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This is the author's version of a work that was submitted/accepted for publication in the following source:

Rose, Timothy M. & Manley, Karen (2011) An integrated framework to assess financial reward systems in construction projects. In Toole, T.Michael (Ed.) *Working Paper Series, Proceedings of the 2011 Engineering Project Organizations Conference*, The Engineering Project Organization Society (EPOS), Aspen Lodge Resort, Denver, Colorado, pp. 1-12.

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AN INTEGRATED FRAMEWORK TO ASSESS FINANCIAL REWARD SYSTEMS IN CONSTRUCTION PROJECTS

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ABSTRACT

Motivation is a major driver of project performance. Despite team member *ability* to deliver successful project outcomes if they are not positively motivated to pursue joint project goals, then performance will be constrained. One approach to improving the motivation of project organizations is by offering a financial reward for the achievement of set performance standards above a minimum required level. However, little investigation has been undertaken into the features of successful incentive systems as a part of an overall delivery strategy.

With input from organizational management literature, and drawing on the literature covering psychological and economic theories of motivation, this paper presents an integrated framework that can be used by project organizations to assess the impact of financial reward systems on motivation in construction projects. The integrated framework offers four motivation indicators which reflect key theoretical concepts across both psychological and economic disciplines. The indicators are: (1) Goal Commitment, (2) Distributive Justice, (3) Procedural Justice, and (4) Reciprocity.

The paper also interprets the integrated framework against the results of a successful Australian social infrastructure project case study and identifies key learning's for project organizations to consider when designing financial reward systems. Case study results suggest that motivation directed towards the achievement of incentive goals is influenced not only by the value placed on the financial reward for commercial benefit, but also driven by the strength of the project initiatives that encourage just and fair dealings, supporting the establishment of trust and positive reciprocal behavior across a project team. The strength of the project relationships was found to be influenced by how attractive the achievement of the goal is to the incentive recipient and how likely they were to push for the achievement of the goal. Interestingly, findings also suggested that contractor motivation is also influenced by the fairness of the performance measurement process and their perception of the trustworthiness and transparency of their client.

These findings provide the basis for future research on the impact of financial reward systems on motivation in construction projects. It is anticipated that such research will shed new light on this complex topic and further define how reward systems should be designed to promote project team motivation. Due to the unique nature of construction projects with high levels of task complexity and interdependence, results are expected to vary in comparison to previous studies based on individuals or single-entity organizations.

Keywords: governance; inter and intra firm collaboration; motivation; financial rewards; construction projects

INTRODUCTION

Financial incentive reward systems aim to align the motivations of interdependent project stakeholders within a temporary project organization. This is achieved through client gain-sharing, that is, by providing the contractor and/or consultants a share in the client's success from the project. A key objective of financial incentives is motivation towards cost containment. Cost containment rewards are one of the most widely used forms of financial reward systems and can be applied to either fixed price, or modified cost reimbursable (cost-plus) contracts, depending on how the incentive is structured (Russell, 2003). Generally, under a cost-plus incentive arrangement, the client's target cost is introduced into a reimbursable contract. This acts as the fulcrum around which the cost containment mechanism is driven, savings achieved below the target cost are split between the contractor and client based on a predetermined share profile (Broome & Perry, 2002). The aim of this arrangement is to motivate the contractor and client to work together to minimize actual costs, as the contractor is able to maximize their profit margin by sharing the benefits of reduced project cost, and the client is motivated to minimize the total cost paid out (Broome & Perry, 2002).

Another common type of financial reward system is a performance bonus which can be integrated into a wide range of contract types, including standard lump sum and cost reimbursable contracts. Simply, a performance bonus aims to motivate the contractor by providing a financial bonus that is additional to their prescribed fee for exceeding minimum acceptable levels of performance (Washington, 1997). In general, performance is evaluated *ex ante* and the reward is distributed from a separate client bonus pool specified at the start of a project. As the financial incentive is drawn from a separate bonus pool, there is a wide range of performance areas that can be rewarded, including schedule, environmental, quality, safety and design performance targets. However, important to the success of bonus incentives are specific, mutually agreed and measurable targets. If the output deliverables cannot be well defined, then an incentivized contract should not be pursued (HM Treasury, 1991).

Construction organizations are increasingly focusing their attention on promoting motivation through the application of financial reward systems that encourage inter-firm collaboration and effort. Yet, such organizations appear to have little understanding of the drivers of motivation that underpin these systems. This has resulted in lackluster performance. Despite the increased uptake of financial reward systems, there is little research into the impact of such systems on motivation in construction projects. This may be due to the complexity of the motivational environment and the potential difficulties in applying organization theories to a project context. This paper addresses this knowledge gap by developing an integrated framework that is suitable for examining the unique context of a construction project. The paper also presents contributions from psychological and economic motivation theory, and interprets the conceptual framework against the results of a successful Australian social infrastructure project case study.

WORK MOTIVATION AND FINANCIAL REWARD SYSTEMS

Work motivation can be defined as a set of external and internal energetic forces that initiate work-related behavior and 'determine its form, intensity, direction and duration' (Pinder, 1998, p.11). This definition acknowledges the influence of both environmental forces (such

as financial rewards and the nature of the task) and inherent forces (such as intrinsic motives) on behavior (Ambrose & Kulik, 1999).

In a work environment, financial rewards and remuneration affect motivation, which in turn impacts on performance, via effort, choice and persistence (Locke and Latham, 2004). Mullins (1996) takes a broader view and argues that performance is a product of motivation, ability and the environment. Similarly, Howard et al. (1997) argues a construction contractor's output is a function of factors within their control (ability and effort) and external factors outside their control (environment). These external factors are referred to as 'noise' elements in the economic literature (Baker, 2002) and introduce randomness into agent performance.

Recently in experimental management literature, serious attempts have been made to integrate the key theoretical concepts across economic and psychological disciplines to investigate the impact of financial reward systems on motivation (e.g. Van Herpen et al., 2005). These frameworks have been empirically applied to performance measurement and motivation at an organizational level, with there being little or no investigation of a project environment.

Although construction management researchers have looked at motivation in a project environment, this appears to have been *either* from an economic perspective (e.g. Howard et al., 1997) or a psychological perspective (e.g. Leung et al., 2004), and never in combination. There appears to be no existing application of *integrated theory* to motivation in projects, let alone concerning motivation on *construction* projects, or financial reward systems in construction. This may be due to the complexity of the motivational environment in a construction project and the potential difficulties in applying organization theory to a construction project context. This paper addresses this knowledge gap by developing an integrated framework that is suitable for examining the unique context of a construction project (e.g. high levels of task interdependence and the strong influence of individual project team members on organizational performance). The paper first outlines key contributions of work motivation theories across psychological and economic disciplines.

Work motivation theories

As the cornerstone of psychological work motivation theory, cognitive theories attempt to understand the thought processes that mediate a person's behavior in the workplace and argue that workers behavior is 'purposeful, goal-directed and largely based on conscious intentions' (Steers and Shapiro, 2004). Prominent cognitive theories of work motivation include goal setting theory and goal commitment, and justice/equity theory. From an economic perspective, principal agent theory is a dominant interpretation of organizational action in a contract setting and assumes an agent (individual or organization) is self-interested and risk-averse. Recent work from experimental economists introduces other ideas that question the traditional principal agent relationship, such as the impact of social preferences and reciprocity on agent behavior.

Goal setting theory and goal commitment

According to Locke & Latham's goal setting theory (Locke & 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 motivational force. For an individual to be

committed to set goals, the goals must be challenging but realistic, clearly understood and meaningful. The theory also argues that for goals to promote effort, timely and accurate feedback is required at appropriate intervals. Feedback will inform an individual that progressive goals have been attained, thus maintaining effort levels. Under certain conditions, specific but difficult goals can lead to higher levels of motivation than vague or easy goals, as expressed in task goal theory (Locke & Latham, 1990). Recent literature on goal setting emphasizes the importance of goal commitment as a critical construct in understanding the relationship between goals, motivation and performance (Klein et al., 1999).

A key theoretical construct behind goal commitment is expectancy theory (Vroom, 1964). Expectancy theory forms the general framework for a wide variety of motivation research (Ambrose & Kulik, 1999) and outlines how individuals and groups make behavioral decisions according to various alternatives. It is based on the principle that individuals will adapt their behavior to achieve a desired outcome and will select the behavioral option with the greatest motivational force. Expectancy theory states that when an individual judges the motivational force (MF) of the behavioral option, three variables are considered. These variables are Expectancy, Instrumentality and Valence. *Expectancy* is the perception of the probability that one's effort will attain desired performance goals. *Instrumentality* is the perceived probability that, if performance goals are met, the desirable outcome (reward) will be received. *Valence* is the perception of relative attractiveness or value an individual places on the desired outcome or reward.

Hollenbeck & Klein (1987), as with Locke et al. (1981), used an expectancy theory framework to identify the antecedents of goal commitment. They argue that the major antecedents of goal commitment can be split into two categories: those that impact on *the attractiveness of goal attainment* and those that impact on the *expectancy of goal attainment* (Hollenbeck & Klein, 1987). Further research undertaken by Klein et al. (1999) confirmed a positive relationship between goal commitment, expectancy and attractiveness of goal attainment after analyzing the results of 174 published articles relating to goal commitment.

Justice/Equity theory

As the basis of justice theory, equity theory, originally developed by Adams (1963), argues that agents are motivated by their need for fair treatment and will develop comparisons between one another (referents) in determining what is fair, just and reasonable. *Distributive justice* is a key conceptualization of equity theory and refers to the perceived fairness of the amounts of compensation agents receive (Greenburg, 1987). Thus, for financial reward systems, distributive justice is determined by how fairly the required input is balanced against the outcome (e.g. money), and how this compares to the input/outcomes of others. The concept of justice and its impact on behavior and motivation has received a great deal of attention over the last three decades – initially focusing on distributive justice, with more recent work focusing on the justice of decision-making processes (that lead to decision outcomes), or what is termed as *procedural justice* (Colquitt, 2001). Procedural justice is delivered by adherence to fair measurement criteria such as clarity, consistency, correctability (flexibility), representativeness, accuracy, bias suppression and ethicality (Leventhal, 1980). If an agent believes the measurement procedures are inaccurate, it can impact on the effectiveness of a financial reward system (Moers, 2000).

From the development of the two factor conceptualization of justice (distributive and procedural), a third type was identified and first introduced by Bies & Moag (1986). This is

interactional justice, or the fairness of interactive treatment received as decision-making processes are undertaken. This third type of justice is fostered when decision-makers treat those agents whose performance is being judged with sensitivity and respect. Decision-makers also need to provide agents with the rationale behind their decisions. There are still questions in justice research about the applicability of a three-factor conceptualization of justice. For example, some researchers have argued interactional justice is a subset of procedural justice (e.g. Moorman, 1991). Yet a recent meta-analysis (Cohen-Charash & Spector, 2001) claims to have found clear distinctions in the three justice types arguing they are each worthy of merit. Colquitt & Shaw (2005) agree, arguing that overall justice perceptions are based on each of the three justice types.

Social preferences and reciprocity theory

From an economic perspective, the ability of financial remuneration to motivate recipients is founded in principal agent theory, which is characterized by a principal (employer or client) who hires an agent (employee or contractor) to undertake actions on behalf of the principal to advance the principal's objectives (Jensen & Meckling, 1976). As an extension to the traditional principal agent theory that assumes agents only do what they perceive to be in their self-interest (Howard *et al.*, 1997), economic reciprocity theory states that agents actually prefer a condition of fairness in the exchange relationship with their principal. Depending on the behavior of the principal, the agent perceives the value of a financial reward as positive or negative. If the agent views the incentive's *intention* as 'calculative' or hostile, the agent may view the incentive negatively, which can lead to a hostile response (Fehr & Falk, 2002). This reasoning is similar to justice theory as discussed in the cognitive theory literature, where the reward mechanism should be fairly applied so that rewards and measurement processes illicit their desired behaviors.

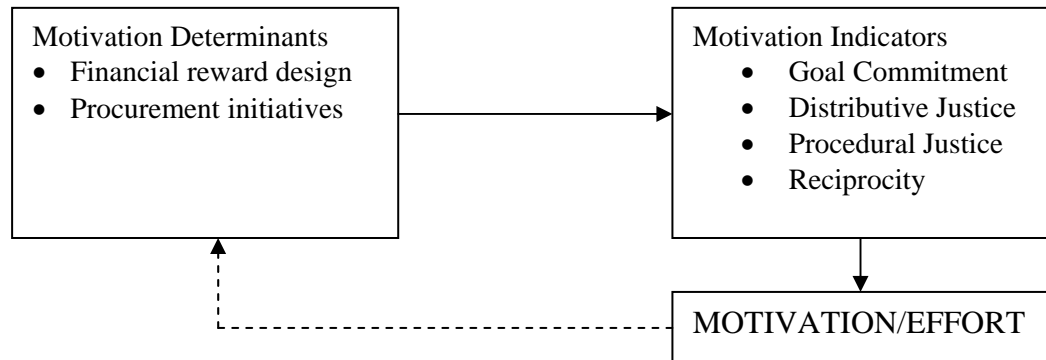
INTERGATED FRAMEWORK

There are current efforts to incorporate psychological theories into economic theory to help in the latter's interpretation of organizational action. The ability of psychological theory to assist in explaining organization action is relevant here because a construction project can be interpreted as an organization. In the construction literature, Turner and Muller (2003) argue that project teams may be viewed as 'temporary organizations'. Similarly, Eccles (1981) proposed an individual construction project might be regarded as a quasi-firm or a loosely coupled inter-organizational form. These interpretations suggest the potential value of applying psychological theories to motivation in a project environment.

Given the minimal research into the impact of financial reward systems on motivation in construction a conceptual framework was developed to identify the contextual determinants that impact on incentive reward motivation. Figure 1 presents the integrated framework. In light of the potential to apply psychological motivation theory to interpret project organizational action, the authors developed a four-fold classification of motivation 'indicators' that form the core construct of the framework. These indicators are: 1) Goal Commitment, 2) Distributive Justice, 3) Procedural Justice and 4) Reciprocity. Thus, this classification predicts that motivation towards financial reward goals in construction projects is strongly influenced by: 1) how attractive the achievement of the goal is to a contractor and how likely it is that they will be able to achieve the goal; 2) the contractors' perception of the fairness of the reward in relation to their performance and other project team members'

performance and rewards; 3) the fairness of the performance *measurement* process; and 4) the contractor's perception of the trustworthiness and transparency of their client.

Figure 1 Integrated Framework



In addition to the motivation indicators, the motivation determinants are split into two categories: the impacting factors relating to the design of the financial reward system and the broader procurement initiatives that impact on motivation towards the reward goals. It is also assumed that greater effort may lead to increased responsiveness to incentive design and procurement initiatives, intensifying the motivational effect and providing a feedback loop. These framework constructs represent a theoretical contribution to construction management literature and proved instructive during the empirical phase of this project-based research.

METHOD

A case study methodology was chosen to empirically explore the determinants that impact on the four motivation indicators in a construction project context. This was seen as the best method given the complexity of project environments, and the need for in-depth understanding of the dynamics surrounding project-based motivation. The project case study presented in this paper was selected in a purposive manner, as it represents an example of the successful design and implementation of a financial reward system as part of the overall project procurement approach.

Case study findings were triangulated across the following data sources: semi-structured face-to-face interviews, project and contractual documentation (including project briefs and minutes from meetings), industry publications, and a site visit. Extensive preliminary data were collected, which helped shape the questions asked during the interviews, as did the conceptual framework. The interviewees comprised eight senior managers; two from each of four key stakeholder types (client, head contractor, consultants and subcontractors) who were heavily involved in the procurement and delivery of the case project. As the unit of analysis was at the organizational level, interviewees represented the view of their organization as senior managers. All interviews were in-person and ranged from 60 to 90 minutes duration, and were based on structured and un-structured questions. Raw interview data was analyzed using content analysis. This involved manually aggregating and categorizing responses from the interview transcripts and the secondary data. The identification and refinement of categories was achieved by inductive coding. The primary data amounted to approximately

8,000 words contained in interview transcripts. The coding process involved interpretation of each interviewee's transcript and each coding category was revised and refined until clear lines could be drawn between the motivation determinants. Key themes were allocated labels in association with each motivation indicator and then categorized by (i) the financial incentive design and; (ii) the supporting procurement initiatives. To test content analysis accuracy and ensure inadvertent bias was minimized, an 'expert panel' was formed. Three expert panel members undertook their own category allocations, resulting in over 80% accuracy in comparison to the original coding; providing support for content analysis reliability.

CASE PROJECT MOTIVATION

The case project involved the design and construction of a major social infrastructure refurbishment with a budget of over \$90 million. A key goal on the project was the achievement of a target completion date, as the government client had made a public commitment to open to the public by a set date. Other project goals included defects-free by completion date, meeting all functionality and design requirements set out in the project brief (including environmental and safety goals), limiting errors and omissions in construction documentation and meeting the client budget. The general contract approach was a Managing Contractor – Construction Management (MC-CM) arrangement with extensive relationship management elements. This approach was chosen as it allowed the client control over the design process, but shared the cost risks associated with the design and construction. Despite using a standard form of contract, the additional relationship elements assisted in mitigating the design and construction risks taken on by the client, through closer integration of the project team and improved decision-making and problem resolution processes. It also established shared project goals against which performance could be assessed. This involved the abolition of the traditional hierarchical structure, replaced by a 'round table' approach that saw key representatives from each project organization form an Integrated Management Team (IMT) and Project Control Group (PCG). There were monthly IMT and PCG meetings, where open and honest communication was encouraged, in an equitable environment. A relationship consultant was also appointed to establish and formalize the management structure and facilitate relationship workshops and ongoing relationship coaching. This approach aimed to foster team commitment to the project goals. All project parties were contractually obliged to 'act in good faith'.

The financial reward system was intended to reward the contractor for efficiently managing the client's risks, above their standard construction management fee. A positive performance-based reward system was jointly agreed in the conceptual stages and aimed to reward three main areas of project performance: innovation contribution, contingency savings and ready-for-use completion. As a key element of the system, the contractor could propose innovations that would achieve cost-savings and/or program savings while preserving functionality and quality. Once the innovation was agreed, 50% of the savings achieved would be placed in a cost savings incentive pool, while the other 50% was reinvested into the project. The incentive pool would be then paid to the contractor on the provision they achieved the target practical completion date. By project completion, approximately AU\$2 million in savings was achieved from innovations by the contractor. As the contractor achieved the finalized practical completion date, they were provided their portion of the incentive pool. The next section presents the elements of the reward system and overarching procurement initiatives that encouraged motivation towards these goals.

Overall, the case project was considered a success by the project team, including the client. This success was partly attributed to the innovations that were encouraged through the financial reward system, and also to the procurement initiatives that motivated the project team to strive for the project goals – maximizing the impact of the reward system on team motivation. The following motivation determinants were nominated by the interviewees as influencing their goal commitment, distributive and procedural justice and reciprocity perceptions leading the achievement of the reward systems goals. The discussions of these determinants not only provide guidance to project organizations in the use of financial reward systems but also provide justification of the four-fold classification of indicators to explore construction project motivation.

Although the share of innovation savings offered by the reward system had a direct motivating effect, the design of the reward system featured some elements that amplified this effect. For instance, a realignment of the financial reward goals late in the construction stages to meet changing project conditions promoted goal commitment (cited by seven of the eight interviewees) by improving the expectancy the goals could be achieved. According to contractor representatives, the realignment of target goals “brought reality back” to an overly ambitious budget and program, restoring fairness in the incentive reward distribution, thus also reinstating distributive justice. Of note, motivation was constrained through perceived injustices in how the financial reward was to be distributed across the project team. Although those who had shared in the incentive reward valued it, seven of the eight interviewees perceived that the exclusion of the consultants from this incentive de-motivated the consultants and resulted in less value delivered from innovation than might otherwise have been the case. This supports the need to equitably distribute the financial reward across organizations who contribute to the successful achievement of goals. Also, according to five of the eight interviewees, the measurement of performance under the innovation incentive was unclear, impacting on perceptions of procedural justice.

Despite elements of the financial reward design that amplified and constrained motivation, the case study results suggested that overarching procurement initiatives had a significant impact on how the reward system was perceived by project organizations. The modified MC-CM contract supported an equitable allocation of design and construction risk under the project conditions according to the client and contractor representatives. These representatives attributed a fair allocation of risk to increased goal commitment, where the client encouraged the contractor’s expectancy that the innovation goal could be achieved. This was achieved by providing the contractor the financial flexibility to put resources into identifying innovative solutions. These representatives also agreed that the project’s contract and relationship elements promoted trust and reciprocity, where the contractor was encouraged to pursue the reward goals under the collaborative contract approach. Also, the establishment of the ‘round table’ senior management structure encouraged motivation towards the innovation goals (cited by five of eight interviewees) as it was seen to improve the team’s ability to control their performance, thus improving the expectancy that the project team could jointly attain the goals, promoting goal commitment. This structure also encouraged reciprocal behavior in dealing fairly with project issues such as the realignment of the project program to meet changing conditions. This was also encouraged by involving the contractor and key subcontractors in the early design process to fast track the commencement of the construction stage and improve constructability.

Additionally, seven of the eight interviewees felt the relationship workshops throughout the project established a collaborative team culture which promoted motivation towards achieving the innovation goals and building the incentive pool. This driver was found to be associated with an increase in the attractiveness of goal attainment, thus promoting goal commitment. The relationship workshops also encouraged fair and just behavior across the team by emphasizing the importance in forming a close working relationship, thus promoting reciprocity. The motivation induced through the project relationships was also promoted through the potential for future work opportunities and the desire to uphold reputation. According to five out of the eight interviewees, the potential for future work with the government client strongly encouraged motivation towards the reward goals. This was linked primarily to goal commitment; the attractiveness of goal attainment was increased through the desire to uphold a strong reputation, potentially leading to future work opportunities. Finally, the selection of the construction team through a value-based multi-criteria tender selection process promoted goal commitment, according to seven out of eight interviewees. The emphasis placed on recognition of previous experience and ability to deliver on the project goals over a traditional price-only selection process promoted key project goal commitment.

CONCLUSION

With input from organizational management literature, and drawing on the literature covering psychological and economic theories of motivation, this paper presents an integrated framework that can be used to explore the impact of financial reward systems on motivation in construction projects. The case study results support the use of a four-fold classification of motivation indicators. Thus, project motivation is influenced by how attractive the achievement of the goal is to a project participant and how likely it is that they will be able to achieve the goal. Case study results also support the importance of fairness in the measurement and distribution of the reward in relation to performance. Finally, it is predicted that motivation towards the financial reward goals is influenced by the perception of the trustworthiness and transparency to encourage reciprocal behavior. There is overlap in the motivation theory literature and this paper has shown how the indicators can be effectively rationalized for application to a construction project context.

As a practical contribution, this paper has presented a range of financial reward design and procurement initiatives that were found to encourage goal commitment, distributive and procedural justice, and reciprocity. In summary, motivation was influenced in the case project by the following:

- Flexibility in realigning of project goals to meet changing project conditions; maintaining the relevance of the goals;
- Equitable allocation of contract risk to allow the contractor financial flexibility to strive for the project goals;
- financial reward offering to all project parties who directly contribute to goal attainment;
- the formation of a collaborative project culture through relationship fostering activities such as relationship workshops and round-table senior management structures;
- direct linkages between project performance and future work opportunities; and

- selection of the construction team through a value-based multi-criteria tender selection processes to recognize previous experience and ability to achieve project goals.

In light of the motivation indicators, the case study results also highlight the importance of situating financial reward systems within a complementary suite of interrelated project procurement initiatives that promote the recognition of high performance. According to literature on social preferences, it is predicted that without a supportive environment based on trust and fairness, contract agents may perceive the intention of a reward system as potentially calculative, and thus, will be less likely to be motivated to pursue its goals. Future quantitative research is planned to further extend the validity of the integrated framework across a broader range of construction project environments and to determine the sensitivity of the four indicators across different combinations of motivation theories. It is anticipated that such research will shed new light on this complex topic and result in further detailed advice on how reward systems should be designed to promote project organization motivation. Owing to the unique nature of construction projects with high levels of task complexity and interdependence, results are expected to vary in comparison to previous studies based on individuals or single-entity organizations. In the meantime, this paper has contributed to theory by confirming the value of the integrated framework to assist in understanding the nature of construction project motivation.

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