Author's version of manuscript published as: **Rose, T. M. & Manley, K. (2010).** 'Motivation toward financial incentive goals on construction projects.' ***Journal of Business Research***, *Article in Press*.

Motivation toward financial incentive goals on construction projects

Dr. Timothy M. Rose and Dr Karen Manley

Queensland University of Technology

Submission: July 2009

Revision: December 2009

Acceptance: May 2010

The authors acknowledge the financial support of Cooperative Research Centre for Construction Innovation, Australia. The assistance of Stephen Kajewski, Keith Hampson, and Judy Matthews has also been invaluable in reviewing earlier drafts of the manuscript.

ABSTRACT

Construction industry observers tout the use of financial incentives as promoters of motivation and commitment on projects. Yet, little empirical evidence exists concerning their effectiveness. What are the drivers of motivation on construction projects? The reasons that construction project participants are motivated to pursue voluntary incentive goals are examined through four Australian case studies. The results demonstrate the critical role played by project relationships and equitable contract conditions in promoting the effectiveness of financial incentives. In the context of a construction project, this study finds financial incentives to be less important to motivation and performance than relationship enhancement initiatives. This finding is unexpected and has implications for the design of project procurement strategies. These results suggest if project clients ignore the importance of relationship quality between participants, the impact of any financial incentive will be compromised.

Keywords: financial incentives, construction, contracts, motivation, projects.

INTRODUCTION

Construction projects shape the built environment in which people live and work. The built environment is typically a country's most important asset, both economically and socially. For advanced countries around 95% of people work in the built environment, where they generate around 80% of GDP (Newton, Hampson, and Drogemuller, 2009). The performance of construction projects and the whole-of life management of constructed assets influences a country's productivity, competitiveness, living quality and ecological sustainability (Newton et al., 2009). Yet many countries face significant challenges with the performance of construction projects and constructed assets (Manseau and Seaden, 2001).

The use of financial incentives in construction projects is seen as a key means of improving built environment outcomes. Financial incentives are typically used on construction projects to invigorate motivation towards above business-as-usual (BAU) goals and provide the contractor with the opportunity for higher profit margins if exceptional performance is achieved. BAU includes the mandatory minimum requirements that are to be delivered under the construction contract. Voluntary goals are higher-order goals set by the client above minimum BAU requirements. Financial incentives aim to increase the efficiency and effectiveness of projects by stimulating the motivation to work harder and smarter in pursuit of such goals (Sliwka, 2003). There are three main types of financial incentives used on construction contracts (Bower, Ashby, and Smyk, 2002):

1. Share of savings incentives, where cost savings are shared between the client and the contractor based on an agreed formula;
2. Schedule incentives, where a premium is offered to the contractor for the early completion of the project; and

3. Technical performance bonuses for meeting performance targets, other than cost and schedule. A performance bonus arrangement can be applied to a wide range of performance areas such as quality and functionality.

The complexity of the construction product supply chain is one of the major challenges in applying financial incentives to motivate project teams. Construction projects emerge in fragments (Mitropoulos and Tatum, 2000). Disjointed relationships between contracting parties, misalignment of objectives, and risk-averse behaviors characterize construction projects (Rahman and Kumaraswamy, 2004). Similarly, adversarial business environments in the construction industry are a major barrier to continued growth and the diffusion of new innovation (Andersen, Cook, and Marceau, 2004). Thus, not only are financial incentives necessary to enhance motivation at personal and organizational levels, but also to promote unified motivation across highly interdependent and contractually fragmented project teams. The teams comprise diverse actors such as contractors, designers and suppliers brought together on a one-off basis, with little scope to build cohesive team relationships over time.

The difficulty in assessing performance in highly interdependent teams compounds the challenge as individual output may be almost indistinguishable from group output (Howard, Turban, and Hurley, 2002). Thus, team-based financial incentives suit construction projects with high levels of sequential and mutual task interdependence. The unique multi-firm production model that construction projects use shapes this interdependence.

The research proposition is that the above factors create a unique environment for the application of financial incentives. The construction project environment varies to that dealt with by the extensive literature on financial incentives in the context of individual psychological processes (e.g., Adams, 1963; Bandura, 1986; Deci, 1971) or the work motivation of employees at organization level (e.g., Hackman and Oldham, 1980; Katzell and

Thompson, 1990; Locke and Latham, 2004). The research described here adds an important new dimension to such literature.

Both academics and business commentators consistently argue that performance incentives can improve project outcomes for the principal (client) and their agents (contractors and consultants) (Bower et al., 2002; Howard, Bell, and McCormick, 1997). For example, Australian construction industry reports claim procurement approaches containing equitable incentive mechanisms applied across the entire project team can improve both project and industry performance (Kenley, London and Watson, 2000; AEGIS, 1998; APCC, 1997). A more recent study indicates that Australian construction clients have the necessary competence to develop such strategies (Manley, 2006), if they have appropriate information.

Despite the heralded benefits of financial incentives, until now little construction-specific information has been available to project managers on how to effectively implement them. Although previous work indicates the importance of client competence and team-based incentives, no detailed investigation has been conducted on how such changes might be implemented to yield maximum advantage. Industry clients across Australia remain skeptical about the usefulness of financial incentives and lack understanding of what determines their effectiveness (Rose, 2008). Indeed, little empirical research has investigated the impact of incentives on motivation and performance in the context of construction projects; Bresnen and Marshall (2000) being a key exception. Bresnen and Marshall note that the connection between incentive systems and performance is often portrayed too simplistically in the literature. They suggest the need for further investigation into the organizational and inter-organization dynamics around incentives in the construction context.

This paper responds to that call and examines the factors that drive motivation to achieve voluntary incentive goals on construction projects, hereafter referred to as motivation drivers, based on four large-scale Australian construction projects that include financial

incentives in their contractual arrangements. The results suggest that without a detailed understanding of the context in which financial incentives are applied, they can have a detrimental effect on motivation towards voluntary project goals. In particular, the results indicate that if construction clients focus on building effective project team relationships, then financial incentives will have a more positive impact on motivation.

CONCEPTUAL FRAMEWORK

Review of construction and general management contributions (Rose 2008) suggests that to assess the impact of financial incentive on motivation in a project environment, consideration must be given to both potential extrinsic (external) and intrinsic (internal) drivers of motivation. Therefore, a big picture approach must be taken to identify and explore the various drivers within the project that promote or discourage motivation to determine the value of financial incentives in driving motivation and thus, performance. The unit of analysis is the construction project, which encompasses the project structure, team and dynamics. Given the lack of research into the impact of incentives on motivation and performance in construction (Bresnen and Marshall, 2000), the present article develops a conceptual framework, based on theoretical evidence, to explore the research question: 'What are the drivers of motivation on construction projects?'

Figure 1 here.

Figure 1 outlines the role of motivation on construction projects and shows that motivation is a mediating variable between core project activities and project performance. Core project activities give rise to various motivation drivers that influence the motivation of project participants. Five core activities are conceptualised and motivation is seen to impact

performance through four key indicators. The current paper describes the drivers of this motivation, about which little is currently known in the context of a construction project. This is the gap in the literature addressed here.

Mullins (1996) argues that performance is a product of motivation, ability and the environment. Similarly, Howard et al. (1997) argues a construction contractor's (agent's) output (or performance) is a function of factors within their control (ability and motivation) and external factors outside their control (environment). Although participant ability and factors external to the project (e.g. market prices) influence performance outcomes, these factors are beyond the scope of the research and are not shown in Figure 1.

The framework shown in Figure 1 is based on insights from organizational management theory (Van Herpen, Van Praag, and Cools, 2005; Moers, 2000; Gibbons, 1998), psychological motivational theory (Locke and Latham, 2002; Colquitt, 2001; Hollenbeck and Klein, 1987; Bies and Moag, 1986), and economic agency and reciprocity theory (Fehr & Falk, 2002; Howard et al., 1997; Holmstom and Milgrom, 1991; Eisenhardt, 1989a; Jensen and Meckling, 1976). The framework is based on a set of four motivation indicators distilled from these theoretical sources, and interpreted in a project-based context. The four indicators represent distinct categories that cover key contributions in the literature. The motivation indicators developed from the combined theories are: 1. Goal Commitment, 2. Distributive Justice, 3. Procedural Justice and, 4. Interactional Justice. This is the first time that such a broad range of indicators has been conceptualized for application to a construction project environment. The indicators are used in this study to assess the relative impact of financial incentives and other project-based motivation drivers. The indicators are briefly defined below:

Goal Commitment

According to goal-setting theory (Locke and Latham, 1984), individuals or groups make calculated decisions about their desired goals, and once the desired goals are identified, the goals themselves can act as a motivator. As an extension to goal-setting, goal commitment (Hollenbeck & Klein, 1987) refers to the sustained determination and motivation to try for a goal; in the case of this research, the performance goal associated with the incentive. Key antecedents of goal commitment are those that impact on *the attractiveness of goal attainment* and those that impact on the *expectancy of goal attainment* (Hollenbeck and Klein, 1987). The theory suggests that the way the goals of a financial incentive are managed over time will impact motivation and commitment.

Distributive Justice

Distributive justice theory suggests that the financial reward amount offered will be judged by its fairness relative to the effort required achieve the reward. A higher reward 'intensity' (strength of reward) increases a contact agent's margin in response to their increased effort (Zenger, 2000). In the case of construction projects, distributive justice and its ensuing motivation, is assessed in comparison to the risk carried by the contractor and the equity of the reward in comparison to other reward recipients in the project team.

Procedural Justice

Procedural justice suggests that the fairness and transparency of procedures linked to incentive distributive decisions will impact a contract agent's motivation. Procedural justice is delivered by adherence to fair measurement criteria such as consistency, correctability (flexibility), representativeness, accuracy, bias suppression and ethicality (Leventhal, 1980). As task interdependence is high in teams, compared to an individual's work, procedural justice is a particularly important indicator of motivation in teams (Colquitt, 2004).

Interactional Justice

Interactional justice relates to aspects of the communication process between principals and agents, such as honesty and respect. Interactional justice indicates that the propriety of the principals' behavior will influence the motivation of an agent (Bies and Moag, 1986). Thus, the quality of the relationship between the principal and agent can impact on the agents' perception of incentive fairness. Organizational behavior can also be influenced by the establishment of trust and trustworthiness in ongoing economic exchanges (Gulati and Sytch, 2008).

Where potential exists for opportunistic behavior from contract agents due to asymmetric information and incomplete contracts, trust and relational quality can play a major role in realizing mutual gains in an economic exchange (Ariño, la Torre, and Ring, 2001). Closely aligned with these ideas, economic reciprocity theory (Fehr and Falk, 2002) indicates that agents are motivated by mutual trustworthiness and the fairness of the incentive intention. This theory predicts an agent will be more likely to cooperate voluntarily with the principal and reciprocate positive behavior, if they perceive an incentive's intention is fair and honorable.

These four motivation indicators where used in fieldwork to identify motivation drivers that were conceptualized to arise from a set of five core project activities which emerged from a review of construction management literature on determinants of project performance (Chan, Scott, and Chan, 2004; Rahman and Kumaraswamy, 2004; Chua, Kog, and Loh, 1999). The five core activities are mutually exclusive and represent the known possible influences on project motivation. They comprise firstly, the four major stages involved in delivering construction projects with incentives – (i) Financial Incentive Design, (ii) Contract, (iii) Tender Selection, and (iv) Design and Construction Management. The last core

project activity is v) Relationship Management, which runs through the final stage, design and construction management.

These framework constructs, the four motivation indicators and five project activities, have been derived for the current research based on content analysis of the relevant conceptual contributions, which are listed above. These constructs represent a theoretical contribution to the literature on construction management and proved instructive during the empirical phase of this project-based research. The authors use the framework to identify construction project motivation drivers, to fill an observed gap in the literature. During fieldwork, questions were framed around the motivation indicators, linked to project activities. Rose (2008) provides further information on the theoretical background to the framework.

METHOD

The research project was undertaken between 2003 and 2007. The research problem addressed is that many construction managers, tasked with the development of procurement strategies for their projects do not have information available to them on how best to incorporate financial incentives into their contractual arrangements, nor do they understand the impact of financial incentives on project motivation (Rose 2008). Four large scale construction project case studies (referred to as case projects) were undertaken to identify the key motivation drivers in each project. The study population is large non-residential building projects, procured by government clients, under managing contractor arrangements, and completed between 2001 and 2006. The research employs a qualitative multiple case study methodology, including semi-structured face-to-face interviews, consultation of project and contractual documentation (including project briefs and minutes from meetings), review of industry publications, and participation in site visits. For each of the case projects, the

collection of extensive preliminary data regarding project and participant characteristics, helped shape the interviews. The four project sites were also visited before the interviews to observe the end results of the projects.

An inductive case study approach is adopted given the complexity of project environments, and the need for in-depth understanding of the dynamics surrounding project-based motivation in order to effectively scope and identify drivers. This case study method results in more valid and reliable findings than a broader quantitative approach. Although Yin (2003) acknowledges shortcomings with case studies in terms of external validity due to the small and selective samples, the aim of the current research is to derive analytical generalizations rather than statistical generalizations, avoiding this problem.

Four case projects were sufficient to derive cross-case conclusions in this study. This number falls within the optimal range that Eisenhardt (1989b) recommends of between four and ten cases to draw robust cross-case conclusions. The sample of four case projects was selected in a purposive manner so that they would represent major differences in incentive design and project context, whilst holding industry sector, client type, procurement approach, project size and time-line constant.

Within each case study, interviewees comprised four key stakeholder types (client, head contractor, consultants and subcontractors) involved in the procurement and delivery of the case projects. Two people from each of the four types of stakeholders were interviewed on each project, so that overall 32 (2x4x4) face-to-face interviews were conducted, ranging from 60 to 90 minutes duration and based on semi-structured questioning. Interview questions were based on the four motivation indicators. Questions were framed to address the research question ‘What are the drivers of motivation on construction projects?’. The questions were based on the respondent’s perceptions regarding the specific case project. Respondents were asked to describe the structural features of the project, followed by questions about their

commitment to the incentive goals, the fairness of the incentive amount in relation to risk, the fairness of the incentive measurement process, and their relationship with the client.

Interview data was captured by digital recording, transcribed verbatim to develop a comprehensive database. The primary data amounted to approximately 32,000 words contained in interview transcripts across all case projects.

Informal field notes included observations during the interviews, summaries of secondary data and hunches about relationships arising from the interview responses. Such field notes help neutralize post-hoc justifications and provide the researcher with background to the data analysis, by acknowledging themes that emerge during data collection (Eisenhardt, 1989b).

Case study data was examined using content analysis, which involves categorizing the data from the semi-structured interviews and the secondary data to identify the key motivation drivers. Each case project is an independent study subjected to cross-case analysis.

Identification and refinement of driver categories was achieved by inductive coding. The coding process involved interpretation of each interviewee's transcript, structured around the four motivation indicators. Such data was analyzed through the lens of the five project activities. These activities contain the antecedents for motivation drivers and thus guided the manual sorting of research data. Key themes were initially allocated to one of the five core activities. Multiple themes were allocated per core project activity. A theme was only allocated to one activity, as the activities are mutually exclusive. Once all project data had been allocated in this way, each project activity was revisited and patterns of dynamism where identified. Distinct patterns were separated into coding categories and allocated motivation driver labels.

. Each of these label categories were revised and refined until clear lines could be drawn between each of the motivation drivers and their association with the motivation indicators and project activities. The goal was to define coding categories that captured the breadth of interview experience, whilst limiting the categories to key concerns. Care was taken to identify categories that cover all instances, are limited in number and are mutually exclusive. The coding categories resulting from the processes described above are: (1) Risk Allocation, (2) Design Involvement, (3) Value-driven Selection, (4) Future Work, (5) Relationship Workshops, (6) Incentive Flexibility, (7) Incentive Goal Opportunities, and (8) Reward Distribution. These are the categories that were developed to denote the key motivation drivers which emerged from the data.

Due to the subjective nature of content analysis, an expert panel of judges was formed to test content analysis accuracy and ensure inadvertent bias was minimized. Testing provided evidence of reliable coding, with 92% accuracy in matched coding across the three expert panel judges.

Following the individual case analyses, cross-case triangulation was undertaken to identify the key motivation drivers. A simple quantitative analysis was undertaken to assess the relative impact of the identified drivers. This involved a weighted count of the number of times a driver was mentioned by interviewees. The use of this weighted frequency data to derive driver rankings was devised after data collection to assist in prioritizing client action arising from the research. Weightings were assigned to the results based on two classes of project participants – those eligible for a financial incentive reward, and those who were not eligible but contributed to achievement of voluntary goals. Drivers mentioned by reward participants received double the weight of those mentioned by non-reward participants. In the absence of justification in the literature for a different decision rule, this convention of doubling was adopted to reflect the assumption that the views of potential reward recipients

carried more weight than the views of non-reward participants on a project. The sensitivity of results to this approach was tested by recalibrating findings assuming no difference in the value of perceptions held by potential recipients and non-participants. The final ranking of drivers remained unchanged.

Case study research methods encompass risks associated with researcher subjectivity which may negatively impact replication. These risks can be minimized with a strong case study protocol (Yin, 2003). For the current study, the protocol comprises a conceptual framework (see Figure 1), case study field notes, and triangulation across cases, stakeholder types and data types. Case projects were completed no more than five years prior to data collection to maximize interviewee recollection and limit the population to a specific period to provide some stability in external environmental factors, such as economic cycles.

FINDINGS AND DISCUSSION

All of the case projects are from the Australian non-residential building sector and are large in scale - ranging from AUS$91.2 million to AUS$135.5 million and are all classified as complex and significant projects. The case projects were commissioned by Australian government client agencies, and procured under a relationship-based managing contractor contract with financial incentives. The case projects cover key financial incentive design types, comprising (1) share of savings, (2) schedule incentives and (3) performance bonuses, together with mixes of these. Relationship management arrangements include the selection of team members based on their capabilities to commit to the project relationship. The case projects also include initial and ongoing relationship workshops, used in various ways. Relationship workshops intend to improve the quality of relationships between team members by undertaking a series of orchestrated exercises, including problem solving

sessions, directed by a facilitator. The aim is to enhance the effectiveness of teamwork by encouraging participants to work together as a unit pursuing joint objectives.

The case projects also vary by the performance measurement systems used, which include self-reporting performance benchmarks, exponential measurement based on extra scope completed and percentage of cost savings below a target construction sum (TCS).

Project outcomes differed substantially between case projects. Project participants in three of the four case projects achieved the majority of voluntary goals, while in one project they failed to achieve any goal and thus the financial incentive reward was not distributed. Table 1 summarizes key case project characteristics.

Table 1 here

This section examines the key motivation drivers that impact motivation, effort and performance across the four case projects. The behavior of the key project participants is investigated in the context of the project environments and the common characteristics across the four cases are identified. Table 2 shows the eight key motivation drivers to emerge from content analysis of the fieldwork data, guided by the conceptual framework; see Figure 1 for the conceptual framework.

Table 2 here

Each of the key motivation drivers is ranked by impact in Table 2 (see methods) and discussed below under the five core project activities: (i) Financial Incentive Design, (ii) Contract, (iii) Tender Selection, (iv) Design and Construction Management and v) Relationship Management.

Financial Incentive Design

The offer of a financial incentive directly motivates the majority of reward participants even though the rewards varied across the four case projects in terms of financial strength, goals, distribution and measurement processes. Several components of the incentive design were seen to promote/discourage motivation across all four projects. These components relate to: (1) the flexibility of the incentive mechanism to meet changing project priorities – incentive flexibility – ranked as the sixth most important motivation driver uncovered in the fieldwork, (2) the goal opportunities to achieve the incentive reward – goal opportunities – ranked seventh, and (3) the fairness of the incentive reward and its distribution design across the project participants – reward distribution – ranked eighth.

Motivation Driver 6: Incentive Flexibility. The impact of a financial incentive is influenced by whether the incentive mechanism can be adjusted to suit changing project conditions, to maintain the relevance of the incentive goals and/or measurement processes. In project C, the flexibility of the incentive mechanism was displayed through agreement with the client to introduce an acceleration incentive (an additional incentive pool) late in the construction stages. This strongly promoted motivation (incentive flexibility was a high ranked driver in project C). The agreement was perceived to 'bring reality back to the incentive measurement process' and improved the participants' expectations that they were still able to achieve the goals, despite the presence of unforeseen and uncontrollable project factors such as early inaccuracies in the client budget.

In projects A and B, a lack of flexibility in the incentive goal and measurement process impacted negatively on the project participants' trust in the fairness and measurement accuracy. The incentive benchmarks set by the participants early in the project were overtaken by changing project circumstances and could not be renegotiated, making

benchmarks more difficult to achieve than expected. This resulted in an unwillingness to strive for the voluntary goals.

Motivation Driver 7: Incentive Goal Opportunities. In project A, aligning multiple performance goals with project priorities gave the project participants considerable control over their performance, as a wide range of opportunities existed to secure the financial incentive, resulting in improved levels of goal motivation. The multiple goal system in project A allowed the participants to focus their efforts on the goals relevant to current project priorities, without surrendering opportunities to secure the financial incentive. Project participants' involvement in setting the financial incentive goals through incentive development workshops ensured that the goals, measurement procedures and reward outcomes were aligned with the project objectives.

In project B and D, however, the project participants felt that the single incentive goal was too restricted, and did not take account of their performance in all key project priority areas. The perceived injustice in the development of the goals negatively impacted on motivation and goal commitment. This reflected the team's perception of unfairness over the client's failure to offer an incentive reward for voluntary goals in areas outside the scope of the original financial incentive mechanism.

Motivation Driver 8: Reward Distribution. On projects B and C, the distribution of the financial incentive reward impacted on motivation. In project B the project participants valued and were motivated by the client's decision to allow them to decide how the reward would be distributed across the team. Allowing the project participants to self-assess their contribution as a team and determine how the incentive would be distributed improved distributive justice perceptions. In project C, the exclusion of key project participants from the incentive distribution reduced their motivation to achieve project goals, but this effect was offset by the strength of project relationships. Despite their disgruntlement with incentive

design, the excluded participants still assisted the head contractor in identifying value-adding innovations due to strong project relationships. Strong project relationships and mutual trust within the project team can minimize the motivation deficits caused by financial incentive distribution inequity.

Contract

"Risk allocation" is the only motivation driver emerging from the type of contract in use on all four case projects. Risk allocation is the most important motivation driver across all five project activities. Risk allocation is ranked 1st by its impact on stakeholder motivation on case projects. Perceived equity of risk allocation between the project parties influences motivation particularly between the client and the head contractor. This risk allocation primarily relates to the risks associated with cost. Despite differences in the contract structure across the case projects, the process of managing cost risk strongly impacts voluntary goal motivation.

Motivation Driver 1: Risk Allocation. Each of the projects had their own specific contractual arrangements. Under their contracts, the head contractors in projects B and D took on a greater share of construction cost risk, than in projects A and C. As the clients took on a majority of construction cost risks in projects A and C, this was seen to improve the managing contractors' ability to achieve project goals, as the contractors were less likely to be focused on their own financial liabilities, and more likely to perceive the client behavior as fair. The contractors' trust in their client was greater on Projects A and C, so they were less likely to try to transfer risk and they appreciated the greater role played by their clients in the project team's decisions to manage design and construction risks.

Despite this strong motivation in projects A and C, the findings also suggest that a perception of equitable risk can be achieved in projects under a cost limited contract,

whereby the head contractor must not exceed a nominated guaranteed construction sum (GCS), as in projects B and D. Under a GCS clause, the head contractor has a contractual obligation to ensure that actual construction costs do not exceed a target cost. If actual costs exceed the target cost, then the managing contractor absorbs these cost overruns. The distinguishing factor between the allocations of risk in projects B and D is that in project B, a limited amount of negotiation occurred between the client and head contractor from when the GCS was nominated, until it was agreed, while in project D, an extensive GCS negotiation process occurred prior to the settlement of the agreement.

In project B, the construction team perceived their cost risks were uncontrollable under the project conditions, partly because of inaccuracies in the GCS relating to rising subcontractor market prices. The inequity in the cost risk allocation significantly constrained the contractor's trust in the client on Project B and strongly influenced the failure of the project participants to achieve the voluntary goals by the conclusion of the project. However, in project D the opposite situation occurred, where the extensive GCS negotiation process, which culminated at the completion of design development stage, provided the opportunity for the head contractor to agree to a fair and reasonable GCS based on a well-developed design and their knowledge of labor market conditions.

Turner (2004) argues that the risk allocation of a standard GCS type contract de-motivates contractors because the cost overrun risks are heavily weighted in the client's favor. However, the findings here suggest that if a GCS is more fairly negotiated, then motivation increases, as the quality of the negotiations offer the managing contractor greater ability to predict and manage construction costs.

Tender Selection

Value-driven selection emerges as a motivation driver in the tender selection process. This driver ranks fifth in its impact on stakeholder motivation on the case projects.

Motivation Driver 5: Value-driven Selection. On all four projects, the selection of project participants was based on their ability to add value to the project (rather than the traditional price-focused tender selection). This increased the project participants' expectations that voluntary goals could be achieved, promoting trust, commitment and motivation. This finding follows from the belief that fellow project team members would be willing to align with the team objectives and meet the client's expectations. The key elements of the value-driven selection process in the projects comprised contractor and consultant selection based on non-price criteria and the matching of project team capabilities and experience with the primary project objectives.

The tender selection process on all four projects emphasized non-price criteria such as previous performance, and ability aligned with the project objectives. This instilled an inherent desire for project participants (both individually and organizationally) to demonstrate to their client that they had been rightly selected based on their capability and competency, and to uphold their reputation in the delivery of a significant project.

Design and Construction Management

Design involvement emerges as a motivation driver within the design and construction management stages. This driver ranks fourth overall.

Motivation Driver 4: Design Involvement. Involving the managing contractor and key subcontractors early in the design development and documentation stages promotes voluntary goal motivation. Due to the complexity of the designs in the case study projects, the consensus of the head contractor and consultant representatives was that the managing contractor should be engaged no later than design development stage and, at best, during

schematic design stage, to improve the effectiveness of the design development process and to improve the perception that project goals can be attained.

In project A, the involvement of the managing contractor and key subcontractors in design development and documentation stages was seen to improve the design team's ability to fast-track the design and manage the integration of design and construction by providing buildability advice. Project A was the only project in this study to comprehensively include the key subcontractors in the design stages, which increased the head contractor's effectiveness in identifying value-added design options. Such value adding options include innovative trade package designs, such as alternate electrical and data communication layouts that cost the client less, but improve overall building functionality and accessibility. The client-driven involvement of subcontractors as the 'buildability experts' greatly enhanced the integration between conceptual design and construction and avoided the need for design rework. This early and positive behavior from the client set the scene for strong project performance by indicating to the contractor that the client could be trusted to act competently in their oversight of the project.

Projects B and C experienced documentation issues that were attributed to late contractor and subcontractor involvement. According to the project participants, these issues related to the requirement for the design team to 'rework' and re-document the advanced design after the contractor was engaged to improve buildability. Participants on both projects felt that if the contractor had been involved earlier, the team would have had the opportunity to jointly develop the design, preventing unexpected design changes prior to the commencement of construction. This ultimately placed pressure on the contingency budgets for projects B and C, as the client was required to pay for the extra design documentation work completed.

Involving contractors early in design stages can increase the ability of project participants to manage their performance. This suggests that increasing the project participants' control over their performance, by actively incorporating the managing contractor and key subcontractors in design development, is likely to improve motivation towards voluntary goals, due to higher expectations that the goals are achievable.

Relationship Management

Across all projects, mutual trust, team relationships and supporting processes played a vital role in promoting motivation toward voluntary goals. Two areas within relationship management significantly promote motivation. These are future work, ranked second and relationship workshops, ranked third.

Motivation Driver 2: Future Work. The potential for future work with a major client is a very strong motivation driver. This driver relates to the desire to uphold and improve reputation so as to increase future commercial opportunities. This driver is particularly relevant to the research population, as Australian government agencies are key repeat clients. The desire to strengthen reputation with repeat clients is likely to be stronger here than with clients who are less likely to provide further work opportunities.

The strength of this driver is particularly evident in the outcomes for project B. Although the voluntary goals were not achieved on the project, the team delivered the project on time and within budget under 'crisis' conditions, in which the head contractor was willing to absorb significant financial losses. According to the contractor representatives, this was primarily due to their long-term relationship with client and their wish to be favorably looked upon for future projects, even at the expense of short-term profits. Future work is a high-level motivation driver in all projects. The analysis of this driver suggests that rewarding high performance by improving future work opportunities can intensify the willingness of project

participants to commit to the project relationship and promotes motivation. This also allows the client to capitalize on the benefits of repeat inter-organizational interactions such as continuous improvement and improved relational quality.

Motivation Driver 3: Relationship Workshops. Each project had varying relationship development processes, although all had in common an initial relationship workshop and informal relationship monitoring which induced high relational quality. This relational quality, in turn, promotes motivation towards the project goals. The importance placed on strong relationships as a major determinant of motivation in these projects indicates that without strong relational quality, the impact of the financial incentive on motivation may be decreased.

In projects A and C, the delivery approach placed greater emphasis on the development of the project relationship, with more intensive relationship workshops than in projects B and D. The research suggests that the greater the level of team building and trust developed through ongoing relationship workshops, the greater the impact on motivation – as this driver was ranked high in projects A and C, and only mid-ranked in projects B and D.

In summary, the results suggest that an intensive relationship improvement strategy will increase personal commitment to the voluntary goals on a project, enhancing the level of motivation induced through a financial incentive.

CONCLUSIONS

Aligning participants' effort with project goals is a key objective of an effective procurement strategy for construction projects. In the four large projects this research explores, varying degrees of alignment occurred between the motivations of participants and the clients' desired outcomes. Although financial incentives enhance project participant motivation, to maximize benefits, construction clients need a procurement strategy that

instills trust, unity and fairness in project team interactions. This implies the need for equitable allocation and management of project risk.

This study is the first to comprehensively explore the drivers within construction project design and delivery that impact on motivation towards voluntary project goals. The research results have significant implications for construction managers when designing a project procurement approach. A key research finding is that underlying distrust between project participants can result in negative perceptions of the incentive intention, limiting its impact on motivation. Construction clients need to promote financial incentives as a supporting tool in the development of trust, cooperation and motivation and not as a performance control mechanism within highly detailed contractual specifications. The use of financial incentives in a respectful contractual environment will avoid the perception that the client is untrusting and suspicious of the contractor's behavior, and encourage the idea that the client aims to promote respect and recognition through rewarding superior performance.

In summary, offering a financial incentive does not assure project motivation and performance automatically. Such incentives may not be sufficient to establish the robust relational quality necessary to efficiently and effectively harness inter-organizational efforts towards voluntary project goals. The case projects clearly show a wide range of motivation drivers influencing motivation and the simple presence of a financial incentive may not be a sufficient condition for performance improvement – nor even a necessary condition. However, financial incentives can enhance the positive impact of a range of other performance-enhancing initiatives, such as an equitable base contract, future work opportunities, relationship workshops, up-front design involvement, and value-driven tender selection.

As such a robust approach may not always be possible, given the limited resources of clients, prioritization strategies may be necessary. In such circumstances, the findings suggest

that clients should focus on creating an equitable contract risk profile and enhancing relationships between project participants. These factors have the greatest impact on motivation towards voluntary goals, over and above the drivers related to the financial incentive design.

Figure 2 presents a revised conceptual framework which fills a gap in the literature by identifying motivation drivers on construction projects and their relative importance. This version of the framework represents theoretical advancement in the field of construction management by combining two streams of motivation theory to derive four motivation indicators to be applied to five core project activities, giving rise to eight motivation drivers. These conceptualizations are unique in the construction management context and represent advancement of knowledge in this field. Previously, construction management research has assumed that financial incentives automatically translate into motivation with little regard to the context in which they are applied (Bresnen and Marshall, 2000). The current research shows that this motivational environment is far more complex. The research discussed in this paper has enabled identification of the diverse motivation drivers that impact construction project performance. This is the first time a comprehensive attempt has been made to understand the relative importance of motivation drivers on construction projects.

Figure 2 here.

The study's findings are consistent with organizational management research which similarly emphasizes the importance of relational quality to business outcomes (e.g., Ariño, la Torre, and Ring, 2005). The results are therefore likely to hold for a wider range of business project environments than those presented here, including non-construction projects.

Nevertheless, the future-work motivation driver will not be applicable to one-off project clients.

This research offers a cross-sectional view of the perceptions of key participants on individual projects. Future studies can expand this view by collecting the perceptions of key participants over time. This expansion would allow the investigation of performance-reward feedback loops, if repeat clients were involved. Such a study could provide important information to such clients on how financial incentives may strengthen motivation over time and over multiple projects. Figure 2 also provides a sound basis for future quantitative research which could improve generalizability and validity. Finally, further research into the differential value of opinions held by potential incentive recipients versus non-recipients may yield a richer explanation of the relative importance of motivation drivers to these two groups than that presented here.

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FIGURE 1

Conceptual Framework - Motivation on Construction Projects

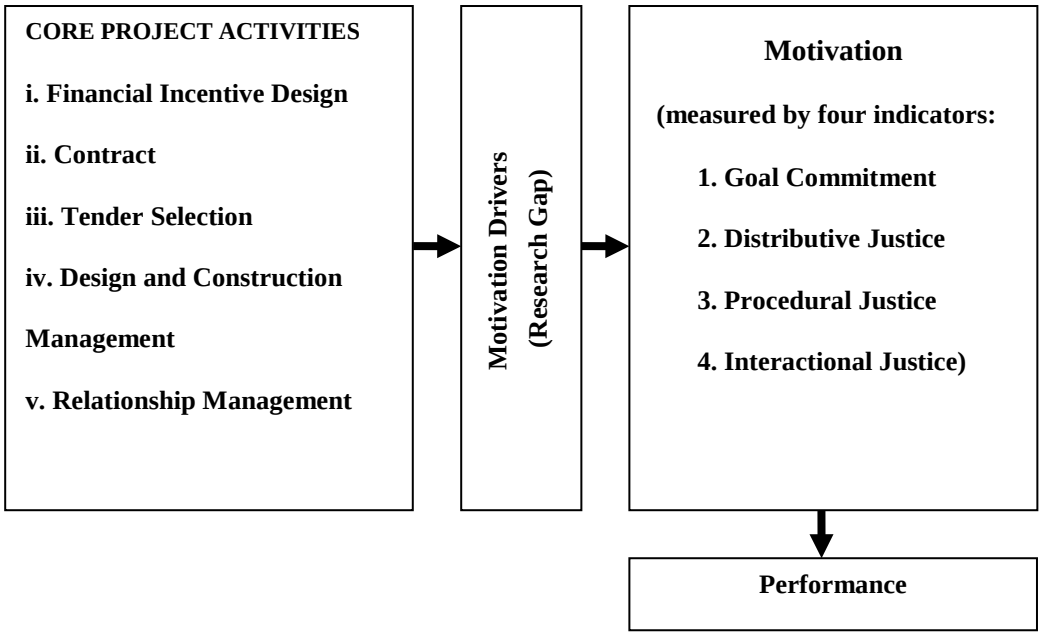

FIGURE 2

Revised Conceptual Framework – Motivation on Construction Projects

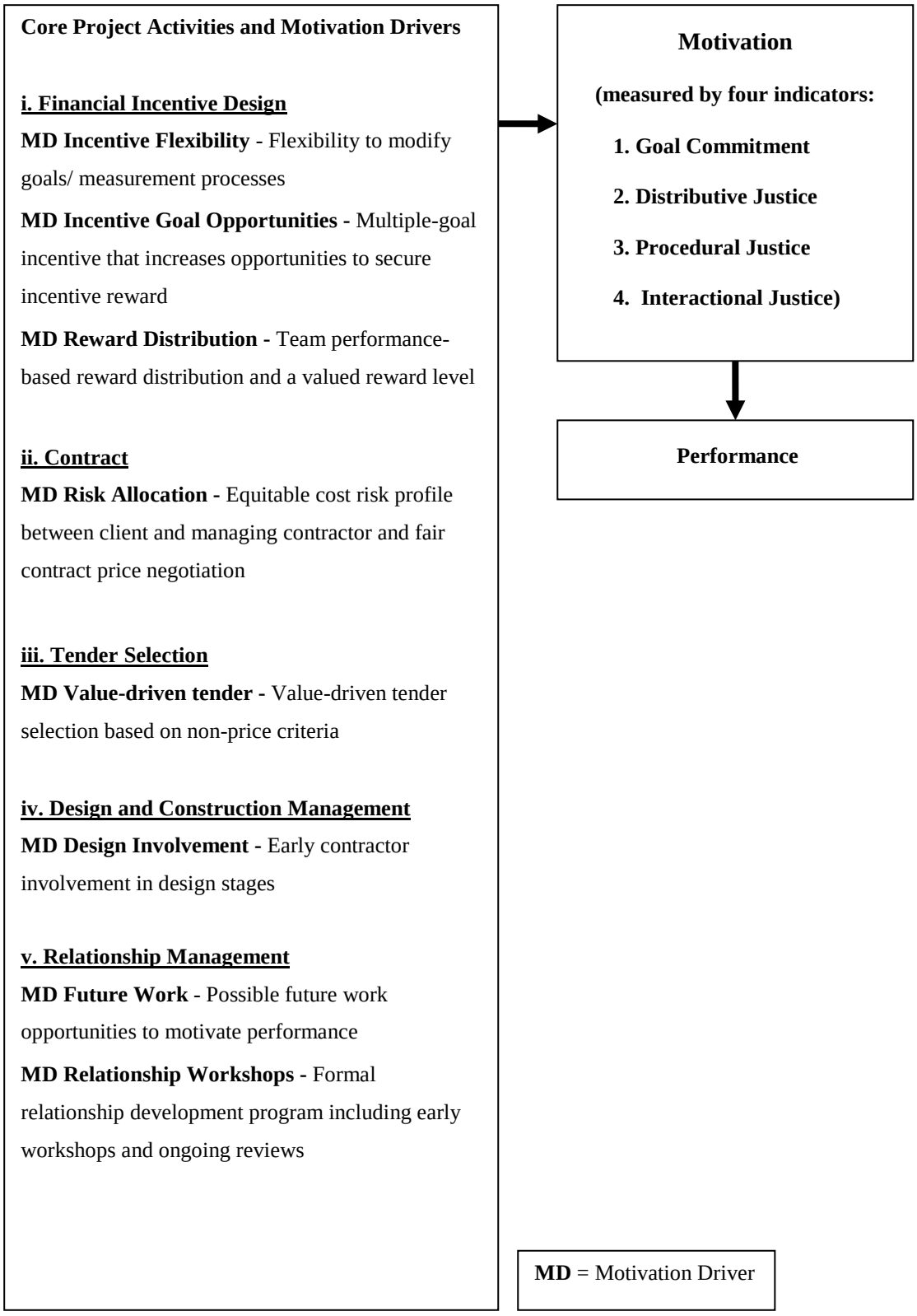

TABLE 1

Case Project Characteristics

	REGIONAL HOSPITAL REDEVELOPMENT	NEW MAGISTRATE COURTS COMPLEX	CONVENTION CENTRE EXTENSION	NEW HEALTH CAMPUS
Code	Project A	Project B	Project C	Project D
Incentive type	Combination	Technical performance bonus	Combination	Share of savings
Building type	Hospital redevelopment	Court complex (greenfield)	Convention centre redevelopment	Hospital campus (greenfield)
Contractual arrangement	Managing Contractor (Construction Management)	Managing Contractor (Design and Construction Management)	Managing Contractor (Construction Management)	Managing Contractor (Design and Construction Management)
Incentive outcome	Majority of voluntary goals achieved	Failure to achieve voluntary goal	Majority of voluntary goals achieved	Voluntary goal achieved
Final cost (AUS$)	91.2 million	135.5 million	92 million	80 million
Completion date	May 2005	November 2004	September 2001	October 2001

TABLE 2

Key Motivation Drivers and Project Activities

Key Motivation Driver	Core Project Activities	Identified on Case Projects	Ranking
Risk Allocation	Contract	A,B,C,D	**1**
Future Work	Relationship Management	A,B,C,D	**2**
Relationship Workshops	Relationship Management	A,B,C,D	**3**
Design Involvement	Design and Construction Management	A,B,C,D	**4**
Value-driven Selection	Tender Selection	A,B,C,D	**5**
Incentive Flexibility	Financial Incentive Design	A,B,C	**6**
Incentive Goal Opportunities	Financial Incentive Design	A,B,D	**7**
Reward Distribution	Financial Incentive Design	A,C	**8**