CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

DEA is a non-parameter method for evaluating the efficiency of non-profit DMUs. It contains solutions for several mutually connected linear programming mathematical models for each of the DMUs. While each of these models addresses managerial and economic issues and provides useful results, their orientations are different and, more important, they generalize and provide contact with these disciplines and concepts. Thus, the models may focus on increasing, decreasing or constant returns to scale as found in economics, which are here generalized into the form of multiple inputs and outputs.

Nowadays is highly competitive environment, the effective selection of suppliers is very essential to the success of a firm. Existing supplier performance criteria along with a ranking by manufacturers, manufacturing has improved the types and order of supplier selection criteria presented by Anthony and Buffa (2005). The strategic purchasing, which encourages achieving needed strategic goals through purchasing choices, has been more and more recognized. Many companies and firms have given growing attention to the strategic supplier selection in the struggle of decreasing the number of suppliers to support effective practice.
Major reductions in costs, late deliveries, and rejected materials can be achieved with inefficient supplier can become more DEA efficient. When suppliers are compared for their overall performances, an aggregate evaluation relevant to the considerations of a firm needs to be conducted. Such a whole performance evaluation of suppliers should be based on performance evaluation for all part types supplied to the purchasing company. A potential use of an overall performance assessment of suppliers is to provide benchmarking data for reducing the number of suppliers, which in turn results in in profits including reduction in the costs of parts and order processing, and better partnership with suppliers.

One more potential use of evaluating the aggregate performances of suppliers is to provide improvement targets and recommendation performance for current suppliers. In this paper, data envelopment analysis is proposed to evaluate the over-all performances of suppliers. DEA can be used for supplier evaluation for an individual product and same group commodity of product.

1.2 RESEARCH OBJECTIVES

1. To identify criteria of efficient supplier.
2. To measure the efficiency of supplier performance using DEA.
3. To identify the inefficiency or the slack factor in supplier performance.
1.3 PROBLEM STATEMENT

There are problems that arise in supplier selection faced by the buyer according to Rajeshekar (2011):

1. Supplier selection is a multi-criteria problem and there are not a lot of efficient techniques or algorithms that addresses this problem. The conventional methods that are being used for supplier evaluation like categorical or key-factor rating method, weighted-cost method and cost ratio method are very subjective in nature. They are subjective because the buyer assigns values to various factors that are involved in selection of suppliers and the values vary from one buyer to another for the same supplier. So the need for methods/algorithms that are more objective in nature, that involves assigning common set of values to the selection criteria, is to be used.

2. It is difficult to evaluate an organization's performance when there are multiple inputs and multiple outputs to the system. The difficulties are further enhances when the relationships between the inputs and the outputs are complex and involve unknown tradeoffs. Thus, DEA is used to calculate the relative efficiencies of multiple decision-making units (DMUs), in our case suppliers, based on multiple inputs and outputs. This relative efficiency calculation can provide benchmarking data for reducing the number of suppliers, which in turn would result in effective supply chain management.