

How Data Envelopment Analysis works

Frontier Analyst is designed to help you measure and improve the performance of your organization. The quest for greater efficiency is never ending as managers are always under pressure to improve the performance of their organizations. In the public sector, governments are constantly seeking better value for tax payers' money, while the emergence of a more global economy has intensified competitive pressures on commercial companies. The onus is therefore on managers to achieve better results from the resources available to them. Frontier Analyst uses a powerful technique called Data Envelopment Analysis (DEA) to assist you in doing this.

The analysis compares the relative efficiency of organizational "units" such as bank branches, hospitals, vehicles, shops and other instances where units perform similar tasks. These units utilize similar resources, referred to as inputs, to generate similar outputs. For example, a shop has inputs of staff and floor space, and has outputs of sales volume and total revenue. However, there can be considerable differences in the way in which individual units combine inputs to produce outputs. In addition, there may also be differences in potential among units caused by the technology they have available, their geographical location or catchment population.

Frontier Analyst allows you to take account of all the important factors that affect a units performance to provide a complete and comprehensive assessment of efficiency. Frontier Analyst does this by converting the multiple inputs and outputs into a single measure of productive efficiency. By doing so it identifies those units which are operating relatively efficiently and those which are not. The efficient units, those making best use of resources, are rated as being 100% efficient whilst the inefficient ones obtain lower scores.

Frontier Analyst generates efficiency scores for all units being analysed. It shows how much inefficient units need to reduce their inputs or increase their outputs in order to become efficient. Frontier Analyst therefore not only helps managers answer the question "How well are the units doing?" but also "How much could they improve?". It suggests performance targets, such as, unit A should be able to produce 15% more output with their staffing level or unit B should be able to reduce costs by 25% and still produce the same level of outputs. It also identifies the units which are performing best and their operating practices can then be examined to establish a guide to "best practice" for others to emulate.

Frontier Analyst presents the results of an efficiency study very effectively, using high powered graphics, so that you can see and understand the information that the analysis provides more clearly. It offers various ways of visualizing the results and shows in detail which units are performing the best and why they are doing so. It graphically displays performance information relating to an inefficient unit and shows the difference between its performance and the "best practice" units to which it has been compared.

Many organizations such as banks, hospitals, airlines, government departments and local authorities are using this analysis. It is used by managers in these organizations to perform a number of tasks including:

- Resource allocation: reallocating from the inefficient to the efficient
- Identification of "best practice"
- Identification of "poor practice"
- Target Setting
- Monitoring efficiency changes over time
- Rewards for good performance
- Planning site locations