PROMISES, PITFALLS AND SHORTFALLS OF THE GUARANTEED MAXIMUM PRICE (GMP) APPROACH: A COMPARATIVE CASE STUDY[1]

Aaron M. Anvuur[1] and Mohan M. Kumaraswamy[2]

[1] *Bartlett School of Construction and Project Management, University College London, Gower Street, London WC1E 6BT, UK*

[2] *Department of Civil Engineering, University of Hong Kong, Pokfulam Road, Hong Kong*

The relative merits of the guaranteed maximum price (GMP) mechanism as a contractual incentive in construction have been much contested. This question was investigated using a comparative case study of two building projects in Hong Kong. Data was collected through semi-structured interviews, review of project documentation and communications, and passive observation of project meetings. The findings suggest that the GMP mechanism has low incentive intensity from an instrumental rationality perspective and high incentive intensity from a value-expressive perspective. Further analysis of the findings leads to two main conclusions about the potential value of the GMP mechanism to a client: (a) it can provide some flexibility in responding to short-term market changes and other idiosyncratic factors and (b) it can be a useful instrument for project work group integration. Based on current approaches to GMP projects in Hong Kong, the ultimate compensation for the additional risk transfer to the contractor should come from the applied mark up or fee rather than any expectation or possibility of some financial reward for net cost savings.

Keywords: contract strategy, guaranteed maximum price, GMP, incentivisation.

INTRODUCTION

Incentives are an important and ubiquitous component of construction contracts because they are considered to align the goals of contracting parties with project objectives (Turner, 2004). Contractual incentives generally involve one or both of two mechanisms (Bower *et al.*, 2002): cost incentives, whereby partners undertake to work jointly to reduce the outturn project cost for an opportunity to share any underruns and, sometimes, overruns of a target cost according to an agreed formula; and performance incentives, whereby rewards and/or sanctions are tied to the attainment or non-attainment of pre-agreed performance targets in relation to outcomes like quality/functional specifications, (sectional) completion date, safety, and resource utilisation. The majority of research on contractual incentives has concentrated on testing their impacts on performance outcomes, with mixed findings. Most studies (e.g. Kumaraswamy and Dissanayaka, 2001; Hinze, 2002) have reported no significant effects, while others (e.g. Ashley and Workman, 1986) reported marginal improvement in performance quantity (rather than quality) but also significantly more contractual disputes. Equally, studies on cost incentives have produced mixed findings with most studies (e.g. Bower and Merna, 2002) reporting better flexibility in planning and improved teamwork but no clear effect

[1] This is the pre-publication version of Anvuur, A.M. and Kumaraswamy, M.M. (2010) Promises, pitfalls and shortfalls of the guaranteed maximum price approach: a comparative case study. In: Egbu, C. (Ed.), 26th Annual ARCOM Conference, Leeds. Association of Researchers in Construction Management, Vol. 2, pp.1079-88.

on outturn project cost, and others reporting tangible improvement in performance outcomes (e.g. Hauck *et al.*, 2004). Explanations for the inconsistent findings have often involved references to, among others, level of analysis confounding (Bresnen and Marshall, 2000), how even the most 'objective' key performance indicators are at best inadequate and can be highly corruptible (Fernie *et al.*, 2006), incentive contingency misalignment (Hinze, 2002). Thus, any research that seeks to provide situated understanding of contractual incentives would seem useful. The purpose of the present paper is to present the findings a study that investigated the promises, shortfalls and pitfalls of the guaranteed maximum price (GMP) mechanism.

The GMP mechanism is one example of a cost incentive, which is usually used on traditional or management forms of contract. Conceptually, the GMP contract has been characterised as a hybrid arrangement consisting of a cost-reimbursable contract to a target price (the GMP amount) and a fixed price contract beyond (Boukendour and Bah, 2001). Under such an arrangement, a client is contractually obliged to pay the GMP amount or a lower price (Carty, 1995; Turner, 2004): If the outturn cost exceeds the GMP amount, the fixed price contract applies and overruns accrue at 100% to the contractor; In the event that the works are completed for less than the GMP amount, the client pays this lesser price and the difference (i.e., net cost saving) is then shared according to a pre-agreed formula between the client and the contractor(s). The findings of previous research on the GMP mechanism have been mixed. While some researchers consider its use in a construction contract as a fool's game (Turner, 2004) and very risky (Stukhart, 1984), others argue that it provides an effective and legitimate framework for risk transfer (Pryke and Pearson, 2006), is an effective solution for the problem of integration in construction projects (Lampman and Dimeo, 1989), and can lead to better project outcomes and value for money (Chan *et al.*, 2007). In short, the GMP mechanism is still a black box phenomenon, with a recent RICS survey of building contracts in use also noting that its use was under reported and may have withered away (RICS, 2007). The present study is an attempt at providing some useful insight into this area of construction contracts.

According to Bower et al. (2002:37), the fundamental principle of incentivisation is that "joint risks unify motives". This indicates the centrality of human motivation in efforts to align parties' goals with project objectives. According to field theory (cf. Gold, 1999), motivation for human behaviour is a function of both the individual and environmental exigencies: the extrinsic factors stem from contractual obligations and formal structures of control, which routinely link individuals' outcomes, in terms of rewards and sanctions, to some standard(s) of performance; whereas the internal factors stem from individuals' desire to maintain and project favourable social identities, which leads them to engage in discretionary and value-expressive behaviours. Thus, a broad proposition adopted in this study is that the GMP mechanism would influence individuals' performance behaviours directly through the reward/sanction contingency and indirectly by shaping the work group context. An analysis of the influences of the GMP mechanism on project work group climate and teamwork aspects, hence project outcomes, should provide some insight into the conditions for appropriate use of, and how contractors should respond to, the GMP mechanism in construction projects. In the sections that follow the present, the research method is outlined followed by an analysis of the results and then a discussion of the findings. The paper ends with a discussion of conclusions and implications for research and practice.

RESEARCH METHOD

The influence of the GMP mechanism on work group cooperation was studied using a comparative case study design set within a critical realist perspective. The comparative case study design allowed the central issues and working hypotheses in the study to be shaped through the use of replication logic (Eisenhardt, 1989; Yin, 1994), whereby each case serves as a field experiment that confirms or disconfirms inferences drawn from the other. The critical realist research approach assumes that individual project work group members' behaviours shape and are in turn shaped by project procedures, practices and processes, and seeks a Weberian understanding of the underlying dynamics (Smyth and Morris, 2007). Case studies provide a holistic view and in-depth understanding of the project practices and processes, the frameworks or paradigms that guide these practices and processes, their influences on the cooperative behaviours of project work group members, as well as work group members' rationalisations of those processes and their impacts (Eisenhardt, 1989). The comparative case study approach was, thus, considered to be suitable for the present study.

Careful selection of cases is important to the effectiveness of a comparative case study design (Zartman, 2005). An overview and comparison of major features in the two selected case studies is provided in Table 1. Each case was part of a programme (of projects). The first case (hereafter, Alpha) was a mixed-use commercial complex and had a prestigious property developer client. The second case (hereafter, Beta) was a single-use residential development and had a public sector client. Both clients are regular and major procurers of construction works and services. The cases embody contrasts that are important to the effectiveness of the comparative case study design: firstly, the residential single-use versus commercial mixed-use project typologies represent perhaps the least and most technically complicated, respectively, of construction projects (cf. Gidado, 1996); and secondly, the private versus public sector client typologies impose perhaps the least and most constraints, respectively, on clients' project behaviour. Also, that each case was part of a programme is important because this allows for the discussions to be situated in the wider contexts of the client organisations' ongoing businesses. These cases, thus, enable structured and focused comparisons and the identification of patterns in events, contexts and behaviour (Zartman, 2005).

Data sources and analysis procedure

Data was gathered through six main sources. We examined project documents and correspondences, minutes of project meetings, reports and press commentaries, and observed a cross-section of project meetings. Semi-structured interviews were then conducted with six executive directors and 15 mid-level/senior managers in Alpha and three executive directors and seven general/senior managers in Beta. Each interview lasted between one and two hours and was conducted by the first author with the help of a colleague who took notes and filled in gaps in the questioning. Soon after each interview, facts/impressions were recorded and cross-checked, recordings transcribed verbatim, and important issues or information gaps flagged for follow-up in subsequent interviews. All interviews generally followed a common interview protocol, which included questions on the characteristics and objectives of the project, project governance structures and processes, project performance criteria, measures and outcomes, team-building practices, and questions/issues flagged up in previous interviews, project meetings or the review of project documentation. Each interview was, however, eclectic and reflexive.

Table 1: Overview and comparison of major features in case studies

Aspect	Alpha	Beta
Project nature and scope	HK$640 million, 25-storey grade "A" mixed-use commercial complex. Sixth of seven sequential phases in HK$1.64 billion premium office and retail complex in city centre.	HK$434 million, 3No 41-storey (2,369 flats) public rental housing estate, trialling R&D components/elements. Fourth of six phases sequenced to service affordable housing demand.
Procurement method	Based on consultants' designs and in-house project management. Sequential and linked traditional contracts for demolition, foundations and superstructure. Incorporates a non-binding partnering charter.	In-house design and project management services, external quantity surveyor. Single traditional contract, with non-binding partnering charter and dispute resolution advisor (DRAd).
Incentive features	Liquidated damages for late completion of demolition contract; win-lose schedule incentive for foundation contract, plus lump sum award for excusable compensatory delays; GMP superstructure contract with: liquidated damages tied to two sectional completion dates; client indemnification against delay of foundation contract; and jointly managed design development fund (about 2% of GMP amount).	Liquidated damages tied to sectional completion dates to meet annual delivery quotas; win-lose bonus (approx. 1% of contract value) for satisfactory safety performance record; GMP clause relating to six named subcontract work packages.
Complexity dimensions	Complexity— technical, medium; logistical, high. Risk— technical, low; logistical/financial: high. Novelty— technical: medium/high.	Complexity— technical, low; logistical, high. Risk— technical, low; logistical/financial, high. Novelty — technical: medium/high
Operational coordination	Cognitive priming and interventions for socialisation standardise work processes, skills and outputs. The GMP mechanism used to facilitate some joint risk and performance management.	Cognitive priming and interventions for socialisation standardise work processes, skills and outputs. The GMP mechanism used to maximise risk transfer, with limited joint performance planning.
	Prescribed sequences, many formalised meetings, informal communications and group consensus used for information processing and operational decision-making.	Prescribed sequences and web-based operations and information management system, a formalised monthly site meeting, informal communications and lateral consultation used for information processing and operational decision-making.
Work group climate	Norms of contractual solidarity supplant formal procedures and are enshrined in a dominant client culture.	Norms of contractual solidarity operate within constraints of formal procedures and are project specific.
Work group cooperation	High level of cooperation attributed mainly to individuals' self-expressive motives, shaped by work group climate.	High level of cooperation attributed mainly to individuals' self-expressive motives, shaped by work group climate.
Project performance	Client's development objectives are achieved. Partners meet baseline expectations, enhance future business opportunities.	Client expects to achieve development objectives. Partners expect to meet baseline expectations, enhance future business opportunities.

J.C. Flanagan's (1954) critical incident technique was adapted and used during the semi-structured interviews as an investigative – rather than scientific – tool, whereby each interviewee was asked to think of the single most difficult problem encountered on the project to date, which required the collective effort of the project work group to resolve and for which the nature and timing of their response was "make or break" for the project. Each interviewee was then asked to describe the circumstances of this problem,

the specific actions they took to try to resolve it and their evaluations of the responses of others in their proximal work group. Remarkably, all interviewees in each case identified the same problem: for Alpha, this was a major redesign of the structural frame and core wall, which event took place barely two months after commencement of the superstructure works; and for Beta, the problem was a delay in obtaining statutory approval for a gabion wall design. "Decision stories" of cross-functional work group problem-solving were developed, by combining the accounts of each interviewee into a time line beginning with problem identification. The information so gathered provided compelling evidence of the extent of team work n each case.

In the course of the semi-structured interviews, interviewees also completed short structured questionnaires designed to measure work group climate, fairness of decision-making procedures, processes and outcomes, and intrinsic job satisfaction. Each CEO/director interviewed was also asked to state their company's corporate objectives and then to rate, on a Likert scale (0 = "not at all important", 10 = "extremely important"), the importance of the stated objectives and others not mentioned by them in a set of 10 commonly cited corporate objectives. Interviewees also provided reasons to substantiate or qualify their ratings of the questionnaire items. Item measures for work group climate were adapted from Albanese (1994), those for work group decision-making norms were adapted from Hauck et al. (2004), while item measures for intrinsic job satisfaction were adapted from Tyler and Blader (2000). Items for the corporate goals question were adapted from Bourgeois (1980). Data collection for Alpha was undertaken between September 2004 and November 2006 and for Beta, between October 2006 and August 2008. The data collection yielded over 420 pages of text comprising handwritten notes and verbatim interview transcripts, which were coded to reflect common themes and then analysed for patterns. This was complemented with an analysis of group-level scores of work group climate, fairness of decision-making norms and outcomes, intrinsic job satisfaction, and corporate goals.

FINDINGS

The cases: nature, scope, objectives and strategies

Table 1 provides an overview and comparison of major features in Alpha and Beta. The project actors in both cases were selected on the bases of competence and commitment to relational norms, as demonstrated on previous projects undertaken with the present and other clients. Each case also used facilitated team-building workshops and periodic champions meetings. Operational coordination in each case was achieved through masses of informal communications – via telephone conversations, e-mails and meetings – and decisions were generally made by consensus of work group members. In each case, a variations protocol, incorporating an adjudication panel and variation quotation procedure, was used for tracking, valuing and agreeing the category membership (i.e. variation versus design development) of change requests.

In Alpha, all three construction contracts were placed with one main contractor on the basis of negotiation. The GMP mechanism was used to share design development risk in the superstructure contract with the main contractor, with the most uncertain aspects of the scope of works – the retail podium levels – being the subject of provisional sums. Underruns of the GMP amount (constituting 71% of total works value) were to be shared 60/40% between client and main contractor and overruns at 100% to the main contractor,

with back-to-back arrangements between the main contractor and any contributing named specialist subcontractors.

In Beta, the main contract was placed on the basis of competition among so-called "premier league" contractors drawn from the client's tender lists. The GMP mechanism was used mainly to transfer design development risk to the main contractor. The in-house project management team still had to first approve any value engineering proposition from the contractor and then facilitate the process of obtaining statutory approval for the modified designs. Underruns of the GMP amount (constituting 31% of total works value) were to be shared 50% apiece between the client and main contractor and overruns at 100% to the main contractor, with back-to-back arrangements between the main contractor and the GMP work package subcontractors. The project contingency fund of about HK$10 million was wholly earmarked for the R&D elements and so did not provide any protection to the contractor against overruns of the GMP amount.

Project outcomes

All the performance targets for case Alpha were reasonably met. All the completion dates, including sectional completions, were achieved. The out-turn quality of the works was adjudged as very good. The project's out-turn cost exceeded the budgeted cost by about 1% but was within the overall redevelopment budget. Despite some modest savings made from the competitive placement of subcontract work packages, there was no net savings left to share as the design development fund was fully expended. No serious site accident was registered and no complaint of major disruption to any adjoining business was lodged. Alpha featured an impressive list of creative solutions and was awarded many industry recognition awards and achieved the highest (i.e. Platinum) rating in the prestigious Hong Kong Building Environmental Assessment Method certification scheme. Alpha was a great business success for the client, as rents from tenant signings were double the initial expectations. All the project partners, including the subcontractors, met their baseline expectations and felt that they had greatly enhanced their reputations with one another and especially with the client, hence their chances of repeat business.

Beta was on track in terms of achieving the project objectives and targets set for it. Materials specifications were rigorously adhered to. Performance quality was adjudged as very high, the results of mock ups were very satisfactory, the trialling of the R&D initiatives seemed to be coming along nicely and the construction site safety record was impeccable and won the main contractor an industry recognition award. Some modest GMP net cost savings (about HK$1.5 million in total) were reported but this was largely seen as being only of symbolic - rather than substantive - value. The project was shaping up to be a big success for the client. The client's own expectation for net project cost savings of about 3% with the incorporation of the GMP mechanism was exceeded as the main contractor tendered a price for the works, which was more than 10% below the consultant's estimate. The main contractor and the GMP subcontractors seemed confident they would meet their baseline objectives. They felt that they had improved relationships with one another and especially with the client, hence enhanced their chances of repeat business. Another important outcome for the main contractor and GMP subcontractors was the first-mover advantage in a contractual mechanism which they believed would favourably shape the space of their future competitiveness.

Work group climate and teamwork aspects

Findings from qualitative interview data

Research (e.g. Anvuur and Kumaraswamy, 2007; Moreno-Luzon and Begona Lloria, 2008) suggests that deliberate interventions for socialisation, as were evidenced in both Alpha and Beta, facilitate the construction of shared understandings of work performance standards and processes and output expectations, hence can constitute well understood mutual risk and performance planning. In both cases, the GMP mechanism transformed the sequential interdependence between project actors (by courtesy of the traditional procurement method) into reciprocal interdependence. There was strong recognition by project actors in each case of mutual interdependence and joint fate, and there was joint commitment by work group members to work together. That this was also observed in Beta is significant given that the GMP subcontract packages accounted for only one-third of the total value of works.

Decision-making (negotiations) in each case was procedurally fair and characterised by joint problem-solving and a tendency towards relationship preservation; norms which Hauck et al. (2004) argued are characteristic of effective teams (as opposed to work groups). Again, the GMP mechanism was credited with providing the platform on and shaping the contexts within which norms of solidarity could develop. It was evident in each case that work group members derived intrinsic satisfaction from work group interactions and felt important to the smooth functioning and success of their work groups. In each case, work group members attributed the good performance outcomes to the high levels of teamwork experienced and as evidence, interviewees routinely cited the collective action of work group members in response to the "critical incident" (which unfortunately cannot be elaborated because of space constraints).

However, the contexts within which the norms of contractual solidarity and teamwork developed were different. In Alpha, the norms of contractual solidarity were embedded in a dominant client culture into which the project actors were actively socialised. In Beta, these norms were largely project-specific and were consolidated only after work group learning especially from the "critical incident". At the organisational level within the client establishment, these norms had subversive undertones, although this client boasts about having pioneered partnering in the public sector in Hong Kong. There was a sense of subdued caution, sometimes reticence, on the part of the client's in-house project managers when dealing with the constructors, especially when assessing value engineering proposals; and this attitude was primarily to stave off any suspicion of impropriety.

Findings from questionnaire data

Table 2 presents the means of self-reported ratings of work group characteristics and the participative value of work group interactions. In order for the mean ratings to be interpreted with any confidence, evidence of sufficient rating consensus is required. Therefore, the James et al.'s (1984) within-group interrater agreement coefficient (rwg) was computed for each work group aspect. Interrater agreement indices of 0.70 or higher are generally considered to indicate satisfactory rating consensus (LeBreton *et al.*, 2003). The quantitative ratings were elicited in order to corroborate findings from the qualitative interview data. The results in Table 2 are very supportive. The James et al. (1984) interrater agreement coefficients were substantially higher ($rwg \geq .97$) than the 0.70 minimum threshold for all four rating categories and across the two cases.

Table 2: Characteristics and participative value of work group interactions

	Alpha (n = 20)^			Beta (n = 7)		
Questionnaire statement	Mean*	SD	Skew	Mean*	SD	Skew
Work group members characteristics (For Alpha, rwg = .98; for Beta, rwg = .97)†						
Had shared goals (Goal congruence)	4.00	0.73	–0.919	4.57	0.53	–0.374
Were interdependent (Interdependence)	4.10	0.72	–0.152	4.14	0.69	–0.174
Had mutual respect for one another (Mutual respect)	4.05	0.76	–0.086	4.43	0.53	0.374
Shared commitment to work together (Joint commitment)	4.00	0.79	0.000	4.29	0.49	1.230
Decision-making norms (For Alpha, rwg = .98; for Beta, rwg = .97)†						
Locate/adopt options that satisfy collective interests (Joint problem-solving)	3.70	0.80	–0.736	4.29	0.49	1.230
Use threats/harassment, time pressure, positional commitments (Contending)‡	3.80	0.95	–0.782	4.43	0.53	0.374
Are honest about strength of feelings on issues (Truth in signalling)	3.65	0.81	–0.541	4.14	0.69	–0.174
Use fair standards and procedures, and seek objective information (Principled negotiation)	4.05	0.60	–0.012	4.43	0.53	0.374
Willing to concede on less important issues (Mutual responsiveness)	4.05	0.76	–0.888	4.00	0.58	0.000
Decision-making outcomes (For Alpha, rwg = .97; for Beta, rwg = .79)†						
Have been exploited and compromised (Win-lose outcomes)‡	3.95	1.23	–1.202	3.43	1.40	–0.052
Have damaged relationships (Adversarialism)‡	4.50	0.61	–0.785	4.57	0.53	–0.374
Have achieved high joint benefit (Win-win outcomes)	3.70	0.66	0.396	3.86	0.90	–1.569
Have 'attacked the problem, not the people' (Professionalism)	4.35	0.93	–2.535	4.14	1.46	–2.122
Intrinsic job satisfaction (For Alpha, rwg = .98; for Beta, rwg = .97)†						
Worthwhile	4.32	0.82	–1.359	4.29	0.49	1.230
Worse than most‡	4.37	0.68	–0.632	4.57	0.53	–0.374
Better than most	3.79	0.71	0.336	3.86	0.69	0.174
Undesirable‡	4.42	0.90	–1.517	4.14	0.90	–0.353
Enjoyable	3.68	0.82	0.007	4.29	0.49	1.230

^ Except that n = 19 for the intrinsic job satisfaction items; * Mean ratings are based on a Likert scale with anchors (1 = "strongly disagree", 5 = "strongly agree"); † Within-group interrater agreement coefficients (rwg) are based on a uniform null distribution with Var(E) = 2.0; ‡ Item was reverse-scored.

All the mean ratings across rating categories and cases in Table 2 are significantly higher than 3.0 and majority are higher than 4.0, thus indicating that respondents generally agree with the individual and work group criterion statements. The results confirm findings from analysis of the qualitative data that, across Alpha and Beta: (a) workgroup members were characterised by mutual interdependence, mutual respect and joint commitment to work together towards cooperatively linked goals; (b) negotiations were principled, procedurally fair, characterised by joint problem-solving; (c) decision outcomes were generally fair and integrative; and finally, (d) work group members derived intrinsic

satisfaction from work group interactions. The results of the CEO/directors' self-reported ratings of the corporate goals question indicate that company prestige (rated at 8 or higher, i.e. as "very important" to "extremely important", by all seven CEO/directors in Alpha and all four directors in Beta), then, net profit over five years (rated as "very important" to "extremely important" by six out of seven CEO/directors in Alpha and three out of four directors in Beta) were the two most important corporate objectives for all participating firms in both Alpha and Beta, thus, confirming that the participating firms were driven by medium- to long-term prospects, rather than the maximisation of short-term profit.

DISCUSSION

The findings indicate that the GMP mechanism can significantly improve work group cooperation and teamwork. The findings also show that the influence of the GMP mechanism is mainly through its ability to favourably shape the work group context rather than its instrumental appeal. Vroom's (1964) seminal work on expectancy theory suggests that the incentive intensity of any contractual incentive is determined by the interplay between three factors: valence, the value of the promised reward; instrumentality, trusting belief that the reward is contingent on adequate performance; and expectancy, self-efficacy beliefs. The findings from the cross-case analysis suggest that all three dimensions were generally low in each case. Therefore, on the basis of economic rationality, it has to be concluded that the incentive intensity in each case was low. Turner's (2004) criticism of the GMP approach as being a fool's game was from an instrumental perspective, and is consistent with the finding in the present study. This is not to suggest that the motives of project actors were devoid of instrumentality. In contrast, the consultants and constructors in both Alpha and Beta considered their firms' chances of repeat business due to improved relationships with the respective clients as having much more superior instrumental appeal than the promise or expectation of performance-contingent rewards.

However, the major influence of the GMP mechanism was in providing a framework for and facilitating the development of a work group climate conducive for effective teamwork. The GMP mechanism deepened the level of interdependence between participating firms and fostered norms of solidarity among project work group members. This finding is consistent with the broader incentivisation principle that 'joint risks unify motives' (Bower *et al.*, 2002). Research (Gaertner and Dovidio, 2000; Blader and Tyler, 2009) shows that work group membership esteem, favourable cognitive (and, in the case of Alpha, affective priming), reciprocal interdependence and procedural fairness, as were evidenced in both case study projects, encourage more inclusive superordinate categorisations of work group memberships. The two results, goal congruence and work group identification, are powerful drivers for teamwork and discretionary cooperative behaviours (Gaertner and Dovidio, 2000). Another significant finding of the study is that, while financially inconsequential, the GMP cost savings realised in both case study projects were of symbolic value - collective teamwork products - and were considered to be greatly energising. This finding is consistent with social cognitive theory (Bandura, 2001), which suggests that rewards which serve as a validation of professional competence and instil self-assurance can improve intrinsic motivation. From this perspective, the findings of this study are consistent with those of previous studies (Lampman and Dimeo, 1989; Pryke and Pearson, 2006) on the positive influence the GMP approach can have on the level and quality of teamwork.

CONCLUSIONS AND IMPLICATIONS

The marketing of the GMP approach often over emphasises its instrumental appeal. The findings of this study show that this potentially can create gaps in expectations between project partners and dissatisfaction with project outcomes. The findings have several implications. They suggest that research on contractual incentives should focus not only on the incentive outcomes so narrowly defined but also on the broader influences on project governance. The GMP approach is a useful instrument of flexibility that clients can use to respond to short-term uncertainties in the market (demand) or other idiosyncratic factors. It is also an instrument of integration that clients can use to integrate both the processes and people in project work groups. The GMP approach can, therefore, be a powerful mechanism for project governance. The GMP approach does result in the transfer of design development risk to the main contractor, financial compensation for which should be priced into the main contractor's tender figure; the compensation should not be based on any promise, or the consequent expectation thereon, of some sharing of net cost savings.

This study also has several limitations, which must be highlighted. Because the case studies were undertaken in Hong Kong, the findings may not be readily generalisable to other cultural contexts. The fact that the clients in the two case study projects both had regular and major construction spends, and so could promise - hence create expectations of - repeat business, may have dwarfed the financial incentive intensity of the GMP mechanism. Both case studies were also of major projects, which raise questions as to the applicability of the findings to smaller projects. Also, while the case studies provided important contrasts that enabled a fruitful comparative analysis, theoretical sampling requirements (cf. Eisenhardt, 1989) were not likely to have been met. These limitations, however, provide opportunities that future research might usefully explore. Future research could undertake conceptual replications of the present study with improvements in the research design (e.g. using theoretical sampling), in different cultural contexts, using case studies of smaller projects and of one-off/on-off clients in order to confirm the validity and extent of generalisability of these findings. That said, this study provides crucial and situated understanding of the relative merits and conditions of use of the GMP mechanism in construction projects.

REFERENCES

Albanese, R. (1994) Team-building process: key to better project results. *J Manage Eng*, 10(6), 36-44.

Anvuur, A.M. and Kumaraswamy, M.M. (2007) Conceptual model of partnering and alliancing. *J Constr Eng Manage*, 133(3), 225-234.

Ashley, D.B. and Workman, B.W. (1986) *Incentives in construction contracts*, Austin, TX: Construction Industry Institute (CII).

Bandura, A. (2001) Social cognitive theory: an agentic perspective. *Annu Rev Psychol*, 52(1), 1-26.

Blader, S.L. and Tyler, T.R. (2009) Testing and extending the Group Engagement Model: linkages between social identity, procedural justice, economic outcomes and extrarole behavior. *J Appl Psychol*, 94(2), 445-464.

Boukendour, S. and Bah, R. (2001) The guaranteed maximum price contract as call option. *Constr Manage Econ*, 19(6), 563-567.

Bourgeois, L.J. (1980) Performance and consensus. *Strateg Manage J*, 1(3), 227-248.

Bower, D. and Merna, A. (2002) Finding the optimal contractual arrangement for projects on process job sites. *J Manage Eng*, 18(1), 17-20.

Bower, D., Ashby, G., Gerald, K. and Smyk, W. (2002) Incentive mechanisms for project success. *J Manage Eng*, 18(1), 37-43.

Bresnen, M. and Marshall, N. (2000) Partnering in construction: a critical review of issues, problems and dilemmas. *Constr Manage Econ*, 18(2), 229-237.

Carty, G.J. (1995) Construction. *J Constr Eng Manage*, 121(3), 319-328.

Chan, D.W.M., Chan, A.P.C., Lam, P.T.I., Lam, E.W.M. and Wong, J.M.W. (2007) Evaluating guaranteed maximum price and target cost contracting strategies in the Hong Kong construction industry. *J Fin Manage Property Constr*, 12(3), 139-150.

Eisenhardt, K.M. (1989) Building theories from case study research. *Acad Manage Rev*, 14(4), 532-550.

Fernie, S., Leiringer, R. and Thorpe, T. (2006) Change in construction: a critical perspective. *Build Res Inf*, 34(2), 91-103.

Flanagan, J.C. (1954) The critical incident technique. *Psychol Bull*, 51(4), 327-358.

Gaertner, S.L. and Dovidio, J.F. (2000) *Reducing intergroup bias: the common ingroup identity model*. Philadelphia, PA: Psychology Press.

Gidado, K.I. (1996) Project complexity: the focal point of construction production planning. *Constr Manage Econ*, 14(3), 213-225.

Gold, M., Ed. (1999) *The complete social scientist : a Kurt Lewin reader*. 1st edn. Washington, DC: American Psychological Association.

Hauck, A.J., Walker, D.H.T., Hampson, K.D. and Peters, R.J. (2004) Project alliancing at National Museum of Australia - collaborative process. *J Constr Eng Manage*, 130(1), 143-152.

Hinze, J. (2002) Safety incentives: do they reduce injuries? *Pract Period Struct Des Constr*, 7(2), 81-84.

James, L.R., Demaree, R.G. and Wolf, G. (1984) Estimating within-group interrater reliability with and without response bias. *J Appl Psychol*, 69, 85-98.

Kumaraswamy, M.M. and Dissanayaka, S.M. (2001) Developing a decision support system for building project procurement. *Build Environ*, 36(3), 337-349.

Lampman, R.J. and Dimeo, B.S. (1989) Team collaboration like playing ball. *J Real Estate Dev*, 5(1), 56-62.

LeBreton, J.M., Burgess, J.R.D., Kaiser, R.B., Atchley, E.K. and James, L.R. (2003) The restriction of variance hypothesis and interrater reliability and agreement: are ratings from multiple sources really dissimilar? *Organ Res Methods*, 6(1), 80-128.

Moreno-Luzon, M.D. and Begona Lloria, M. (2008) The role of non-structural and informal mechanisms of integration and coordination as forces in knowledge creation. *Br J Manage*, 19(3), 250-276.

Pryke, S. and Pearson, S. (2006) Project governance: case studies on financial incentives. *Build Res Inf*, 34(6), 534-545.

RICS (2007) *Contracts in use: a survey of building contracts in use during 2007*, London: The Royal Institution of Chartered Surveyors.

Smyth, H.J. and Morris, P.W.G. (2007) An epistemological evaluation of research into projects and their management: methodological issues. *Int J Proj Manage*, 25(4), 423-436.

Stukhart, G. (1984) Contractual Incentives. *J Constr Eng Manage*, 110(1), 34-42.

Turner, J.R. (2004) Farsighted project contract management: incomplete in its entirety. *Constr Manage Econ*, 22(1), 75-83.

Tyler, T.R. and Blader, S.L. (2000) *Cooperation in groups: procedural justice, social identity and behavioural engagement*. Philadelphia: Psychology Press.

Vroom, V.H. (1964) *Work and motivation*. New York: Wiley.

Yin, R.K. (1994) *Case study research: design and methods*. 2nd ed. Thousand Oaks: Sage Publications.

Zartman, I.W. (2005) Comparative case studies. *Int Negot*, 10, 3-16.