



International Journal of Applied Business and Economic Research

ISSN : 0972-7302

available at <http://www.serialsjournals.com>

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Volume 15 • Special Issue • 2017

Impact of Self Obligation on the Performance of Public Sector Enterprises in India: A Comparative Study of Manufacturing and Service Enterprises

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ABSTRACT

This paper has two objectives; first, to assess the impact of Self obligations/ Memorandum of Understanding (MoU) on the performance of central public sector enterprises (PSEs) over the time span of seventeen years (*i.e.* 1993-94 to 2010-11); second to compare the financial performance of these PSEs at industry level, by bifurcating them into manufacturing and service MoU PSEs. The financial performance has been assessed on the basis of 15 ratios related to profitability, efficiency, liquidity and solvency. The findings suggest that the MoU has played a decisive role in improving the performance of manufacturing and service PSEs. After signing MoU, their commercial profitability and operational efficiency have shown significant improvement.

Keywords: Financial performance; profitability; efficiency; liquidity; public enterprises; liquidity; MoU.

1. INTRODUCTION

Central public sector enterprises (PSEs), reckoned as the engines of India, were formed with the intention to bring socio-economic development, to enhance industrial as well as infrastructure base and to boost the economy in a planned manner. However, during later half of 1980's the Indian economy had been facing severe pressure of financial crunch due to high debt, unbridled expenditures and unquantified socio-economic obligations. Therefore, an inevitable need of an instrument/process had been realized to quantify the obligations, to enhance accountability for PSEs managers and gradually to help them in overcoming from that precarious situation.

Memorandum of Understanding (MoU) or Self obligations (recommended by Arjun Sengupta Committee, introduced in 1988) had been introduced to quantify not only the socio-economic responsibilities but also to describe the mutual obligations and responsibilities between government (represented by administrative ministry) and the public enterprise. MoU measures the total performance of the PSEs by taking into account the complexity of fusing social and financial objectives into measurable parameters (Sengupta 2002). Above all, public enterprises should be judged by their total performance (public enterprises survey 2011-12). Though, the efficacy of the MoU in improving performance depends upon how well it has removed the internal and external constraints that has affected the functioning of the public enterprises (Sengupta, 2002 and Public Enterprises Survey, 1997-98).

The objective of this paper is to measure the impact of the MoU on the performance of manufacturing and service PSEs over a period of time. For better exposition, the subject matter of the paper has been divided into six sections (including the present one). Section two outlines in brief *modus-operandi* of using MoU system for performance evaluation. Section three is related to the review of literature. The scope, data source and methodology of the study have been described in section four. Financial performance of manufacturing and service PSEs has been discussed under section five. Finally, section six enumerates the summary of results and main findings.

1.1. MoU in India

The objective of this section is to briefly present the concept of the MoU, its features and its *modus operandi* in MoU organizations. It is expected that the signing of MoU would improve the performance of PSEs and also help the government in monitoring their performance. The subject matter of this section has largely been drawn from Arjun Sengupta Committee Report and Public Enterprise Surveys. Initially only 4 PSEs signed the MoU, with the time it has steadily increased to 100 by 1994-95, then to 144 in 2007-08 and further rose to 214 in the year 2014-15.

MoU is a negotiated document between the government, acting as the owner of public sector enterprise (PSE) and a specific PSE. It documents the intentions, obligations and mutual responsibilities of both the parties. In operational terms, it serves as an instrument of evaluating the performance of PSE (signing the MoU). Since the management has provided a written undertaking of its obligations (say, in terms of number of units to be produced or the amount of profit to be earned etc.), it makes the management of the PSE result-oriented, as it increases autonomy as well as commensurate accountability of the board of PSEs.

1.2. Structure of memorandum of understanding (MoU)

The MoU, a management system, consists of three sub-systems, namely, performance information system, performance evaluation system and performance incentive system.

1.3. Performance Information system

It provides sources of information which assists in designing the performance evaluation system. The major sources are the original objectives at the project formulation stage, comparison with similar other firms in the PSEs and the private sector, standards achieved by the similar undertakings of the other selected developed and developing countries, compared with the performance of the same firm in the previous years and professional judgment of third parties at the ministry level and at the enterprise level.

1.4. Performance Evaluation

Performance evaluation in MoU involves five steps. First three steps, namely, criterion selection, criterion weight selection and criterion value selection are taken at the beginning of the year and the last two steps (of evaluation and reward of performance) are taken at the end of the year.

1. **Criterion selection:** Only those criteria should be included in the MoU which are “fair” to the manager, as well as “fair” to the country and have been negotiated freely. Fairness to manager implies that it should measure only those aspects of managerial performance which are under manager’s control. Thus, performance criteria must be selected carefully, not arbitrarily. These should be based on the enterprise’s corporate plan that looks at three to five years in the future. They must also be consistent with the plan and budgetary goals of the government. MoU is an instrument that measures the performance of the manager and not that of the enterprise. While selecting performance criteria, this must be kept in mind and only those parameters that judge managerial performance should be selected.
2. **Criteria weight selection:** The weightage score for each parameter in the MoU is worked out by taking into account the actual achievements and relative weight assigned to that parameter.
3. **Criteria value selection:** It distinguishes between “criteria” and a criteria value. It is a value, which distinguishes at various levels of performance. In MoU, there is a 5-point scale, where “1” represents “excellent” performance and “5” represents “poor” performance. In simple words, one value or one measure cannot be applied to all the PSEs uniformly. They are to be different for different PSEs. It is suggested that value/ targets should be carried out through a participative process, well defined and not ambiguous.
4. **Performance assessment:** It is based on the composite score that would lie between 1 and 5. If the management has done excellent on all parameters mentioned in the MoU, it gets a score of 1. In contrast, if it has totally failed to meet the targets, its score is 5; a score between 1 and 4 represents excellent to fair performance and 5 poor performances. This composite score enables to evaluate the performance of the management of their own commitments, facilitates in measuring ability to meet their own commitments and to compare and rank various central PSEs even though the commitments of these PSEs are different.

This final step in the performance evaluation exercise cannot be a mechanical procedure. For reasons beyond the control of PSEs and its managers, everything in business may not materialize according to plans, there is need to have a mechanism to deal with such exigencies in a credible system. The MoU system does provide an opportunity to adjust the criterion values (at the review meeting at the end of the year) for factors which were genuinely unanticipated by both parties to the MoU, such as natural disasters, wars etc.

5. **Performance reward:** It provides a set up to measure the degree of achievement of the objectives; evaluation of itself does not lead to improvement in performance. Unless performance evaluation is coupled with a system of rewards and penalties (for good and bad performance) and utilized as a means for that purpose. A transparent system of rewards and punishment is thus a corollary to the introduction of an objective performance evaluation system of the PSEs. Thus, a performance reward scheme constitutes an essential component of the MoU system.

1.5. Performance Incentive System

1. **Basic Targets:** Basic target will be placed in 'Good column' in respect of PSEs which are in growth phase and are operating below 100% capacity utilization. For PSEs which are performing near or above 100% capacity utilization and are fully operative, the basic target will be placed in "Very Good" column. No provisional or conditional target fixation is permissible. Hence, all performance targets are unconditional.
2. **Awards under the MoU system:** Performance evaluation under the MoU system is followed by 'performance incentive'. The incentive system assumes two forms, namely, monetary and non-monetary. MoU scores have implications for monetary incentive as performance related payments are based on them. The non-monetary incentive is in the form of MoU Excellence Award and MoU Excellence Certificate.
3. **Old System of Excellence Awards (upto 2005-06):** Under the old system, the top 10 excellent performing central PSEs were awarded with 'MoU Excellence Certificates and Trophy' and other excellent performing PSEs were awarded with 'Merit Certificates'. The top ten central PSEs were ranked on the basis of their MoU composite score, irrespective of which sector/syndicate they belonged to.
4. **System of Excellence Awards (after 2005-06):** The High Power Committee (HPC) on MoU during its meeting held on 15th December, 2006 decided to constitute a Committee under the Chairmanship of Shri N. K. Sinha to review the than system of MoU Excellence Awards to central PSEs. The HPC considered the Sinha Committee report in July, 2007 and decided that the total number of Excellence Awards will be 12, that is, one from each of 10 Syndicates, one from the listed central PSEs, and one from amongst the turnaround sick and loss-making enterprises. All other excellent performing central PSEs will get merit certificates. The three basic principles for selection of central PSEs for MoU Excellence Awards as laid down by HPC in its meeting dated 10th March, 1995 will continue. Compliance of corporate governance should also be included as one of the criteria for consideration of the awards in all the 3 categories from 2007-08 onwards.
5. **New Incentives System under MoU (from 2008-09):** The incentives under the present system take two forms, namely 'monetary' and 'non-monetary' incentives. As per the Jagannath Rao Committee's (Second Pay Revision Committee) recommendations (for the executives of Central PSEs) in Nov.2008, the variable Performance Related Pay (PRP) would be payable in the case of profit-making central PSEs (PSEs) at 100 % eligibility levels, if the PSE achieves the MoU rating as "Excellent". If the PSE's MoU is rated as "Very Good", the eligibility of PRP would be 80% of the basic pay. In respect of "Good" and "Fair" ratings, the eligibility levels would be 60% and 40% respectively. However, there will be no PRP irrespective of the profitability of PSE, in case it is rated as "Poor". Moreover, 60% of the PRP will be given with the ceiling of 3% of Profit Before tax (PBT) and 40 % of the PRP will come from 10% of incremental profit. Further, the PRP has been linked to the performance of the individual executives, which will be based on a robust and transparent Performance Management System (Public Enterprises Survey 2008-09). The signing of MoU by the central PSEs with their parent Ministries/Departments/

Holding Companies has been made mandatory for making them eligible for PRP variable pay; the MoU rating also forms the basis of PRP with all key results identified in MoU (as per report/ (s) on MoU Model, 2010).

1.6. Institutional arrangements for implementing MoU policy

The reasons for having institutional arrangements in this regard is to ensure commitment from the higher levels of the government, to enable third party evaluation, to ensure Task Force (TF) professionalism, binding recommendations and to ensure fairness and equality in the process of negotiation of MoUs. The institutional arrangement consists of the High Power Committee, Task Force and MoU Division.

1.7. High Power Committee (HPC)

The apex of this institutional arrangement is the High Power Committee (HPC); it consists of Cabinet Secretary (Chairman), Chairman, Tariff Commission, and several members, such as Finance Secretary, Secretary (Expenditure), Secretary (Planning Commission), Secretary (Statistics and Program Implementation), Chairman (Public Enterprises Selection Board), Chief Economic Adviser and Secretary (Public Enterprises).

The functions of this Committee include assessing the performance of MoU signing enterprises with reference to the commitments made in the MoU. It also assesses how far the administrative ministries have been able to provide the necessary administrative and financial support committed by them in the MoU. It oversees the functioning of the MoU system, provides guidelines and gives directions to strengthen and improve the system besides taking general decisions on broader issues pertaining to the improvement of the performance of public enterprises. The power to approve the final MoUs has been delegated to the task force (TF) and only in those cases where TF is not able to take a decision, it is referred to HPC.

1.8. Task Force (TF)

Task Force on MoU is a neutral and independent body of experts that assists the High Power Committee on MoU and Department of Public Enterprises. The main objective behind the creation of a TF was to take care of the imbalances in technical expertise available between the government and PSEs. The main functions of the TF are: (a) to examine the design of MoU at the beginning of the year and (b) to carry out the evaluation procedure at the end of the year. It is the primary responsibility of the Task Force to do evaluation and determine the composite score for each enterprise on the basis of actual achievements *vis-à-vis* the MoU targets.

This Task Force consists of management professionals and independent members with considerable experience in managing business enterprises. In order to lend greater technical and professional expertise as well as diverse and rich experience to Task Force on MoU for the year 2011-12, PSEs were categorized into 11 new syndicate groups including syndicate groups “Sick and Loss-Making CPSEs” and “Section 25¹ central PSEs”. Each syndicate normally consists of 6 members, comprising 1 Convenor (Senior most among the members), 1 Administrative member (retired secretary to GOI), 1 Finance/ CA expert, 1 Ex-CMD of any CPSE, 1 renowned academician, and 1 domain expert. There were 66 Task Force members and one Chairman for the year 2011-12. Similarly, in 2015-16 the Task Force was divided into 12 Syndicate Groups covering different sectors.

1 PSEs under section 25 are engaged in promotion of commerce, art, science, charity and useful purposes as prescribed under Section 25 of the Companies Act (Public Enterprises Survey, 2001-02, Vol 2, pp.304.

1.9. MoU Division

The HPC and TF are assisted by the MoU Division in the Department of Public Enterprises. It acts as a permanent secretariat to them. The main functions of this Division include re-constituting Task Force each year and providing logistical support, to shortlist PSEs for signing MoU, to prepare MoU guidelines, to act as a buffer between the Task Force members and the two signatories to the MoUs (*i.e.*, PSEs and Administrative Ministries), to develop information and data base on MoU signing PSEs, to prepare the agenda and background papers for the High Power Committee, to monitor the progress of MoUs, to provide advice and counsel to the MoU signatories on methodological and conceptual aspects of the MoU policy and to coordinate research and training on various aspects of MoU policy.

1.10. Working of MoU System

The process of signing of MoU is initiated by the MoU Division along with guidelines for its drafting. These guidelines indicate the broad structure and the aspects to be covered in the draft MoU including the weights to be accorded to the financial parameters. These guidelines reflect the concerns of the government and provide the general direction to the PSEs.

1.11. Drafting of MoUs

Based on guidelines, the draft of MoU is prepared by PSEs after due discussions in Board and the concerned Administrative Ministry/Department in the month of December and submitted to the Department of Public Enterprises (DPE). The MoU's draft received by DPE is examined in MoU Division in consultation with members of Task Force. If required, additional information is sought from PSEs/Ministries to ensure that the targets proposed in the draft MoUs are realistic and challenging.

1.12. MoUs negotiation Meetings

MoUs negotiation meetings are held in the month of February/March. Before the meetings, background papers are prepared by MoU Division on the MoU draft of each PSE. These meetings are attended by TF members, senior officials of administrative ministry, top executives of PSEs and representatives from nodal agencies of the Government of India such as Planning Commission, Ministry of Finance and Ministry of Statistics and Program Implementation. The targets under various parameters are discussed and finalized during these meetings.

1.13. Evaluation of MoU

Performance of MoU signing PSEs is evaluated with reference to their MoU targets in May/June on the basis of provisional results and in October/November on the basis of audited data. The central PSEs are required to submit performance evaluation report on the basis of audited data along with annual accounts, balance sheet etc. to the Department of Public Enterprises through their administrative ministry departments within the target dates. The performance evaluation at the end of the year indicates the extent to which the mutually agreed targets between central PSEs and administrative ministries are achieved. On the basis of their performance, the PSEs are graded as "Excellent", "Very Good", "Good", "Fair" and "Poor".

1.14. NCAER Study on MoU and Performance Evaluation

The Department of Public Enterprises assigned a study to the National Council of Applied Economic Research (NCAER) in 2003 to examine afresh the choice of criteria for performance evaluation and the allocation of weights to the different parameters (Public Enterprises Survey, 2006-07). The NCAER finally came up with following principal components for weight of parameters expressed in percentage (%) as 50% to the financial parameters and 50% to non-financial parameters (consisting of dynamic parameters 30%, enterprise-specific parameters 10% and sector-specific parameters 10%).

While the performance evaluation under the earlier system allocated 60% weight to 'financial parameters' and 40% weight to 'non-financial parameters', the NCAER recommended equal weights (50%) to both financial and non-financial parameters, similar to the 'balanced scorecard' approach of performance evaluation. The financial parameters for evaluation may be both in absolute and relative terms. The 'non-financial parameters' were further sub-divided into 'dynamic parameters', 'enterprise-specific parameters' and 'sector-specific parameters'. Whereas, the 'financial' parameters primarily relate to profit and productivity parameters, the 'dynamic' parameters refer to project implementation, investment in R & D and extent of globalization etc. Similarly, while the 'sector-specific' parameters refer to macro-economic factors like change in demand and supply, price fluctuations, variation in interest rates etc. beyond the control of the management, the 'enterprise-specific' parameters relate to the issues, such as, safety and pollution etc.

While the principal components recommended were to be the same for all central PSEs, the individual items/suggested as criteria for performance evaluation under each of these principal components were indicated to be different for different central PSEs classified as (a) social sector, (b) financial sector, (c) trading and consulting sector and (d) other than financial trading/consulting and social sector. Besides, the new approach allowed discretion to the Task Force to change the weights of the different criteria included under dynamic, enterprise-specific and sector-specific parameters depending on their perception of the PSEs under consideration. The recommendations of the NCAER were subsequently accepted by the Government and the new methodology for setting up performance targets came into force with effect from the financial year 2004-05.

As per DPE's guidelines issued for drafting MoUs to be signed between Central PSEs and administrative Ministries for the year 2010-11, Corporate Social Responsibility (CSR), R&D & Sustainable Development were included in non-financial parameters with a mandatory 5% weighted each. The choice of individual non-financial parameters constituting 50% of weightage are left to the combined wisdom of the PSE, Administrative Ministry and the Task Force. All parameters are required to be SMART (*i.e.* Specific, Measurable, Attainable, Result-oriented and Tangible) and objectively verifiable. Whereas, in 2011-12, the non-financial targets should be assessing the performance of the PSE under Corporate Social Responsibility, R&D, Sustainable Development, Human Resource Management and Corporate Governance, for which at least 5% marks each are earmarked. To the extent possible, the targets for non-financial parameters should be independently verifiable, and PSE should also specify the agency and means of their verification. In the MoU 2015-16, negative marking was introduced to penalize noncompliance to department of public enterprises (DPE) guidelines, Corporate Governance, ministry of micro small and medium enterprises (MSME) procurement guidelines, corporate social corporate social responsibility (CSR) guidelines and Entry of Survey and ministry of statistics and program implementation (MoSPI) data (Public Enterprises Survey, 2014-15)

2. REVIEW OF LITERATURE

The brief review of the national (Indian) and international studies has been enumerated in this section.

Naik (2001) has outlined some measures introduced to reform the public sector undertakings (PSUs) signing the MOU with the government to improve performance, restructuring/ modernization, rationalization of capacity, downsizing the workforce, product-mix changes and so on; the author further states that MoU system facilitates greater autonomy to PSUs and mend to achieve the negotiated and agreed objectives without the ministerial and bureaucratic interference in the day-to-day affairs of the enterprises. *Kumar (1994); Trivedi (1991)* and *Kaur (2004)* have explained the conceptual foundations of the MoU policy. They state that the performance evaluation of public enterprises by the government has undergone a revolutionary change, from ad-hoc, ex-post procedure oriented process becomes a systematic and result-oriented exercise by taking into account both commercial and non-commercial criteria in their static and dynamic aspects and ensuring performance by making the autonomy aspects more transparent.

Vithal (2001) has enumerated the linkage of the MoU targets to internal incentive schemes for the managers and employees. MoU supports in replacing multiple objectives by few clear goals for the management to achieve as well as provides functional and operational autonomy to the management in order to focus their efforts in improving the performance of the PSEs. *Kaur 1998 and 2004; Trivedi (1989 and 1990)* have mentioned the 5-point rating scale, use to measure the ability of public enterprise management to meet its commitments and has also stated reasons for not inducting soft targets in the MoU system, such as, consistent targets are to be set in the context of public enterprise's corporate plans, sudden deviation from the trend has to be explained to the Ad-Hoc Task Force as mentioned/ inducted targets are based on last five year's achievements.

Sengupta (2002) and Sangeeta (2005) has suggested that the efficacy of the MoU in improving performance depended upon how well it removed the internal and external constraints that affected the functioning of the public enterprises. The internal constraints includes excess manpower, lack of motivation among the executives and workers, poor internal control systems and inadequate resources while the external constraints are related to the interference of the politicians and bureaucrats in appointments, transfers and award of contracts. Whereas, *Sankar (1990)* observes that MoU does not make any attempt to remove these internal or external constraints. *Murthy (1990)* describes that the policy of MoU is a typical good news-bad news story. The good news signals an increase in the level of interest and awareness regarding the existence of the MoU policy. The bad news is that it is, unfortunately, factually quite inaccurate and betrays a surprising lack of clarity regarding the current status of the MoU policy. *Mint (2012)* has stated that MoUs are fixed but they are sometime unrealistic, as targets cannot be met and that is why for these companies some kind of more operational flexibility is required.

Trivedi (1991b) states that both privatization and MoU are a response to the general perception that public enterprises have not delivered what was expected of them. In South Korea, performance improvement through an MoU like system was used to increase the value of public enterprises before selling them. *Ganesh (2001)* observes that the 'MoU' system, introduced to revitalize the public sector units, has had little impact.

Nagaraj (2005) describes profitability, as a yardstick of measuring PSEs performance; it has gained importance when governments world over started feeling the burden of loss-incurring PSEs on their budget deficit. India followed the suit in this regard and accorded importance to financial performance ratios in the MoU. *Sangeetha, (2005)* signifies that MoU system helped the PSE management to focus its efforts in

improving the firm's profitability performance. She has analyzed incremental impact of delegating authority to PSE management by setting performance targets and grading them for their performance through MoU system; they have significant positive impact on the profitability of PSEs. *Gerard and Khalid (2000)* act as additional incentives for the management to perform better.

Mohapatra,(2012) has described the role, purpose and usage of MoU system and has observed that the planning exercise laid much emphasis on the core sectors of steel, heavy engineering, coal, power, petroleum and fertilizers, the Committee favored MoUs in respect of such enterprises only. *SarojKoul (2009)* has emphasized an accelerated need in communication management as India emerges as a world power in economics, trade, and manufacturing, all areas where the country seeks to make its contribution to the world. *Shantanu(2012)* opines that the target setting mechanism in MoU is crucial for nearly 200 profit-making central PSEs (such as ONGC, Indian Oil, Coal India, NTPC etc.) as their performance-related pay which goes up to 200 per cent of the basic pay in case of a CMD, actually depends on whether they achieve those targets or not. He further explains that one of the major concerns before government is how to bring loss-making public enterprises into the ambit of the MoU system. *Trien and Jonathan (2010)* suggest that both state ownership and debt have detrimental performance consequences in transition economies and the confluence of these two conditions (may not be harmful) has a positive impact on firm performance. *Varghese and Dass (2015)* indicate that public enterprises require improvement to reduce the distance to performance frontiers by opting best practices.

As far as studies pertaining to sector specification are concerned,*Hoekman (2007)*, *World Bank (2004)*,*Mohapatra (2012)* and *Arnold et al. (2008)* have demonstrated the contribution of India's policy reforms in services and have examined the link between these reforms and the productivity of manufacturing firms. They have stated that rapid liberalization in the service sector during the 1990s followed the economic and political success of the liberalization of the manufacturing sector. They found that banking, telecommunication and transport reforms had laid significant positive effects on the productivity of manufacturing firms. The study of,*Jain and Yadav(2005)*have observed for the better profitability of service enterprises than manufacturing enterprises during the aggregate period (1991-2003). *Michael et.al (2006)* study the relationship between accounting profits and technical efficiency of more than two thousand manufacturing enterprises in Shanghai and have found technical efficiency to be a significant factor in explaining profitability; it is affected by type of ownership.*De Cos et.al. (2004)* have stated that degree of competition seems to have a positive and significant effect on firm performance. *Vijaykumar and Jaychanad (2015)* note improvement in the operating and financial performance in at least 41% of the Indian manufacturing enterprises after disinvestment.

Further, the contribution of several studies at cross-country level, *Bradbury(1999)* examines the financial performance of New Zealand Government Computing Services (GCS) which is required to be as profitable and efficient as comparable businesses. *Yip et.al. (2009)* have used frontier analysis technique to identify the relative performance and provides assistance to the managers and analysts in making prompt and better decisions.*Windsor et.al. (2011)* suggest a more transparent (i.e., more predictable) monetary policy that has an uncertain effect on the variance of aggregate output; a reduction in the variance of the monetary innovation will unambiguously reduce the variance of aggregate output. *Amiti and Konings (2007)* are of the opinion that liberalization affects productivity. They find that the reduction in tariffs has positive productivity effects in Indonesia through both input and output tariffs. *Yves and David (2005)* have discussed the advantages and limitations for public sector employment.

In brief, the review of literature indicates the contribution of MoU for the development of the PSEs, problems being encountered by them, the impact of the reforms on their performance and suggestive measures/techniques opted to assess their performance. Notwithstanding the above notable works/studies on the subject, there has been hardly any study which has examined in depth the financial and operating performance of MoU PSEs (in India) based on sector specification comprehensively for the time span of nearly two decades by incorporating all major financial parameters, namely, profitability and efficiency. The present paper is a modest attempt to fill this gap.

3. METHODOLOGY, DATA SOURCE AND SCOPE OF THE STUDY

This section aims at assessing the financial performance of the non-financial central PSEs (100 in number) in India, which have signed MoU (referred henceforth MoU PSEs); the performance has been determined by segregating the sample PSEs into manufacturing and service PSEs. The benchmark year is 1994-95 (a year in which 100 PSEs signed MoUs). On the basis of cut-off year 1994-95, the sample consists of 66 MoU PSEs (having MoU in all subsequent years till 2010-11, the last year of the present study; it excludes the enterprises which have not signed MoU in the later year/years).

The data has been collated from the various volumes of the Public Enterprises Survey, published by Government of India. The time span of the present work is confined to 1994-95 to 2010-11, due to the change in reporting standard of financial statements from the year 2011-12 as per Revised Schedule VI of Company Act 1956²; this, in turn, has brought change in many figures/constituents of balance sheet and income statement. Therefore, we were constrained to have the present study restricted to 17 years i.e., 1994-95 to 2010-11 (where financial reporting requirements remain virtually the same over a period of time of the study).

The time span has been divided into three phases. The first phase (covering a time span from 1994-95 to 1999-2000) is referred to as initial phase of the PSEs signed self obligation contract or MoU. Security and Exchange Board of India (SEBI) SEBI has accepted the recommendations on the provision of corporate governance³ in January 2000. Therefore, the second phase time span starts from 2000-01 and closes at pre-recession year 2007-08. Subsequent to the American financial crisis (impacted the world economy) recession seems to be landed in India during the second-half of 2008⁴ (in June 2008); therefore, to assess the impact of recession on the performance of PSEs, third phase from 2008-09 to 2010-11 has been referred as post-recession phase.

2 Ministry of Corporate Affairs (Government of India) Notification no. F.No.2/6/2008-C.L-V dated 30-3-2011, revised the existing Schedule VI to the Companies Act, 1956 and made it applicable to all companies for preparation of the Financial Statements from the financial year commencing on or after April 1, 2011. Financial statements has to be prepared for the year 2011-12 (1st April 2011 to 31st March 2012) onwards as per revised/changed schedule.

3 To improve the level on Corporate Governance in India, a committee was set up by Security and Exchange Board of India (SEBI) in May 1999 under chairmanship of Kumar Mangalam Birla. In January 2000, SEBI has accepted the recommendations of corporate governance committee. The Company Act, 1956 was amended to incorporate certain provisions to raise the level of corporate governance.

4 According to United Nations Council on Trade and Development (UNCTAD) investment brief (November 2009), the year 2008 marked the end of a growth cycle in global foreign direct investment (FDI) with worldwide flows down by more than 20 percent. Therefore, the capacity of the companies to invest has been weakened by reduced access to financial resources, both internally and externally. In India total net capital flows fell from US \$17.3 billion in April-June 2007 to US \$ 13.2 billion in April-June 2008. (Sources: UNCTAD investment briefs, investment issues analysis branch of UNCTAD, 2009)

Further, the financial performance of MoU PSEs has been assessed in view of The National Council of Applied Economic Research (NCAER) recommendations also. For the purpose, the second phase (2000-01 to 2007-08) of MoU has been segregated into two sub-phases, namely, first sub-phase consists of 2001-02 to 2003-04, referred to as pre-NCAER recommendation phase two and second sub-phase covers 2004-05 to 2007-08, referred to as post-NCAER recommendation phase two. The rationale for splitting the second phase stems from the recommendations of NCAER in 2003; the Council had proposed a new criteria for performance evaluation and weight allocation which came into force in the year 2004-05.

The ratio analysis, being an effective technique to assess the financial performance, has been used in the study. For the purpose, 15 ratios pertaining to profitability, efficiency, liquidity, and solvency have been computed. The financial performance of sample enterprises has been measured primarily in terms of profitability and efficiency. Profitability has been measured in terms of investment and sales, namely, return on total assets (ROTA), return on capital employed (ROCE) and return on net worth or shareholder's equity (RONW), operating profit margin (OPM) and net profit margin (NPM). The first two RORs (ROTA and ROCE) determine how efficiently the financial resources are deployed by the PSEs and the third ROR (RONW) indicates the return earned for their equity owners (government). ROTA has been determined on the basis of earnings before interest and taxes (EBIT) and in the case of ROCE non-operating incomes has been excluded from the EBIT. RONW has been computed dividing net-profit after taxes minus preference dividend to the average net-worth (share capital plus reserves minus accumulated deficit and deferred expenditures).

The OPM indicates the magnitude of operating profits in relation to sales; the NPM determines the relationship of reported net-profit after taxes to sales; these margins indicate the ability of management to perform the business profitably and express the overall cost/price effectiveness (Helfert, 2003).

Similarly, efficiency in utilization of resources has been determined on the basis of three dimensions, i.e., the first one is concerned with the extent of utilization of assets, namely, total assets turnover ratio (TATR), fixed assets turnover ratio (FATR) and current assets turnover ratio (CATR); low turnover is indicative of under-utilization of available resources and presence of idle capacity and the uses of firm's; in general, higher the firm's assets turnover, the more efficiently are the assets being used (Gitman, 2009). TATR, FATR and CATR are computed dividing average net sales to average total assets, average fixed assets and average current assets respectively. The second dimension of efficiency is based on analyzing the change in a holding period (in number of days) of various types of inventories and third, on the collection period of debtors which are the sub-constituents of current assets.

Raw material inventory holding period (RMIHP) is the ratio of raw materials used during the year and average raw materials. Work-in-process inventory holding period (WIPIHP) has been computed on the basis of cost of production and average work-in-progress. Finished goods inventory holding period (FGIHP) is based on the relationship between cost-of-goods-sold and average finished goods. Debtor collection period (DCP) presents the relationship between sales and average debtors.

Solvency has been measured in terms of total borrowings and shareholders fund. Likewise, liquidity has been measured in terms of current ratio (CR) and acid test ratio (ATR). To lend credence to the findings, paired t test and independent t test have been conducted.

4. DISCUSSION AND ANALYSIS

This part of the study examines and compares the financial performance of MoU manufacturing and MoU service sector PSEs (hereafter referred to as manufacturing PSEs and service PSEs as all the enterprises covered in this section have signed MoU) during the post-MoU phases; it has been analyzed in terms of five parameters, *i.e.*, profitability, efficiency, leverage, liquidity and productivity per manpower.

It is hypothesized that MoU PSEs would have posted better financial performance over the years; in other words, the performance of manufacturing and service PSEs has improved across the phases. The primary reason is the managers of MoU PSEs would have their best efforts to meet the targets laid down in MoU as their own evaluation is based on achieving the parameters contained in MoU.

5. MANUFACTURING AND SERVICE SECTOR MOU PSES

5.1. Profitability Analysis

Relevant data contained in Table 1 (given at the end of the chapter; others Tables 2 to 19 are also provided at the end) indicates that there has been a significant improvement in all the parameters of profitability in the case of manufacturing PSEs during the first three phases; these improvements are statistically significant during pre-and post-NCAER phase two. Figures 1 and 2 depict the rising trend in respect of these ratios. However, the reduction has been noted in these parameters during phase three, statistically significant (save ROCE) compared to phase two. Notwithstanding this decrease, the various rates of return and profit margins (during recession phase) seem to be at satisfactory levels. In other words, standalone profitability ratios during recession phase of MoU manufacturing and service PSEs are satisfactory.



Figure 1: Mean Values of Profitability Ratios (RONW, ROCE and ROTA) of the Manufacturing MoU PSEs for the Period 1994-95 to 2010-11

Similar conclusions follow based on positional values of median and quartiles (Table 2). Median and quartile 3 values show consistent increase in phases three and two compared to phase one for all the five measures of profitability. Further, it is a matter of satisfaction to note that there has been positive ROCE for one-fourth of manufacturing PSEs in phases two (pre-recession) and three (post-recession); these enterprises were incurring losses in earlier two phases (Table 2).

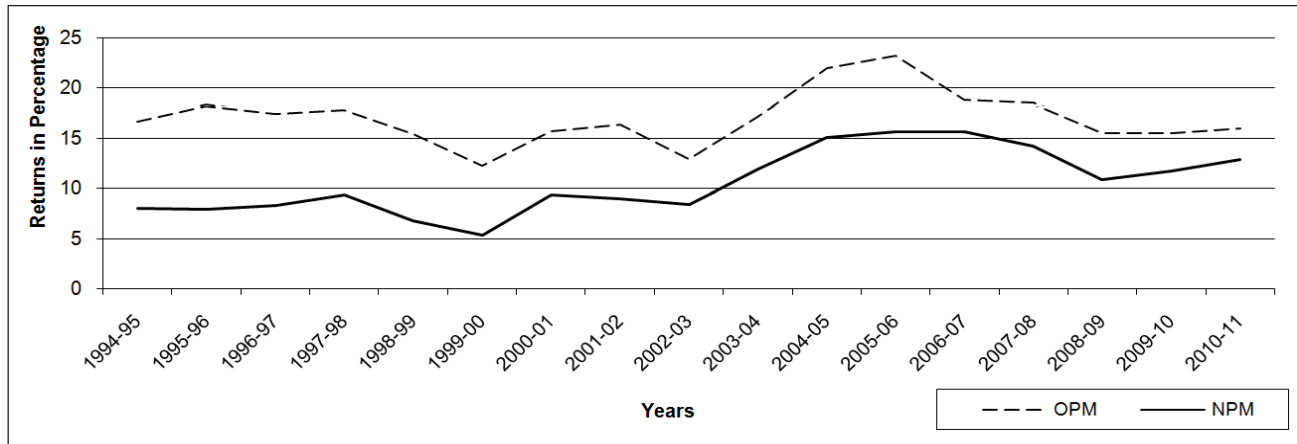


Figure 2: Mean Values of the Profitability Ratios (OPM and NPM) of the Manufacturing MoU PSEs for the Period 1994-95 to 2010-11

Table 1
Mean Values of Key Profitability Ratios of the Manufacturing MoU PSEs, 1994-95 to 2010-11

Years	RONW		ROCE		ROTA		OPM		NPM	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	7.97	41	8.76	41	8.97	41	16.49	40	7.48	40
Mean 2000-01 to 2003-04 (phase-2-before NCAER recommendation)	9.78	41	8.34	41	10.26	42	15.78	39	9.83	40
Mean 2004-05 to 2007-08 (phase-2-after NCAER recommendation)	17.75	41	14.12	41	13.46	42	22.47	39	15.45	40
Mean 2008-09 to 2010-11 (phase-3)_recession	12.02	41	10.38	40	9.91	42	14.75	39	10.58	41
Aggregate Mean (1994-95 to 2010-11)	11.76		9.98		10.18		16.70		10.17	

Paired Sample T Test

Ratios	Phases-1 and 2 pre NCAER		Phase-2 (pre and post NCAER)		Phases-2 (post NCAER) and 3		Phases-1 and 3	
	df	Sign	df	Sign	Df	Sign	df	Sign
RONW	40	0.32	41	0.02*	41	0.01**	40	0.01**
ROCE	40	0.78	41	0.03*	40	0.07	40	0.66
ROTA	40	0.09	41	0.02*	41	0.00**	40	0.44
OPM	38	1.00	39	0.00**	37	0.00**	37	0.78
NPM	39	0.15	40	0.00**	40	0.04*	39	0.01**

Note: ** signifies to significant difference at 1% level and * signifies to significant difference at 5% level. This applies in all the underlying tables

Table 2
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Profitability Ratios of Manufacturing MoU PSEs, 1994-95 to 2010-11

Ratios	Median s			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
RONW	8.34	9.44	15.09	11.40	1.73	0.98	7.23	5.67	17.54	21.92	27.56	19.82
ROCE	8.14	7.37	12.84	9.12	-1.60	-3.41	2.93	2.29	20.08	26.02	32.35	21.87
ROTA	7.83	7.90	10.26	8.40	2.49	2.89	5.02	2.55	14.28	17.95	21.58	16.62
OPM	11.21	11.86	17.44	13.51	5.29	3.82	5.85	2.95	27.94	27.17	39.21	29.57
NPM	4.52	7.76	12.36	8.21	0.93	0.42	3.52	1.56	17.74	18.11	27.59	21.46

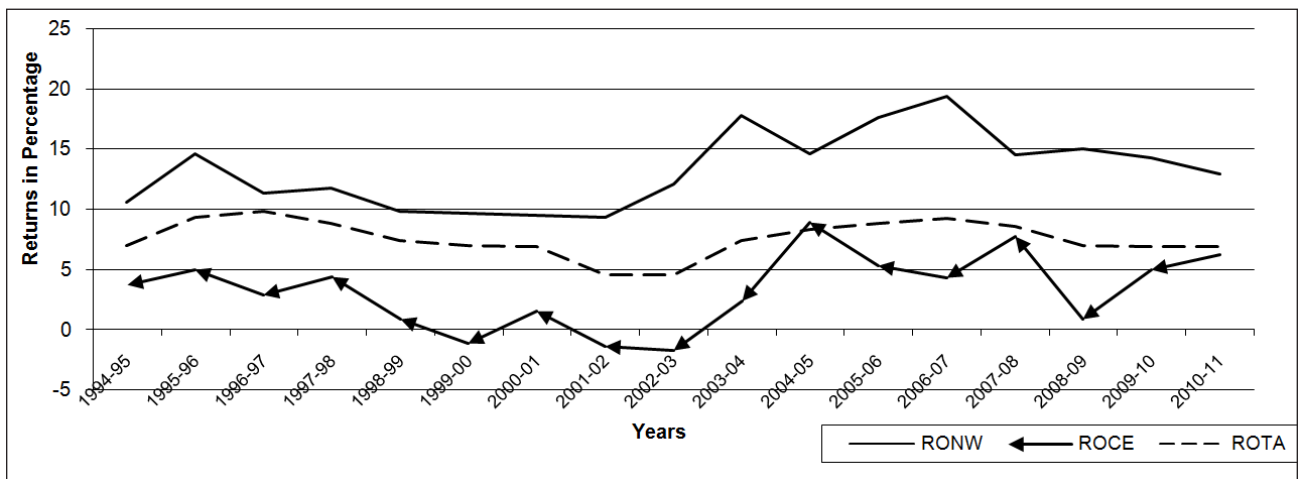


Figure 3: Mean Values of Profitability Ratios (RONW, ROCE and ROTA) of the Service MoU PSEs for the Period 1994-95 to 2010-11

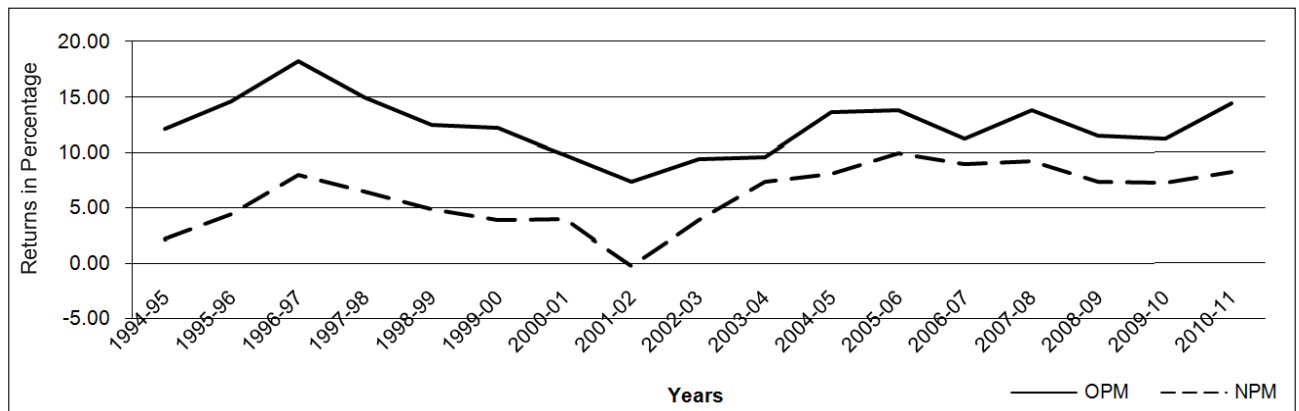


Figure 4: Mean Values of the Profitability Ratios (OPM and NPM) of the Service MoU PSEs for the Period 1994-95 to 2010-11

In contrast, the statistics of profitability of service PSEs is not equally commendable from the perspective of all parameters. It is satisfactory in respect of RONW only. In other four measures, namely, ROCE, ROTA, OPM and NPM, there has been a decline in both phases two and three (Table 3 and Figures 3 and 4); the decrease is statistically significant in the case of ROTA and OPM in phases one and two. Though, the increase is noted in post-NCAER phase two in all the parameters of profitability compared to pre-NCAER phase two, the difference is significant as per paired t test in NPM only (Table 3). Marginal decline has also been observed in post-recession phase compared with pre-recession phase of these enterprises. In other words, positive effect of NCAER recommendations and minor effect of recession has been observed in service MoU PSEs.

Table 3
Mean Values of Key Profitability Ratios of the Service MoU PSEs, 1994-95 to 2010-11

<i>Years</i>	<i>RONW</i>		<i>ROCE</i>		<i>ROTA</i>		<i>OPM</i>		<i>NPM</i>	
	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>
Mean 1994-95 to 1999-2000 (phase-1)	11.31	21	4.45	21	9.47	21	15.52	21	8.36	21
Mean 2000-01 to 2003-04(phase-2-before NCAER recommendation)	12.46	21	0.23	23	5.87	24	9.59	24	3.71	24
Mean 2004-05 to 2007-08 (phase-2-after NCAER recommendation)	17.15	21	7.84	24	8.72	24	12.89	24	8.87	24
Mean 2008-09 to 2010-11 (phase-3)	14.06	22	4.38	22	6.92	23	12.38	23	7.57	23
Aggregate Mean (1994-95 to 2010-11)	12.83		3.16		7.56		12.59		6.08	

Paired Sample T Test

<i>Ratios</i>	<i>Significance (two tailed test and degree of freedom (df))</i>							
	<i>Phases-1 and 2 pre NCAER</i>		<i>Phase-2 (pre and post NCAER)</i>		<i>Phases-2(post NCAER) and 3</i>		<i>Phases-1 and 3</i>	
	<i>df</i>	<i>Sign</i>	<i>df</i>	<i>Sign</i>	<i>Df</i>	<i>Sign</i>	<i>Df</i>	<i>Sign</i>
RONW	18	0.52	20	0.17	20	0.31	18	0.61
ROCE	19	0.28	22	0.08	21	0.54	18	0.59
ROTA	20	0.03*	23	0.09	22	0.08	19	0.05*
OPM	20	0.03*	23	0.07	22	0.42	19	0.21
NPM	20	0.09	23	0.02*	22	0.15	19	0.56

Positional values indicated in Table 4 have also followed the mean observations in majority of the cases. It is pathetic to note that one-fourth of the service PSEs have negative ROCE in all the phases of the study, indicative of erosion of capital employed in such enterprises. From the above, it is reasonable to conclude that manufacturing PSEs have shown better performance in respect of profitability compared to service PSEs in their post MoU period.

Table 4
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Profitability Ratios of the Service MoU PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
RONW	11.45	12.19	14.89	13.47	3.38	2.80	7.01	3.79	20.05	21.42	28.91	23.75
ROCE	3.01	-1.47	7.74	4.73	-9.91	-18.94	-10.62	-8.05	13.51	18.28	21.68	20.80
ROTA	7.10	4.22	6.35	6.66	3.04	-2.26	1.69	2.57	12.50	11.10	12.55	11.15
OPM	9.90	4.41	7.96	8.17	3.13	-1.88	1.53	1.81	25.36	19.34	20.43	19.64
NPM	2.62	0.99	5.76	4.49	-0.16	-2.33	0.81	0.50	14.31	12.66	14.55	12.34

Independent *t* test shown in Table 5 (group statistics) also demonstrates better profitability of manufacturing enterprises compared to service PSEs across the phases; though the difference is significant only in the parameters of ROTA, OPM and NPM (during phase 2) and in OPM during phase three. The finding is in conformity with observations of Arnold et.al (2008); they have emphasized that post-1991 growth of Indian manufacturing sector is based on trade liberalization and industrial de-licensing and laid positive effects on the productivity of manufacturing firms.

Table 5
Independent Sample t-test of Key Profitability Ratios of the Sample Manufacturing and Service MoU PSEs during 1994-95 to 2010-11 Group Statistics

Ratios	Coding	Phase 1		Phase 2 (Pre and Post NCAER recommendations)				Phase 3	
		N	Mean	N	Mean Pre-NCAER	N	Mean Post-NCAER	N	Mean 3yrs
RONW	Manuf.	41	8.65	42	9.90	42	17.77	42	13.20
	Service	21	11.32	21	12.42	21	17.01	22	14.10
ROCE	Manuf.	41	9.51	42	8.07	42	14.53	41	10.74
	Service	21	4.44	23	0.23	24	7.84	22	4.43
ROTA	Manuf.	41	8.97	42	10.26	42	13.46	42	9.91
	Service	21	9.47	24	5.87	24	8.71	23	6.92
OPM	Manuf.	40	17.14	40	15.66	40	22.42	39	16.29
	Service	21	15.53	24	9.59	24	13.04	23	12.38
NPM	Manuf.	40	8.09	41	9.75	41	15.39	41	11.94
	Service	21	8.36	24	3.71	24	8.91	23	7.57

Independent Samples Test

Ratios	Variances	<i>t-test for Equality of Means</i>							
		Phase 1		phase 2 (Pre NCAER)		phase 2 (Post NCAER)		Phase 3 (3 yrs post recession)	
		df	Sig.	df	Sig.	df	Sig.	df	Sig.
RONW	EV	60	0.31	61	0.57	61	0.83	62	0.78
	NEV	52	0.26	38	0.58	39	0.84	53	0.76
ROCE	EV	60	0.17	63	0.09	64	0.2	61	0.18
	NEV	28	0.24	44	0.09	48	0.21	40	0.2
ROTA	EV	60	0.77	64	0.06	64	0.06	63	0.24
	NEV	35	0.79	41	0.07	59	0.04*	62	0.16
OPM	EV	59	0.68	62	0.15	62	0.04*	60	0.38
	NEV	43	0.68	43	0.17	58	0.03*	55	0.35
NPM	EV	59	0.92	63	0.1	63	0.06	62	0.26
	NEV	45	0.92	48	0.1	60	0.04*	61	0.18

EV- Equal variances assumed, NEV- Equal variances not assumed.

5.2. Efficiency Ratios

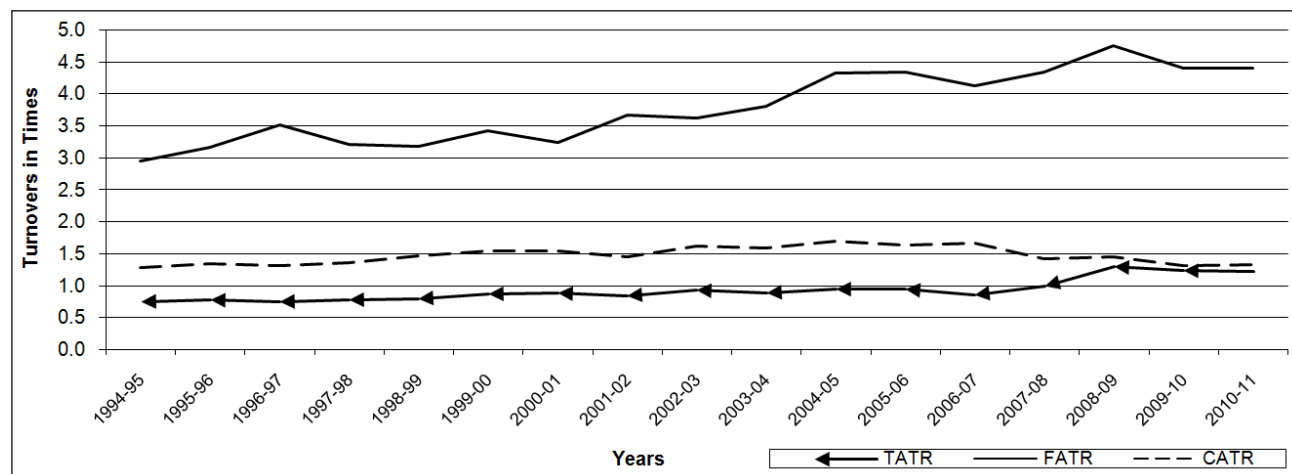


Figure 5: Mean Values of Turnover Ratios (TATR, FATR and CATR) of the Manufacturing MoU PSEs for the Period 1994-95 to 2010-11

Further, efficiency has been assessed on three parameters (as followed in other sections); *i.e.* the turnover basis, inventory holding period and debtors collection period. It has been observed that the assets turnover (measured in terms of TATR, FATR and CATR) of service PSEs is better compared to manufacturing PSEs (Tables 6 and 8 as well as Figures 5 and 6); the respective mean figures being 0.84, 3.75 and 1.48 (manufacturing MoU enterprises) and 1.17, 3.87 and 1.55 (service MoU enterprises) for the period of seventeen years. Independent *t* test depicted in Table 14 has indicated a higher edge in turnover ratios of service PSEs over manufacturing PSEs after signing MoUs, though the difference is not statistically significant except in phase two of TATR.

Table 6
Mean Values of Key Turnover Ratios of the Manufacturing MoU PSEs, 1994-95 to 2010-11

Years	TATR		FATR		CATR	
	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	0.80	41	3.11	39	1.40	41
Mean 2000-01 to 2003-04 (phase-2-before NCAER recomme)	0.89	42	3.67	40	1.55	42
Mean 2004-05 to 2007-08 (phase-2-after NCAER Recomm.)	0.94	42	4.28	40	1.63	42
Mean 2008-09 to 2010-11 (phase-3)	0.79	41	4.54	38	1.36	41
Aggregate Mean (1994-95 to 2010-11)	0.84		3.75		1.48	

Paired Sample T Test

Ratios	<i>Significance (two tailed test and degree of freedom (df))</i>							
	Phases-1 and 2 pre NCAER		Phase-2(pre and post NCAER)		Phases-2(post NCAER) and 3		Phases-1 and 3	
	df	Sign	df	Sign	Df	Sign	df	Sign
TATR	40	0.00**	41	0.03*	40	0.00**	39	0.00**
FATR	37	0.01**	39	0.04*	37	0.19	35	0.00**
CATR	40	0.01**	41	0.32	40	0.00**	39	0.72

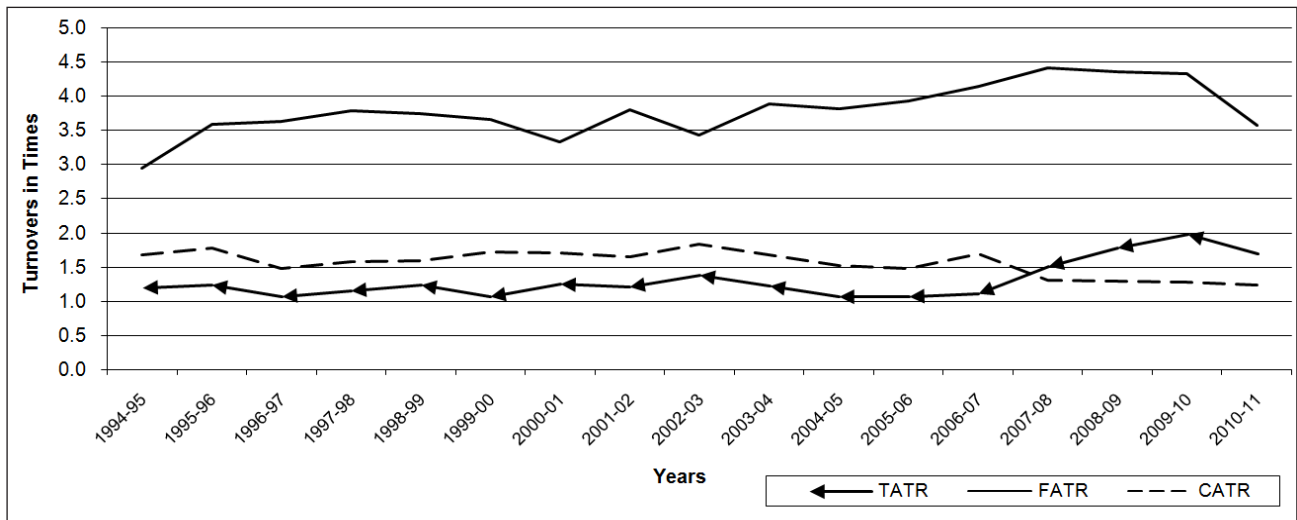


Figure 6: Mean Values of Turnover Ratios (TATR,FATR and CATR) of the Service MoU PSEs for the Period 1994-95 to 2010-11

It may be noted that TATR of manufacturing sample PSEs is not satisfactory; it is less than one in all the 17 years period of the study, indicative of under-utilization of total assets; likewise, CATR has not depicted satisfactory results after signing MoU (less than the ideal standard) in all the phases compared to service sector MoU PSEs. However, the position of FATR is quite satisfactory. Further, decrease in TATR is primarily attributed due to decrease in CATR. The difference is statistically significant in almost all the phases of manufacturing PSEs. On the other hand, difference is found to be significant in TATR

and CATR during phases one and three only of service PSEs. Positional values have also shown wide variations (Tables 7 and 9). While the assets turnover of one-fourth of the sample manufacturing as well as service enterprises (as per quartile 3) can be reckoned quite satisfactory; another one-fourth of total MoU PSEs (indicated as per quartile 1) have indicated dissatisfactory performance across the phases. Further, it is important to note a significant increasing trend in all the turnover ratios during the first two phases of manufacturing MoU PSEs; whereas, the trend is reversed (decreasing) in the case of service MoU PSE.

Table 7
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Turnover Ratios of the Manufacturing MoU PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2 (pre and post NCAER)	Phase 3	Phase 1	Phase 2 (pre and post NCAER)	Phase 3	Phase 1	Phase 2 (pre and post NCAER)	Phase 3			
TATR	0.60	0.64	0.64	0.55	0.30	0.36	0.28	0.28	0.98	1.05	1.26	0.97
FATR	2.64	2.87	3.23	3.80	0.72	0.93	1.66	1.51	5.96	6.27	7.97	7.82
CATR	1.12	1.08	1.02	0.94	0.57	0.62	0.52	0.53	1.76	2.07	2.01	1.58

Table 8
Mean Values of Key Turnover Ratios of the Service MoU PSEs, 1994-95 to 2010-11

Years	TATR		FATR		CATR	
	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	1.30	21	3.75	13	1.80	21
Mean 2000-01 to 2003-04 (phase-2-before NCAE recommendation)	1.26	24	3.91	15	1.71	24
Mean 2004-05 to 2007-08 (phase-2-after NCAER recommendation)	1.11	24	4.56	14	1.49	24
Mean 2008-09 to 2010-11 (phase-3)	1.09	23	4.30	11	1.27	23
Aggregate Mean (1994-95 to 2010-11)	1.16		3.87		1.55	

Paired Sample T Test

Ratios	Significance (two tailed test and degree of freedom (df))							
	Phases-1 and 2 pre NCAER		Phase-2 (pre and post NCAER)		Phases-2 (post NCAER) and 3		Phases-1 and 3	
	df	Sign	df	Sign	Df	Sign	df	Sign
TATR	20	0.62	23	0.74	18	0.08	16	0.00**
FATR	12	0.92	13	0.11	10	0.41	9	0.21
CATR	20	0.76	23	0.07	22	0.17	19	0.03*

Table 9
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Turnover Ratios of the Service MoU PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
TATR	0.79	0.90	0.86	0.80	0.45	0.58	0.50	0.48	1.42	1.43	1.68	0.97
FATR	2.99	3.69	4.29	4.59	0.89	1.34	1.55	1.28	6.87	6.20	7.71	6.85
CATR	1.13	1.30	1.16	0.97	0.65	0.75	0.82	0.69	2.24	2.86	2.23	1.17

Table 10
Mean Values of Inventory Holding Period and Debtor Collection Period of the Manufacturing MoU PSEs, 1994-95 to 2010-11

Years	RMIHP		WPIHP		FGIHP		DCP	
	Mean	N	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	227.48	34	25.57	28	28.12	37	89.90	39
Mean 2000-01 to 2003-04 (phase-2-before NCAER recommendation)	186.93	36	24.98	29	23.37	37	85.00	41
Mean 2004-05 to 2007-08 (phase-2-after NCAER recommendation)	150.50	37	21.40	29	17.24	37	68.28	42
Mean 2008-09 to 2010-11 (phase-3)	128.58	36	26.95	29	18.08	35	60.35	40
Aggregate Mean (1994-95 to 2010-11)	174.52		18.99		19.97		76.79	

Paired Sample T Test

Ratios	Significance (two tailed test and degree of freedom (df))							
	Phases-1 and 2 pre NCAER		Phase-2(pre and post NCAER)		Phases-2(post NCAER) and 3		Phases-1 and 3	
	df	Sign	df	Sign	df	Sign	Df	Sign
RMIHP	33	0.00**	35	0.00**	33	0.91	32	0.00**
WPIHP	28	0.74	29	0.11	27	0.19	26	0.76
FGIHP	34	0.10	35	0.00**	33	0.29	32	0.02*
DCP	38	0.00**	40	0.13	39	0.40	36	0.00**

A Second test of efficiency relates to the assessment of the inventory holding period (IHP) and third for the debtors collection period (DCP) of MoU manufacturing and service PSEs over a time span of more than one and half decade (*i.e.*, seventeen years). The IHP (measured in terms of RMIHP, WPIHP and FGIHP) and DCP have shown a declining trend over the phases in both types of sample manufacturing

and service PSEs except WIPIHP and FGIHP of service PSEs (Tables 10 and 12). The differences are significant in majority of the phases (for RMIHP), during phase two (related to pre and post NCAER recommendations) as well as in phases three and one (for FGIHP) and in phases three and one and phases one and two (for DCP) of the sample manufacturing enterprises; though, it is statistically significant in the case of service enterprises during phase two in the parameter of RMIHP only. *Inter-se*, the IHP of service PSEs is lower compared to manufacturing PSEs. The effect of recession has hardly been observed in the IHP and DCP in both types of PSEs. The holding period of raw materials, work-in-process and finished goods during the pre-recessionary period (2004-05 to 2007-08) and post recessionary period (2008-09 to 2010-11) are 151, 21, 17 days and 129, 27, 18 days respectively for manufacturing firms; the corresponding figures are 71, 14, 19 days and 68, 10, 22 days for service firms.

Table 11
Median, Lower (Q1) and Upper Quartile (Q3) Values of IHP and Debtor Collection
Period of the Manufacturing MoU PSEs, 1994-95 to 2010-11

<i>Ratios</i>	<i>Median</i>			<i>Q1</i>			<i>Q3</i>					
	<i>Phase 1</i>	<i>Phase 2(pre and post NCAER)</i>	<i>Phase 3</i>	<i>Phase 1</i>	<i>Phase 2 (pre and post NCAER)</i>	<i>Phase 3</i>	<i>Phase 1</i>	<i>Phase 2(pre and post NCAER)</i>	<i>Phase 3</i>			
RMIHP	179.63	146.18	113.34	89.93	83.40	75.26	41.89	37.05	294.93	287.45	251.50	182.24
WIPIHP	5.87	7.43	7.49	3.21	1.06	1.92	1.82	1.07	54.49	50.02	21.50	21.32
FGIHP	19.04	22.57	13.15	18.08	4.58	3.86	5.09	4.17	44.85	37.92	28.02	26.81
DCP	71.95	65.84	49.09	50.53	29.83	21.71	19.78	19.95	150.58	134.82	103.59	98.16

Table 12
Mean Values of Inventory Holding Period and Debtor Collection Period of the
Service MoU PSEs, 1994-95 to 2010-11

<i>Years</i>	<i>RMIHP</i>		<i>WIPIHP</i>		<i>FGIHP</i>		<i>DCP</i>	
	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>	<i>Mean</i>	<i>N</i>
Mean 1994-95 to 1999-2000 (phase-1)	215.46	12	6.83	9	22.87	13	98.64	23
Mean 2000-01 to 2003-04(phase-2-pre- NCAER)	162.71	17	11.02	11	18.04	14	103.03	24
Mean 2004-05 to 2007-08 (phase-2-post- NCAER)	71.10	18	13.85	11	19.86	14	79.16	24
Mean 2008-09 to 2010-11 (phase-3)	68.43	10	10.00	10	22.00	13	86.27	23
Aggregate Mean (1994-95 to 2010-11)	139.67		5.89		12.27		90.37	

Paired Sample T Test

Ratios	Significance (two tailed test and degree of freedom (df))							
	Phases-1 and 2 pre NCAER		Phase-2(pre and post NCAER)		Phases-2(post NCAER) and 3		Phases-1 and 3	
	df	Sign	Df	Sign	df	Sign	df	Sign
RMHP	11	0.30	17	0.00**	14	0.26	9	0.44
WPIHP	8	0.56	11	0.99	9	0.14	7	0.98
FGIHP	12	0.59	13	0.59	12	0.65	11	0.22
DCP	19	0.71	23	0.07	22	0.50	18	0.92

The improved efficiency in terms of reduction in inventory holding period and debtors collection period is manifested in Figures 7 and 8. A steep decline from the year 1999-2000 for manufacturing firms and from 2003-04 for service firms is very apparent.

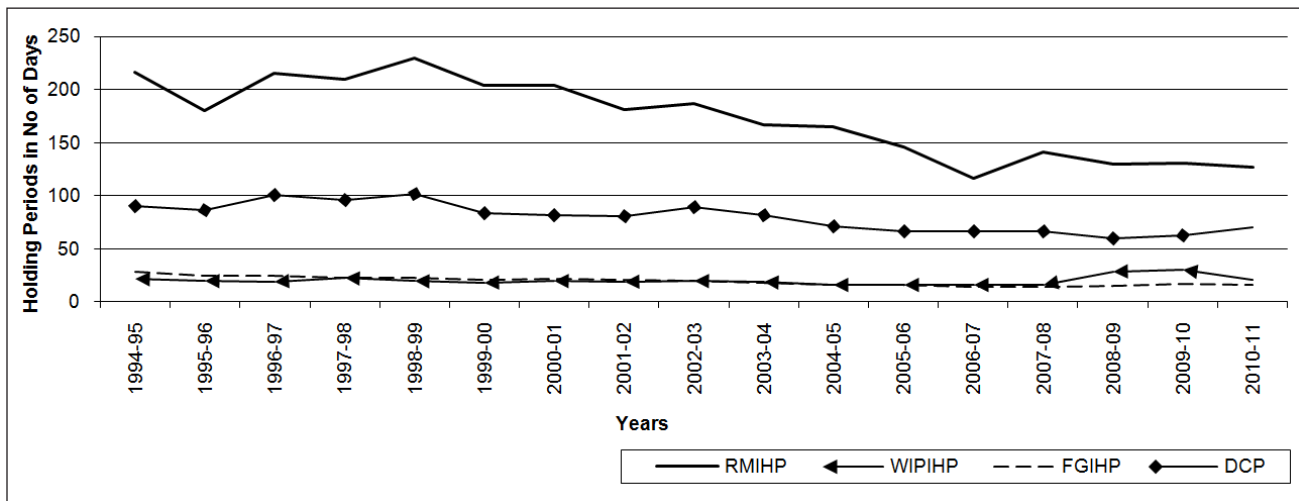


Figure 7: Mean Values of the Inventory Holding and Debtors Collection Periods of the Manufacturing MoU PSEs for the Period 1994-95 to 2010-11

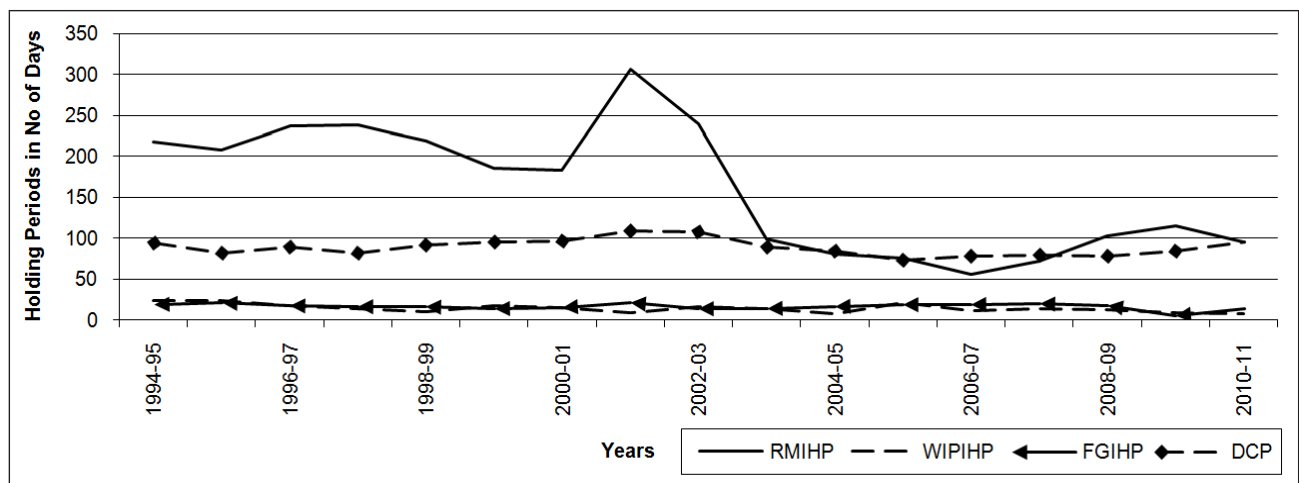


Figure 8: Mean Values of the Inventory Holding and Debtors Collection Periods of Service MoU PSEs for the Period 1994-95 to 2010-11

At the same time, positional values (depicted in Tables 11 and 13) indicate that one-fourth of manufacturing and service sample PSEs (as per upper quartile) have very high RMIHP, i.e., six months to one year and more than four months to 14 months respectively. The select list from manufacturing sector PSEs includes Indian Rare Earths Ltd., Neyveli Lignite Corp. Ltd., Oil India Ltd., Garden Reach Shipbuilders Ltd. and Engineers India Ltd; similarly, the list consists of National Small Industrial Corp. Ltd, Mineral Exploration Corp. Ltd. and Central Warehousing Corp. Ltd. from service sector PSEs.

Table 13
Median, Lower (Q1) and Upper Quartile (Q3) Values of IHP and DCP of the Service MoU PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
RMIHP	181.53	91.25	24.76	10.08	36.19	14.45	2.07	1.81	404.76	340.29	133.12	59.62
WIPIHP	2.88	5.42	5.68	1.49	0.00	0.00	0.30	0.00	22.82	18.71	19.16	9.82
FGIHP	2.10	2.35	3.83	3.16	0.00	0.00	0.12	0.28	28.05	10.03	13.95	17.97
DCP	73.07	89.35	62.30	91.88	26.36	40.69	31.98	27.81	167.80	175.05	127.20	117.51

Table 14
Independent Sample t-test of Key Efficiency Ratios of the Sample Manufacturing and Service MoU PSEs during 1994-95 to 2010-11

Ratios	Coding	Phase 1		Phase 2 (Pre and Post NCAER recommendations)				Phase 3	
		N	Mean	N	Mean Pre-NCAER	N	Mean Post-NCAER	N	Mean 3yrs
TATR	Manuf.	41	0.79	42	0.89	42	0.98	41	1.26
	Service	21	1.30	24	1.26	24	1.23	19	1.86
FATR	Manuf.	39	3.17	40	3.72	40	4.43	38	4.55
	Service	13	3.75	15	3.91	14	4.56	11	4.30
CATR	Manuf.	41	1.39	42	1.55	42	1.63	41	1.36
	Service	21	1.80	24	1.71	24	1.49	23	1.27
DCP	Manuf.	39	93.63	41	87.18	42	70.94	40	63.64
	Service	20	85.52	24	103.03	24	79.16	23	86.27
RMIHP	Manuf.	34	225.00	36	184.37	37	147.06	36	128.35
	Service	12	213.88	18	175.98	19	70.01	15	114.66
WIPIHP	Manuf.	29	26.10	30	25.58	30	21.91	31	35.25
	Service	9	6.83	12	13.57	12	13.44	10	10.00
FGIHP	Manuf.	35	28.61	36	23.35	36	17.27	34	18.46
	Service	13	19.62	14	16.93	14	19.18	13	15.21

Independent Samples Test

Ratios	Variances	<i>t</i> -test for Equality of Means							
		Phase 1		phase 2 (Pre NCAER)		phase 2 (Post NCAER)		Phase 3 (3 yrs post recession)	
		<i>df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>
TATR	EV	60	0.05*	64	0.13	64	0.30	58	0.08
	NEV	28	0.10	42	0.15	51	0.29	27	0.12
FATR	EV	50	0.52	53	0.83	52	0.90	47	0.82
	NEV	19	0.55	27	0.83	21	0.90	16	0.83
CATR	EV	60	0.25	64	0.65	64	0.72	62	0.78
	NEV	35	0.27	57	0.63	64	0.68	59	0.76
DCP	EV	57	0.67	63	0.42	64	0.64	61	0.16
	NEV	45	0.65	49	0.42	55	0.63	38	0.18
RMIHP	EV	44	0.84	52	0.85	54	0.03*	49	0.74
	NEV	22	0.83	31	0.85	51	0.01**	20	0.77
WIPIHP	EV	36	0.08	40	0.24	40	0.41	39	0.24
	NEV	36	0.01**	39	0.12	31	0.33	38	0.06
FGIHP	EV	46	0.36	48	0.47	48	0.83	45	0.63
	NEV	17	0.43	16	0.59	14	0.89	14	0.72

EV- Equal variances assumed, NEV- Equal variances not assumed.

The inventory holding period, *prima-facie*, seems to be of a longer time span than desired, causing high carrying cost of inventory, adversely impacting production costs and profit margins. Independent t test has observed no significant difference in any of the efficiency parameters between manufacturing and service PSEs (Table 14); group statistics suggests better performance of service PSEs compared to manufacturing PSEs.

5.3. Leverage and Liquidity Ratios

Table 15
Mean Values of Key Leverage and Liquidity Ratios of the Manufacturing MoU PSEs,
1994-95 to 2010-11

Years	Leverage Ratios		Liquidity Ratios			
	TD/TE		CR		ATR	
	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	1.77	38	2.12	41	1.51	41
Mean 2000-01 to 2003-04(phase-2-pre NCAER recom.)	1.65	37	2.11	42	1.60	42
Mean 2004-05 to 2007-08 (phase-2-post NCAER recom.)	1.38	40	2.12	42	1.72	42
Mean 2008-09 to 2010-11 (phase-3)	1.58	40	1.89	40	1.27	39
Aggregate Mean (1994-95 to 2010-11)	1.52		2.07		1.51	

Paired Sample T Test

Ratios	Significance (two tailed test and degree of freedom (df))							
	Phases-1 and 2 pre NCAER		Phase-2(pre and post NCAER)		Phases-2(post NCAER) and 3		Phases-1 and 3	
	df	Sign	Df	Sign	df	Sign	df	Sign
TD/TE	36	0.47	37	0.05*	40	0.07	37	0.34
CR	40	0.81	41	0.99	39	0.09	38	0.46
ATR	40	0.25	41	0.43	38	0.08	37	0.45

It has been noted that debt has been a major source of finance for manufacturing as well as service PSEs during the 17 years period of the study. *Inter-se*, the TD/TE ratio is higher at 1.85 in the case of service PSEs compared to 1.52 for manufacturing PSEs (Tables 15 and 17). Though, the relative proportion of external obligation is higher for service PSEs, statistically, the difference in the TD/TE ratio between service and manufacturing PSEs is insignificant (Table 19).

Table 16
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Leverage and Liquidity Ratios of the MoU Manufacturing PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
TD/TE	1.26	1.00	0.98	0.80	0.59	0.43	0.33	0.43	2.67	2.18	2.09	2.57
CR	2.00	1.66	1.70	1.65	1.22	1.17	1.25	1.21	2.88	2.74	3.04	2.35
ATR	1.38	1.21	1.30	1.25	0.72	0.78	0.94	0.80	2.24	2.39	2.49	1.89

Table 17
Mean Values of Key Leverage and Liquidity Ratios of the Service MoU PSEs, 1994-95 to 2010-11

Years	Leverage Ratios		Liquidity Ratios			
	TD/TE		CR		ATR	
	Mean	N	Mean	N	Mean	N
Mean 1994-95 to 1999-2000 (phase-1)	1.64	20	2.10	21	1.83	21
Mean 2000-01 to 2003-04(phase-2-before NCAER recom.)	1.74	17	1.97	24	1.70	24
Mean 2004-05 to 2007-08 (phase-2-after NCAER recom.)	2.28	17	2.01	24	1.56	23
Mean 2008-09 to 2010-11 (phase-3)	2.35	17	2.01	21	1.57	20
Aggregate Mean (1994-95 to 2010-11)	1.85		1.98		1.62	

Paired Sample T Test

Ratios	<i>Significance (two tailed test and degree of freedom (df))</i>							
	Phases-1 and 2 pre NCAER		Phase-2(pre and post NCAER)		Phases-2(post NCAER) and 3		Phases-1 and 3	
	<i>df</i>	<i>Sign</i>	<i>df</i>	<i>Sign</i>	<i>df</i>	<i>Sign</i>	<i>Df</i>	<i>Sign</i>
TD/TE	16	0.25	16	0.26	13	0.05*	14	0.05*
CR	20	0.06	23	0.81	20	0.67	17	0.44
ATR	20	0.23	22	0.65	19	0.45	17	0.64

Table 18
Median, Lower (Q1) and Upper Quartile (Q3) Values of Key Leverage and Liquidity Ratios of the Service MoU PSEs, 1994-95 to 2010-11

Ratios	Median			Q1			Q3					
	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3	Phase 1	Phase 2(pre and post NCAER)	Phase 3			
TD/TE	1.27	1.11	1.93	2.01	0.79	0.80	0.89	0.63	2.49	2.55	3.40	3.06
CR	2.00	1.65	1.32	1.33	1.21	1.17	1.05	1.13	2.83	2.36	2.22	2.23
ATR	1.56	1.57	1.14	1.26	1.09	1.03	0.95	1.06	2.53	2.25	1.75	1.86

Table 19
Independent Sample t-test of Key Leverage and Liquidity Ratios of the Sample Manufacturing and Service MoU PSEs during 1994-95 to 2010-11

Ratios	Variances	<i>t-test for Equality of Means</i>							
		Phase 1		phase 2 (Pre NCAER)		phase 2 (Post NCAER)		Phase 3 (3 yrs post recession)	
		<i>Df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>	<i>df</i>	<i>Sig.</i>
TD/TE	EV	56	0.73	53	0.82	56	0.06	56	0.10
	NEV	53	0.70	35	0.81	24	0.10	25	0.14
CR	EV	60	0.82	64	0.57	64	0.67	59	0.74
	NEV	36	0.83	47	0.57	37	0.70	32	0.76
ATR	EV	60	0.15	64	0.77	63	0.49	57	0.30
	NEV	38	0.16	55	0.76	49	0.48	44	0.28

However, as per trend, the decrease in debt-equity ratio has been noted over the phases (except phase 3) in the case of manufacturing PSEs (Figure 9); the decrease is statistically significant in phase two (2004-05 to 2007-08) and post-recession phase (2008-09 to 2010-11) as per Table 15. In contrast, there has been increased use of debt in the case of service PSEs, significant statistically in phases one and three as well as in phase two (post-NCAER) and phase three (Table 17 and Figure 10).

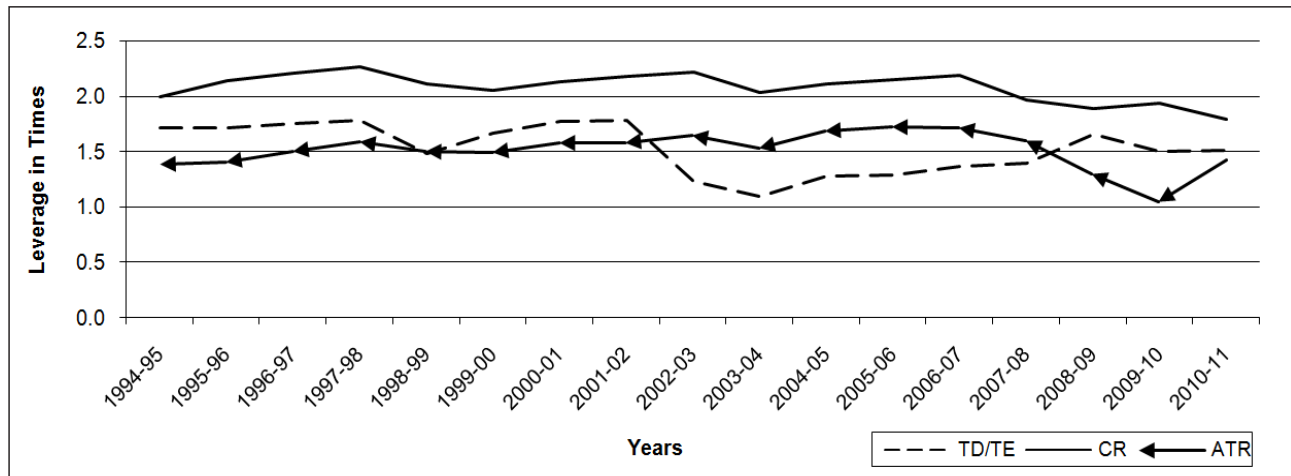


Figure 9: Mean Values of Leverage Ratios (TD/TE) and liquidity Ratios (CR and ATR) of the Manufacturing MoU PSEs for the Period 1994-95 to 2010-11

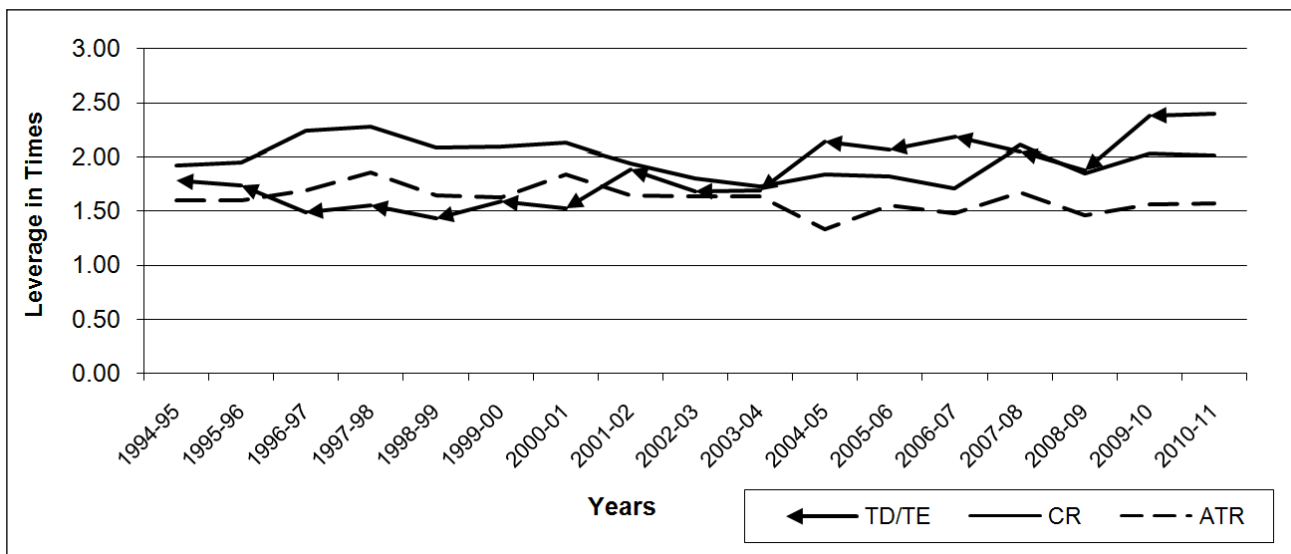


Figure 10: Mean Values of Leverage Ratios (TD/TE) and liquidity Ratios (CR and ATR) of the Service MoU PSEs for the Period 1994-95 to 2010-11

The data in respect of positional values is more revealing on the subject. The debt-equity ratio for three-fourth of the sample manufacturing PSEs is less than one (a satisfactory level) during phases two and three (Tables 16). Likewise, in the case of service PSEs, this ratio is less than one for one-fourth of PSEs (Table 18). In other words, debt level appears to be higher than warranted only in one-fourth of manufacturing and three-fourth of service PSEs.

In contrast to the above findings, set of liquidity ratios is satisfactory for both types of PSEs. Between the two, CR of the manufacturing PSEs have an edge over the service PSEs. However, the difference is not statistically significant across the phases (Table 19).

It is heartening to note that the acid-test ratio for both types of PSEs is higher than the desired norms of 1:1, the respective figures being 1.51 and 1.62 for manufacturing and service PSEs during the 17 year period of the study. Likewise, the current ratio (at 2.07) exceeds the desired norms of 2:1 in the case of manufacturing PSEs. Although, it is lower at 1.9 for the service PSEs, viewed along with ATR of 1.62, it is very safe to conclude that the sample MoU PSEs are not likely to encounter any problems in meeting their short-term maturing obligations on time. Apparently, they have felt almost negligible impact of recession. In view of the above, it would be appropriate to infer that MoU PSEs (service as well as manufacturing) has sound liquidity position and satisfactory level of debt.

6. MAJOR FINDINGS AND CONCLUDING OBSERVATIONS

Following are the major findings based on the analysis contained in the paper. It has been analyzed that among the PSEs signing MoU, profitability of manufacturing PSEs is better than that of service PSEs signing MoU. The positive performance (in terms of ROCE) has been observed in the one-fourth of manufacturing PSEs during post-recession period *vis-à-vis* pre-recession period; it is a matter of satisfaction since these PSEs were incurring losses in earlier two phases. On the contrary, negative ROCE has been noted during all the phases in the one-fourth of the service PSEs, it is indicative of erosion of capital employed in such enterprises.

Similarly, the debt-equity ratio of three-fourth of the sample manufacturing PSEs is satisfactory (less than one) compared to one fourth in the case of service PSEs. In other words, debt level appears to be higher than warranted only in one-fourth of manufacturing and three-fourth of service PSEs. Likewise, the liquidity position of both types of enterprises is satisfactory whereas between the two manufacturing has an edge over service PSEs.

However, service MoU PSEs have shown better performance in utilization of assets *vis-a-vis* manufacturing PSEs. In other words, positive effect of NCAER recommendations and minor effect of recession has been observed in service MoU PSEs. The turnover ratios of service MoU PSEs has shown a moderate increase over manufacturing MoU PSEs; it is indicative of under-utilization of total assets in manufacturing PSEs; *inter-alia*, the decrease assets turnover is primarily attributed due to decrease in CATR; except these two parameters, T test signifies no sector-wise variations in other financial performance parameters in both types of MoU PSEs. Whereas, it is worth to recall a significant increasing trend in all the turnover ratios during the first two phases of manufacturing MoU PSEs; the trend is reversed (decreasing) in the case of service MoU PSE.

The findings are in conformity with observations of Arnold et.al (2008) and Sangeetha (2005); they have emphasized that post-1991 growth of Indian manufacturing sector is based on trade liberalization, environment aspect and industrial de-licensing that has laid positive effects on the productivity of manufacturing firms and improved the environment in which PSEs operate through delegation of operational and functional autonomy to the managers. In view of salutary impact of MoU, it is suggested that the government should encourage signing MoU with the remaining PSEs.

The marginal impact of recession has been observed in few parameters only; in other words, recession has not affected, to a marked extent, the financial performance of these enterprises. Therefore, it is safe to conclude that MoU has not only enhanced the operational and productive efficiency of all MoU PSEs but also has improved the profitability position.

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