

A Principal-Agent Model for Sharing Mechanism in Integrated Project Delivery Context

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Abstract : Integrated project delivery (IPD) is a project delivery method distinguished by a shared risk/rewards mechanism and multiparty agreement. IPD has drawn increasingly attention from construction industry because of its efficiency of solving adversarial problems and reliability to deliver high-performing buildings. However, some evidence showed that some project participants obtained less profit from IPD projects than the typical projects. They attributed it to the unfair IPD sharing mechanism, which resulted in additional time and cost of negotiation on the sharing fractions among project participants. The study is aimed to investigate the reward distribution by constructing a principal-agent model. Based on cooperative game theory, it is examined how to distribute the shared project rewards between client and non-client parties, and identify the sharing fractions among non-client parties. It is found that at least half of the project savings should be allocated to the non-client parties to motivate them to create more project value. Second, the client should raise his sharing fractions when the integration among project participants is efficient. In addition, the client should allocate higher sharing fractions to the non-client party who is more able. This study can help the IPD project participants make fair and motivated sharing mechanisms.

Keywords : cooperative game theory, IPD, principal agent model, sharing mechanism

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