BOOK OF PROCEEDINGS

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Abstract
Traditional contracting has been largely shown to cause adversarial relationships between client and contractor in the construction sector. This leads to claims during construction by contractors, which increase transaction costs for both parties in the form of policing and enforcement costs. In literature, partnering is widely advocated as a governance form to more cooperative relationships between client and contractor. The partnering approach, however, requires a significant investment in elaborating a specific procurement approach, and is therefore regarded as inappropriate for small, one-off, less complex projects which are of low strategic importance. Municipal governments in the Netherlands are searching for alternative solutions to increase cooperation with contractors and reduce transaction costs by applying immediate post contractual negotiations in traditionally procured projects. We studied four such municipal projects which have showed that immediate post contractual negotiations positively influence cooperation as it creates joint risks analysis and management, stimulates a reduction of design errors, stimulates design and planning optimization, provides a platform for joint problem solving, leads the contractor to involve key participants early in the process, and leads them to align goals and expectations. We observed these effects that partnering aims to achieve despite the initial traditional procurement procedures applied in these projects. These negotiations seem to reduce the transaction costs of traditional procurement making them particularly applicable in smaller projects where high set up costs would not be justifiable due to their limited size, complexity, or cost.

Introduction
Traditional contracting has been largely shown to cause adversarial relationships between client and contractor in the construction sector [1-4]. This leads to claims during construction by contractors, which increase transaction costs for both parties in the form of policing and enforcement costs. The current climate of austerity exacerbates this problem as fewer investments are made, margins decrease, and competition becomes ruinous. Various authors argue that cooperative relationships should lead to improved productivity, financial savings and create opportunities for innovation [3-5]. In literature, partnering is widely advocated as a governance form to more cooperative relationships between client and contractor. It does so by aligning goals between the parties, integrating contractor's expertise in the design and planning of the project, involving key participants early, creating an integrated team, and improving communication. The partnering approach, however, requires a significant investment in elaborating a specific procurement approach, and is therefore regarded as inappropriate for small, one-off, less complex projects which are of low strategic importance, as the set-up costs simply do not justify an extensive collaborative approach [6, 7]. Additionally, the implementation of partnering is not always possible due to public procurement laws, making it particularly difficult to implement for government institutions [8]. The required investments are leading some municipal governments in the Netherlands to search for alternative solutions to increase cooperation with contractors and reduce transaction costs by applying immediate post contractual negotiations in traditionally procured projects.

Immediate post contractual negotiations are a meeting between the client and contractor directly after the project has been awarded to agree on an updated contract to reach a fixed price agreement or modify the design. In this paper we present the results of a study of four projects in which immediate post contractual negotiations were implemented. We evaluated the effect of these negotiations on the accuracy of project cost estimations before construction is started, maintaining product quality and increasing constructability, and the occurrence of discussion and renegotiations during the construction phase. Our results show that immediate post contractual negotiations have a positive impact on these effects as it creates effective risk transfer and management, stimulates a reduction of design errors, stimulates design and planning optimization, provides a platform for joint problem solving, leads the contractor to involve key participants early in the process, and leads them to align their goals and expectations. Provided that there are no further scope changes during construction, the results show that the need for further discussions and renegotiation is removed. Awarding based on quality shows promising capacity to strengthen these effects of immediate post contractual negotiations as it increases the level of knowledge parties have before the negotiations are initiated, increasing their effectiveness.

The results show that post contractual negotiations achieves several components of partnering, despite the traditional initial procurement procedures applied in these projects. They show goal alignment between the client and contractor, joint problem solving, and the involvement of key participants during the design and planning of the project. The cooperative procurement procedures prescribed by project partnering literature were not obviously applied in these projects. We therefore suggest that immediate post contractual negotiations are an interesting alternative for partnering to transform adversarial into cooperative relationships in traditionally procured projects. These negotiations seem to reduce the transaction costs of traditional procurement making them particularly applicable in smaller projects where high set up costs would not be justifiable due to their limited size, complexity, or cost.

In this paper we show the effects of immediate post contractual negotiations by highlighting the importance of the problem of adversarial relations in construction, and the method we used to analyze the effects of post contractual negotiations. We follow this with the results of the study and discuss them in the light of partnering. We conclude the paper with suggestions for further research and the implications for practice.

Background

This study is an effort to provide more understanding in the creation of cooperative relationships in the construction sector in the dyadic relationship between client and contractor. Adversarial relations have plagued parties in the construction industry for a long time. Partnering is a concept in construction management literature that describes this fundamental shift away from the adversarial relationships in construction [9]. The implementation of partnering, however, proves to be difficult in practice as there is no unified understanding of the topic. The literature tends to give prescriptive accounts of how partnering should be implemented, yet the effectiveness of these measures is rarely examined [10]. Much of the literature, however, shows agreement on the components that describe a partnering relationship. Bygballe, Jahre [9] and Nyström [11] conducted literature reviews of existing partnering literature and conclude that the most prevalently discussed components of partnering include: common goals and objectives, mutual understanding, trust, joint problem resolution, commitment, continuous evaluation, and group working.

Partnering literature is replete with methods and tools to achieve these components such as appropriate procurement procedures [12-14], application of partnering tools such as charters, dispute resolution mechanism, teambuilding workshops and the use of facilitators. The purpose of partnering, however, is to create a deep seated cultural change towards creating cooperation, which implies that relational aspects must not be overlooked [15, 16]. As stated earlier, the implementation of adequate partnering tools require significant investment by both parties. Public procurement acts also make implementation difficult because public clients are restricted in the procurement methods they are permitted to apply [17]. Additionally, the effectiveness of implementing these measures is questioned, particularly in the case of small, one off contracts for small scale projects in which the required investments cannot be justified, it may even work counterproductive [6]. From this perspective, it is interesting to see whether alternatives to partnering are viable to stimulate the transformation to more cooperation between client and contractor in these small projects. This study aims to fill this gap by investigating the effects of an alternative approach with similar goals: immediate post contractual negotiations.

Method

The research presented in this paper was undertaken to evaluate the effects of immediate post contractual negotiations in several municipal projects. The aim of the clients in these projects was to increase cooperation with the contractor and in some cases to take advantage of contractors' knowledge in the final stages of the design phase. To this end we evaluated the effects on visible aspects of this: the accuracy of project cost estimations before

construction is started, maintaining product quality and increasing constructability, and the occurrence of discussion and renegotiations during construction. It was carried out for a master thesis graduation project at the faculty of Construction management at the University of Twente. The projects studied were local projects run by municipalities in the local region. We particularly chose municipal projects because partnering is considered too expensive for the majority of their projects, as they are too small. Data was collected from four case studies in which immediate post contractual negotiations were applied. Three of the studied cases were relatively small projects which could be considered as routine and of less strategic importance. These projects, which we will refer to as projects A, B, and C were street refurbishment projects in low density residential areas including subterranean replacement of sewers, pipes, and cables. These projects had the following conditions:

- Project A: The project was awarded selected on basis of the lowest price tender for a completed design. Immediate post contractual negotiations were initiated after the project was awarded. The project cost approximately €500.000,-.
- Project B: The project was awarded on basis of the lowest price tender for a completed design. The post contractual negotiations were initiated after the project was awarded. This project had a total cost of approximately €600.000,-.
- Project C: The project was awarded on basis of quality for a completed product design. The selection procedure asked tendering parties to include a process plan, a risk plan, and potential value-adding measures. The total costs for this project was approximately €300.000,-.
- After the procurement process and after the projects were awarded; the involved parties conducted immediate negotiations to reach a fixed price agreement; in which design risk was transferred to the contractor. The fourth project was of a larger scale, and was a more strategically important project as it was located in a plaza surrounding a busy railway and bus station which was refurbished including underground works. We refer to this project as project D.
- Project D: The project was awarded on basis of quality for a provisionally completed design. The selection procedure asked tenders to include a detailed process plan and a risk management plan. Immediate post contractual negotiations were announced before procurement, where the client had the intention to increase the constructability of the design with the contractor. The total costs for this project was approximately €2.500.000,-.

Data from these projects was gathered using document study, central evaluations with both client and contractor present, and qualitative interviews with key participants in these projects from both the client and contractor. The studied documents included procurement documents, meeting reports, budget reports, cost reports, and change orders. In total, spread across the case studies, information was gathered from 17 key participants in these projects. Data gathered from the document study was used to develop semi structured interview and evaluation guidelines for each project. The evaluations took approximately 90 minutes each, the individual interviews 60 minutes each and all were transcribed by the author. The data was collected in Dutch, and the quotes have been translated to English by the author for the purpose of this paper. The study provided some interesting results as elaborated in the following section.

Findings

In this section we present the effects we observed in the various case studies of immediate post contractual negotiations on the accuracy of projects cost estimations before construction, the level of product quality, and the occurrence of discussions and renegotiations that occurred during the construction process. The findings show that immediate post contractual negotiations reintroduce a period of planning into the construction process in which the goals of the parties are aligned, problems are jointly solved and key participants from the contractor are involved. Due to this, a more accurate cost estimation is made, and risks are better defined and managed. We observe a remarkable decrease in discussion and renegotiations during the construction process.

Goal Alignment

Through the application of immediate post contractual negotiations, the goals between client and contractor are aligned. This effect was achieved by the clients in all projects where they transferred design and stagnation risks to the contractor during these negotiations. Through this the contractor no longer has an interest in claiming, as they are responsible for any delays and design errors. This arrangement was defined in an amended contract which concluded the immediate post contractual negotiations.

The transfer of these risks resulted in a project phase devoted to a detailed risk analysis and problem solving in all projects. The initial effect of this was that the contractors in these projects recalculated the design and the bill of quantities associated with the design to gain a more precise understanding of the project. In projects A and B this happened directly after the project was tendered. In projects C and D, the client and contractor did additional design work before doing final calculations. In all cases; the project leader of the contractor responsible for the construction of the project looked at the bill of quantities and made sure it was correct. Remarkably, the contractors

did not experience this as a large risk. This was mentioned by three of the contractors, *"If we recalculate all the quantities, then it isn't really a risk for us anymore. We can get a very precise estimation of what products will need to be applied." (Project manager projects A, B, and C)*

As a result, the contractor removed errors in the designs and corrected the associated costs. In project B, these recalculations led to a minor increase in costs attributed to mistake correction. For projects C and D costs increased, but this is mostly attributable to the design changes that were implemented during this phase. Remarkably, in project A, the costs were reduced due to recalculation. In this case, the contractor recalculated the units in the bill of quantities which were overestimated in the tender, and valued the risks below what was predicted during the tender, because he had control over the management of them.

During construction, due to the risk transfer, the contractors were obliged to pay any deviations, provided they were within the design scope. In projects A, B, and C the contractors indicated that deviations were insignificant and that the changes that did occur were to the advantage of neither party. Project D, however, did not go so smoothly. This project was conducted under high time pressure, political pressure, and was more complex than projects A, B, and C. As a result, the construction phase was initiated before the preparations were complete. During construction, there were significant scope changes in the project, which led to the inclusion of new parties working in the project zone, and significant alterations to the design. As a result, the cost indication that resulted from the negotiations was inaccurate.

The result is that in projects A and B, the contractors had no need for maintaining a list of changes and mistakes during construction. The lack of attention to money during the execution process for the client reduced potential discussions throughout the construction phase, as stated by the clients: *"It was really nice that we could just focus on the work. The costs were already arranged, so we didn't have to discuss about that. We could just do our work and solve any problems that occurred (Project leader, project C)"*, and *"The biggest difference is that we didn't have to sit together and calculate the extra costs that were made every week. That saved us a lot of discussions and time (Project supervisor, project B)"*. This resulted in fewer discussions during construction. One contractor states, *"We only had two meetings during the entire process. We never had a reason to come together and discuss problems; we had already solved them beforehand (Project B)."* In these projects we observed that within the scope of the contract, there were very limited cost overruns in projects A, B and C. As the contractor of project A puts it, *"We took actions that we should always take. The only difference is that now we are much keener to do it, because if it went wrong, we were the ones paying for it."*

In project C, the fixed price arrangement wasn't translated correctly to an accurate contract; leading to some confusing about the agreement during construction. This was especially the case because there was a project management transfer between the planning and construction phase on the client side. This lead to some inconsistencies in the application of the contract, meaning the client initially made some payments that were not necessary. This situation was, however, quickly corrected amicably. The end result was a cheaper than anticipated project, despite these inconsistencies.

Joint problem solving

The period of negotiations provided the client and contractor with a platform to analyze the project risks a second time and make more detailed estimations of these risks. In all projects we observed that parties made purposeful risk allocations, attempting to place the risks with the parties that are best able to manage them. This has been applied in these projects with varying levels of effectiveness. During the negotiations, parties discussed potential risks in the projects and jointly developed strategies to deal with these risks. This lead the parties to optimize the process, transfer some of the project risks, allocate budget for risks and in some cases even partially redesign the project and planning due to the integration of contractor knowledge. The risk allocation in the projects was as follows:

- In project A, the contractor priced all the risks. The only risk the client took were the ground conditions, meaning that the client would have to pay if the ground required sanitation.
- In project B, the contractor and client took a close look at the risks in the project. They determined that there was significant uncertainty about the condition of a sewer pipe connection, which they were unable to survey beforehand due to a concrete encasing. The consequences of this risk were estimated at approximately 10% of the total project. The client and contractor made a joint estimation of this risk and included this in the cost estimation for the project.
- In project C, the contractor took an active role in preventing the risk of tree roots hindering the construction process or damaging the quality of the final product by developing a redesign of the street.
- In project D, the contractor actively managed the risk of surrounding inhabitants. They developed and applied an extensive plan to ensure access to the train- and bus station for travelers, manage bicycle parking effectively and inform the surrounding entrepreneurs of the construction works.

The data shows that this risk analysis leads the client and contractor to make a more accurate set of cost estimations. The involvement of the contractor in the risk analysis ensures that more risks are discovered and planned for during the preparation phase. The initial design developed by the client in project C for example, did not consider tree roots. Along the entire road the trees had large roots which could interfere with construction works or damage the newly constructed road during its lifetime. The contractor developed a new design for this to avoid this and reduced the construction costs by smartly integrating the sewer system into this design. In project B it became apparent that there was a significant risk that a sewer pipe connection needed to be replaced which was encased in concrete. The client and contractor decided together what the cost of such a risk would be, giving the client a more accurate insight into the costs overruns that could occur during construction if this risk were to present itself. As a result there was no discussion or renegotiation necessary during construction when it became apparent that the sewer connection would pose cost overruns. At the end, the costs of these risks were quite accurate, with only minor deviations from the risk budget in projects A, B, and C.

In project D however, contractor and client did not discuss the largest risk: the third parties that would be working in the construction zone. They did not develop a strategy to deal with this, and due to the time and political pressure described earlier, this was rushed to start construction early. When third parties were included at a later date, there were design conflicts with works that were already constructed. For example; the concrete of the plaza was already poured when another party indicated that they needed space for foundations to place the bus station. Additionally, the late integration of these third parties led to planning delays, as products could often not be delivered on time. For example, the traveler information signs for the bus station were not placed until several months after construction was completed. The integration of these parties led to scope changes and planning changes which made the effects of the risk effects negligible. The result was a process in which 137 change orders were processed, many of which originated from the client. The parties quickly devolved back into a traditional working style in which cost overruns were discussed every week leading to frequent renegotiations.

Involvement of key participants

All the studied projects show that knowledge of the contractor is used during post contractual negotiations to improve the planned construction process. The contractors achieved this by including their executing project managers in the negotiations to develop smarter solutions for the process. For example, in projects B, C, and D, phasing plans were discussed during negotiations and improved due to input by the contractor. In projects C and D this was expected as they were tendered with selection based on quality, where contractors were asked to create a phasing plan for the project. In project B, this was not the case and it happened without prior input. During post contractual negotiations it became apparent that phasing would be an issue, as it was a 1000 meter long stretch of road with no side roads connecting to it that needed to be refurbished. As a result, the contractor developed a process to ensure that all residents would be able to reach their homes despite the construction works. In all three projects, the phasing plan was discussed in detail between the client and contractor. Additionally, in projects A and B, the contractors suggested to reuse existing materials within the project. In project A and B the contractor suggested reusing the soil within the project. In project A the contractor suggested reusing part of the clinker bricks in the road. These modifications saved the client money in both cases. Three of the project managers claimed these contributions were due to the different viewpoint they have of the project, as they are the executing party. As the contractor in project B stated, *"[The contractor] looks differently at the project, because he will be there standing in the mud for 6 months to execute this plan."*

Redesign seems to be stimulated by selection based on quality. In projects C and D we observe that selection of quality stimulates the contractors to develop a plan to execute the projects more effectively, and prove to the client that they have intimate knowledge of the project and the area before they are selected as a partner. With this increase in knowledge they are more effectively able to conduct post contractual negotiations. In project C, for example; the contractor had developed a phasing plan consisting out of five phases that ensured residents in the area were always able to reach their homes. In project D, an extensive area management plan was developed by the contractor to ensure that people were always aware of the construction works being performed and to ensure access to the shops in the area and the train station at all times throughout the process. This was clarified by the contractor of project C who stated, *"Well, to win the tender with a high quality score, we sent our executing team to the location to talk to the locals and take a good look at the project site, these guys look at a project in a completely different way and develop solutions that we wouldn't consider in a normal tender."* This was confirmed by the client in this project, who stated, *"Normally in a project like this, the contractor needs startup time to get used to the project. Now, with these negotiations, I saw that right from the start he knew everything, and was able to work at his best from day one (Project leader project C)."* In project D the contractor improved the design of a water retention basin under the project used to collect rainwater from the plaza. The client had developed an expensive design to deal with this. The contractor improved and simplified the design during post contractual negotiations. This solution was half as expensive as the one the client had suggested, thus saving the client money.

Summary
Post contractual negotiations show remarkable effects on the cooperation between client and contractor. By introducing a period of planning into the construction process in the form of negotiations, the parties align their goals, jointly solve problems before construction is started and effectively integrate the contractors' expertise into the design and planning of the project. These results show an interesting parallel with the goals that partnering aims to achieve which is worth exploring.

Discussion
The results show that there is a remarkable change in the way that contractor and client interact during the construction process when negotiations are condensed into a single period of time immediately after the project has been awarded. Conducting such negotiations introduces a period of planning into the construction process in which the goals of parties are aligned through risk transfer, and a more accurate estimation of costs is developed through redesign, process optimization, and joint risk analysis. We show an overview of the effects of the immediate post contractual negotiations in Fig. 1.

We note that projects A, B, and C show remarkable changes in the interaction between client and contractor throughout the process due to the immediate post contractual negotiations. The initial intention of these negotiations was simply to gain a better insight into the price of the project beforehand to reduce discussions during construction and perhaps improve the execution process of the projects. While the findings support an improvement in these aspects, the results also show a remarkable resemblance to a number of the partnering components discussed earlier.

We observed that the risk allocation that takes place during these negotiations creates common goals and objectives. Once the risks are transferred and established in a new contract the contractor is responsible for any overruns and delays, provided that the project scope remains fixed. It is no longer in the interest of the contractor to stagnate the process through claims, as he will bear the costs of this. Taking this risk also appears to stimulate the contractor to improve the construction process. The risk allocation ensures that during the weekly meetings between client and contractor, there is no discussion about cost overruns as they have become irrelevant. Instead, the parties use these meetings to jointly solve any issues that may arise. We observed that the irrelevance of these costs during these meetings allows the parties to reduce the amount of meetings that they have during construction, reducing transaction costs.

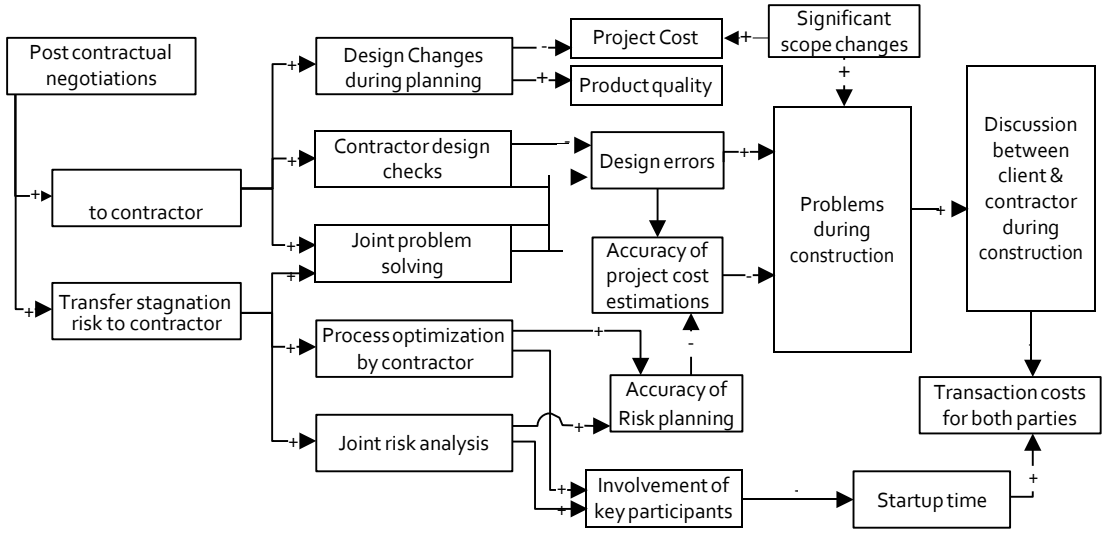

Figure 1: Overview of the effects of post contractual negotiations

The reallocation of risks during the negotiations leads the client and contractor towards making a joint risk analysis which gives the parties a more explicit insight into the risks. This allowed the parties to make joint decisions about these risks and plan for them in the process and budget. When the risks become a problem during construction, there is fewer discussion and no renegotiation, because both parties were prepared for it and budget has been allocated for it.

The negotiations also allow the contractor to influence the design and optimize the process, which has a risk reducing effect for him and has shown to create cost benefits for the client in these projects. This is especially apparent in the projects which were awarded on quality as we see evidence that this leads contractors to develop design changes or process improvements to improve their odds of winning the tender. The effort put into the process of winning the tender on basis of quality increases the knowledge contractors have before negotiations are started, improving their effectiveness.

The negotiations cost the parties resources at the beginning of the process. These costs, however, appear to be recovered quickly, as weekly discussions about cost increases become superfluous. Instead, the client and contractor focus their time on jointly solving the problems that occur during the project to minimize their impact on the process. Additionally this reduces the administrative overhead for both organizations because fewer transactions take place. The reduction in design errors and other discrepancies, the improved knowledge of the construction process and risk responsibility for the contractor reduce the occurrence of issues during execution.

In one project we find mixed results. This project was executed under significant time and political pressure which caused the parties to wrap up the negotiations and start construction while there was still a lack of clarity about the project. During construction the scope changed significantly and new parties were introduced which had a significant impact on the process and project costs. When these parties were added, there was no new round of negotiations and instead, this project devolved back into the traditional, adversarial relationship that negated many of the positive effects seen in the other projects.

Conclusion

This paper has shown that immediate post contractual negotiations are an interesting alternative to partnering in small, one-off projects. It has shown that in the studied projects, clients gain increased insight into project costs before construction starts, that clients can better take advantage of contractor knowledge and insight in the construction process, and that discussion and renegotiation that occur during construction are minimized resulting in lower transaction costs. It stimulates joint problem solving both during the negotiations phase and the construction phase. In the cases where we observed renegotiations during construction; the data shows that this is usually caused by significant scope changes or by risks that were identified during negotiations. In the latter case, the client budget has been prepared for it, preventing the negotiations from regressing to adversarial relations. The negotiations align project goals of both parties. As a result; since the parties are working towards shared business goals, their adversarial relationship makes way for more cooperation, without the requirement for significant investments in changing procurement procedures.

In practice, these findings provide construction managers with an additional tool to avoid adversarial relations with contractors in small, low complexity projects of lower strategic importance. Creating more cooperation allows clients to benefit from improved problem solving; a higher quality execution process exemplified by fewer discussions and renegotiation, and it creates cost benefit for both parties by reducing transaction costs. We recommend further research to confirm these effects in other organizations. Additionally, it would be interesting to see whether immediate post contractual negotiations are a viable alternative to partnering in larger, more complex projects.

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