Abstract

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Conceptual profit allocation framework for construction joint ventures: Shapley value approach

Construction joint ventures (CJVs) execute business by pooling diverse technical and financial contributions from collaborating entities. Traditional CJV profit-allocation approaches account only for investment shares, and do not address the marginal contribution of the participating parties. Therefore, disagreements may arise between stakeholders. This research aims to reduce profit-share-related disagreements among multiple CJV members by allocating profit based on the marginal contribution of each party. The authors developed a conceptual framework using the Shapley value as an alternative to the traditional investment-based approach. Three illustrative examples demonstrated the possible use of the developed conceptual framework. Results of the study highlighted the potential of Shapley value as an alternative profit allocation scheme. The stability of the generated results was validated mathematically, and decision makers' perception of fairness was addressed following the methods of prior experimental cooperative game theory research. This paper contributes to the body of knowledge by proposing an axiomatically fair methodology for profit-sharing negotiations among multiple collaborating parties in a project. This approach can be utilized in other engineering domains where the management needs to foster stable and fair collaborations among its stakeholders.