

Profit efficiency of black tea processing industry: a data envelopment analysis

Shanaz Thamiem¹, LHP Gunaratne¹ and KG.MCPB Gajanayake²

Although Sri Lanka is the largest black tea producer in the world, the country's productive performance shows a declining trend compared to other competing countries. Despite the fact that the proportion of allocated resources and technology in the tea processing is satisfactory, it is evident that there is a gap between the potential and actual level of factory productivity. Against this background, this study attempted to estimate the profit efficiency of tea factories in all three elevation zones using Data Envelopment Analysis (DEA). In addition the sources of inefficiency and the robustness of the estimates were also investigated. The profit efficiencies were estimated for 212 factories using DEAP 2.1. Normalized profit per kilogram, green leaf price, wage rate, electricity cost and fuel wood price were used as variables. Mean pure profit efficiency scores of up, mid and low countries in output-oriented zonal frontiers were found as 0.74, 0.51 and 0.51 respectively. However, with respect to the national frontier, mean profit efficiency scores were 0.29, 0.44 and 0.51. Exogenous variables such as ratio of running capacity to full capacity, main grade percentage and quality management certificates had influence on low and up country factories in the zonal analysis. In contrast, main grade percentage and quality management certificates affected in both up and low country tea factories respect to the national frontier. Frontiers owned by Regional Plantation Companies were more efficient in up and mid country factories while privately owned factories were more efficient in low country. The study reveals that all tea factories in Sri Lanka operate below their full capacity and there is a great scope of improving profit efficiency without incurring additional cost.

Key words: Profit efficiency, DEA, Frontier, Normalized variables, Exogenous variables

¹Department of Agricultural Economics and Business Management, Faculty of Agriculture, University of Peradeniya, Sri Lanka

²Department of Plantation Management, Wayamba University of Sri Lanka