

IMPACT OF TOTAL COST MANAGEMENT ON PROFITABILITY: A STUDY WITH PARTICULAR REFERENCE TO SAIL

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ABSTRACT

Total Cost Management is an integral part of management through which managers urge to control costs so that the objective(s) of a firm can be achieved in an efficient and prudent manner. It is the effective application of professional and technical expertise to plan and control resources, costs, profitability and risk. The present article has been divided into two parts viz. conceptual framework and Case Study. This paper makes an attempt to assess the impact of total cost management on profitability of SAIL on the basis of available data collected from published Annual Reports of the company over the period of 10 years (i.e. from 2000-01 to 2009-10). The available data have been analyzed by using important statistical tool viz. correlation and statistical test viz. students' 't'-test, has been applied to test the significance of the results of the empirical study.

KEYWORDS: *Total Cost Management, Profitability, ROI.*

INTRODUCTION

The goal of the rational customers is to make the most practical purchase of available products that will perform their function timely and can be operated cost effectively. This assumes that the buyers' perception of the value and benefits received from the product is driving the purchase. In the market oriented economy; organizations are striving to offer customers maximum value at minimum possible price. Since they have more control over cost than price, the obvious option is to turn towards cost management to access the seemingly paradoxical situation of offering more value at lesser price and still maintaining the profitability. This call on cost management requires

an integrated approach involving both strategic and operational areas, a system that pervaded through the organization, horizontally as well as vertically. Total cost management (TCM) is generally associated to this call. Cost management is the key to manage costs. Good practical in total cost management, involves accounting and applying cost information to provide relevant cost performance measurement with an objective of enabling organizations to deliver increased value to customers. Cost management also facilitates better understanding of application of resources in the activities, behavior of products/ processes and ultimately the profitability can be achieved. TCM tools can be applied to achieve the objective of cost management through precise cost measurement.

LITERATURE REVIEW

Gao (2009) made an attempt to study and analyze the relevant issues relating to cost control and management of real estate project. By analyzing the cost structure of real estate construction, this paper identifies problems in cost control and management of real estate construction at present. The study concludes that the cost control and management of real estate construction is a systematic project. It depends on all participators' dedication. The guidance thought for cost control and management of real estate construction is in accordance with the idea of building a resource-saving society in China. This paper is supposed to exert certain effect on China's real estate construction with the hope of benefitting the cost control and management of real estate construction in future.

Ferrin and Plank (2002) performed exploratory research in the availability of life cycle cost and total ownership cost analysis models. Many leading companies used the models with a focus on value purchase opportunities but "firms are unsure of their ability to effectively identify the critical cost drivers for estimating total cost of ownership" (Ferrin & Plank, p.24). They noted that "the study suggests a generic model of total cost of ownership is not appropriate. However, the findings suggest a TCO model based on a core set of cost drivers, along with an auxiliary set of cost drivers, is appropriate" (p.18). No single solution will meet the needs for all total ownership cost models. They contended purchasing managers could use a core set of cost drivers and additional tailored drivers for computation in a particular purchase situation. They also noted, "it is also suggested that a value based multi-firm or supply chain TCO computation model is needed" (p.18).

Ahgren and Wierda (2007) found that the implementation of total ownership cost strategies provides the decision makers with effective methods for evaluating cost and comparing alternatives that reduce total net cost.

King (2007) studied a decision-making framework for total ownership cost management of complex systems using a modified Delphi method. It was conducted to develop a decision making framework for the total ownership management of complex systems in the aerospace industry. The primary focus of total ownership cost is to look beyond purchase price when evaluating complex system of life cycle alternatives. The resultant study framework provided the business leader with incentives and methods to develop and implement strategies for controlling

and reducing total ownership cost over the entire product life cycle when balancing cost, schedule and performance decisions.

Ellram and Siferd (1998) examined total ownership cost as a key concept in strategic management decision making in a case study of all organizations. The case study provided a robust view of both internal and external cost management to enhance competitive advantage. The cost study determined manufacturers rely heavily on suppliers “purchase items make up an average of 63.5 percent of total costs for manufacturing firms and 25 percent for non-manufacturers.” The availability and accountability of the data necessary to calculate TCO are provided as a barrier to implementation.

Milligan (1999) determined, “accurate total cost management is illusive because most organizations either don’t understand the calculations or don’t have or won’t share the data necessary for such calculations” (p.22).

Hollmann (2006) studied the total cost management framework- an integrated approach to portfolio, program and project management. Simply stated TCM is a systematic approach to managing cost throughout the life cycle of an enterprise, program, and facility, project, product or service. It is a framework that highlights and differentiates the main cost management application areas namely project control and strategic assets management. The intent is that the TCM framework will be studied, applied and continuously improved by a world-wide audience from all industries thereby advancing the profession of cost engineering and cost management.

The Total Telecom Cost Management Solution Section Report (2006) recommended that enterprises start by determining which delivery model is most appropriate for their environment and then assessed TTCM Solutions in five primary areas capabilities for inventory tacking, assets management, implementation plan, supplier domain enterprise, supplier financial health and future vision and overall program value/price. This report will help to address challenges in evaluating TTCM Solutions. In addition, the report helps companies to assess their gaps in their current environment, solution requirements, how to select the best-fit solution and guidelines for the implementation.

PURPOSE OF THE STUDY

The main objective of the present study is to provide an insight into the conceptual side of total cost management and to assess the impact of total cost management on profitability of SAIL on the basis of available data collected from published Annual Reports of the company over the period of 10 years (i.e. from 2000-01 to 2009-10). The specific objectives of this study are as follows:

- i) To measure, test and evaluate the total cost management position of SAIL.
- ii) To determine the profitability position of SAIL.

- iii) To find out the degree of association between the ratios of selected key elements of cost to total cost with the measure of profitability (viz. ROI) of the company under study.

DATABASE AND METHODOLOGY

The study is mainly based on secondary sources of information. The required data have been collected from the published annual reports of the company SAIL and also from the published annual reports of the Public Enterprise Survey by the Ministry of Heavy Industries, Govt. of India over the period of ten years i.e. 2000-01 to 2009-10. For collecting relevant data for the purpose of conducting this study internet surfing has also been done for obtaining the requisite and latest information. Editing, classification and tabulation of the financial data collected from the above mentioned sources have been done as per requirement of the study. In order to analyze the data the ratios of some vital elements of cost to total cost and an important tool of measuring profitability have been calculated on the basis of available data for the selected company under study. The ratios which have been applied for highlighting the proportion to total cost are Raw Materials cost to Total Cost (RMTC), Power & Fuel Cost to Total Cost (PFCTC), Employee Cost to Total Cost (ECTC), Other Manufacturing Cost to Total Cost (OMCTC), Selling and Administration Cost to Total Cost (SACTC) and Miscellaneous Expenses to Total Cost (METC) and the measure of profitability which has been selected is Return on Investment (ROI). For assessing the degree of association between the ratios of some selected elements of cost to total cost with the profitability, Pearson's Simple Correlation Coefficients have been applied. To examine the significance of the computed values of correlation coefficients 't' test has been used.

SECTION-I

CONCEPTUAL FRAMEWORK

WHAT IS TOTAL COST MANAGEMENT (TCM)?

Total cost management is a company-wide systematic and structured approach, which provides a holistic framework to control, reduce and eliminate costs, throughout the value chain. This process of managing the financial outcome of activities encompasses all operations- internal and external. For these reasons, TCM is one of the most powerful tools that corporations can wield in their quest for competitive advantage. It consists of both visible and invisible costs. Directly visible costs are (a) cost to resolve downtime (b) technical support costs which include the cost of help desk, support staffs, tools, and payments to vendors and (c) administration and management costs to supervise the support staffs and to do vendor management. The other part of TCM which is usually not visible, but significant like the lower portion of an iceberg is the hidden costs. These hidden costs consist of (a) productivity loss of all affected employees due to downtime and (b) revenue loss to the organization because of outage. Key elements of TCM are activity-based costing, process value analysis and performance measurement. These tools have increased cost accuracy and have identified and eliminated duplicative and non-value added

activities. TCM is the effective application of professional and technical expertise to plan and control resources, costs, profitability and risk.

ACTIVITY BASED COSTING

OVERVIEW: Activity Based Costing (ABC) addresses internal operating concerns and is an augmentation to the traditional General Ledger based cost management system. It is not a replacement for traditional accounting, but makes use of the source documents provided from standard job costing systems. Instead of being heavily labour based, ABC looks at a business unit's events as cost drivers and ascribes all company resources and accumulated costs against those events in a time-phased sequence. Revenue tracking provides management with a different perspective on the profitability of products and services, providing insight into pricing. Middle management and technical performing organizations are involved in the line item reporting provided within the ABC system, enabling management to achieve more responsibility of reported information throughout all levels of the organization. ABC is being professed by the accounting industry as the wave of the future and is gaining broad acceptance within larger organizations. This system is intended to serve performing entities and management alike. The key ingredient is integration: that is true integration, of scheduling and cost management systems.

VALUE CHAIN CONCEPT

A value chain can be defined as a sequence of productive processes from the provision of specific inputs for a particular product to its primary production, transformation, marketing and distribution, and final consumption. A value chain systematically takes all steps of a production process into account. It analyzes the links and information flows within the chain and reveals the strengths and weaknesses in the process. It also analyzes the boundaries between national and the international chains, takes into account buyer's requirements and international standards, and allows international benchmarking. The value chain approach addresses the so-called critical success factors that determine if a product meets market requirements with regard to quality, price, dependability, volume, design and speed of delivery, and consequently, improves competitiveness. Value chains generally include three or more of the following factors: producers, processors, distributors, brokers, whole sellers, retailers and consumers. The partners in the value chain work together to identify objectives; they share risks and benefits; and invest time, energy and resources to make the relationship work. Value chain promotion is the development of each stage in the value chain to enhance the competitiveness of the industry. For example, the introduction of new processing technologies can ensure quality production; however, working at the production end of the chain is not enough. This must be coupled with efforts to market and distribute products. Value chain promotion works with all stages of the value chain, thereby having a greater impact on development of the industry as a whole. In this rapidly globalized world, the application of the Value Chain Analysis (VCA) is increasingly

important and widely considered in SMEs development (Kaplinks and Morries, 2000) due to:

1. The increasing importance of a systematic competitiveness as a result of the growing division of labour and the global dispersion of the production of components.
2. The increasing importance of improving production efficiency to compete globally. However, efficiency in production is only a necessary condition but not a sufficient condition for successfully penetrating global markets.
3. An increasing number of developing countries engaging in contract manufacturing increase pressures of competition. In order to maintain sustained income growth, an understanding of dynamic factors within the whole value chain is required.

FINANCIAL APPRAISAL

Financial appraisal is a scientific evaluation of the profitability and financial strength of any business concern. Financial performance can be determined through financial analysis which reveals the significant operating and financial characteristics of a firm from accounting data and the accounted data is presented in the form of financial statement. In the interest of sound financial policy, every company must analyze its accounts periodically. The preparation of financial statement is not the end. The purpose of preparing these statements is an attempt to determine the significance and meaning of the financial statement data, so that a forecast may be made to the prospect of future earnings, ability to pay interest, debt maturities, both current and long-term as well as probability of a sound dividend policy. According to Henry G. Guthman, the first and most important function of financial statement is of course, to serve those who control and direct the business, to the end of securing profits and maintaining a sound financial condition. Analysis and interpretation of financial statements refers to such a treatment of the information contained in the income statement diagnosis's the profitability and financial soundness of the business.

COST CONCEPTS

TYPES OF COST: Total fixed costs (TFC), Average fixed costs (AFC), Total variable costs (TVC), Average variable cost (AVC), Total cost (TC), Average total cost (ATC) and Marginal cost (MC)

FIXED COSTS (FC): Fixed Cost denotes the costs which do not vary with the level of production. FC is independent of output. E.g.: Depreciation, Interest Rate, and Rent, Taxes. Total fixed cost (TFC): All costs associated with the fixed input. Average fixed cost per unit of output:
 $AFC = TFC / \text{Output}$

VARIABLE COSTS (VC): Variable Costs is the rest of total cost, the part that varies as you produce more or less. It depends on Output. Eg: Increase of output with labour. Total variable cost (TVC): All costs associated with the variable input. Average variable cost- cost per unit of output:
 $AVC = TVC / \text{Output}$

TOTAL COSTS (TC): The sum of total fixed costs and total variable costs: $TC = TFC + TVC$
Average Total Cost Average total cost per unit of output: $ATC = AFC + AVC$. $ATC = TC / \text{Output}$

MARGINAL COSTS (MC): The additional cost incurred from producing an additional unit of output: $MC = \Delta TC / \Delta \text{Output}$ $MC = \Delta TVC / \Delta \text{Output}$.

SECTION –II

CASE STUDY

COMPANY PROFILE

Steel Authority of India Limited (SAIL) is the leading steel-making company in India. It is a fully integrated iron and steel maker, producing both basic and special steels for domestic construction, engineering, power, railway, automotive and defense industries and for sale in export markets. SAIL is also among the four Maharatnas of the country's Central Public Sector Enterprises.

SAIL manufactures and sells a broad range of steel products, including hot and cold rolled sheets and coils, galvanized sheets, electrical sheets, structural's, railway products, plates, bars and rods, stainless steel and other alloy steels. SAIL produces iron and steel at five integrated plants and three special steel plants, located principally in the eastern and central regions of India and situated close to domestic sources of raw materials, including the Company's iron ore, limestone and dolomite mines. The company has the distinction of being India's second largest producer of iron ore and of having the country's second largest mines network. This gives SAIL a competitive edge in terms of captive availability of iron ore, limestone, and dolomite which are inputs for steel making.



OWNERSHIP AND MANAGEMENT

The Government of India owns about 86% of SAIL's equity and retains voting control of the Company. However, SAIL, by virtue of its 'Maharatna' status, enjoys significant operational and financial autonomy.

With technical and managerial expertise and know-how in steel making gained over four decades, SAIL's Consultancy Division (SAILCON) at New Delhi offers services and consultancy to clients world-wide.

SAIL has a well-equipped Research and Development Centre for Iron and Steel (RDCIS) at Ranchi which helps to produce quality steel and develop new technologies for the steel industry. Besides, SAIL has its own in-house Centre for Engineering and Technology (CET), Management Training Institute (MTI) and Safety Organization at Ranchi. Our captive mines are under the control of the Raw Materials Division in Kolkata. The Environment Management Division and Growth Division of SAIL operate from their headquarters in Kolkata. Almost all our plants and major units are ISO Certified.

COMPUTATIONS AND MAJOR FINDINGS OF THE STUDY

TABLE-1: SIMPLE CORRELATION ANALYSIS BETWEEN THE RATIOS OF VARIOUS SELECTED ELEMENTS OF COST TO TOTAL COST AND RETURN ON INVESTMENT OF SAIL FOR THE PERIOD FROM 2000-01 TO 2009-10

Year	RMTC	PFCTC	ECTC	OMCTC	SACTC	METC	ROI
2000-01	40.12	11.78	22.81	13.75	7.53	4.00	(-)3.89
2001-02	39.97	12.23	22.93	12.52	7.98	4.36	(-)10.18
2002-03	39.21	12.97	23.42	12.37	7.40	4.64	(-)1.97
2003-04	38.50	12.20	26.53	12.07	6.56	4.14	18.3
2004-05	47.30	11.26	19.27	13.18	5.90	3.10	53.88
2005-06	50.92	10.38	17.08	13.43	6.03	2.16	22.44
2006-07	49.96	9.82	19.13	14.04	5.18	1.87	28.65
2007-08	44.96	9.23	25.53	14.04	4.77	1.49	29.59
2008-09	51.27	8.20	21.72	12.09	3.79	2.93	16.76
2009-10	52.77	10.39	16.48	13.63	4.63	2.10	13.72

Correlation Coefficient (r)	(-)0.13	0.24	(-)0.05	0.26	0.31	0.01	-
Calculated value of t with (n-2) d. f.	0.38	0.70	0.15	0.77	0.93	0.03	-

Note(s): (i) Tabulated values of ‘t’ with (n-2) d .f. i.e., 8 d. f. both at 5% and 1% levels of significance for both tailed tests are 2.31 and 3.36 respectively. (ii) Since the calculated values of t , in all cases, are less than the tabulated values of ‘t’ with 8 d. f., so the correlation coefficients are statistically insignificant for both 5% and 1% levels of significance.

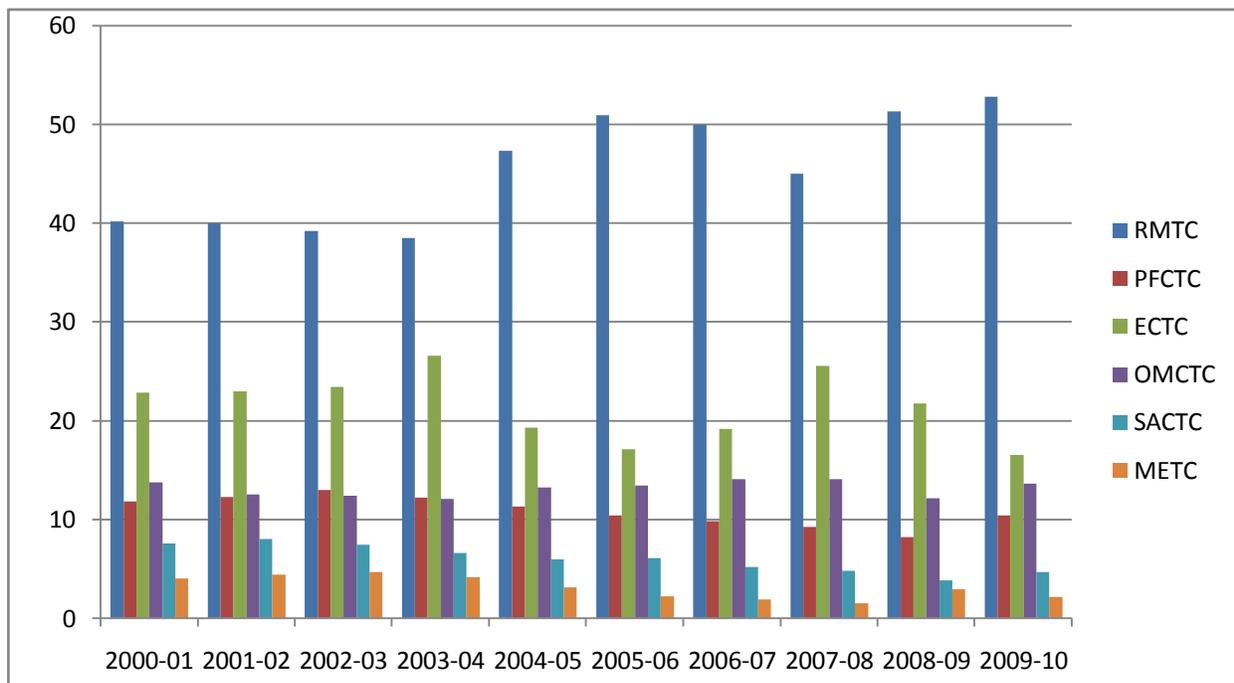
$$r \times \sqrt{(n-2)}$$

(iii) Formula used for calculating $|t| = \dots\dots\dots$ With (n-2) d f.

$$\sqrt{(1 - r^2)}$$

Source: Compiled and computed from Published annual reports of SAIL.

DIAGRAMMATIC REPRESENTATION OF RATIOS RELATING TO SELECTED ELEMENTS OF COST TO TOTAL COST OF SAIL FOR THE PERIOD FROM 2000-01 TO 2009-10



MAJOR FINDINGS OF THE STUDY

In table-1 an attempt has been made to measure the impact of total cost management on profitability by computing Karl Pearson's correlation coefficients between ROI and selected ratios relating to key elements of cost to total cost. Table-1 shows that the correlation coefficient between ROI and RMTC is (-) 0.13, which indicates that there is low degree of negative association between the profitability and the raw materials cost to total ratio of the company and the correlation coefficient is found to be statistically insignificant both at 5% and 1% levels of significance. Generally speaking, the lower the ratio of raw materials cost to total cost, the better is the efficiency of materials cost management, the higher is the profitability of the company and vice-versa. The computed value of correlation coefficient between the raw materials cost to total cost and return on investment conforms to this generally accepted principle during the period under study.

It is observed from table-1 that the value of correlation coefficient between ROI and PFCTC is 0.24, which indicates that there is a lower degree of positive association between the profitability and the ratio of power and fuel cost to total cost of the company under study and the correlation coefficient is found to be statistically insignificant both at 5% and 1% levels of significance, that means there is insignificant association between ROI and PFCTC of the company during the study period.

It is highlighted in table-1 that the coefficient of association between ROI and ECTC during the study period is (-) 0.05. It implies that there is a very low degree of negative association between the profitability and the ratio of employee cost to total cost. The coefficient of correlation is found to be statistically insignificant both at 5% and 1% levels of significance during the study period. Generally speaking, the lower the employee cost to total cost the greater is the efficiency of employee cost management, the larger is the scope of profitability and vice-versa. The calculated value of correlation coefficient between ROI and ECTC under study conforms to this accepted principle.

Table-1 exhibits that the coefficient of correlation between ROI and OMCTC during the period under study is 0.26, which is also found to be statistically insignificant both at 5% and 1% levels of significance. Generally speaking, the lower the other manufacturing cost to total cost, the greater is the efficiency of production cost management and larger is the scope of profitability and vice-versa. The computed value of correlation coefficient between ROI and OMCTC does not conform to this acceptable principle.

It is seen in table-1 that the correlation coefficient between ROI and SACTC is 0.31, which implies that there is a positive association between these two variables. The calculated value of correlation coefficient is found to be statistically insignificant both at 5% and 1% levels of significance respectively. The accepted principle is that the higher the selling and administration cost to total cost the poorer the efficiency of administration and selling cost management, the lower is the profitability of the company. The computed value of correlation coefficient between ROI and SACTC under study does not conform to this accepted principle.

It is observed at table-1 that the correlation coefficient between ROI and METC is negative and is computed at (-) 0.01 during the period under study. The correlation coefficient is found to be statistically insignificant both at 5% and 1% levels of significance respectively. That means there is an insignificant association between ROI and METC during the study period.

CONCLUSION

The study of correlation analysis reveals both positive and negative coefficients of associations, out of the six ratios associated to total cost management selected during the period under study, in case of four ratios, namely PFCTC, OMCTC, SACTC and METC registered positive associations with the selected profitability ratio (ROI) and the remaining ratios viz. RMTC and ECTC witnessed negative associations with the selected profitability ratio during the period under study. All these six selected ratios relating to total cost management have no significant associations with the profitability ratio for the selected company during the period under study.

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