Efficiency measurements in multi-activity data envelopment analysis with shared inputs: An application to farmers' cooperatives in Taiwan

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Abstract

Purpose – The paper aims to propose a modified multi-activity data envelopment analysis (MDEA)
to provide information on the efficiency performance of farmers'
cooperatives with inputs shared
among several closely-related activities.
Design/methodology/approach – The directional distance functions are used to construct a
non-radial measure of performance in which the optimal input/output adjustment and the optimal
allocation of shared inputs is simultaneously taken into consideration. The model is applied to study
the case of 201 farmers' cooperatives in Taiwan.
Findings – The empirical results suggest that there exist significant discrepancy in terms of the
performance among the four departments of the farmers' cooperatives. Furthermore, the wide
discrepancy in the returns to scale warrant further deregulations by easing restrictions on their
consolidation with other cooperatives to operate over broader geographical areas.
Originality/value – An empirical study on Taiwan's farmers' cooperatives is used to demonstrate
its applicability and how they can effectively allocate their fixed resources in a multi-activity
environment. Such a measure can be used for rewarding the individual groups of an organization
based on their relative contributions to the overall performance.