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How do contract types and incentives matter to project performance?

Mohammad Suprapto *, Hans L.M. Bakker, Herman G. Mooi, Marcel J.C.M Hertogh

Faculty of Civil Engineering and Geosciences, Delft University of Technology, Stevinweg 1, 2628 CN, Delft, the Netherlands

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Abstract

How collaborative contracts and contractual incentives might influence project performance remains equivocal. We hypothesized that their effects on project performance are mediated by owner–contractor collaboration, measured in terms of relational attitudes (relational norms and senior management commitment) and teamworking quality (inter-team collaborative processes). Using PLS-SEM, we analyzed a sample of 113 capital projects. The results suggest that through better relational attitudes and teamworking quality, projects with a partnering/alliance contract are likely to perform better than those with lump-sum and reimbursable contracts. Likewise, the projects with incentive contracts are likely to perform better than those without incentives through better relational attitudes and teamworking quality. There were no differences in project performance directly associated with different contract types and contractual incentives. Taken together, a partnering/alliance contract and incentive contracts do not necessarily result directly into better project performance but through relational attitudes and how they play out into actual teamworking behavior.

Keywords: Capital project; Collaboration; Contract; Incentive; Relational; Teamwork; Trust

1. Introduction

There is a wide agreement that the choice of contract types should be contingent upon various circumstances such as product and/or process uncertainty, desired allocation of risk, owner in-house capability, and market conditions (Merrow, 2011; Turner, 2003; Turner and Simister, 2001; Walker and Rowlinson, 2008). A proper contract type is chosen to encourage the owner and contractor to work rationally together to achieve the best outcomes in accordance to their common objectives and within the expected risk (Morris and Pinto, 2007; PMI, 2008; Smith, 2002; Turner, 2009; Walker and Rowlinson, 2008). However, two separate empirical studies at different times by CII (1986) and IPA (2010) suggest that there is no clear or direct relationship between the contract type and project performance. CII suggests that regardless of the choice of contract type, the real issues that affect the project cost performance are associated with the alignment between owner and contractor and their agreement in allocating and managing risk. In a similar vein, IPA suggests that any contract type can deliver success or failure because contract is a second-order concern. One contract type may work well for some owners but fail for others because different contract types bring different difficulties and situations.

In this study we focused on three basic types of contracts underlying the relationship between owner and contractor in the execution of capital projects: lump-sum or fixed price, reimbursable, and partnering/alliancing (Smith, 2002; Turner, 2003; Turner and Simister, 2001). A lump-sum contract is a contract where the contractor is paid a fixed amount for the whole scope of works defined in the contract. A reimbursable

* Corresponding author at: Infrastructure Design and Management, Faculty of Civil Engineering and Geosciences, Delft University of Technology, Stevinweg 1, 2628 CN, Delft, the Netherlands. Tel.: +31 15 278 4330.
E-mail addresses: m.suprapto@tudelft.nl (M. Suprapto), h.l.m.bakker@tudelft.nl (H.L.M. Bakker), h.g.mooi@tudelft.nl (H.G. Mooi), m.j.c.m.hertogh@tudelft.nl (M.J.C.M. Hertogh).

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contract, commonly called cost reimbursable contract is a contract where the owner reimburses the contractor for all costs, reasonably incurred and directly associated with the amount of work done for the project; plus a certain fee (fixed fee or percentage fee) and/or an incentive fee (Berends, 2006; Merrow, 2011). A partnering/alliance contract is an extension to reimbursable contract where the owner and the contractors (often including specialist contractors and key suppliers) jointly establish the target out-turn cost and share the gain and/or pain resulting from the actual cost (Meng and Gallagher, 2012; Ross, 2003; Turner, 2003).

What is the potential influence of different contract types (partnering/alliance versus lump-sum versus reimbursable) on the nature of the relationship between owner and contractor? On one extreme, the lump-sum contract demands less owner intervention (or less involvement) and therefore offers more flexibility and less administrative burden to the contractor in executing a project (Berends, 2006; Lowe, 2007). But it also has some perceived drawbacks. A lump-sum contract is often considered to create an adversarial relationship between the parties in dealing with changes of circumstances during the project execution (Smith, 2002; Turner and Simister, 2001). The reimbursable contract, in contrast, implies that more owner involvement and support can be expected and thus less barriers to building a collaborative relationship and an integrated team (Berends, 2006; Smith, 2002). But a reimbursable contract also has some drawbacks from the one party's perspective toward the other party (Berends, 2006; Smith, 2002). The contractor often perceives that the owner will be more demanding for achieving target cost and schedule. On the other side, the owner perceives that the contractor will come up with additional work and thereby increase costs over what was initially estimated. In the end, lump sum and reimbursable contracts have a quite similar implication on owner–contractor collaboration (Müller and Turner, 2005).

On the other extreme, a partnering/alliance contract focuses on the 'principles' of relational contract to change project participants' attitudes from being short-term and adversarial toward a more collaborative mind-set and behavior (Cowan and Davies, 2003; Larson, 1995; Macbeth, 1994; Naoum, 2003; Ross, 2003; Thompson and Sanders, 1998). A partnering/alliance contract is often advocated to be more collaborative than lump-sum or reimbursable contract (Davis and Walker, 2008; Thompson and Sanders, 1998; Turner, 2003; Turner and Simister, 2001).

Several in-depth case studies of partnering/alliance practices, however, reveal that this contract type does not always eliminate the underlying adversarial attitudes. Lack of top management commitment, lack of collaborative mind-set, and insufficient initial effort to establish shared culture remain in practice (Aarseth et al., 2012; Alderman and Ivory, 2007; Bresnen and Marshall, 2002; Chan et al., 2012; Smyth and Edkins, 2007). Contemplating the practical difficulties of partnering/alliance projects, it is questionable whether a partnering/alliance contract is better than other contract types. Merrow (2011) coins a controversial view on the role of alliance contracts, "…, even if everything possible has been done to prepare the project (industrial megaprojects)… Alliance contracts … do nothing to help us understand who is responsible for what" (p.293). This contradiction provokes an important research question, to what extent do different contract types actually enact different quality of collaborative relationship between owner and contractor and in turn affect project performance?

This paper adopts Suprapto et al.'s (2015) conceptualization of owner–contractor collaborative relationship as a set of norms and the manifested interactional processes by which the project parties (owner and contractor) jointly act and decide on the issues emerging during the course of a project in order to bring mutually satisfactory project outcomes. Owner–contractor collaborative relationship includes two dimensions: (1) relational attitudes; and (2) teamworking quality. Relational attitudes refer to *norms and commitment developed and shared by the senior management from both owner and contractor to govern their project-specific relationship*. The essential elements of relational attitudes include fairness, inter-organizational trust, transparency, and no blame culture alongside the commitment of senior management to support the project teams (Cheung et al., 2006; Rahman and Kumaraswamy, 2008; Suprapto et al., 2015). Building on the works of Hoegl and colleagues (Hoegl and Gemuenden, 2001; Hoegl and Parboteeah, 2007; Hoegl et al., 2004), Salas et al. (2005), Pinto et al. (2009), and Suprapto et al. (2015) define teamworking as *a set of underlying mechanisms reflecting the task-related and social interactions between owner team and contractor team in executing a project*. They operationalize teamworking quality as a higher-order construct capturing the quality of inter-team interactions and including 5 facets of task-related interactions: *communication*, *coordination*, *balanced contribution*, *aligned effort*, and *mutual support*; and 2 facets of social interactions: *cohesion* and *affective trust.*

The efficacy of relational attitudes and teamworking quality on project performance (in terms of efficiency, effectiveness, perceived satisfaction, and perceived success) has been empirically substantiated whereas relational attitudes indirectly influence project performance through teamworking quality (Suprapto et al., 2015). Extending Suprapto et al.'s research model, we addressed the research question by examining the effects of contract types (partnering/alliance, reimbursable, and lump-sum) and contractual incentives on project performance through two mechanisms: (i) directly and (ii) indirectly through the mediation of relational attitudes and teamworking quality.

By quantifying such direct and indirect effects, this paper attempts to make three contributions. First, we extend the scope of analysis by considering the *ex-post* effects of contract types and incentives on the quality of owner–contractor relationships and project performance that have been assumed *ex-ante* and lacking empirical support. Second, by moving beyond the direct effects, this study is the first to assess potential indirect effects of contract types and incentives on project performance through the parties' relational attitudes and their inter-teamworking quality. Third, the findings provide explanation to which contract type is better than the others toward project performance and what mechanisms are underlying it.

The paper is structured as follows. Section 2 presents the theoretical background on the relationships between contract types, contractual incentives, relationship quality, and project