical estimations indicate that performance contracts such as MOUs have had a positive impact on PSU performance by increasing their ROC by 8-9 per cent. This result holds more strongly 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) has a significant impact on performance, making them ideal candidates for more aggressive disinvestment. Larger PSUs (Maharatna's) appear to perform better than smaller PSUs and even better than private firms of similar size. Smaller PSUs (Navratna's and Miniratna's) perform worse than private companies and should be good candidates for strategic disinvestment (privatization). PSUs that do not have Ratna status – and are loss makers should be disposed of their asset value.

Practical implications: The study recommends that India should change the public sector balance sheet by raising capital through strategic disinvestment (privatization), disinvestment and liquidation of PSUs and re-investing it, in public infrastructure through the National Infrastructure Investment Fund and not into the budget as a revenue raising measure. It should also transform Maharatna's into world class companies with greater commercialization.

Originality/value: The paper makes significant contributions to academic literature on the changing dynamics of state-owned enterprises in emerging economies by examining the effect of performance contracts and disinvestment on India's PSUs performance. It is one of unique longitudinal-empirical studies on India's PSUs performance in several dimensions.

Keywords: Public Sector Undertakings, State-owned Enterprises, MOU, Performance Contracts, Disinvestment, Privatization, Financial performance, India, Emerging Economies

Paper type: Research paper

1. India's Public Sector Undertakings (PSUs): How Did We Get Here?

India took a sharp turn towards socialism with the Industrial Policy Resolution of 1956. Many new public sector companies were established and a large number of companies in sectors such as coal, airlines, banking and insurance were nationalized. Industrial licensing was introduced mimicking the Soviet Union – prescribing what the private sector could produce. The license-raj combined with inefficient public enterprises nurtured inefficiency and corruption. During this period, public sector investment exceeded 50 per cent of total investment.

As a result, India's GDP growth remained low averaging only 3.5 per cent between 1950 and 1980, in the first three-decades after independence with per capita GDP growing at only 1.3 per cent on average. It was famously called the "Hindu growth rate". India's poverty rose during this period and India fell behind many countries on social and economic indicators. Some internal liberalization was pursued in the 1980's, but it was insufficient to address the growing problems in the economy. It eventually took a balance of payments crisis in 1991 to force the political establishment to accept the need for reform.

India introduced a new industrial policy in the 1990s that emphasized delicensing, greater independence for profitable PSUs, and restructuring of loss-making firms through the Bureau of Industrial Financing and Restructuring (BIFR). Other elements of the liberalization involved: i) Free entry to private sector firms in industries reserved exclusively for PSUs; ii) Disinvestment of a small part of the government's shareholding (while still holding majority stocks) and listing PSUs on the stock exchanges.

Bhagwati and Srinivasan (1993) were among the few that recommended outright privatization. But between 1992 and 1998, privatization was not pursued aggressively. One PSU was sold to another PSU but this was more like consolidation rather than outright privatization. The BIFR was created to track performance of the PSUs and advise them - especially the sick ones - on investment and restructuring. Three categories of PSUs were formed and named; Maharatna's, Navratna's, and Miniratna's, and performance contracts (memorandum of understanding, MOU) were signed with government and several of them to create incentives for better performance (Figure 1).

The NDA government followed an aggressive privatization policy but faced political and bureaucratic hurdles. 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. But there was considerable criticism of how this disinvestment was carried out (e.g. Arun and Nixson, 2000).

[Insert Figure 1 about here]

[Insert Figure 2 about here]

The UPA 1 government which came to power in 2004, did not try to privatize PSUs – although, a few were shut down. UPA 2 brought back share sales (disinvestment) with the intent to raise revenue, and the share of private equity in total equity in all PSUs combined jumped from around 4 per cent in 2008-09 to over 9 per cent by 2013-14 (Figure 2). Over one third of the PSUs had some private equity in them. The UPA government also encouraged

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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.

Given that public policies such as performance contracts and disinvestment affect the dynamics of state-owned enterprises in emerging market economies, this unique longitudinal-empirical paper examines the performance of India's PSUs in several dimensions. Using firm level data on 235 PSUs with total assets of about $500 billion over the past two and half decades 1990-2015, the study tests the effect of performance contracts, measured by MOU and disinvestment, measured by private equity share, on PSUs performance indicator such as return on capital (ROC). Data were collected from the Public Enterprises Survey Reports and Capitaline database. The preview of our regression estimations suggest that performance contracts such as MOUs have had a positive impact on PSU performance by increasing their ROC by 8-9 per cent. This result holds more strongly 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) has a significant impact on performance, making them ideal candidates for more aggressive disinvestment. Larger PSUs (Maharatna's) appear to perform better than smaller PSUs and even better than private firms of similar size. Smaller PSUs (Navratna's and Miniratna's) perform worse than private companies and should be good candidates for strategic disinvestment (privatization). PSUs that do not have Ratna status – and are loss makers should be disposed of for their asset value. Thus, the paper makes significant contributions to the changing dynamics of state-owned enterprises in emerging economies.

The remainder of this paper proceeds as follows. Section 2 reviews the extent evidence on India's PSUs performance, MOUs and disinvestment. Section 3 describes econometric model of the factors affecting PSUs performance, such as performance contract, partial privatization and control variables. In Section 4, the regression results were presented in several dimensions. Finally, Section 5 concludes the paper with policy recommendations.

2. The Extant Evidence on PSU Performance

The following trends can be gleaned from the data available in the PSUs survey (see also, Gupta, 2013; Gunasekar and Sarkar, 2014).

Almost half the PSUs were making losses in the 1990's , but with the period of high growth from 2002-03 onwards and better MOUs (performance contracts) applied to many more of them, as well as greater private equity, the number of loss-making PSUs declined to about a quarter of the total (Figure 3). 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 PSUs, measured by profits over total sales, has also increased from an abysmal level of 2 per cent in 1990-91 to around 3 per cent by 2000-01, then peaked at almost 9 per cent between 2003-04 and 2006-07 and has since fallen to between 5-6 per cent. How much of the improved performance is due to MOUs 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

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degree of competitiveness in the industry in which the PSU is operating. Ramaswamy and Renforth (1996) in fact argue that subjecting PSUs to greater competition is a better way to improve their performance rather than privatization or performance contracts. Bruton *et al.* (2015) argue that with PSUs with both public and private equity should be considered as hybrid entities. Grossi *et al.* (2015) in a comprehensive survey examine the gaps in issues related to corporate governance and accountability of state-owned enterprises.

[Insert Figure 3 about here]

Second, the return-on-assets and return–on-capital in the largest 7 PSUs – Maharatna's is better than firms in the private sector and in FDI-based companies of similar size, though the value of assets, especially land, needs careful scrutiny. Independent audits are needed to assess their performance. Khanna (2015) argues that because PSUs perform better than private companies, they should not be privatized. But in the case of the next category of PSUs such as Navratna's, the performance of the private firms of similar size is much better, except for the better performance of the Navratna's over their private sector comparators during the period of high growth from 2003-04 to 2008-09. It is also interesting that the returns on both assets and on capital went up during the period of rapid growth and has declined quite sharply since the global economic crisis.

Third, PSUs in the service sectors, such as Air India, Mahanagar Telephone Nigam Limited (MTNL) and Bharat Sanchar Nigam Limited (BSNL), and those providing a range of other types of services both financial and non-financial have done poorly relative to those in mining and manufacturing. This is not surprising, given the lack of service orientation in service-sector PSUs. Not only is the performance of PSUs in service sectors worse but their presence could have also adversely affected the performance of private sector firms in those sectors. Mukherjee (2015) also stated that services erstwhile public monopolies, the vested interest of the government and PSUs adversely affect the performance of the service sector. This is probably truer of the airline sector than in the telecommunications sector. The presence of PSUs in the telecom sector has not had a negative effect on the industry because of a more effective regulatory environment, and also did not hindered the functioning of the private sector companies. The telecom regulator, Telecom Regulatory Authority of India (TRAI), has had its share of critiques but it has not been accused of helping PSUs against the private sector. But in aviation, the Director General of Civil Aviation (DGCA) has not worked as effectively in creating a level playing field and has favored Air-India. It has deliberately or unconsciously affected the performance of private sector airlines. But service sector private companies have also performed poorly for other reasons.

There are two strands of literature on the PSUs. One strand argues that standard firm's profitability and efficiency criterion do not apply to PSUs as the objective of having these enterprises in state hands is not private sector profitability but also other social objectives so social welfare criterion should be used to assess their performance. Trivedi (1986) argued early on that PSUs should not be evaluated on the same criterion as private enterprises but they must be evaluated. Trivedi also argued that PSUs should establish an incentive scheme such that PSU managers acting in their own perceived self-interest behave in a fashion that leads to better PSU performance based on agreed criterion. This line of thinking led to the development of MoUs (Trivedi, 1990).

But the thinking gradually changed as private investment picked up after liberalization and almost half the PSUs remained loss makers while the MOU system showed

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many of them as excellent performers. Murthy (1990) described MOUs as more memorandum and less understanding. Shirley and Xu (1998) showed the same problems existed in other countries and examined 12 performance contracts in 6 developing countries and found that all suffer from the same contracting problems. A new MOU system was introduced after careful study based on the idea that narrowly designed MOU objectives were being gamed by PSU managers. Venkatesan (2008) and Sharma (2013) showed that the redesigned MOU instrument examined business performance appraisal and at how management exploited new business opportunities and responded to threats to the organization, especially as the industry became more competitive after increased private investment. There was also greater recognition that there was a need to recognize heterogeneity in PSUs especially those in finance and service sectors *vs.* those in manufacturing and mining (NCAER, 2004).

The evidence on whether MoUs or disinvestment has a bigger impact on PSU performance is mixed, both in India and elsewhere in the world. D'souza and Megginson (1999) using data from 28 industrial countries between 1990 and 96 showed that privatization has a very positive impact on firm performance. Nagaraj (2005) assessed the performance of PSUs and raised the issue of disinvestment. Mathur and Mathur (2010) showed that the classification of the PSUs into Maharatna, Navratna and Miniratna categories as well as the introduction of PSUs had a positive effect on PSU performance. Seema *et al.* (2011) studied the performance of PSUs pre- and post-divestment over a period of more than two decades from 1986-87 to 2009-10. Using financial performance indicators measuring profitability, efficiency and productivity their findings suggest that partial disinvestment has not had any positive impact on PSU performance. They attribute this to problems faced by PSUs even after divestment such as high cost and competitive industrial structure, operational inefficiency due to high government interference, and low amounts of divestment.

In more recent studies, again the evidence is mixed. Gupta (2005, 2013) showed that disinvestment (even the sale of minority shares) had a positive effect on PSU performance, ostensibly because new owners injected greater commercial drive, which helped to improve productivity. But this result did not factor in the MOUs. Gunasekar and Sarkar (2014) showed that when PSUs with and without MOUs are considered, much of the performance improvement – earlier attributed to privatization is due to the performance effect of MOUs. 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 efficiency.

In another recent paper Jain (2016) uses technical efficiency as the performance variable, instead of financial returns. Jain 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. Jain's results are however dependent on the credibility of the method used to calculate technical efficiency.

But more work on this is needed to better understand the performance of PSUs and in the next section using new, longitudinal data from Public Enterprises Survey Reports, we look into the factors that explain PSU performance.

3. Estimation approach: Factors affecting PSU performance

As we saw in the previous section 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 may affect the performance of the PSUs. Some PSUs 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. PSUs 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. Though lately India has become more open so even PSUs 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 performance, we estimate a model on all PSUs over the period from 1990 to 2015. Data were collected from the Public Enterprises Survey Reports released by the Department of Public Enterprises under India's Ministry of Heavy Industries and Public Enterprises, Department of Disinvestment, Bombay Stock Exchange (BSE) Disinvestments database and Capitaline database.

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 performance variable, ROC or ROA, 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.

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

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.

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3.1 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

3.2 Performance contract variables:

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 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.

3.3 Partial privatization variables:

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

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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'.

[Insert Table 1 about here]

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

$$Y_{it} = \alpha_2 + \alpha_3 + \eta_I + \beta_1 MOU_{it} + \eta' P_{it} + \gamma' Z_{it} + \varepsilon_{it} \qquad (1)$$

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 MOUs 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_SHR captures its incremental effect over and above of MOU.

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

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.

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

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.

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

3. Results and Discussion

We have estimated the equations (1), (2), and (3) for the period 1990-2015. Column (i) of Table 2 shows the regression results using the sub- sample S1, S2 and S3 as described above. The effect of MOUs on the performance of the PSUs is highly significant which suggests that signing of MOUs or transferring more autonomy to them does have positive

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effect on the performance of PSUs by increasing the return on capital ROC by about 5 per cent. This is a huge effect of MOUs on the performance of the PSUs as it measures a before and after MOU effect.

Larger size PSUs measured by the size of total assets, LASSET, has significant effect on the performance of the firms, which implies that the large firms are performing better than the smaller ones by about 4 per cent points. This is possible because larger PSUs are likely to dominate the industries or sectors in which they operate. And, enterprise with higher capital intensity, proxy by DEPINT, experience low rate of return, although the coefficient is not significant.

A soft budget constraint – which we represent by the availability of soft loans -hurts the performance of PSUs by almost 4 per cent. Soft loans are a disincentive to hard commercial decisions and allow the perpetuation of waste and inefficiency and reduce returns.

[Insert Table 2 about here]

The coefficients of the dummy variable α_2 for Type 2 firms which signed an MOU are positive but insignificant – not surprising since most firms had signed MOUs by 2014-15. But the coefficient for the dummy variable α_3, which control for group effects of firms that had some privatization, is positive and highly significant. This shows that privatization has mainly occurred in firms that have higher ROC.

Column (ii) of Table 2 presents the regression results after controlling for the preparation period by the firms for signing the MOU. The preparation effect is incorporated to account for the argument that the PSUs might be preparing for the autonomy so that relinquishment of autonomy does not lead to any unexpected results. However, the coefficient of the two most immediate year dummy variables namely, mouprep0, mouprep1, is significant whereas in years further back mouprep2 and, mouprep3 are all insignificant implying that preparing for signing the MOU starts giving benefit to the PSUs only in the last two years prior to signing and improves the ROC by 4 per cent – quite a significant improvement in addition to the 5 per cent improvement that comes with MOU itself. The total MOUs effect is therefore close to 9 per cent improvement in the ROC due to the preparatory process and the signing of the MOU.

How well the economy is doing has an impact on the performance of PSUs. A 1 per cent improvement in the GDP growth rate improves the ROC by about 0.4 per cent. This is also not a surprising result as PSUs would get much better results in a fast growing economy. Export orientation, measured by export sales to total sales, does not have any significant effect on PSU performance and neither does on capital intensity measured by depreciation expense as a share of total sales.

Column (iii) and (iv) report the results using the sub- sample S2 by eliminating the type-1 firms i.e., those which were neither granted autonomy nor were subject to strategic privatization. The results remain more or less the same as there are very few firms that do not have an MOU.

In column (v) and (vi) of Table 2, we re-estimate the model by considering only Type-2 firms that is those that were subject to MOUs only: so we measure a pure MOU

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effect. The results between sample S2 and S3 are not very different at all, but the results are much stronger for the effect of MOU on firm performance. The combined effect of the MOU and the preparation benefits add up to an improvement in the ROC by 10 per cent. The results for the ROA are not very reliable as there appear to be problems with the estimation of value of assets for the PSUs and need further investigation (these results are available from the authors upon request).

When we look at the performance of service sector PSUs such as airlines, telecommunications against non-service like manufacturing and mining PSUs, we find that the ROC in service sector PSUs cannot be explained by any of the explanatory variables whereas the ROC equation for the non-service sector performs well (Tables 3 and 4). In the case of the non-service sector the MOU has a strong positive effect on the return on capital, but MOUs have no effect on performance in the case of the service sector PSUs.

Non-service sector PSUs also perform much better when the economy is doing well , but in the case of service sector PSUs the returns are unaffected by overall economic performance. For the service sector PSUs the only significant variable is soft loans and they have a negative effect on performance. These soft loans not only are a drain on the budget but also make the performance of the service sector PSUs much worse.

[Insert Table 3 about here]

[Insert Table 4 about here]

We next turn to study the effect of disinvestment on PSU performance. Table 5 presents the effects of share of private equity, and MOU on performance. In Columns (i) and (ii), we show the results for the sample S4 which includes all firms whether they had an MOU or not or whether they had any disinvestment or not. We find strong MOU effects on ROC but no privatization effect. The same result holds in sample S5 which excludes all firms which had no privatization or an MOU. In S6, we study the effect of pure privatization by taking only firms which had disinvestment. This drops the number of firms considerably as only about a third of the PSUs had any disinvestment. Now the effect of disinvestment is significant at 10 per cent level of significance when the preparatory effects are included.

[Insert Table 5 about here]

Further when we examine the service and non-service sectors separately, we find that the non-service sector PSUs show results very similar to the overall set of results. But when we examine the service sector PSUs, we find very strong effects on performance due to disinvestment for both ROA and ROC (Table 6 and Table 7). Once again for ROC the effect of privatization is significant when the sample only includes firms that had any disinvestment and excludes all firms that had no disinvestment. Surprisingly, when we look at ROA the effect of privatization is much stronger in the case of service sector firms with the effect of disinvestment improving PSU performance from 20 per cent in sample S5 to a staggering 50 per cent in sub- sample S6 in Table 7. But as we have noted earlier the results for ROA need further investigation.

But given these results we can conclude that disinvestment is the right approach for service sector firms whereas for non-service sector firms a mixed approach with a combination of disinvestment and better MOUs may be needed. These results are not

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surprising as the service sector firms like airlines (Air India) and telecommunications (MTNL) operate in industries where they face considerable competition from much more efficient private firms.

[Insert Table 6 about here]

[Insert Table 7 about here]

4. Conclusions

A bolder roadmap for gradually getting the government out of the 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?

For now India could leave the Mahartana's which hold about one third of total assets of all PSUs in state hands, but with a plan to make them world class companies. Choudhury and Khanna (2014) showed the case of public R&D laboratories how this could be done. But the remainder, especially those in the service sectors could be privatized or sold off for their assets. This could raise capital up to $250 billion over the next ten years for other uses such as investment in public infrastructure.

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 returns. 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 foreign direct investment.

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 per cent 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.

Overall, the study recommends that India should change the public sector balance sheet by raising capital through strategic disinvestment (privatization), disinvestment and liquidation of PSUs and re-investing it, in public infrastructure through the National Infrastructure Investment Fund and not into the budget as a revenue raising measure. It should also transform Maharatna's into world class companies with greater commercialization.

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Figure 1: Growth of Public Sector Undertakings and Performance Contracts, 1988-89 to 2015-16

Source: Public Enterprise Survey Reports, Department of Public Enterprises, India's Ministry of Heavy Industries and Public Enterprises
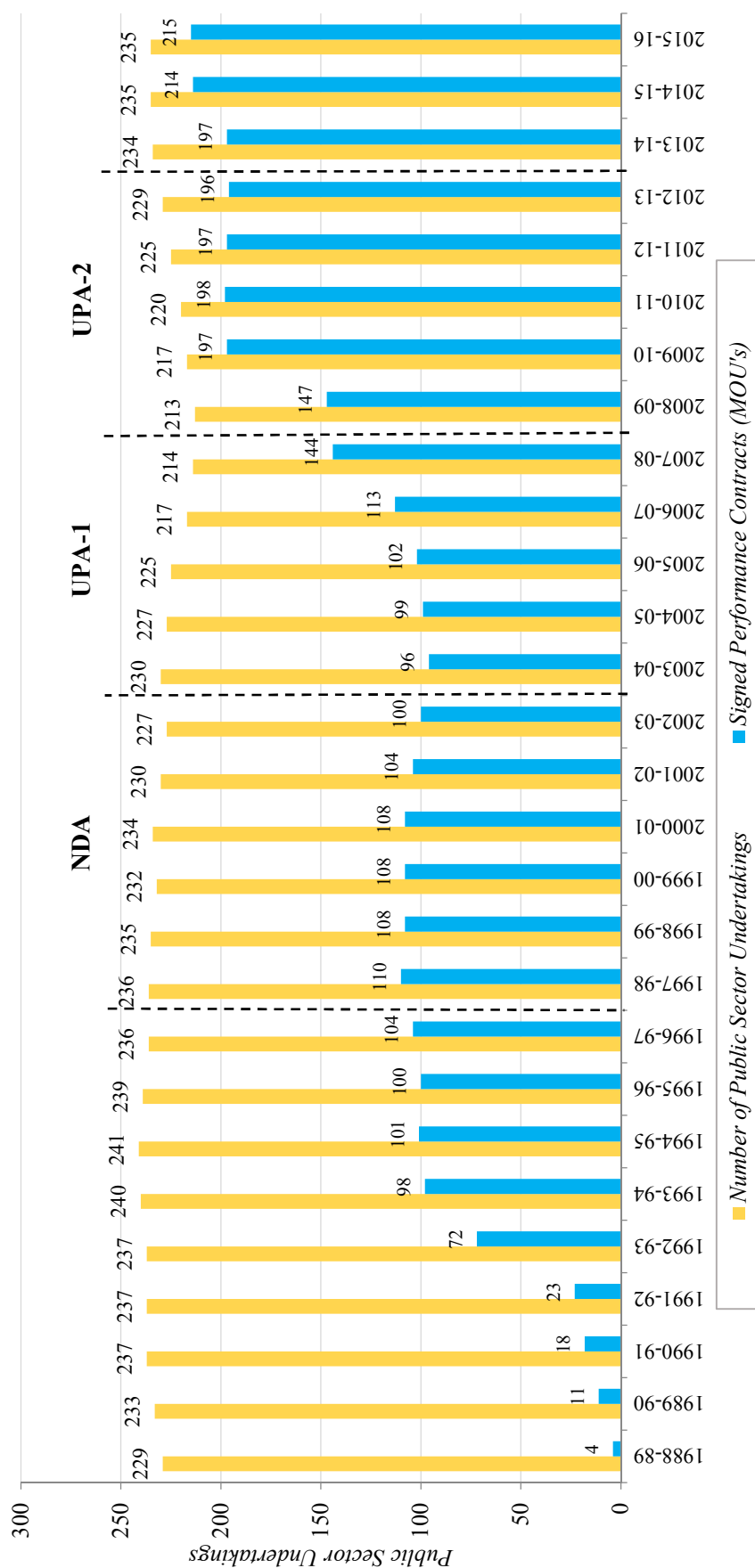
Figure 2: Progress on Disinvestment (Partial Privatization), 1989-90 to 2014-15

Source: Public Enterprise Survey Reports, Department of Public Enterprises, India's Ministry of Heavy Industries and Public Enterprises
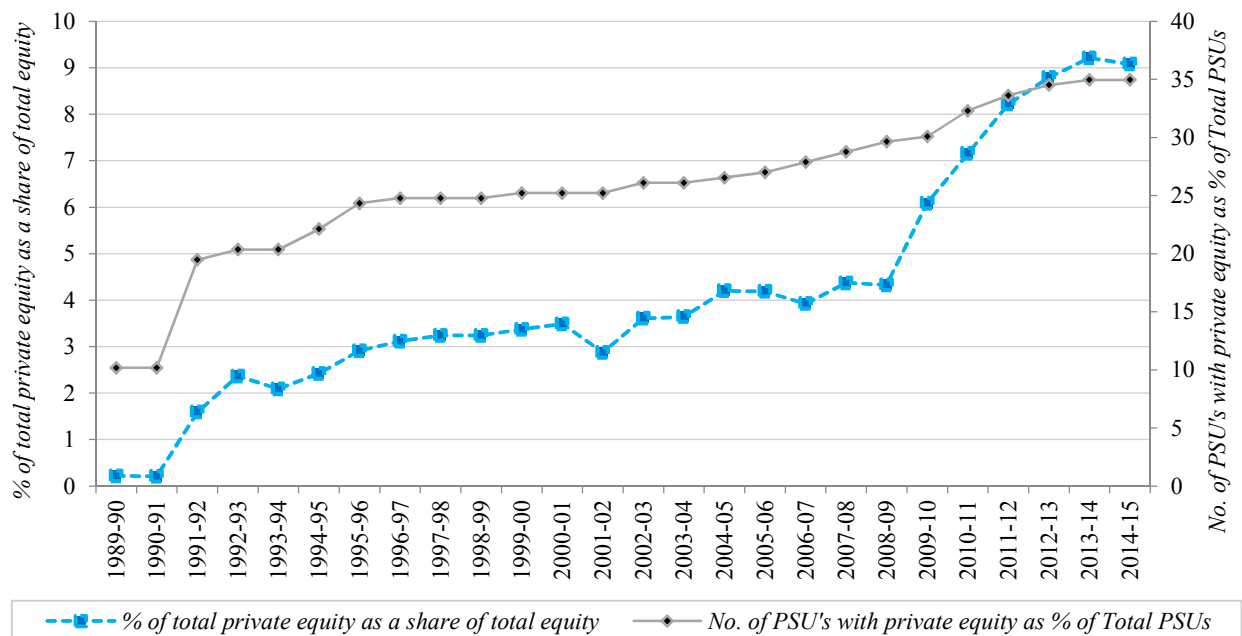
Figure 3: Cumulative Overall Performance of the PSUs, 1990-91 to 2014-15

Source: Public Enterprise Survey Reports, Department of Public Enterprises, India's Ministry of Heavy Industries and Public Enterprises

Tables

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

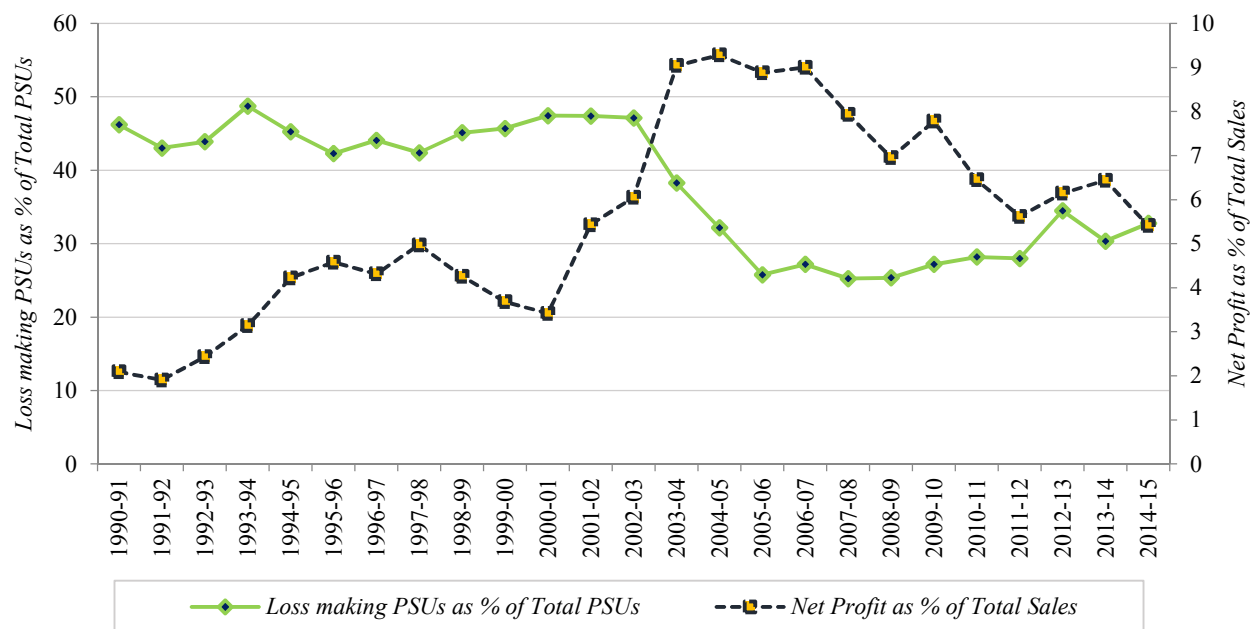|	Sample Observations					
	Type-1	**Type-2**		**Type-3**		
Sample Type	No Reform *Regime 1*	Pre-MOU *Regime 1*	Post-MOU *Regime 2*	Pre-MOU *Regime 1*	Post MOU- Pre-PPVT *Regime 2*	Post-PPVT *Regime 3*
S1	√	√	√	√	√	-
S2	-	√	√	√	√	-
S3	-	√	√	-	-	-
S4	√	√	√	√	√	√
S5	-	√	√	√	√	√
S6	-	-	-	√	√	√

Table 2: Effect of MOU on Return on Capital (ROC) 1990-2015

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.035902	-0.0375647	-0.0165545	-0.0240994	-0.0340032	-0.0417228
mou_prep0		0.0200315*		0.0206216*		0.0265776*
mou_prep1		0.0209393*		0.0207662*		0.0234335*
mou_prep2		0.0179488		0.0178684		0.0190609
mou_prep3		0.0112715		0.0102926		0.0118552
MOU	0.045753***	0.0497025***	0.0465193***	0.0504218***	0.052949***	0.0568163***
SOFTLN	-0.0365683***	-0.0372015***	-0.0367916***	-0.0374149***	-0.0431662***	-0.0437122***
LASSET	0.0356996***	0.0382999***	0.035091***	0.037628***	0.038349***	0.0407785***
EXINT	-0.0000303	-0.0000231	-0.0000172	-0.0000074	-0.0000178	-0.0000058
DEPINT	-0.0034714	-0.0035617	-0.0075681	-0.0081506	-0.0067371	-0.007479
GRGDP constant price	0.004132***	0.003959***	0.004395***	0.004222***	0.004245***	0.004032***
$\alpha 2$	0.0229949	0.0170898	NA	NA	NA	NA
$\alpha 3$	0.0651729**	0.0549526*	0.0458461**	0.0416313**	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.1374	0.1373	0.1135	0.114	0.1204	0.1208
No. of Observations	2882	2882	2710	2710	2395	2395

Source: Author's calculation using data from PES and Capitaline (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 3: Effect of MOU on ROC of Service Sector PSU's (1990-2015)

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.1004521*	0.0980306*	0.0748451**	0.0717434**	0.0695348*	0.0635097
mou_prep0		0.008827		0.0091675		0.0173026
mou_prep1		0.0099275		0.0095069		0.0170274
mou_prep2		0.0216732		0.0211769		0.0279458
mou_prep3		-0.0742332**		-0.0765026***		-0.0891445***
MOU	0.0285764	0.0293293	0.0293096	0.0299415	0.0315521	0.033463
SOFTLN	-0.0281636*	-0.0274937*	-0.0305124*	-0.0298221*	-0.0371677**	-0.0370639**
LASSET	0.0067307	0.0076379	0.0065756	0.0073881	0.0061427	0.0078107
EXINT	0.0056679	0.0058568	0.0051693	0.0053987	0.0054872	0.0058085
DEPINT	0.0034041	0.0037965	0.0150464	0.0174298	0.0171915	0.0187898
GRGDPconstant price	0.0028927	0.0031042	0.003337	0.003574*	0.0029858	0.0032514
$\alpha 2$	-0.0206635	-0.0213605	NA	NA	NA	NA
$\alpha 3$	0.0742011	0.0724308	0.0960556***	0.0950483***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.0844	0.0897	0.081	0.0879	0.0674	0.0768
No. of Observations	949	949	905	905	814	814

Source: Author's calculation using data from PES and Capitaline (1990-2015)

*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 4: Effect of MOU on ROC for Non-Service Sector PSU's (1990-2015)

Variables	Sub-Sample S1		Sub-Sample S2		Sub-Sample S3	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.1874486***	-0.1863941***	-0.1457611***	-0.1504919***	-0.1579897***	-0.1620522***
mou_prep0		0.0240735		0.0240809		0.0273503
mou_prep1		0.0250805		0.0242393		0.022206
mou_prep2		0.0106126		0.0090833		0.0102717
mou_prep3		0.0313302		0.030383		0.0323432
MOU	0.0546249***	0.0590925***	0.0542465***	0.0585098***	0.0643231***	0.0679873***
SOFTLN	-0.0372021***	-0.0381888***	-0.036688***	-0.0376138***	-0.0455559***	-0.0459626***
LASSET	0.0611967***	0.0638044***	0.0601824***	0.0627016***	0.0665738***	0.0687553***
EXINT	-0.0000179	-0.0000099	-0.0000013	0.0000082	0.0000048	0.0000156
DEPINT	-0.0034914	-0.0035362	-0.0084165	-0.0087896	-0.0078148	-0.0082427
GRGDP constant price	0.0047377***	0.0042526***	0.0048419***	0.0043517***	0.0048405***	0.0043227**
$\alpha 2$	0.0401612	0.0340245	NA	NA	NA	NA
$\alpha 3$	0.0575488	0.0455326	0.020416	0.0146295	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.1767	0.1775	0.1385	0.1398	0.1489	0.1497
No. of Observations	1933	1933	1806	1806	1582	1582

Source: Author's calculation using data from PES and Capitaline (1990-2015)
*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 5: Effect of Disinvestment (using private equity share) and MOU on ROC

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0169726	-0.0172540	-0.0054755	-0.0055544	0.2394639***	0.2536213***
ppvt_shr	0.0261482	0.0369378	0.0207063	0.0329928	0.0644991	0.1337881**
ppvt_prep1		0.0178906		0.0181734		0.0245269
ppvt_prep2		0.0130659		0.0134373		0.0156402
ppvt_prep3		0.0035883		0.0046588		0.0108017
mou_prep0	0.0242786**	0.0187279	0.0196751*	0.0188968	0.0039236	-0.0002001
mou_prep1	0.0257636**	0.0211644*	0.022257*	0.0215502*	0.0184606	0.0124779
mou_prep2	0.0243489	0.0233106	0.023868*	0.0233956	0.0135768	0.0087079
mou_prep3	0.0039159	-0.0026460	-0.0029334	-0.0027893	0.0214062	0.0236297
MOU	0.0437332***	0.0431065***	0.0442914***	0.0436812***	0.0264787	0.0245394
SOFTLN	-0.0334151***	-0.0336091***	-0.0321806***	-0.0323951***	0.0159830	0.0190197
LASSET	0.0329806***	0.0329456***	0.0343255***	0.0342253***	0.0118366	0.0039467
EXINT	-0.0000343	-0.0000351	-0.0000938	-0.0000949	-0.05332***	-0.0531498***
DEPINT	0.0009637	0.0010040	0.0037718	0.0038364	0.0049727**	0.004691**
GRGDP constant price	0.0048601***	0.0048487***	0.0050224***	0.0050089***	0.0072091***	0.006949***
$\alpha 2$	0.0179514	0.0180990	NA	NA	NA	NA
$\alpha 3$	0.0303157	0.0283588	0.0174496	0.0152727	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.1436	0.1452	0.1212	0.1232	0.2073	0.2228
No. of Observations	3175	3175	3020	3020	863	863

Source: Author's calculation using data from PES and Capitaline (1990-2015)

*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 6: Effect of Disinvestment (using private equity share) on ROC of Service Sector PSU's

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	0.0862764	0.0864719	0.060555*	0.0617577*	0.4490629***	0.445011***
ppvt_shr	-0.0308279	-0.0285086	-0.0717866	-0.0686443	0.2186363***	0.2353511***
ppvt_prep1		0.003818		-0.0002416		0.0278912
ppvt_prep2		0.0055083		0.0012934		0.0140727
ppvt_prep3		-0.0195963		-0.0205251		0.001352
mou_prep0	0.0064001	0.0060997	0.0073291	0.0071169	-0.0188654	-0.0203204
mou_prep1	0.0095038	0.0097724	0.0106226	0.0108664	-0.0225286	-0.0250046
mou_prep2	0.0219638	0.0217484	0.0223359	0.0221188	-0.011672	-0.0125135
mou_prep3	-0.0441449	-0.0441577	-0.0439569*	-0.0441285*	-0.0202549	-0.0181735
MOU	0.0246745	0.0253038	0.0251373	0.0259149	-0.0041181	-0.0082643
SOFTLN	-0.0330537**	-0.0336362**	-0.0346199***	-0.0356298***	0.0748841**	0.0756981**
LASSET	0.0086351	0.00833	0.0088594	0.0082454	-0.0404871**	-0.0405747**
EXINT	0.0022070	0.0022307	0.0018457	0.001801	-0.0466756	-0.0428764
DEPINT	-0.0021638	-0.0022173	-0.0179785	-0.0178094	-1.297214***	-1.29144***
GRGDP constant price	0.0028213	0.002764	0.0031016*	0.0030506*	0.0026281	0.0023536
$\alpha 2$	-0.0215112	-0.0209804	NA	NA	NA	NA
$\alpha 3$	0.046844	0.0474736	0.0747495***	0.0751691***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.0801	0.0804	0.0714	0.0723	0.392	0.3939
No. of Observations	1056	1056	1015	1015	240	240

Source: Author's calculation using data from RES and Capitaline (1990-2015)

*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Table 7: Effect of Disinvestment (using private equity share) on ROA of Service Sector PSU's

Variables	Sub-Sample S4		Sub-Sample S5		Sub-Sample S6	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Intercept	-0.0013601	-0.0035876	0.0325809	0.0298291	0.2519487***	0.2214306***
ppvt_shr	0.1652567***	0.2086082***	0.0747121	0.117765**	0.2827628***	0.3326532***
ppvt_prep1		0.0575711**		0.0467008**		0.0739751***
ppvt_prep2		0.0403024		0.0284835		0.038503
ppvt_prep3		0.0652584*		0.0585188*		0.0881597***
mou_prep0	0.0027302	0.0026113	0.0022679	0.0024225	-0.001982	-0.0027196
mou_prep1	0.0050539	0.0037129	0.0048936	0.0037146	-0.0016307	-0.0156779
mou_prep2	0.0237409*	0.0237098*	0.023102*	0.0232732*	-0.0043784	-0.0046479
mou_prep3	0.0092741	0.0113093	0.0085732	0.0103006	-0.0112692	-0.0040925
MOU	0.0116037	0.0084416	0.0104309	0.007747	0.0087454	-0.0169857
SOFTLN	-0.0129158***	-0.0128504***	-0.0130211***	-0.0129763***	-0.0243147	-0.0215911
LASSET	-0.0015123	-0.0007537	-0.0013589	-0.0008332	-0.0355164***	-0.0342484***
EXINT	-0.0022628	-0.0020340	-0.0016043	-0.0014419	-0.0368316*	-0.0264678
DEPINT	-0.0213771***	-0.0207128***	-0.0266167	-0.0261883	-0.9088692***	-0.8793109***
GRGDPconstant price	0.0019781	0.0020504	0.002099*	0.0021579*	0.0039788	0.0041544
α2	0.0344034	0.0330714	NA	NA	NA	NA
α3	0.1106488***	0.0986642***	0.077307***	0.068165***	NA	NA
industry effects	Included	Included	Included	Included	Included	Included
Adj. R- sqr	0.2049	0.2128	0.1545	0.1657	0.4665	0.5058
No. of Observations	1048	1048	1009	1009	232	232

Source: Author's calculation using data from PES and Capitaline (1990-2015)

*Significance at 10% level **Significance at 5% level *** Significance at 1% level

Public Sector Undertakings: Bharat's other Ratnas

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