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## **Whither Partnering? A trade-off analysis using a Hong Kong case study**

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### **ABSTRACT**

Evidence suggests that the profit margins of contractors on partnered projects are lower than on projects without partnering. On the client side, conventional procurement is still a preferred choice implying that partnering and non-conventional procurement systems may not align themselves with the objectives of both the contractor and the client respectively. However, there are instances of clients and contractors using these tools consistently to achieve their objectives. Ascertainating the attraction of these strategies in terms of what they gain as against the things they lose is expected to aid in successful utilization of these strategies towards improving project performance, thus aiding development.

This paper treats construction procurement as a bargaining exercise and analyses it on the basis of game theory by modelling it as a two-stage game and presents a trade-off analysis of a Hong Kong case study wherein the main contractor is committed to partnering on all of its projects and the client has gone in for a non-conventional procurement system. The trade-off's are analysed at contract formation stage, the first stage of the two stage game in relation to the potential tradeoffs in the second stage, i.e. bargaining issues that develop during the course of the construction stage.

**Key words: Game Theory, Trade-off Analysis, Bargaining, Construction Procurement**

### **1. BACKGROUND**

The construction industry is known to operate in an adversarial environment which gives rise to poor performance, non-productive disputes and disrupted relationships between the stake holders resulting in calls to

revamp industry practices for better performance and relationships (Latham, 1994; Egan 1998 and 2002). In order to address these shortcomings of the traditional procurement systems a plethora of improved procurement systems (e.g. target price contracting, design-build, PPP's) coupled with strategies to enhance cordial relationships between the parties (e.g. partnering, alliancing, relational contracting and so on) and flexible contract arrangements have been tried and tested. Partnering, being the most common strategy used towards initiating co-operative relationships, is seen to have its effects on the profitability of construction companies.

Evidence from extensive research through interviews with senior executives on partnering in practice by Wood (2005) is inconclusive about whether a contractor's profit margin improves on partnered projects or not. The contractors in this study express that they make consistent profits in partnered projects. However, their view is split on whether a contractor's margin improves on partnered projects is unclear. Masons (2002) "saw a limit to growth of partnering as a proportion of turnover - not for want of opportunity but as a matter of commercial judgment. A self imposed limit of perhaps 70% turnover for partnering was seen as a sensible target. This was rationalized in two ways: many of these companies perceived partnering as less profitable than conventionally contracted projects. Therefore they wished to retain an element of conventionally contracted work in order not to depress profitability".

Further on the client side, conventional procurement (lowest bid competitive tendering) is still a preferred choice (Holt and Proverbs, 2002). This suggests that partnering and non-conventional procurement systems may not always be in tune with the principal objectives of both the contractor and the client respectively. On the other hand, many clients and contractors are evidently using such strategies and apparently succeeding in meeting their objectives. This paper presents one such case study and analyses the facts to understand what makes these strategies attractive for them in terms of their potential costs and benefits.

## **2. INTRODUCTION TO THE CASE STUDY**

The project reported here as a case study involved the redevelopment of an existing office tower in Hong Kong at a total construction cost of about US\$8 million. The client in this project is a prestigious property developer that owns and manages prime office and retail space in Hong Kong. The scope of works involved demolishing the existing office tower, supplementing the existing foundations and erecting a steel-cored superstructure tower (25 floors). This involved three separate and sequential contracts for the demolition, foundation and the superstructure works.

Data collection methods of the case study involved project documentation and semi-structured interviews. The interviews were

conducted in two phases. The first phase of interviews were conducted during the construction phase and consisted of six project directors from the client, consultant and contractor teams, three senior project managers from the main contractor and client's in-house project management teams and, two subcontractors. The second phase of interviews was conducted after practical completion with one representative each from the main stake holders. The interviews were recorded and the resultant transcripts were analyzed to ferret out common perceptions. Further, the authors attended a sample of meetings as observers to supplement the data.

The project's objectives were: to create a small grade 'A' office building; to complement and extend existing luxury retail space; and also to provide more food and beverage space. Other client drivers included the need to provide assurance that construction costs are competitive and reflect the current market price levels and, to improve relationships with contracting partners through a partnering 'offensive'.

Summarized details of procurement and contractual arrangements (data relating to the use and impact of contractual incentive arrangements and other motivations for cooperation) from this case study have been analyzed and presented in Anvuur et. al. (2006).

### **3. ANALYSIS METHOD**

For the purpose of ascertaining the attractiveness of procurement and relationship building strategies, this paper borrows the two stage game approach utilized by Saxby (2004) to demonstrate that there can be a prisoner's dilemma at the heart of the client-contractor bargain in conventional procurement systems. In this approach, construction procurement comprises of two games: game one – the selection process, followed by game two – an on-going relationship as the project progresses.

### **4. TRADE-OFF'S IN GAME ONE**

Tradeoffs in game one mostly occur in the selection process of the contractor, and of the appropriate contractual arrangement. In terms of contractor selection, inefficiencies in the open competition approach to tendering were highlighted by Sir Harold Banwell in the early 60's (Murray and Lanford, 2003). Saxby (2004) takes this further and demonstrates that there can be a prisoner's dilemma at the heart of the client-contractor bargain in conventional contractor selection methods, which induces dishonest bidding (extremely low bids to win jobs). This in turn leads to a 'winners curse phenomenon' which is bidding more than the item ultimately turns out to be worth. This, when done consistently over longer period of time will lead to contractors going out of business. This may result in contractors cutting corners in terms of quality delivered to claw back their over optimistic tender prices. However, there are ways in which the

construction industry can positively correct itself for this winners curse phenomenon (Dyer and Kagel, 1996).

Contracts are tools to allocate risks and hence, the choice of contractual arrangement is generally dependent on the complexity of the project, the risks inherent in it and how the owner wants them to be managed. Traditional contract arrangements encourage adversarial attitude but are generally perceived to give lowest cost products whereas non-traditional contracts offer various advantages as a tradeoff against the expected cost and to some extent the nature of relationship.

## **5. STRATEGIES EMPLOYED FOR OBJECTIVE ORIENTED TRADE-OFF'S IN GAME ONE**

As indicated earlier, the works encompassed three separate contracts; (1) Demolition – negotiated, lump sum management contract (2) Foundation - negotiated lump sum traditional contract (3) superstructure – negotiated, GMP, traditional-management hybrid contract with sharing of savings from value engineering. The selection process followed for all the three contracts was single source negotiations. The owner's perceived advantages in taking a negotiated approach were the main contractor's reputation, the main contractor and the client belonging to the same group holding company and the main contractor's commitment to cooperation and familiarity of client requirements because of prior experience.

However, it has to be noted that, additionally, negotiated contracting facilitates complete disclosure of unusual building characteristics during extensive negotiations and reduces the contingency allowances, usually needed to cover these risks, and results in lower expected costs to owners (Rothkopf, 1969) and the scope of work for all the three contracts had elements of unusual characteristics. Further, this approach removes the effect of a prisoner's dilemma from the selection process and encourages co-operation. The contractor also gains in the sense that his investments in tendering are paid back with the certainty of getting the project. However, by single point negotiations, the client may lose out on an opportunity to go into the market and derive cost advantages from competitiveness. This was balanced by asking the contractor to demonstrate the competitiveness of his pricing against the market and then verifying this with an independent QS firm.

Demolition of the existing office tower was a job fraught with risks due to its location and interfaces of service termination and diversions which called for a specialized contractor. The tradeoff here was retaining the management expertise of the main contractor while bringing in a specialized contractor to tackle the associated risks. This was achieved by the choice of negotiated, lump sum management contract with no direct works. The foundation works consisted of a new basement to be constructed within an existing basement with an 8m head of water. When the existing office tower was first built, the adjoining street collapsed into the site and there was a risk of history repeating itself. This called for

innovative and safe construction methods with prior experience of the conditions with emphasis on total control. By choosing a negotiated, lump sum traditional contract the owner was able to emphasize on the risks associated during negotiations; transfer its knowledge of the risk and its responsibility to the contractor. The contract minimized management interfaces by not allowing any portion of work to be subcontracted out, thereby providing total control to the contractor.

The superstructure was of a steel core and off-centered with cantilevered floors. This was the first of its kind for the client. Owner requirements for phased finishing allowing phased occupancy meant additional milestones inked to high liquidated damages for delays. Negotiated, GMP, traditional-management hybrid contract was the chosen approach for the delivery of superstructure. . The trade off in procuring through GMP contracts is cost certainty against lower costs when procured through competitive bidding along with opportunities to innovate and time to further develop the design. Since, cost certainty was more essential for the owner along with the quality of the project GMP was considered to be the right choice. However, the designs were 90% complete when tendered and the main contractor was engaged throughout that process. But what it did achieve was to provide some amount of buffer time in case problems were encountered with design which in hindsight proved to be very important in completing the project on schedule.

The choice can also be attributed to the fact that GMP contracts provide a vehicle for risk sharing and quality control on more complicated and specialized building jobs such as on this project. Except for the main superstructure, the majority of the specialized works were subcontracted out and named subcontracts were used as a control over the quality of subcontractors employed making it a traditional-management hybrid contract.

## **6. TRADE-OFF'S IN GAME TWO**

Construction projects are plagued by uncertainties which inevitably result in variations and change orders, with the price of these being usually negotiated between the contractor and the client. The winners curse phenomenon seen in game one of procurement sometimes encourages opportunistic behavior from contractors when negotiating these variations and change orders to claw back the over optimistic tender prices in the second game. This leads to non-productive claims and disputes leading to poor performance and adversarial relationships.

## **7. STRATEGIES EMPLOYED FOR OBJECTIVE ORIENTED TRADE-OFF'S IN GAME TWO**

According to Axelrod (1984) the value of the future relationship is the critical variable which governs the emergence of co-operative behavior in a

situation defined by prisoner's dilemma and if there is no prospect of future work, outcomes are likely to be highly inefficient. This view has been validated in various case studies on strategic partnering that are shown to produce cooperation and more efficient project outcomes (Bennet and Jayes, 1995; 1998; Barlow et. al., 1997). The accompanying pain share / gain share mechanism in a GMP contract not only opens up a constructive route for the contractor to claw back the over optimistic tender prices in the second game through savings from innovations and better management but also is a vehicle to create future value for the contractor in an one off project. This discourages the contractor from opportunistic behavior at the initial stages of the project if there is a winner's curse problem. However, there were no savings reported at the end of the project and this was attributed to the advanced stage that the design was in when tendered. Although the contractor did have expectations of savings which did not materialize, the mere existence of the savings sharing mechanism created a project culture of working together in the initial stages which is difficult to change later even after encountering losses. The contractor's gain in terms of variations and change of scope attracted a pre-agreed profit margin that was above the prevailing market rates.

Partnering was used as a strategy to foster relationships with an aim to achieve objectives. The entire partnering process was geared towards face to face meetings with a problem solving approach, while there was a neglect of the usual formal aspects of partnering such as workshops, champion's meetings, and periodic evaluation. The stress was on fairness and understanding of each others objectives. Although there was an opinion from many participants that the number, frequency and long durations of meetings was unnecessary, in the author's opinion they did help in enhancing open communications between the stakeholders in the sense that they imparted knowledge about owner's micro-objectives and made the stakeholders understand them and orient their objectives towards the owner's. Added to this, objective decision making processes were achieved by open book accounting and the practice of fully pricing and agreeing to subcontract variations by the client, consultants, main and subcontractors before they were implemented; and this enhanced trust. Further, the owner's sensible and fair use of its bargaining power without resorting to exploitation and a conscious choice of not to call contractual safeguards such as liquidated damages unless there were severe economic losses was made known to all the parties. This developed a sense of a safety net cast for them protecting them from unfair losses. This also created a feeling of collective responsibility for project objectives within the stakeholders, and avoided claims, while fostering better relationships and trust.

## **8. PROJECT PERFORMANCE**

The project encountered many problems that could have affected its delivery in terms of time, cost, quality and safety. However, all of them were

resolved and their resolution was attributed to teamwork and collaborative problem solving approach. The intermediate milestones were achieved, the quality was termed as good, the end product was delivered within envisaged budget of the owner and there were hardly any significant claims or disputes in spite of there being no cost savings. Although there were minor safety incidents, there was no major issue with safety in spite of the project being located in a congested area and safety being envisaged as a major risk at the commencement.

## **9. INFERENCES FROM THE CASE**

The successes of the project mentioned above from the owner's perspective can be attributed to clarity of each stakeholder about their respective objectives and their understanding towards objectives of other stakeholders which encouraged team play. This clear knowledge assisted in making conscious and rational tradeoffs in terms of selection processes tailor made to achieve the objectives which strengthened the owner's position. From the contractor's perspective, the case supports the contention that partnering does limit profitability to an extent. The conscious choice of the contractor in this case to pursue partnering in all of its projects is probably due to Hong Kong being an extremely developed and saturated market.

Further, the experiences in the project suggest that co-operative relationships are a means to achieve the objectives rather than as an objective in it-self, supporting the argument of Cox and Thompson (1997). Relationships alone cannot act as a substitute for contractual safeguards and hence partnering, although important is not a must for project performance as much as orienting project participants individual objectives towards common objectives.

In a broader perspective, if the results are extrapolated to a general scenario, the limit to profitability from partnered projects may lead to contractors viewing a limit to the extent of their partnering as a proportion of turnover which supports the findings of Masons (2002). Theoretically, the exact nature of the proportion of the turnover will be dependent on market conditions and the amount of fixed costs of operating that the company needs to recover, which in essence is the breakeven turnover. Probably, above this breakeven turnover, contractors would prefer to maximize profits and hence could be reluctant to partner unless there is a clearly beneficial tradeoff such as the project is a part of ongoing continuous relationship with an owner or it being a prestigious project.

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## 11. REFERENCES

- Anvuur, A. M., Kumaraswamy, M. M. and Mahesh, G., 2006, Which governs – the relationship or the contract? In *proceedings of Annual Conference of COBRA*, London
- Axelrod, R., 1984, *The evolution of co-operation*. Penguin Books
- Barlow, J., Cohen, M., Jashapara, A., and Simpson, Y., 1997, *Towards Positive Partnering*. The Policy Press, University of Bristol
- Bennet, J. and Jayes, S., 1995, *Trusting the Team*. Center for Strategic Studies in Construction, University of Reading
- Bennet, J. and Jayes, S. with the Reading Construction Forum, 1998, *The Seven Pillars of Partnering*. Thomas Telford
- Cox, A. and Thompson, I., 1997, 'Fit for purpose' contractual relations: determining a theoretical framework for construction projects. *European Journal of Purchasing and Supply chain Management*, **3(3)**, 127-135
- Dyer, D., and Kagel, H. K., 1996, Bidding in Common Value Auctions: How the Commercial Construction Industry Corrects for the Winner's Curse. *Management Science*, Vol. **42**, No. **10**, pp. 1463-1475
- Egan, J., 1998, *Rethinking Construction*. Construction Task Force (CTF) Report, Department of Environment, Transport and the Regions, London
- Holt, G., and Proverbs, D., 2002, A Survey of Public Sector Procurement in England. *Journal of Construction Procurement*, Vol. **7**, No. **1**
- Latham, J., 1994, *Constructing the Team*. The Stationery Office
- Masons, 2002, *Partnering in Practice*, A report by Construction Forecasting and research
- Rothkopf, H. M., 1969, A Model of Rational Competitive Bidding. *Management Science* **15**, pp. 362-373
- Saxby, W., 2004, Is there a prisoner's dilemma in construction procurement? In *proceedings of Annual Conference of COBRA*, Leeds
- Wood, G., 2005, *Partnering practice in the relationship between clients and main contractors*. *RICS Research paper series*, Vol. **5**, No. **2**, April 2005