TARGET COST CONTRACTS: ADOPTING INNOVATIVE INCENTIVE MECHANISMS TO IMPROVE THE PROJECT DELIVERY PROCESS

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Target Cost Contracts are widely recognised as cost-led procurement models which incentivise client and contractor to work collaboratively and develop mutual gains. Their use on recent high profile projects and inclusion in the recently published UK Government Construction Strategy recognises Target Cost Contracts as a "cost-led procurement model." They have been identified as a model capable of producing the "15-20%" cost savings required for public sector construction projects by 2015, and act as key drivers for their use. This research aims to facilitate innovation in future Target Cost Contracts by expanding the current incentives offered to include a wider variance of stakeholders and performance metrics. A cross-sectional study utilising semi-structured interviews to test the initial findings generated by the literature review was employed to validate the use of such innovative incentives. Incentivising alternative performance metrics is required to generate greater motivation amongst project stakeholders, although there was insufficient evidence to suggest that incentive frameworks could achieve this. Incentive frameworks to include the design team and alternative performance metrics have been defined for testing in future research which could be pilot tested in practice.

Keywords: target cost contract, incentivisation, NEC3, performance metrics, key performance indicator

INTRODUCTION

Target Cost Contracts (TCCs) were introduced as a cost management tool in order to reduce the cost of construction projects (Pennanen et al., 2011), promote collaboration in the whole supply chain, and are unique in that they motivate both client and contractor to reduce costs (Perry and Barnes, 2000; Hughes et al., 2012). TCC are an incentive-based procurement strategy which will award savings or penalise cost overruns according to a pre-agreed target cost and share ratio (Masterman ,2002). Incentivisation is used in construction contracts to motivate the contractor to achieve excellent performance, rather than the minimum contractual standards (Meng and Gallagher, 2012). The catalyst for this research has been the recently published UK Government Construction Strategy which recognised TCC as a "cost-led procurement model" (Cabinet Office, 2012, p.52) that could produce the "15-20%" cost savings required for public sector construction projects by 2015 (Cabinet Office, 2012, p.6).

TCCs have been successfully used on a number of recent high profile projects, such as; the London 2012 Olympic and Paralympics Games infrastructure, Heathrow Airport Terminal 5 Project and the Crossrail Procurement Strategy. The authors' aim

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in this research is to promote innovation within the use of NEC3 Option C and D contracts. The criticism evident in the published literature is that TCCs tend to incentivise cost, incentivise the client and contractor only and are sometimes perceived as profit making tools for contractors. The authors wish to implement the principles of innovation and project integration, by establishing incentivisation frameworks that, if adopted, could address some of the weaknesses identified in the literature.

LITERATURE REVIEW

Incentivisation in Construction Contracts

The Construction Industry is often criticised for its poor performance [Latham (1994); Egan (1998); National Audit Office (2000)]. The traditional fixed-price lump-sum contract is often a major factor in poor performance, as its use often engenders limited trust, lack of incentives, misalignment of objectives and adversarial relationships between the whole project team [National Audit Office, (2000); Rose and Manley, (2010)]. There is often inequitable risk allocation and lack of incentives to improve performance, which often leads to delays, cost overruns and a claims culture (Chan et al., 2010). There is limited opportunity for early integration of the supply chain and early contractor involvement under traditional forms of procurement (Latham, 1994), which often fuels poor project integration. Added to this is the fact that all project participants have conflicting objectives, which often leads to adversarial relationships (CIRIA, 2001).

Incentives and dis-incentives aim to reward or penalise the contractor based on his performance during the project (Bubshait, 2003). Chan et al. (2011b) found that incentivisation in construction contracts promotes deeper collaboration between client and the contractor, thus driving the contractor to innovate, save cost, work efficiently and solve problems as the project proceeds. Bubshait (2003) found that 64% of clients surveyed agreed that incentive provisions should be used at tender stage, while 60% of contractors believed that they should be included at construction stage. Meng and Gallagher (2012) also concluded that when time, cost or quality incentives are used, performances related to these measures are enhanced when compared to non-incentivised projects.

This view is further acknowledged by Bayliss et al. (2004), who found that the number of claims decreased, the percentage of valuations certified increased and the time taken to resolve claims reduced when incentivisation was introduced part way through a live project. Hughes et al. (2012) advance this theory by suggesting that the use of incentives helps to make partnered projects successful. Incentivisation improves trust, honesty, communication, teamwork and motivation to achieve mutual objectives [Bayliss et al., 2004; Rose and Manley, 2010]. Sir John Egan (2008, p.4) suggested when reviewing the progress of the Rethinking Construction report, that:

"I have to say that I would introduce, as early as possible, in every possible project, a gain share between client and the industry, with a target based upon an agreed set of parameters, plus or minus I would say 15%."

Egan (2008) appears to reinforce the opinion that incentivisation should be introduced in all construction projects in order to improve performance. There is a clear impetus in the construction industry to move from adversarial arms length procurement systems, to more collaborative systems that are based on trust and co-operation (Espling and Olsson, 2004). CIRIA (2001) suggest that disincentivisation often leads

to the development of adversarial relationships, and challenged the use of reactive disincentivisation schemes and support the implementation of incentivisation schemes that are more proactive and collaborative.

The published literature indicates that incentivisation should be included in all future construction projects. There is a strong argument to share risk and reward through collaborative incentivisation where the motivation is proactive performance improvements from which all parties can gain.

Incentivisation in Target Cost Contracts

Masterman (2002, 106.) provides a useful definition of TCCs:-

"An incentive-based procurement strategy which will reward the contractor for any savings made against the … target cost and will penalise him when this sum is exceeded as a result of his own mismanagement or negligence according to a pre-agreed share ratio."

TCC provide a higher level of cooperation, which reduces the opportunity for conflict and disputes to occur (Eriksson et al., 2009). Shorter construction programme is a perceived benefit due to the opportunity for early contractor involvement during design and early integration of the supply chain (Eriksson et al., 2009; Chan et al., 2011). The incorporation of the collective expertise of the contractor and other key members of the supply chain during the design phase promotes innovation which provides the potential for substantial cost savings (Chan et al, 2011). Faloon et al (2005) concluded that early contractor involvement and early integration of the supply chain provides a systematic cost reduction model. The collaborative integration of the supply chain ensures that accurate estimates are produced which minimise the use of inaccurate construction programmes and cost estimates (Chan et al, 2011).

In contrast Hughes et al. (2012) maintain that TCC are only beneficial for the client, as the contractor absorbs the additional cost to increase future workload. They suggest that there could be disadvantages including free-rider problems, self-interest and teams that are not easy to motivate. TCC are often criticised for the additional time required to complete the projects (Chan et al., 2011) and the additional time and cost required for administration (Badenfelt, 2008). Chan et al (2011) criticise the purely cost based incentives offered under a TCC as there are little incentives for quality, time and other performance metrics. It is apparent from the published literature that TCCs are mainly incentivised by the Pain Share / Gain Share (PS/GS). The more cost savings the contractor establishes, the larger the gain share. This develops a need for the contractor to work more efficiently and collaboratively in order to develop cost savings, thus producing a gain for both client and contractor.

It is broadly accepted in the contemporary published literature that incentive goals should cover all performance areas [Rose and Manley, 2010; Chan et al, 2011; Meng and Gallagher, 2012; Hughes et al., 2012]. Rose and Manley (2010, p.258) specifically criticise the current incentivisation offered under TCC as, "limiting goals to financial performance alone fails to encapsulate all incentive opportunities." Rose and Manley (2010) concluded from their research that when multiple incentive goals were offered under a contract, this increased the incentive intensity and motivational power and delivered successful projects.

There is a concern in the published literature that multiple incentives that drive performance areas such as time, cost, quality, health and safety and other performance metrics would be more effective. There is also criticism that TCCs only incentivise the

client and contractor (Rose and Manley, 2010). To deliver a gain under a TCC it requires collaboration between the client, contractor, consultants, sub-contractors, design team, supply chain and manufacturers. How do TCCs motivate other stakeholders outside the contract if they do not receive any shares of the gain?

Generally the published literature indicates that TCCs tend to focus on cost as the incentive measure, and further suggests that multiple incentives that include further performance metrics and key members of the supply chain would fully incentivise the contractor. The use of such a system combined into the PS/GS mechanism therefore warrants further investigation.

RESEARCH APPROACH

The aim of this research was to develop incentivisation frameworks that are transferable across construction sectors. It is proposed that these incentivisation frameworks could be used as part of the NEC3 Option C or D standard form of contract. Primary data was required to validate the use of such frameworks. The chosen methodological approach was a cross-sectional study. The research was concerned with understanding how incentivisation frameworks could be utilised in the future, including any barriers or limitations for their use. The chosen methodological strategy was well suited to the research as understanding the experience and opinion of key contractual parties is essential to the use of incentivisation frameworks in the future. The nature of cross-sectional studies is to collect primary data from a purposefully selected range of respondents.

The decision to utilise interviews was encouraged by the initial communications with potential respondents. Interviews would allow the authors to gather the opinions of respondents whilst maintaining their confidentiality. The qualitative approach gave the authors more flexibility to pose further questions or explain incentive frameworks. This approach developed a closer relationship with respondents, thus encouraging expansive responses. Table 1 overleaf illustrates the chosen interview sample.

Semi-structured interviews were preferred as the authors wished the respondents to answer the questions in as much depth as possible. The authors felt that allowing the respondents to answer the questions as freely and openly as possible would develop a close relationship with the interviewer. A sample of interviewees was selected to represent all roles within a project. A series of ten interview questions were developed. To aid analysis and synthesis of the primary data, the authors opted to pose questions within identified themes. The authors felt that grouping questions in themes would allow responses to be analysed more effectively, and encourage respondents in their responses. The interview themes were Profile, Benefits, Limitations, Pain Share Gain Share and Further Incentives.

Table 1: Profile of Interview Respondents

Respondent	Sample	Abbreviation
A	Innovation Expert	IE
B	Project Manager	PM
C	Procurement Specialist	PC
D	Contractor	CON
E	Construction Lawyer	CL

The aim of the research was to develop incentivisation frameworks to incentivise alternative performance metrics. The authors consider performance metrics to include time, cost, quality, safety and sustainability; areas that the client would have based his award decision on. The authors developed incentivisation frameworks that were tested in the series of interviews. Each performance metric is linked to the overall PS/GS for the project. The performance metrics are weighted by the client, in relation to the procurement strategy and overall objective of the project. The client then sets Key Performance Indicators (KPIs) against each performance metric. The framework was developed from findings of the literature review and the authors own experience of managing TCCs. Table 2 below illustrates an example of a project with £50,000 of gain where the contractor did not complete on time due to operational inefficiency, and was therefore penalised 40% of his gain share. Note - for the purposes of this conference paper Table 2 provides a simplified extract of the actual framework developed which serves to demonstrate the underlying principles involved.

Table 2: Example incentive framework

Performance Metric	Target Cost Percentage	Example Key Performance Indicator	Completion Percentage	Contractor Share (50%)	Client Share (50%)
Time	40%	Programme	0%	£-	£20,000:00
Cost	20%	Target Cost	20%	£5,000:00	£5,000:00
Quality	20%	Zero defects	20%	£5,000:00	£5,000:00
Health and Safety	10%	Zero accidents	10%	£2,500:00	£2,500:00
Sustainability	10%	BREEAM Excellence	10%	£2,500:00	£2,500:00
Overall Gain				£15,000:00	£35,000:00

The interviews were divided into two main thematic categories. The first category asked interviewees questions reflecting on their current and previous experience of target cost contracts. Following this general discussion the authors then introduced the interviewees to their incentive framework for their appraisal of its feasibility for utilisation on TCCs.

DISCUSSION OF RESULTS

Interviewees Profile

All five interviewees had extensive experience working on NEC3 TCCs and are currently actively working on TCCs. The five interviewees possessed 75 years of collective experience. This is extremely important as all five respondents work for organisations that are widely recognised throughout the construction industry, thus ensuring that responses are reflective of contemporary industry practice and beliefs.

Benefits

The Innovation Expert (IE) suggested that the main benefits are that it provides some incentive and focus for the process for the client, contractor and possibly the design team. The Project Manager (PM) believed that the openness about risk through the use of Compensation Events was a major benefit. Compensation events are events which, if they occur and do not arise from the Contractor's fault, entitle the Contractor to be

compensated for any effect the event may have on the prices (NEC3, 2005). The way that the contract manages risk in an open environment, with an open discussion on the allocation of risk, which allows risks to be mitigated and managed effectively, is also a major benefit for the PM. The Procurement Specialist (PS) agreed with the other interviewees, although also suggested that the greater degree of certainty, the collaborative teamwork approach and the ability to reinvest the gain of a project on future projects were major benefits. This ability to manage the gain and provide a degree of certainty on budget is a major advantage to a public sector body. This advantage is demonstrated by the PS:

"I certainly on major projects wouldn't look at using anything else now that we have been using target cost."

For the Contractor (CON) the main benefits are the ability to work in a partnered collaborative approach, the ability to identify and manage the pain gain and the ability to commit to a project while the work packages are not yet fully developed. The Construction Lawyer (CL) did not cite any of the previous benefits, and believed that the main benefit is the incentive for the contractor to undertake value engineering. The CL suggested that the contractor using his abilities to seek savings and enjoy the pain gain is the major benefit of TCC.

Several of the interviewees stated that the major attraction for the client is the degree of certainty achieved and the ability to share some risk, as the PM described this as a "common sense approach." The ability for the client to see compensation events priced openly and the focus on providing up-to-date information is a major benefit. The PM considers that this allows the client at any point in the project to have an idea of the overall financial commitment, which might not be achieved under alternative contracts. The CL suggested the main benefit is the potential ability for the client to lower his final project cost.

The IE suggested that the main motivation for the contractor is that it provides a focus and a target, and the ability to introduce continuous improvement into the process. The IE discussed the motivation for the contractor to improve from contract to contract, thus enhancing innovation. There was a need for the contractor to be claims conscious, and have an understanding of the way to deal with the contract. There was a consensus that it forces the client to work as a more informed client, which makes it a "very clearly defined process." The CON and the PS were consistent as the CON suggested that early contractor involvement enhances the open collaborative way of working, while the PS suggested that it breeds openness about issues. The PS also indicated that such an open approach could not be achieved under alternative contracts, therefore encouraging an open forum where everybody can accept and discuss risks.

Limitations

All interviewees agreed that the main limitations of TCCs are the lack of full cost certainty and they are open to abuse if not approached in the right mind set. The CL firmly believed that the only benefit for the contractor is money. When asked by the interviewer if it is a purely profit making tool, the CL stated:

"Purely. Yes. There is no other reason for it … it doesn't help the contractor. It gives no incentive. It's purely based upon money."

The CL further developed this argument by suggesting that the contractor can "artificially inflate the target cost" which in essence is only going to benefit the

contractor through the gain share proportion. The IE also expressed this concern, and asserted that TCCs are open to abuse form all parties if not managed correctly. The IE also suggested that TCCs are only really well suited to long term relationships as it can be easily abused on one off projects. Three of the interviewees highlighted the difficulty of establishing an equitable TC. The CON summarised this as:

"Quite heavily resourced approach I think target cost, because all of the work you have to do behind the scenes."

The majority of interviewees believed that the interplay between fee and the PS/GS weightings can disincentivise the contractor, and agreed that the share arrangement affect contractors' motivation. In addition to these limitations, there was a general consensus that the understanding of the parties to the contract is a limitation. They cite the need for an investment in time to understand TCCs as a barrier to its use.

All respondents agreed that TCCs provide cost only incentives. The IE felt that a way of overcoming this concentration on cost is to "develop some proper measure for softer targets like quality issues." The IE felt that including some KPIs in TCCs would incentivise the contractor, although was also wary of utilising too many "artificial KPIs." In contrast the PM proposed that TCCs do incentivise time and quality as doing things as quickly as possible and getting things to the right quality the first time affects the actual cost. The PM recommended that TCCs could do more to specifically incentivise contractors. The PS also stated:

"Yes it is limited to cost. It would be difficult to see how you could bring other incentives in that would mean as much as money does at the end of the day. Both for the client and back on the contractor side I think."

All respondents throughout their interviews referred to the misalignment of objectives between client, contractor and design team as they are motivated for different things. The IE suggested that a way of overcoming this would be to include the design team on a 40:40:20 or 45:45:10 PS/GS basis, and also suggested "innovation should come from the design team and without that sort of incentive for them they will just become disengaged from the process." The PS strongly agrees with this statement by suggesting that this would allow the design team to become more commercially aware, drive the collaborative effort and would make designers "think a bit harder about their design and the cost plan." In contrast to other respondents, the PM had some experience where the design team and consultants were under TCC, which were beneficial in terms of the whole scheme cost. The CL noted that such a system could be used, although was concerned about the complexity required to implement it. Contractually linking the system was also an issue, although the PM suggested overcoming this issue by having the individual TCCs linked to one PS/GS pot.

Pain Share Gain Share

The majority of interviewees agreed that 50:50 is the correct PS/GS weightings to use, while the CL states that a minimum 60:40 or ideally 70:30 in favour of the contractor should be utilised. The IE, PS and CON stated that if it is weighted in favour of the client or contractor this can affect the incentive power as it does not seem that the parties are working equally. The PS evaluates this argument by suggesting:

"I think the fifty fifty was right and that's what it was about. We are in this together so we are going to work through it together, and therefore will benefit or fall either way by that working together."

The PM generally agreed with the even split, although did suggest that under competitively procured TCC the share should be in favour of the contractor in order for a realistic TC to be developed. The CL argues that the PS/GS should always be in favour of the contractor by advising clients that "if you are happy with your target cost, deal with this as a bonus." While the PS disagreed with this:

"We really need the contractor to be driving the target cost to be as accurate as we can get it.

All respondents had experience of PS/GS where there was one hundred percent of pain to contractors. All respondents disagreed with such a system. The PM strongly suggests that if the client adopts the approach to pass all the pain to the contractor, he should follow a variant of a lump sum contract. The PS and CON also raised some concerns regarding the use of PS/GS frameworks by suggesting how far down the supply chain does the PS/GS go; possibly an area for future research.

Incentive Frameworks

The IE supported the use of such frameworks and believed that the frameworks could be used in practice. The IE believed that the performance metrics should be aligned to the tendering process and used under collaborative long term relationships. Therefore if a TCC is competitively procured the contractor should be favoured in the PS/GS weightings to motivate the contractor to develop a favourable target cost. The PS also agreed with the IE by confirming that they would "not be too difficult to administer." Although the PM did not agree with this and suggested:

"I am unconvinced as to whether or not the time it takes understanding it before you bid, the provisions you make when you bid and the time you spend administering it when you're on the project actually pay their way."

The CON was unconvinced as to whether the frameworks should be used as he believed that Clause X20 caters for bonuses for KPIs. Clause X20 is an optional clause which allows the use of KPIs and incentive payments with NEC3 contracts. They differ to the authors'proposed incentive frameworks as Clause X20 is not linked to the PS/GS framework as is being suggested by the authors. None of the interviewees had ever seen clause X20 used. The CON was not convinced that the target cost should be adjusted if a certain performance metric is not achieved. This perhaps is evidence of the drive for a contractor to make profit under a TCC as previously suggested by the CL. The CL was in favour of such frameworks that assess the contractor's performance, although did not believe that there should be a monetary link. In contrast the IE and PS felt that the frameworks should be used. A major point that all interviewees questioned was how such frameworks would be measured fairly.

The PS was strongly in favour of such frameworks, although was also concerned as to whether such frameworks would "skew the contractor in different ways." In response to this the CON stated that they see "things like that give a good incentive," as it "breeds a proactive collaborative way of working." The PM indicate that "incentivisation of timely performance is a key matter," and incentivising the project team to make decisions quicker would save time, save money and allow that money to be used elsewhere on the project. The IE strongly supported the use of such frameworks as long as they were "fair, equitable and transparent." He felt that the use of alternative incentive mechanism would incentivise the contractor to develop a more sensible target cost. The CL strongly supported the use of alternative incentive mechanisms, and believed that it is a "wasted opportunity" if they are not used. The

PS provided a useful summary of how she considers alternative incentive mechanisms:

"So yes I think it's a good idea. I think it will be interesting to look at further and see how it works, but you have got to be careful that it is not driving the contractor to just behave in a different way."

All respondents felt that alternative incentive mechanism could have a beneficial impact on TCCs, although they were also concerned how they would work in practice. It could be suggested if a contractor at tender stage predicts that he will deliver a project within gain, with zero defects, to the proposed completion date, with zero harm and with BREEAM Excellent rating, why should he not be penalised if he does not achieve a certain performance target? Conversely why should he not be rewarded for achieving a certain performance target? In the instance of a quality price tender, a contractor would have been awarded the contract based on the Target Cost value and the quality elements. It would only be reasonable and transparent to all parties if the contractor fulfils what he anticipated.

CONCLUSIONS

TCCs are largely criticised in the published literature as they tend to focus on cost as the incentive measure and only provide an incentive to the client and contractor. To generate greater motivational power the authors proposed incentive frameworks could be modified for time, cost and quality-led projects. These were discussed in the series of five semi-structured interviews. The interviewees believed that such frameworks could work, although were sceptical about the industry's ability to bear the cost of the complexity and time required to understand, perform and measure the metrics. However there was a strong suggestion from the interview data that there was a requirement to align the objectives of the project team. The interviewees noted that designers need to become more commercially aware and highlighted the importance for information to be provided on a timely basis. It was also noted that this could potentially drive innovation which in turn could generate greater gains. The flexibility of the incentive frameworks would allow designers to be included in the share arrangement, with the overall motivation for collaboration and integration of the supply chain.

The aim of this research was to identify how effective further incentives would be under TCCs, and develop incentivisation frameworks to motivate parties to achieve alternative performance metrics. In essence incentive frameworks have been developed which motivate parties to achieve better performances in alternative performance metrics. However the research is based on limited interview data and the performance frameworks developed by the research have not yet been tested in practice. Further investigation is required to understand how the incentive frameworks and including the design team in the PS/GS affect the overall motivational power of incentivised performance metrics, and in turn the overall project outcome.

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