Managerial economics essay examples

Business, Marketing

Introduction

DEA is the Data Envelopment Analysis. It is a non-parametric approach used in investigates for the assessment of production frontiers. It is used to assess the relative efficiency of various units, called DMUs in the language of DEA. DEA uses multiple inputs and outputs to estimate the efficiency and for benchmarking the best performing units.

The structure of the market economy is a concept with many aspects. In particular, the structure of the market economy can be characterized in terms of the competitive relationship, the degree of their development. There are several approaches to the study of the structure. In Marxist, political economy emphasis was on study of the structure of production, the concentration of production and capital, which determine the structure of the market. In this direction, different concepts are " free capitalist competition" and " monopoly capitalism." Criteria for distinguishing market structures, according to this approach is whether the regulatory role in the economy - or big business or government. Moreover, the main trend in the development of market relations is to oust orderly. Economics has a more differentiated approach to the problem of the structure of the market economy; by combining market actors (buyers and sellers) and their number (one, several, many), there can be the most general classification of the market structure. Several classifications that are more detailed offered in 50-60s of the twentieth century uses the following criteria: interchange-ability of products offered by different companies (coefficient of price cross-elasticity), interchange-ability of the enterprises themselves (you can imagine the volume ratio or quantitative, cross-elasticity); and Conditions of entry to the

market

According to this classification, there are the following types of market structure microeconomics: perfect competition, monopolistic competition, oligopoly homogeneous, heterogeneous oligopoly, monopoly. One of the first, who explored, in particular, the processes in conditions of perfect competition, was Alfred Marshall, who has analyzed the interaction of supply and demand, as the forces that determine the processes occurring on the market, revealed the shortcomings of the market.

Graphically demand function, analyzed the process of maximizing profits. Antoine Augustin Cournot not only addressed the issue of pricing in the market of perfect competition, but also laid the foundations of the theory of pure monopoly and duopoly theory. According to the theory of duopoly, competition because buyers are prescribed price and volume sellers adapt their products to designated prices. At the same time, one of the duopolists independently evaluates the function of demand for products and sets its volume, intended for sale, assuming that the volume of products sold by its competitor remains unchanged.

Considering the interaction of oligopolists, he showed that each firm prefers to sell a number of products that maximizes its profits. However, he proceeded from the fact that the volume of goods sold competitors remains unchanged. Cournot did two main conclusions:

- For any industry there is a certain and stable balance between sales and cost of goods;

- Equilibrium price depends on the number of sellers.

Monopoly price occurs when a single vendor. With an increasing number of

sellers equilibrium price falls, approaching the marginal cost. Thus, Cournot model shows that a competitive equilibrium is achieved in the greater extent than the more increases the number of sellers. Chamberlin proposed the theory of monopolistic competition, justifying the idea of synthesis of monopoly and competition, which led to the revision of the existing theoretical concepts of the mechanism of functioning and development of markets, cost and price formation, laws of supply and demand. Prerequisite combination of monopoly and competition is, on the one hand, the possession of " differentiated product" (monopoly), and on the other - the release of substitutes, " substitutes" (break the monopoly, increased competition).

The concept of " monopolization" Chamberlin uses not only in connection with product differentiation. It examines the range of phenomena that are also associated with a restriction of competition. First, it refers to a simple oligopoly. In oligopolistic market conditions (such as the market in which a few firms control most of it), there is the problem of interdependence of producers, each of which seeks to maximize its own profits. Each manufacturer, taking action to adopt and change their decisions, including with regard to price must take into account the reaction of competitors and the associated consequences. Ultimately, by Chamberlin occurs spontaneous tendency to parallelism of price action and price leadership because of spontaneous interaction between economic actors.

Explanation

The paper under discussion is written in order to calculate for the relative efficiency of different airports. For the sake of the study, ten international

airports have been selected. The data regarding the inputs and outputs is obtained through different data collection sources. Four inputs including terminal area, claims, check-in desks and parking are to be minimized in order to maximized the only output of the study that is, APM. Airport industry appears to be one of the most important industries in any society that plays a significant role in the economy of any nation. This industry appears to be dynamic in its formation and structure. The paper proceeds by introduction of the DEA and then the two approaches that work at the back channel of this system. Then the researcher has detailed the data and then has defined the calculation mechanism. In the end results are listed and a detailed discussion on the results is provided. There has always been a highly growing concern with measuring and comparing of organizational unit efficiency. For example; schools, shops, local authority government departments and banks which has homogeneous set of units. In simple terms, efficiency is calculated with the help of a simple formula where output obtained is divided by the input that is,

Efficiency = Output

Input

However, there appears to be a major issue concerning this usual formula for the calculation of efficiency measures. The roots of the problem lie in the fact that this formula is appropriate when one is dealing with a single input and output. In order to fully grasp the concept, let us discuss a simple example involving this issue. Suppose there are depots of large retailing organizations that supply goods to the supermarket. Inputs in this case, for assessing the relative efficiency, are value of the stock and the wages. The

outputs are represented by the actions of the depot measured by number of issues depicting deliveries to the supermarkets, the number of receipts and the number of requisitions. This example has been quoted to highlight the underlie difficulty of measuring the relative efficiency with two inputs and three outputs. Hence, it is apparent that simple efficiency formula cannot be used in such type of situations.

It is important to pen down that in recent times, most of the efficiency calculations involve such tenuous situations so the researchers found an answer to this query. A relative efficiency formula comprising multiple inputs and outputs is innovated by the investigators in reaction to resolution of the higher up trouble. Therefore, a model was developed that allowed the relative efficiency measures to be determined and this model is known as DEA.

The term relative efficiency was first discussed by Farrell, who proposed a measure of relative efficiency with multiple inputs and outputs. The relative efficiency is calculated as the weighted sum of efficient units in comparison to the inefficient unit. Therefore, the formula takes the following form:

Efficiency = weighted sum of outputs

Weighted sum of inputs

There is a big assumption that works with this formula. This assessment of efficiency needs an ordinary set of weights. Here, the problem lies with the fact that how these weights will be assigned.

CCR Model:

The developers of the model, Charnes, Cooper and Rhodes identified the complexity in finding an ordinary set of weights to conclude relative efficiency. They distinguished the authenticity of the proposition that units may value inputs and outputs in a different way and so assume dissimilar weights, and projected that each unit must be granted to assume a set of weights, which demonstrates it in the most well disposed light in comparability to the other units. Hence, this led to the development of the first approach or model to DEA that is, the CCR model. This CCR model is de-abbreviated as Charnes Cooper and Rhodes model. It is a model that is based on the principal of output maximization. Also known as the primal model, the model allows the DMU measurement to find out the set of optimum weights for each of its components (outputs are y and x) to maximize its competence. The resolution comprises of a set of weights selected so that the competence of any other unit with these weights may not go beyond one, the worth at which a unit is comparatively competent.

BCC Model

In contrast to CCR model, the researchers have also been successful in developing an alternative model that is known as the BCC model. This model is de-abbreviated as Banker Charnes and Cooper model. What differentiates this model from the CCR model is the fact that BBC is an input oriented model that also allows and incorporate for the variable returns to scale.

Software Applications

It is interesting to note that the DEA operations of constructing the production frontiers and efficiency calculations are being performed by using a computer application known as DEAP. DEAP is de-abbreviated as Data Envelopment Analysis (Computer) Program. It is a software application for DEA. In addition to this, efficiency calculations are being performed in MS Excel using the option of Solver. As mentioned before, solver is a software application that is used to find the relative efficiencies of different units by assigning them weights.

Data Compilation

In an attempt to calculate the relative efficiencies of various airports around the globe, by using both the two approaches of DEA, namely the CCR and BCC, there is a need to collect data that corresponds to the problem statement. Since we need to hint upon the relative efficiencies of various airports, so first we need to identify the possible inputs and outputs that will correspond to the airport efficiency. In this regard, the researcher have made used of four inputs and one output.

Inputs

Terminal area, Parking, Check-in desks and Claims are treated as inputs for efficiency allocation.

Output

APM is treated as output for ten airports data; below the required data set has been tabulated for the convenience of the reader.

Inputs Output

Data Calculations

The calculations on the data have been performed using the software technique of solver in excel. The technique works by a simple logic. First, we have to list the inputs and outputs in the excel sheet. Then we randomly assign weights of one to all inputs and the outputs. Next, we work on by finding the weighted sum of inputs and the weighted sum of outputs separately in two different columns labelled as uI and vO for weighted sum of input and weighted sum of output respectively. Next, we find efficiency score against each DMU, which happens to be the airports in this case, by dividing weighted outputs by weighted inputs. The next step involves finding the difference between weighted inputs and outputs. Once we done with all these columns, here comes the role of the solver. In solver, we are going to identify the input or output orientation by selecting min or max button, respectively. Then target cells are selected.

Target cells are the cells where weights have been listed initially. Lastly, we define the constraints. Three constraints will be listed. Firstly, in case of output maximization, we will define that the weights are greater than equal to zero. Secondly, the weighted inputs should be equal to 1 and lastly, the difference should be less than equal to 1. It goes with input minimization with altering the first condition where the weights will be less than equal to zero while rest of the two conditions goes the same. Solver will then provide the efficiency measures for each separate DMU.

Results

The results of the calculations show an interesting picture. Below, the results of efficiency scores have been listed for the sake of discussion.

As has already been discussed in the previously mentioned literature, DAE is a technique that is used for bench marking. Bench marking is a technique that is used to make a comparison of something with the set standards. The term is mostly used in business studies where the business processes of one organization are evaluated against the market leaders. So, the DEA technique allows for the practice of bench marking by comparing the efficiency scores to that of the market leaders. Here, it is important to note that an efficiency score of 1 or closer to 1 is an indication of the fact that the related DMU is working quite efficiently, therefore, termed efficient.

Looking at the above results, among the ten listed DMUs, Copenhagen have been successful in achieving a score of 1, making it the most efficient DMU among its listed peers. Copenhagen is the market leader in this case and all the other nine DMUs need to make a comparison of themselves with the selected unit. The comparison leads to the realization of the fact that the worst performing DMU appears to be Warsaw in this case. It has achieved an efficiency score of 0. 1. Therefore, the need of the hour is the realization of the fact that there is a serious problem that requires an immediate attention. Warsaw needs to compare its processes with the best in town that is, Copenhagen, to identify where the problem resides. This is the most important step that needs to be taken, as without realizing where the problem exists, one is no able to find any remedy for cure.

Concluding the paper, DEA is a technique that is used for the purpose of

bench marking. In an attempt to study the relative efficiency of various airports, it is concluded that the DMU that have achieved an efficiency score of 1 appeared to most efficient, that is Copenhagen, in this case. So, the DMUs that are lagging behind the market leaders, should concentrate on the policies adopted by the efficient groups and should try to maximize their outputs in the most efficient way.

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