

Inventory Investment in Public Sector Undertaking in India

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Abstract—Globally, inventory investment is most importantly judged as a potential factor in the optimization of public resources used. Considering possible variability, inventory replenishment process becomes an extremely complex challenging task, since the lack of essential material may do more harm to the undertaking than the maintenance of a minimum stock of the same. In this scenario, inventory investment, one of the oldest questions of production management, still arouses much interest both in organisations and in academic. As compared to private sector undertakings, public sector undertakings face different challenges because their needs to fulfil multiple, often conflicting goals and are subject to financial, legal, contractual, staff and institutional nature restrictions. Thus, an analysis of inventory investment in the public sector undertaking applied in this context becomes justified and relevant. The findings of the study show that irrespective of the fact that the selected undertaking has been applying the tenets of good inventory management, it from time to time runs into the problems of inventory inadequacy. This consequently affects its profitability and consequential effectiveness negatively. This paper also provides recommendation to the undertaking and for further research.

Keywords: - Replenishment process, Inventory, Production management, Profitability, Investment.

1. PROLOGUE

Inventory generally occupies the most strategic position in the structure of working capital and important contribution to the maximisation of profit of a business enterprise. Inventory is the stock of any item or resource used in an organisation. Inventory is a double-edged sword; under investment leads to loss of productivity while over investment leads to loss of profitability. Investment in inventory is used as a cushion against the supply and demand uncertainties. Optimum investment by maintaining adequate and satisfactory levels of inventory capable of meeting the requirements of customers is the destination of inventory management. A firm, therefore, is required to maintain the optimum inventory. Any further accumulation of inventories beyond this optimum will be uneconomical. The dichotomy in inventory investment is that while increased procurement of inventories might lead to reduction in costs owing to bulk buying, it will also result over a time, in higher carrying costs. Inventories are recognised as

‘Graveyard of Business’ and the uncontrolled inventories as ‘Industry’s Cancer’. Galloping inflation, the credit squeeze imposed by the Government and the resultant general paucity of funds has focussed the attention of the nation on the crucial problem of inventories. The magnitude of the problem is such that it needs top priority of the nation. Apart from fire fighting and adhoc measures, hardly any organised approach seems to be in vogue in a majority of our organisations. For tangible results on a sustained basis, the basic causes lying at the root of the problem require to be identified and tackled effectively. To meet success, managers should seek the satisfaction of service levels through the pursuits of cost minimization. Undertakings should diversify monitor and manipulate their inventory system to suit specific needs of production, upkeep production consistency for undertaking’s profitability and effectiveness. Fortunately, public sector undertakings in India are paying attention in this regard and we are now hearing of ‘Inventory Control’ and ‘Materials Management’. But considering the inefficiencies observed in the manufacturing sectors, particularly in the public sector and inventory management and based on the above analogy, this paper has made an attempt to analyse the factors affecting the inventory position adversely in Steel Authority of India Limited (SAIL), a giant public sector undertaking in India. This paper also proposes a multiple suggestions based on field of study, which points to a better organisation and inventory control by achieving higher productivity of capital employed in them.

2. A BRIEF HISTORY OF STEEL AUTHORITY OF INDIA LIMITED (SAIL)

Steel Authority of India Limited (SAIL) incorporated on 24th January, 1973 is one of the largest state-owned steel making company based in New Delhi, India and one of the top steel makers in world. This public sector undertaking trading publicly in the market is largely owned by the Government of India and acts like an operating company focused on steel making SAIL has 79,601 employees and annual production of 13.9 million tons as on 1st October, 2017. It is the 24th largest steel producer in the world. As a part of its global ambition, SAIL is undergoing a massive expansion and modernisation

programme involving upgrading and building new facilities with special emphasis on state of art green technology. According to a recent survey, SAIL is one of the India's fastest growing public sector undertakings. In addition, it has Research & Development Centre for Iron & Steel, Centre for Engineering and Technology, Management Training Institute and SAIL Safety Organisation located at Ranchi, Capital of Jharkhand. Besides others, SAIL received SCOPE Meritorious Award for Environment Excellence & Sustainable Development in 2010, Wockhardt Shining Star CSR Award in the Iron & Steel Sector category in 2011 and Golden Peacock Environment Management Award in 2011.

3. RESEARCH METHODOLOGY

For the purpose of this study, the researcher has used both primary and secondary data as required for both qualitative and quantitative methods and utilised a descriptive survey research design as permitted an in-depth investigation of the problem under study¹. The researcher being an external analyst, has to depend mainly upon secondary data for the examination of the investment in inventories SAIL. Hence, the data required for the study have been called out mostly from the annual report and accounts of SAIL and from the 'on-the-spot studies' conducted in the years 2008 and 2017. The latest year for which data are available is 2017. The analysis, therefore, confines itself to the period from 2008 to 2017. Discussions, personal interviews and observation with the officials and the enterprise executives at the plant and the head office levels and different office bearers of the undertaking have been carried out with the help of questionnaires issued to the undertaking. Regarding the methodological framework, a case study has been choice to examine contemporary events and can handle varieties of evidences. In addition, case study is adopted as this method enables to answer different questions with full understanding of the nature and complexity of the phenomenon. Although, the use of single case study restricts the generalizability of the research findings and the development of new theories, this method has the opportunity to make deeper observations about the object of study. As this study does not have as target the development of new theory, rather it aims to examine the application of the existing practice in inventory management, the single case study is sufficient, despite its aforementioned limitations. Moreover, simple random sampling method is used in selecting the respondents and obtaining the respondents for the questionnaires in the undertaking. Structured questionnaires are used since they are simple to administer and will ease the data analysis process². Reliability is tested using Cronbach's alpha scores.

4. LIMITATIONS

The study suffers from the following limitations: -

- 1) Most of the data used in this paper are secondary and this paper is related with financial variables; so there may be some variations.
- 2) This study based on only one public sector undertaking may reflect some partial view.
- 3) In this study, only 10 years' data is taken as the period of time commencing from 2008-2017 which is a short period of time.
- 4) Inflation, the most crucial factor being not for financial terms is not considered in any type of interpretation.
- 5) Ratio is used as statistical tool to interpret the data.
- 6) Detail study about all the materials has not been possible because of time constraint, secrecy of the stores department, lack of prior reference sources, skill, experiences, etc.

5. OBJECTIVES

The broad objective of this research is to examine the inventory investment problems and seek the best recommendation to be practiced by the undertaking to improve its inventory position while the prime objectives are: -

- 1) To diagnose and analyse the factors responsible for affecting the inventory position in SAIL, the selected public sector undertaking in India;
- 2) To offer suggestions or measures to tackle the problems of inventory investment reasonably so that the undertaking can run efficiently and effectively.

6. LITERATURE REVIEW

- 1) Chakravarty, A.M.³ in the study of "Inventory Stabilization" defined inventory in commercial usage as detailed schedule of goods held at a particular point of time, expressed in quantities and values. He concluded that with fluctuating sales both high inventories turnover and low labour turnover are not simultaneously attainable. Compromise can be reached by way of careful preparation of budgets of production inventory.
- 2) Paul N.K.⁴ carried out the study of "Inventory Control" in which, one question is raised that whether rate of return is crucial in deciding whether firm is profitable or not? He observed that successful inventory control raises rate of return.
- 3) Bandyopadhyay J.⁵ in the study of "Inventory Reduction" opined that the management of inventory is crucial part and optimum stock level reduces several botheration of production flow and finance blocking. The pattern of investment in inventory is 60% in moving, 30% in slow moving and 10% in non-moving items of inventory.
- 4) Shah B.R.⁶ in the study of "Investment in Inventory- A Critical Review" observed that an upward trend in investment in inventory affected profitability. Hence,

management of inventory is equally important for reduction of investment and improvement in profitability. Efficient management of inventory carrying costs reduces cost of production which, in turn, leads to improved profitability.

- 5) Gansha M.K.⁷ in the study of “Control and Management of Surplus Inventory” observed direct impact of stock on demand, supply and price level. Efficient management, results in reduction of costs.
- 6) Munish⁸ discussed the “Selective Inventory Control Techniques” with an object of inventory control and their impact on inventory control and reporting policies in selected Indian enterprises like Engineering, Chemicals, Cotton Textile and Miscellaneous. He concluded that the ABC analysis was the most popular technique for inventory control used by three-fourth firms.
- 7) Koumanakos⁹ studied the effect of inventory management on firm performances. The findings suggest that the higher the level of inventories preserved by a firm, the lower the rate of return.
- 8) Orga¹⁰ defines inventory control as a process of ensuring that the right quality of the relevant stock is available at the right time and in the right place.
- 9) Bourne and Walker¹¹ say company performance depends on many variables e.g. sales, marketing, good human resource, less production cost, success inventory, etc.
- 10) Desselle and Zgarrick¹² define inventory management as the continuing process of planning, organising and controlling inventory that aims at minimising the investment in inventory while balancing supply and demand.

7. INVENTORY INVESTMENT – THEORETICAL FOUNDATION

Judicious investment in inventory is regarded as a key element for the reduction and control of total costs and improvement of the level of service provided by the undertaking. This area plays a very important role in the overall cost of operations and supply chain of any business big or small. Thus, inventory management has significant influence on operational performance and corporate finances. Effective inventory management gives a competitive advantage to the business over its competitors.

8. ANALYSIS OF INVENTORY INVESTMENT IN THE PUBLIC SECTOR UNDERTAKING IN INDIA

Table-I (Part-1 & Part-2) shows analysis of inventory investment. Table-I shows inventory investment, gross fixed assets, total capital employed, value of production, cost of production, sales and net profits after tax of the selected undertaking during the period from 2008 to 2017. Inventory

investment of the undertaking varies between Rs. 6,857 crores in 2008 and Rs. 15,711 crores in 2017 during the period under study. The highest investment in inventory of Rs. 17,736 crores is observed in 2015 and lowest of Rs. 6,357 crores is in 2008. Inventory investment increases by 129.12% (or, 29 times) from 6857 crores in 2008 to 15711 crores in 2017, while gross fixed assets have increased from Rs. 30923 crores to Rs. 48768 crores or by 57.69% (or, 1.58 times). However, in spite of the increase in gross fixed assets and inventories, inventories are not accompanied by a similar rise either in the value of production or in the sales of the undertaking. During the study period, value of production increases by 6.93% (or, 1.07 times) while there is 7.96% (or, 1.08 times) rise in the sales. Thus, the phenomenal increase in the production and sales not accompanied by so much increase in inventories reveals somewhat distorting picture regarding inventory growth rate.

9. INVENTORY ACCUMULATION IN THE PUBLIC SECTOR UNDERTAKING

The study of the investment in inventory has shown in very broad terms that the rise in ‘production’ and ‘sales’ has positively contributed to its growth in the selected public sector undertaking, but it does not disclose the status of investment of the undertaking. While it is difficult to lay down single standard to assess in precise terms the adequacy or otherwise of the inventory, there are certain ratio tests, which provide a good insight into the extent of overstocking or under stocking. The common determinants are the value of inventory expressed into months’ cost and value of production. According to the Tariff Commission¹³, inventory in the public sector undertakings should not exceed four to six months’ value of production. The CPU¹⁴ in its report on the working of materials management in public sector undertaking have considered the level of six months’ production reasonable. Inventories in SAIL are held equivalent to 3.01 months’ to 5.47 months’ cost of production. Thus, the study shows that the inventory holding in SAIL has been always within the norm set by the Tariff Commission and the CPU Report. Although the undertaking, of late, has tried to reduce its inventory holding in terms of either months’ cost or value of production from time to time, but this might not be called highly impressive if judged in the light of frequent variations in the different years of study. The selected undertaking may reduce its inventory holding at least to the level with a view to bringing them on a par with the production and sales in this regard; then, a portion of capital locked up in inventories would be released for gainful employment in some other essential development programme or projects which will reduce the inventory carrying costs and consequently, performance of the undertaking would be improved more and more.

Measured in terms of value of production also, inventory holding in the public sector undertaking is relatively small. Inventories are held equivalent to 3.03 months’ to 4.27

months' value of production as shown in Table- 1. Although, of late, the undertaking has tried to reduce its accumulation in terms of either months' cost or value of production from time to time, but this might not be called highly impressive owing to its frequent variations in different years of study.

10. SIGNIFICANCE OF INVENTORY HOLDING IN THE PUBLIC SECTOR UNDERTAKING

The significance of inventory holding in an enterprise or undertaking is mainly reflected in (i) the ratio of inventory to total capital employed; (ii) the ratio of inventory to value of production; and (iii) the ratio of inventory to sales. The high ratios indicate that the undertaking is run uneconomically mainly owing to relatively large inventory accumulation, and vice versa.

- i. **Ratio of inventory to total capital employed:** - Table-1 reveals that inventory constitutes 21.65% in 2010 to 51.01% in 2013 of the total capital employed during the study period. In 2013, the ratio is more than 50%, in rest of the cases; the ratios are more than 21%. On an average, inventory constitutes 33.01% of total capital employed. However, in recent year the ratio has increased slightly from 28.65% in 2016 to 28.84% in 2017; but this might not be called a highly satisfactory position rather moderate. The ratios have also varied frequently during the period of study.
- ii. **Ratio of inventory to value of production:** - This ratio is another criterion of inventory soundness. Measured in relation to value of production, inventory investment in the public sector undertaking has been relatively moderate during the study period. This ratio varies between 14.78% in 2008 and 33.89% in 2016 in the public sector undertaking. The ratio of inventory to value of production is, on the average, 26.35% in the public sector undertaking. Inventories in terms of value of production and in terms of cost of production were, on an average, 3.16 months' and 4.28 months' respectively in the public sector undertaking. The moderately high ratio in the public sector undertaking indicates that inventories are accumulated without much relation to the volume of anticipated production.
- iii. **Ratio of inventory to sales:** - Inventory to sales relationship gives a measure how long the inventory will last at present sales. Over and underinvestment can be ascertained by rate of inventory turnover. A low turnover indicates an underinvestment in inventory and a high turnover indicates overinvestment. It is observed from the table that in 2009, 2011, 2012, 2013 and 2015, the inventory to sales ratio has increased; by contrast, in the remaining years the same has decreased. This ratio ranges between 15.05% in 2008 and 35.03% in 2015 during the study period. On an average, the ratio is 27.03%. The study of variations of the inventory to sales ratio reflects

moderate economic aspect of inventory accumulation in the undertaking.

Table also evidences that barring a few cases, inventory-sales relationship, inventory-value of production/cost of production relationship and inventory- net profit after tax relationship are significant. From the foregoing analysis it is apparent that inventory investment in the public sector undertaking has been relatively moderate, viewed in relation to total capital employed, value of production and sales. The study of variations of the different ratios shows that the inventory investment in the undertaking has not been very impressive; the undertaking has followed rather moderate economic aspect of inventory.

11. FACTORS AFFECTING THE INVENTORY POSITION IN THE SELECTED UNDERTAKING

Inventory investment in SAIL has not been very impressive. The factors responsible for adverse inventory position are: - (i) Government is of the view that material holding of the undertaking varies and depends upon the nature of projects and inventory management. Materials management embracing a wide range of functions like planning of materials, purchases, control on inventory, warehousing, disposals etc. directly or indirectly affects the flow of materials used in the industry, their conservation, utilisation, quality and costs. The importance of the purchasing activity may be learnt from the fact that the average industrial firm spends substantial portion of its income on purchases of raw materials. (ii) Improper storage, care and custody of the materials generally lead to indiscreet buying which ultimately results in unscrupulous accumulation of inventory. (iii) Inadequate attention on the part of the management leads to inconsistent accumulation of inventory which mostly happens due to dependence on the advice of the suppliers or collaborators. Improper control over purchases of spares, parts, etc., absence of suitable system to determine periodically the surplus, unserviceable and/or obsolete stores, etc., old mechanism for disposal of surplus stores, mostly absence of any lower/or upper limit laid down for stocking of finished and semi-finished goods have also attributed much to uneconomical accumulation of inventories in the undertaking from time to time. On-the-spot studies reveal that SAIL has carried a surplus of stores and spares which have been either declared obsolete or not have been used for a considerable time or will not be required by the consuming department or any other section of the plant in near future. (iv) Difficulty also arises due to insufficient experience of managing the inventory in proper perspective, underutilization of capacities, etc., leading to accumulation of inventories. (v) Absence of sufficient classification and codification in the undertaking has led to accumulation of identical items in many cases. (vi) Mostly, the purchases are made on 'emergency' basis due to improper planning. This leads to accumulation of stores. By and large, there is no suitable system devised by SAIL which automatically replenishes exhausted stores, based on minimum, maximum

and re-order levels. In many cases, no analysis is made of inventories on the basis of their consumption value and importance. Consequently, there cannot be any proper control on inventories. Besides these, uncongenial organisation, inexperience in regard to the working of the plant in the prevailing conditions, inordinate delays in the release of foreign exchange, transport bottlenecks etc. might be the other reasons which have pressed the undertaking to accumulate the different types of inventory uneconomically from time to time.

12. CONCLUDING OBSERVATION

Inventory investment in SAIL as a problem is recognized quite late. From the foregoing study, the following inferences can be drawn: -

- 1) Inventory ratios do not help us in drawing conclusions about the inventory level. The turnover ratio, to some extent, takes care of the growth in value, but conclusion cannot be drawn that the inventory level is adequate. Optimum inventory level can only speak about the status of actual inventory level.
- 2) Only "Indent Control" and "Consumption Control" by the user groups can make the "Inventory Control" effective.
- 3) On the spot studies reveal that due to ambiguity in specification, wrong materials are procured which unnecessarily lead to increase of non-moving items.
- 4) SAIL has installed plant and equipments in collaboration with British and American experts; accordingly, with the age of the plants the requirements of spares and replacement items have escalated. But due to economic condition, the Government has to impose drastic cut in imports. The absence of proper indigenous manufacturer and lack of commonality between various steel plants has given birth to the idea of inter-plant standardisation in steel industry.
- 5) Non-moving items known as "Risk Insurance Spares" are highly responsible for carrying high inventory.
- 6) In ideal situation, there should have been no investment in inventory, but practically it is impossible to operate without some backup stock to take care of contingencies.
- 7) Most of the present stockyards have limitation in space and suffer from inadequacies in handling.
- 8) According to the visits and interviews conducted and as part of the observation, it has been observed that SAIL has not been using proper inventory control and storage methods and management models. Sometimes constant differences between the stock sheet in the warehouse and the system logs are found. Besides, the previously installed system does not allow the control of lots of materials as well as their validity. As a consequence, materials are expiring and being held in stock, even without being able to be used.

- 9) Purchase orders are triggered based on intuition and experience of the buyers disregarding often even the inventory level registered in the system causing materials shortfalls to the undertaking and sometimes loss of materials due to obsolescence.
- 10) Very often, excess of materials unused and lack of materials required cause an inventory imbalance. Situations of lack of materials cannot be easily contained owing to the stiffness of the procurement system in the public sphere and the long lead-time.
- 11) Lack of procedures and inventory control bring the problem of lack of space in the warehouse and improper storage causing the cycle of inventory imbalance.
- 12) Large organizational structure is the most evident characteristic of inventory imbalance in SAIL.
- 13) Political interests of the employees, the security caused by job stability, lack of training and aversion to formal control, difficult to implement system improvements and corroborate to the inefficiency of the process also create obstacles to satisfactory inventory control. Inadequate inventory management cannot meet the aspirations of customers resulting loss of revenue to the organisation.
- 14) Adversarial short-term relationships with suppliers pose a challenge to the procurement function of the undertaking.
- 15) Fortunately, use of information technology application, legal policies, etc. improve the performance of the procurement function by reducing errors, waste and adhering to legal framework, guidelines, etc.

13. SUGGESTIONS

Although various measures have been adopted so far, the basic causes remain untouched which require distinguished and tackled effectively. However, the following suggestions are recommended to overcome the problems of inventory investment in the selected public sector undertaking: - (i) A better and vigilant purchase department with separate 'Inventory Management Department' having a high status and trained and talented personnel can help a great deal in preventing accumulations of inventory in many cases. (ii) The public sector undertaking should take every care towards materials management and the application of various scientific techniques to control inventories and to keep the level of inventories as low as possible. (iii) The public sector undertaking should review the systems prevalent in the undertaking about planning and purchasing of stores and spare parts and review the items to ensure that the undertaking is not burdened with excessive stock. (iv) All the items in the stock should be properly classified and codified taking into account the price changes in recent years. 'Selective Inventory Control' (ABC analysis) will greatly help in concentrative efforts to control inventory in areas necessitating urgent need. (v) Planning and programming of materials should be such

that no occasion should arise for emergency purchase except in unforeseen circumstances. Norms for the stocking of materials, finished goods and stores & spares are to be laid down on scientific basis and are to be strictly adhered to. Close liaison between production department and materials management department be made. (vi) Ordering system for inventory procurement is usually governed by capacity and convenience of the buyer. Factors determining economic order quantity are not in some cases systematically taken into account by the undertaking. Unplanned and 'rush' purchases of stocks and stores should give place to orderly procurement. Delays in placing purchase orders or in obtaining stocks result in waste and mounting costs. Dependence on imports for spares and parts also contributes to this. Therefore, economic order quantity should be worked out systematically in the undertaking. (vii) Periodical reports to top management about various aspects of materials management will enhance the grip of the management over inventory control. It is also suggested to lay down both physical and financial ceilings based on production programmes, budgeting, forecasting etc. so that proper control on inventories can be exercised. (viii) Proper inspection and maintenance of statistics for rejected materials be made to minimise losses. (ix) SAIL need activate its sales department, take firm decision on the range of products and enter into firm contract with its customers. (x) Stores and spares inventory can be reduced if the programme for import substitution is given due encouragement and ancillaries are developed around the undertaking to cater to its needs. (xi) Inefficient staff, uncongenial organisations, poor quality of materials, transport difficulties, inordinate delays in the release of foreign exchange, lack of storage cum custody facilities etc. causing wastage can be remedied with due attention to these aspects of materials management. (xii) It becomes essential to attach suitable importance; status and recognition to the inventory control function and administer the management of a great change with the full support and backing of the top management. (xiii) Items where the consumption norms can be reduced should be identified and revised norms should be set with the help of techno-economists. (xiv) Considerable savings can be achieved by controlling the drawl of stores and spares to avoid a build up on the shop floor. Items already drawn and held in the shops need to be utilised first to ensure a reduction in the overall inventory holding. (xv) Reclamation of the worn out parts through specialised processes available can reduce the pressure of demand for spares on the one hand and affect economy on the other. (xvi) Captive facilities for manufacturing/reconditioning of spares can be effectively utilised to bring reduction in outside procurement and thus lowering of inventory levels. (xvii) Commonly used items should have control procurement and transferability. (xviii) For effective inventory investment, the items of regular use should be brought under stock control and by this process the indenting function can be shifted from field executives to the stock controller and thus the divided responsibility may be eliminated. (xix) Instead of maintaining the status quo, the task of inventory management should be done through proper

selection, recruitment and training of the staff responsible for this work. (xx) Inventory management requires cooperation, involvement, participation, recognition, suitable status of several departments from top level to bottom level to remove all misconceptions amongst the staff. (xxi) Action may be required for development of infrastructure facilities where infrastructural inadequacies lead to high inventory. (xxii) Creation of second tier and third tier distribution can supply matching section to the industry in time. Dealers can be encouraged to set up slitting and other facilities to cater to the need of the industry. (xxiii) As a large portion of the total sales of iron and steel are shared by SAIL, this huge quantity is to be distributed and reached in the hands of customer living at the different corners of this vast country. It is to be kept in mind that it is a national problem apart from the problem of inventory. (xxiv) With the help of consumption budget, inventory at the end of the year can be forecasted and effective control measures can be established. (xxv) Close liaison between production department materials department are to be maintained under any circumstances. (xxvi) Supplier's appraisal by the procurement function should be a key element in inventory management as it helps evaluate the suppliers and chooses the best from the many and develop long-term round table relationships with them. (xxvii) SAIL should install appropriate inventory control technique to increase asset turnover ratio, inventory turnover ratio, return on assets, etc. (xxviii) Total inventory is suggested to be segregated into high, medium and low price before it can be rearranged based on department, brand, merchandise and category. (xxix) The undertaking is suggested to improve cycle counting where a small subject of inventory, in a specific location, is counted on a specified day by skilled worker. (xxx) Management should closely monitor and manipulate their inventory system to maintain production consistency for organisational profitability and effectiveness. (xxxi) Cost minimisation techniques should be employed in the keeping and allocation of inventory. (xxxii) The undertaking should diversify its inventory system to suit specific needs of production and maximize its space to timely deliver in order to avoid staying off production.

14. CONCLUDING COMMENT

This study relates to investment in inventory position of SAIL, a public sector undertaking in India. As conclusion, it is worth noting that despite the recent modernisation of the plant, it still needs more efficient management models. Thus, the adoption of modern management techniques from other sectors can bring positive results to the processes. But, at the same time, it is important to emphasize the need to adapt these techniques to the reality of the public sector undertakings. Finally, it is important to recognize the limitation of this work i.e. a single case study does not permit generalisation of the results. However, since it has been chosen as object of study a public sector undertaking with more than four decades of existence and globally recognised for its quality, the researcher believes

that an adaptation of the results to other public sector undertakings can be easily made. Inventory problems of too great or too small quantities can cause business failures. Management of inventory investment, of late, has highly developed to meet the rising challenges in most of the corporate sectors which might be the positive response to the fact that inventory is an asset of distinct feature. The researcher also believes that if the recommendations are followed by SAIL, it should be able to improve the inventory management practice and lead to better performance.

15. RESEARCH OPPORTUNITIES

Areas like lean inventory system, strategic supplier partnership, modern information technology, legal policies, etc. in inventory investment position affecting the performance of procurement function of SAIL are recommended for further research in future. The researcher also suggests to include more samples in future research because one undertaking might not reflect the actual problem of the unit. It also generates better statistical analysis results especially testing relationships between inventory management and company performance. The gap remains as to how inventory management can guarantee the performance of the procurement function in a manufacturing undertaking. A gap also exists between inventory theory and practice as regards the procurement function. No comprehensive study has been still done on the effect of inventory management on the performance of the procurement function of manufacturing companies. Hence, further study intends to fill this gap.

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CPU, BPE No. 9(28) Fi/67/Cir/Adv. (U.I., dated 16th October,1967.TABLE – I (Part -1)

Inventory Investments in SAIL, the selected public sector undertaking in India

Year	Inventory (Rs. in crores)	Gross fixed assets (Rs. in crores)	Total capital employed (Rs. in crores)	Value of Production (Cost of production) (Rs. in crores)	Sales (Rs. in crores)
2008	6857	30923	28450	46385 (27342)	45555
2009	10121	32739	34704	51243 (34271)	48738
2010	9027	35396	41696	43363 (28756)	43935
2011	11303	38263	39431	49138 (34389)	47041
2012	13742	15748	32921	52791 (39707)	50348
2013	16008	15235	31381	52380 (39923)	49350
2014	15201	25257	38450	51825 (37680)	51866
2015	17736	34658	48314	52724 (38923)	50627
2016	14680	44379	51238	43323 (37058)	43294
2017	15711	48762	54476	49598 (41373)	49180

Source: - Annual reports and Accounts of SAIL – Results Computed.
Note: - Figures in brackets indicate cost of production.

Table – I (Part -2)
Inventory Investments in SAIL, the selected public sector undertaking in India

Year	Inventory as % of Total capital employed	Inventory as % of value of production	Inventory as % of Sales	Inventory in terms of no. of months of value of production	Inventory in terms of no. of months of cost of production	Net profits after tax (Rs. in crores)
2008	24.10	14.75	15.05	1.77	3.01	7537
2009	29.16	19.75	20.77	2.37	3.54	6170
2010	21.65	20.82	20.55	2.50	3.77	6754
2011	28.67	23.00	24.03	2.76	3.94	4905
2012	41.74	26.03	27.30	3.12	4.15	3543
2013	51.01	30.56	32.44	3.67	4.81	2170
2014	39.53	29.33	29.31	3.52	4.84	2616
2015	36.71	33.64	35.03	4.04	5.47	2093
2016	28.65	33.89	33.91	4.07	4.75	-4021
2017	28.84	31.68	31.95	3.80	4.56	-2833

Source: - Annual reports and Accounts of SAIL – Results Computed.

Note: - Figures in brackets indicate cost of production.