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Container Port Production and Management

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Preface

As the competition among the world container terminals has become increasingly fierce, every terminal is striving to increase its investments constantly and lower its operational costs in order to maintain the competitive edge and provide satisfactory services to terminal users. The unreasoning behaviour, however, has induced that substantial waste and inefficiency exists in container terminal production. Therefore, it is of great importance for the manager to know whether it has fully used its existing infrastructures and that output has been maximized given the input.

From this perspective, data envelopment analysis (DEA) provides a more appropriate benchmark for the container terminal. This study analyzes the relevance of data envelopment analysis (DEA) to the estimation of productive efficiency in the container terminal industry. Following an exposition of the DEA methodology, the many previous applications of the technique to the terminal industry are reviewed and assessed. The DEA technique is illustrated through a detailed application of data relating to the Chinese and Korean major container terminals. This study applies three models of DEA to acquire a variety of analytical results about the operational efficiency of container terminals. By applying with the DEA models based on input orientation and output orientation, the study first establishes the causes of inefficiency on the basis of efficiency value analysis. Slack variable analysis is then used to identify potential areas of improvement for inefficient terminals and giving the projection results. This is followed by the utilization of return to scale analysis to assess whether each terminal is in a state of increasing, decreasing, or constant return to scale.

Overall, the results reveal that substantial waste exists in container terminal production. It is also found that the Chinese and Korean major terminals exhibit a mix of decreasing, increasing and constant returns to scale. The study concludes

that the optimum efficiency levels indicated by DEA results might not be achievable in reality, because each individual terminal has its own specific and unique context. Moreover, the results of this study can provide terminal managers with insights into resource allocation and optimization of the operating performance.

Dalian, China

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