A new approach for allocating fixed costs among decision making units.

Summary: How to equitably distribute a common fixed cost among decision making units (DMUs) of an organization is a typical problem in organization management. Based on the data envelopment analysis technique, this paper proposes a new proportional sharing model to determine a unique fixed cost allocation under two assumptions: efficiency invariance and zero slack. It is noteworthy that the fixed cost allocation determined by our proportional sharing model is a feasible solution to the model proposed by W. D. Cook and J. Zhu [Comput. Oper. Res. 32, No. 8, 2171–2178 (2005; Zbl 1146.90442)]. To ensure the uniqueness of the fixed cost allocation, three algorithms are proposed under the new model. Different from current fixed cost allocation methods under the efficiency invariance assumption, our approach can generate a fixed cost allocation that is unique, partially dependent of DMUs’ inputs and units-invariant, and thus is more effective. Numerical examples are used to illustrate the validity and superiorities of our approach.

Keywords: data envelopment analysis; fixed cost allocation; efficiency invariance; uniqueness; units-invariance