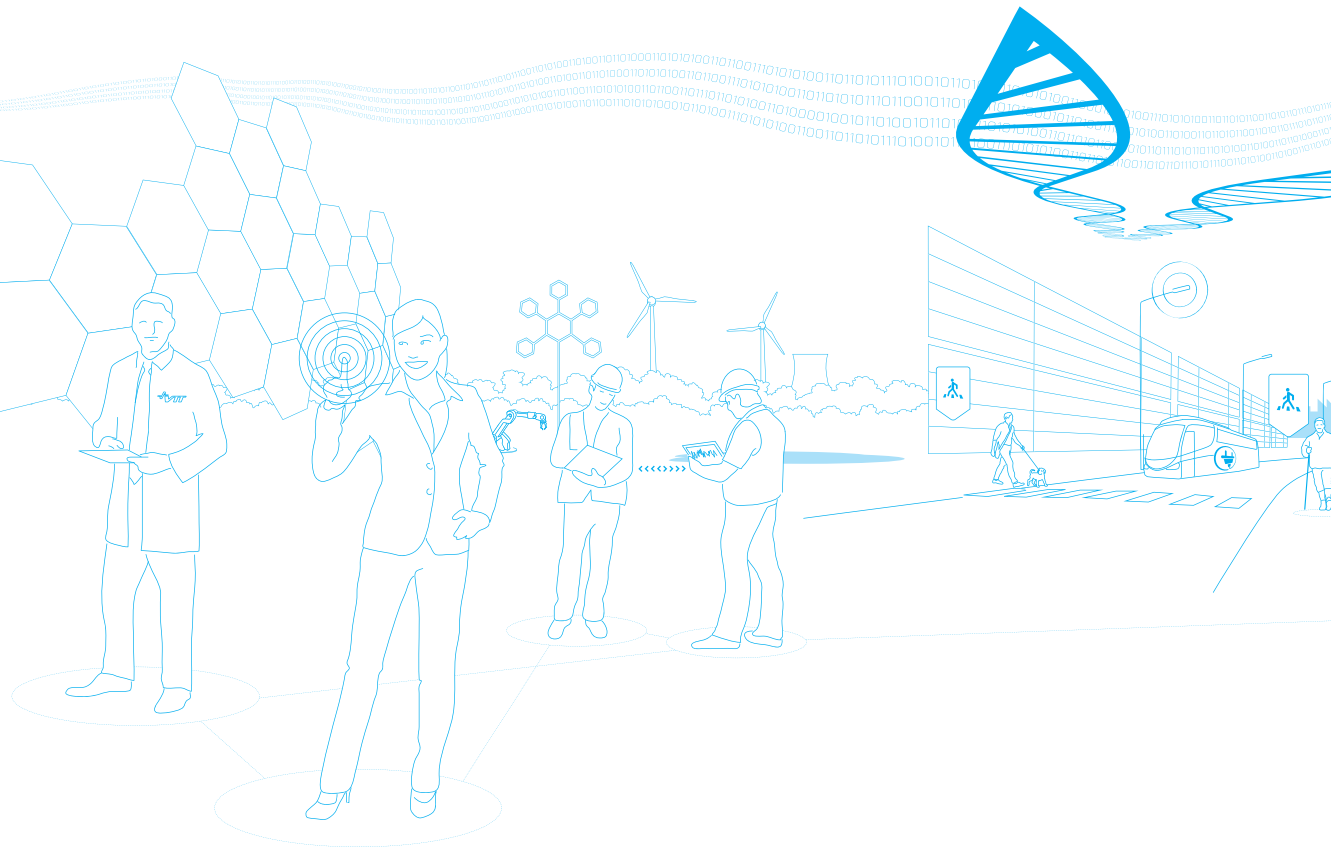




In search of a happy medium: price components as part of alliance team selection

Pertti Lahdenperä



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In search of a happy medium: price components as part of alliance team selection

Kultaista keskitietä etsimässä: hintakomponentit osana allianssitiimin valintamenettelyä.
Pertti Lahdenperä. Espoo 2014. VTT Technology 174. 67 p.

Abstract

In project alliancing the construction project owner and service providers assume joint responsibility for project planning and construction through a common organization; the parties also share project-related risks. That allows integrating a wide range of expertise in support of successful implementation of demanding ventures. In order to fully exploit alliancing, the key service providers must be involved in project planning from an early stage which often makes use of the full-price criterion in the selection of service providers questionable. On the other hand, selection involving no price criteria leaves it uncertain whether the project will be profitable or not. Thus, it is not immediately clear how the price aspect should be integrated in the criteria of alliance team selection.

This publication hopes to increase the understanding of the appropriateness of using price factors by delving into the practices and experiences of the Australian infrastructure sector. The presently used form of project alliance is an Australian innovation which is why it is justified to chart their experiences. The presentation begins with a review of the Australian guidelines for team selection and the underlying motives. Research related to the subject and the spirited debate in the sector are also delved into. Admittedly, the discussion and writing have focussed on the comparison of so-called extreme models – i.e. selection based on full price and selection that totally excludes price. Consequently, the conducted discussions are included in the publication as a frame of reference although the main aim of the work is to seek solutions in-between these extremes.

The essential goal of the publication is to determine whether it is possible to find some intermediate forms that would integrate the good features of both extreme models so that projects could be carried out based on both broad-based competition and good, creative collaboration. An answer to the question was sought by trying to find and describe the procedural solutions of those Australian projects where team selection is based on price tenders for some cost items or parts in addition to capability assessment (i.e. partial price selection). These items do not cover the total project price leaving part of the project un-priced. An estimate for the part in question is prepared on the basis of offered component prices and/or the owner's own cost-estimate items to determine the comparative price.

Three partial price (price component) selection projects will be described in more detail. Application of this method has so far been scarce. Experiences from the projects have, however, been for the most part encouraging and support the validity of partial price selection. Yet, it must be remembered that different projects call for different selection methods derived from project properties and boundary conditions of implementation. Use of price components may also make a project considerably more challenging unless the content of components is defined clearly enough.

Keywords project alliance, alliancing, partial price selection, public procurement, selection criteria, team selection, contractor selection, competition, collaboration, Australia

Foreword

The publication at hand is one result of the *Patina Project*^{*}. The project delves into the many aspects of infrastructure construction project practices in order to allow realising their common unifying goal of developing systematic and functioning procedural solutions primarily for implementing large transport infrastructure projects.

The *Patina Project* is part of the *Built Environment Programme* of the *Finnish Funding Agency for Technology and Innovations (Tekes)*. The project will be carried out by *VTT* in 2011–14 and the participants are *Destia Ltd*, *Lemminkäinen Infra Ltd*, the *Finnish Transport Agency*, *Skanska Infra Ltd*, the *City of Tampere*, *Tekes*, *VR Track Ltd*, *VTT* and *YIT Construction Ltd*.

Service procurement procedures and alliance team selection are a development theme of the *Patina Project*. This publication reports on related aspects concerning alliance team selection processes used in Australia. The main focus is the application of price criteria and the emphasis of the work are the challenges and opportunities relating to use of partial price components.

The essential parts of the work are based on material collected during a two month stint in Australia in October–December 2012. The base of the mapping work was *RMIT University – The Royal Melbourne Institute of Technology – School of Property, Construction and Project Management*.

Yet, the bulk of the work consisted of visits to alliance projects and interviews of practical experts instead of academic endeavours. Thus, the success of the work has depended on many Australian experts of whom the major contributors are listed in the Acknowledgements of this publication.

My warm thanks to these persons and parties.

Tampere, May 2013

Pertti Lahdenperä

^{*} The acronym stands for the English name of the project *Project Alliance for Transport Infrastructure: Advancing New Theories and Applications*.

Note to the English edition

This publication is a translation of an original in Finnish (VTT Technology 124) based on discussions in and references from Australia. Due to the back-and-forth translations, some concepts and statements may deviate from the original ones to some extent. The followed procedure also explains the extensive introduction to Australian guidelines and the given sources of further information relevant in the Finnish context at the time.

Despite these peculiarities, it is hoped that this summary also provides a good, general view to the English-language audience since it appears that very few publications that shed light on partial price selection practices and experiences have come out so far.

The translation is by Mr. Jorma Tiainen with a contribution from the author. Except for this note and the replacement of some sources originally in Finnish with their English counterparts, this report is identical to the Finnish version published a year earlier.

June 2014

Pertti Lahdenperä

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1. Introduction

1.1 Background

Project alliance is a project delivery method that seeks to enhance implementation by integrating know-how and collaboration. In order to gain significant benefits by the procedure, the major service providers must be included in project preparation already at an early stage. That makes use of full-price criteria in service provider selection impossible in principle or at least questionable. After all, experience suggests that genuine, open collaboration and interaction can occur only after the competition phase. Thus, a price fixed at the competition phase cannot be based on full exploitation of collaboration.

Selection without any price criteria, again, leaves pricing largely to the service providers since cost awareness is higher among them than project owners. That is why independent estimators and financial auditors are involved in the project. That alone does not fully eliminate the challenge that data from all previous projects as such is not usable in future projects, and risks may be naturally overemphasised as a result of the service providers' need to secure the financial success of a project due to changing conditions and economic developments. This favours considering the price aspect to some degree in service provider selection, which is required by the regulations on public procurement from public owners.

For the above reasons, it is natural to ponder how different competition models that emphasise the cost aspect more or less contribute to successful alliance team selection. Could there be intermediate forms between the extreme models that integrate the good features of both favourably so that competitiveness and good, creative collaboration would be realised at the same time to provide project owners good value for money and profitable business for enterprises.

1.2 Objectives and scope

The work reported in this publication aimed at mapping the experiences from Australian alliance projects and expert views as well as to give examples of different competition procedures particularly from the price competition perspective. Project alliancing has been widely used especially in Australia, which is why it is reasonable to expect that mapping of their models will enable acquiring extensive knowledge on

the subject area. The study looks into the spectrum of selection models from one focussing merely on capability to the full-price tender, but the main emphasis lies in between these two extremes: the main issue is what kinds of partial price components could the selection of service providers be based on in project alliancing. That is, would it be possible to hit 'a happy medium' between the extremes.

The study focusses especially on the price aspect of alliance service provider selection while other issues are examined only to the extent that they contribute to the understanding of this perspective. For instance, the capability determination made for selection is not dealt with although it is a significant part of alliance team selection in all cases.¹ The reader is also assumed to know the features and applications of project alliances which are not specifically addressed here although Table 1 presents the main principles of the operational model.²

1.3 Implementation and reporting

The publication begins with a review of the current guidelines for alliance team selection in Australia. The guidelines recognise both non-price and full-price selection. In addition, they present a model based on a partial or tentative price which, as far as is known, has not earlier been properly dealt with in public discussions or guidelines. This model is particularly interesting since it is closest in spirit to price component selection which is the basic focus of this publication.

The fact that the guidelines hardly deal with the partial price model, but introduce it mainly as an intermediate form between extremes is, however, a challenge. Public discussion and writing has similarly focussed on comparing extreme end models. Consequently, this public discussion is included as a sort of framework, and the partial price model may perhaps have to be considered a sort of compromise between these extreme models. Whether partial price (price component) selection combines the possibilities or weaknesses of the extreme models is left ultimately to the reader to decide.

Indications of the performance of the price component model can, however, be drawn from the case projects presented at the end of the publication. The operational modes of three case projects have been examined with people involved in them in October–December 2012, and the situation reported in the publication reflects the state of the project and views of the actors at that time. The beginning of the publication focusses strongly on a literature review, but the views of many experts have also contributed to it.

¹ A general idea of capability assessment and the profoundness of the selection process is provided e.g. by a publication that described the processes used in the first alliance-type road and rail projects in Finland (Lahdenperä, 2012).

² Lahdenperä (2009).

Table 1. Main features of the alliance contract.

| | |
|--|--|
| <p>Project alliance is a project delivery method based on a <i>joint contract</i> between the key actors to a project whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a <i>joint organisation</i>, and where the actors <i>share</i> both positive and negative <i>risks</i> related to the project and observe the principles of information accessibility:</p> | <p>Besides solutions related to these structural type features, features related to the nature of the collaboration are important in alliance contracting:</p> |
| <ul style="list-style-type: none"> • <i>Joint agreement.</i> The tasks of an alliance include project planning and implementation tasks and (possibly) ones related to them and to the promotion of the project traditionally performed by the owner, which said actors are jointly responsible for. The parties enter into a <i>single joint multi-actor contract</i> instead of several bilateral contracts (different in spirit). • <i>Joint organisation.</i> The alliance organisation comprises people from all partner organisations, including the owner's. Decisions on project implementation are taken jointly by the parties. The cost estimate covers all related tasks and persons. The project target cost is defined correspondingly to include the items of various parties and is consequently the total cost of the project. • <i>Sharing of risks.</i> Alliance partners share the risk of project implementation as concerns the bulk of both positive and negative risks. Thus, the reward of service providers is also based on the success of overall project implementation, not on their performance of their own tasks. The practice requires observing the principles of openness in cost monitoring. | <ul style="list-style-type: none"> • <i>Trust.</i> Trust between the partners is a central element of project alliance. It is difficult to derive any benefits from a model based on risk sharing and openness without it. The development of trust is tied to emotional and human behaviour and takes time: thus the arduous actor-selection phase and its knowledge intensity and workshops are a natural part of the alliance. • <i>Commitment.</i> Internalisation of the alliance's common goals, resolution of problems faced and continuous improvement are possible only when the actors are committed to the project. Commitment is determination which people try to create by incentive systems and joint decision making as well as appropriate organisation structures which also contribute to an atmosphere of trust. • <i>Co-operation.</i> Project alliance brings the key partners to a project under a joint and several contract with the intent of improving and increasing the parties' mutual cooperation and interaction: they are the key factors considering the workability of the alliance. Efforts can be made to improve the preconditions for efficient operations and information exchange by joint space arrangements and information systems as well as prearranged decision-making principles. |

2. Alternative selection procedures

2.1 Development of alliancing and current models

Project alliancing was first applied in construction in Australia at the end of the 1990's after encouraging experiences had been received from energy and mining industry projects. It was first applied to a building construction project³, but only one major such project is known to have been implemented since by genuine alliancing.⁴ The method has been used primarily in the infrastructure sector with roads, railways and water supply and sanitation as the main applications.

In the years following its introduction, alliancing was typically used in a few or a maximum of about ten projects annually until the number started increasing significantly in the middle of the next decade. As infrastructure volumes increased strongly, use of alliancing followed suit. Soon the total number of alliancing projects numbered in the hundreds and reached nearly a third of the annual value. Alliancing had become a genuine alternative instead of involving only pilot projects or highly exceptional ones.

The increased role of the alliancing in public procurement also provided the impetus to assess the performance and uses of the model more accurately. Various states collaborated in a study⁵, which served as a basis for new guidelines.⁶ These guidelines will be delved into in the following to the extent that they deal with various ways of taking the price element into consideration in team selection. The portrayal will serve as an introduction and framework for later assessments of selection methods and examples that shed light on partial price competition.

³ The first alliancing-type construction project implemented by the public sector is the architecturally diverse Australia's National Museum in Canberra. The implementation has been widely reported e.g. by Walker & Hampson (2003), Hauck et al. (2004). The rank of the project is indicated e.g. by the DTF (2006) publication that lists the alliancing projects of the first years.

⁴ Said project is the Hamer Hall concert hall in Melbourne refurbished in 2010–2012.

⁵ DTF (2009).

⁶ The State of Victoria, which also published the guidelines first under its own name (DTF, 2010), co-ordinated the joint guidelines development project. Later on, practically identical guidelines were introduced also in federal projects (DIT, 2011b), and Victoria guidelines have since been content to refer only to federal guidelines. As concerns Victoria, the DTF (2010) guidelines had replaced their earlier ones (DTF, 2006), which is why this publication uses the old guidelines as a point of reference for current federal guidelines.

2.2 Three alternative selection models

Australian public sector alliancing guidelines recognise currently three competitive tendering and selection methods for service providers. They are 'full-price selection', 'partial price selection' and 'non-price selection'.⁷

Full-price selection

In this process the number of competitors is first reduced based on competence so that the price-based stage typically includes just two competing teams. Competence-based assessment focusses on resources and references. In a process adhering to the guidelines, it is assumed that development-phase alliance agreements are signed with these actors and the owner pays related costs to a certain, predetermined limit.⁸ As design progresses, competing teams are expected to offer a ready-made solution and a comprehensive, binding full price as the Target Outturn Cost (TOC) according to Table 2, while development-phase practical work demonstrations serve as a capability criterion and project strategies and workshop 'role-playing' do not have the same status as in so-called non-price selection. The aim is to enter an alliance implementation agreement with the winning proponent where the TOC is as per tender.

Partial price selection

In this process the number of competitors is reduced and progress toward development-phase agreements takes place with two teams as in full-price selection. Thereafter, the competitors work out their corresponding proposals with the exception that here designs and pricing are not assumed to be final, at least in all respects (cf. Table 2). In keeping with the name of the model, e.g. the price tender is tentative or applies only to certain price elements (or possibly to a commercial framework, its allocation models, bonus pool or company overheads and profit) instead of full price.^{9,10} At the competition phase, these elements are also used

⁷ The terms are those used by the guidelines (DIT, 2011b) for different main models for service provider selection. In respect to earlier corresponding guidelines (DTF, 2006), the full-price selection process corresponds most closely to the so-called 'Dual TOC' selection process and the non-price process to the 'Single TOC' process (TOC is an abbreviation of 'Target Outturn Cost'). Partial price selection has been included as a new alternative.

⁸ Expert comments and practical observations reveal that the competition model is often also applied in design-build style: the owner is rarely willing to pay several parties for development work and designs are produced and a price tender submitted already at the actual competition phase without a separate development-phase agreement.

⁹ The guidelines expressly warn not to use binding price components, which in a competitive situation can lead to their under-pricing and subsequent compensation of the losses by overpricing of cost items priced later. The guidelines' view of tentative price does, however, deviate from all views of the case projects at the end of this publication, where the actors emphasised the bindingness of the tender price components.

2. Alternative selection procedures

Table 2. Competitive elements of various selection approaches.

| | Full-price | Partial price | Non-price |
|-------------------------|------------------------------------|-----------------------------------|-------------------------------|
| Competitive elements | | | |
| • Design solution | Advanced design | Concept design | - |
| • Construction solution | Advanced method | Preliminary method | - |
| • Commercial framework | Ready | Principles | - |
| • Team work | Joint team in action (incl. owner) | Proponent team in action | Workshop |
| • Price | TOC (full price) | TOC estimate, some price elements | - |
| Agreement on TOC | As per tender | Negotiated based on proposal | Negotiated (without proposal) |

to gain a preliminary understanding of the TOC. After selection of the preferred proponent, the project solution is finalised by the owner and the proponent, and only then is an attempt made to reach an alliance implementation agreement. The best team is also compensated for the development work done after selection prior to signing the alliance agreement.

Non-price selection

This selection process starts with competence-based reduction of the number of proponents as do the alternative processes. Then, the selected – let's say three proponents – enter the selection stage involving selection workshops where the best proponent is selected and an agreement is signed with that team to implement the development phase of the alliance. Accordingly, selection is made in principle entirely on the basis of capability without planning and tender prices. Costs will be estimated more accurately only at the development phase where the TOC is defined in co-operation between the owner and the rest of the team (cf.

¹⁰ At the same time, the guidelines also warn about using the fee percentage of service providers as a selection criterion since it is only a minor factor and excessive focus on it may reduce the attractiveness of the project and make proponents decide not to use their best resources in the project (DIT, 2011b). It is also considered that a small fee may have a detrimental effect on project development efforts.

Table 2). While in other models the solution is developed in interaction with the owner due to the competition being unfinished, this model makes the owner part of an integrated team consisting of the owner and service providers.¹¹ Team selection, which is made very early with respect to design, is thus conditional and is confirmed after the development phase has been successfully completed.¹²

Comparison of the models

The progress of the three alternative main-level selection models has been compared in Figure 1 in keeping with the guidelines. The events of the selection process have been placed indicatively on a timeline, and timing differences have been visualised by the verticals traversing all models. The horizontal lines of the models, again, indicate the number of teams involved in each stage of selection or implementation.

The presentation visualises the above-mentioned differences. It shows how both the full-price model and the partial price model select two teams for the competitive development phase. However, in the partial price model, selection of the implementing team does not involve finalising the design but joint development continues thereafter before the final alliance agreement is made, unlike in the full-price model where the aim is to take design already during the competition phase to a level where preconditions for drawing up a final agreement exist.¹³

The non-price model selects only one team for the development phase without any price tender while capability assessment is much more thorough than in the pre-development phase selection of the two other models.¹⁴

Table 3 describes the criteria used in different selection processes on heading level. Yet, the presentation only describes use of criteria as such, which means

¹¹ The partial price model also aims to genuinely take advantage of the integrated team structure in the development phase implemented with a single actor after the concept phase.

¹² The first alliance procurements of the Finnish Transport Agency were associated with the Lielähti–Kokemäki Rail Renovation (2011) and the Tampere Road Tunnel (2012). The procurement process used in both projects is described in detail in Lahdenperä (2012). Said selection procedure adhered generally to the non-price model although that term does not literally encompass applications where the competitors also tender for the fee. It should, however, be noted that the fee percentage has also been subject to tender in Australia in the capability-oriented single TOC process that ignores other price factors, though the older guidelines (DTF, 2006) recognise only audits and negotiations as means of determining the fee.

¹³ It should be noted that both models assume two competitors to be involved for the same duration, which means that partial price selection does not ease competition significantly: it is probable that the intention has been to use the latter in more demanding projects (see Table 4).

¹⁴ It must be emphasised that inspections of accounting methods of service providers by the owner's financial auditor and pricing of service providers by the cost estimator precede and lay the groundwork for setting TOCs in an attempt to ensure their appropriateness. The same methods are for the most part also used in selection processes adhering to the partial price competition model.

2. Alternative selection procedures

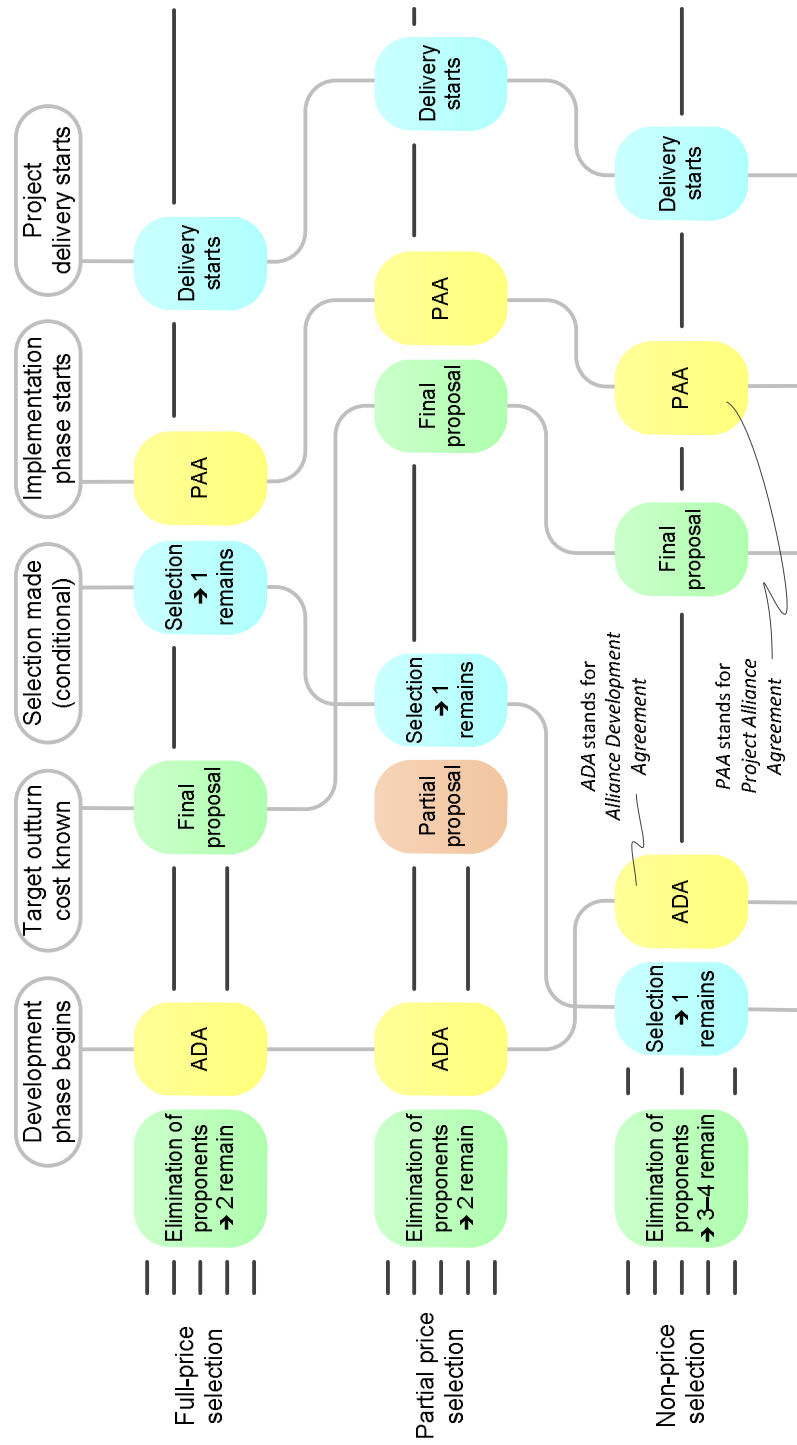


Figure 1. Flow of alternative processes and outline of timing of tasks.

Table 3. Criteria used with different selection processes.

| | Full-price model | Partial price model | Non-price model |
|--|-------------------------|------------------------------|-----------------------------|
| Elimination of proponents | (elimination to two) | (elimination to two) | (elimination to one) |
| • Company capacity and track record | ✓ | ✓ | ✓ |
| • Experience of team members | ✓ | ✓ | ✓ |
| • Team's alliance affinity | ✓ | ✓ | ✓ |
| • Project understanding | | | ✓ (*) |
| • Project approach | | | ✓ (*) |
| • Fees and response to commercial framework | ✓ (**) | ✓ (**) | ✓ (**) |
| Implementer selection or confirmation of selection | (implementer selection) | (selection and confirmation) | (confirmation of selection) |
| • Design solution | ✓ | ✓ | ✓ |
| • Construction solution | ✓ | ✓ | ✓ |
| • Commercial framework | ✓ | ✓ | ✓ |
| • Team work | ✓ | ✓ | ✓ |
| • Tentative price | | ✓ (***) | |
| • Price | ✓ | ✓ (***) | ✓ |

*) Project understanding and approach to solution development are used only in the process where the best team is selected without actual planning/design.

**) It is recommended that fees be used as elimination stage criteria to ensure that companies' expected profits are normal for the branch of industry.

***) In partial price selection, the best team is initially selected based on e.g. tentative price. Later confirmation of selection (implementation agreement) after follow-up design requires a binding price in line with the tentative price.

that they are not used in different processes always at the same stage. Thus, the Table should be interpreted in conjunction with the presentation in Figure 1.

The guidelines recommend that the owner reimburse proponents for about half of the costs of preparing their proposals, since the costs are larger than with traditional project delivery methods, and the preparation increases essentially the work load of senior management. Reimbursement lowers the threshold of taking part in the competition and benefits thus the owner. It can also be assumed that the proposal planning of the second best team also produces innovative solutions that can be utilised in the project. Naturally, the condition for reimbursement is that the

proposal conforms to requirements and the owner is granted the immaterial property rights to use the solutions in the project. The reimbursements are fixed and made known in advance in the request for proposals.¹⁵

2.3 Use situations of different selection models

The alliance guidelines deal with the criteria for the use of different selection processes based on general alliance use criteria.¹⁶ They are the following:

- The level of project risks cannot be determined reliably enough before commencing procurement, or even before the tender phase.
- Transfer of risks to the supplier would be unreasonable and might make companies less willing to compete thereby reducing competition.
- The project must be launched as quickly as possible and project definition and risk identification cannot be done soon enough.
- The owner has superior knowledge, skills, capabilities and resources to promote, plan and contribute to the implementation of the project.
- Joint risk assessment and management produces a better result e.g. as concerns the safety of the project and the general public.

The guidelines assume that the full-price model is used unless there is a justifiable reason to depart from it.^{17,18} The first two factors on the list have been found by themselves to justify using the partial price and non-price models, provided that the risks significantly affect the project cost estimate. A situation where final project definition can only be made during the implementation phase is covered by these bases for deviation. The importance of the risk aspect as a selection criterion in selecting the competitive approach is emphasised also by summary Table 4 derived from the guidelines, according to which the natural use area of the partial price model falls between the other two models.¹⁹

The third factor on the list may also be a basis for deviation, although very rarely. If the common good requires rapid launching of construction, the price competition procedure may be too slow. The common good must specifically demand

¹⁵ Owners only rarely appear to reimburse proposal costs in alliance competitions.

¹⁶ The Main Roads (2008) report also looks into selection between so-called extreme models.

¹⁷ Use of alternative models must always be justified in practice, and authority to use them requires a decision by a higher public administration level than use of the default procedure (e.g. DIT, 2011c; DIP, 2010).

¹⁸ The earlier guidelines, DTF (2006), considered using a selection process where price is not a competition factor the default and recommendable process. That was also the generally followed procedure in practice.

¹⁹ One should note the continuum of projects in the figure from low-risk to exceptionally high-risk – i.e. from full-price selection through partial price selection to non-price selection applications. DIT (2011a) complements this continuum further by Design-Build projects as simpler types than the first mentioned. [It must be mentioned that besides the above-mentioned DIT (2011a), the primary source used here – DIT (2011b) – has been complemented with about ten other instructional documents and model documents which are not dealt with in this publication focussing on team selection.]

Table 4. Uses of alternative selection processes.

| | Amount and impacts of difficult-to-assess risks | | |
|---------------------|--|---|------------------|
| | Low | Moderate | Extremely high |
| Project type | Normal, but involves other special challenges | ↔ Unique, the like of which have never or very rarely been implemented | |
| Stakeholders | Essential issues are identifiable and number of stakeholders is small | ↔ Many key stakeholders with conflicting needs that are difficult to engage with multiple proponents | |
| Technology | The technologies and methods have been used previously but require novel application | ↔ Requires new processes or unique application of familiar methods e.g. due to experimental construction | |
| Construction work | Challenges of construction are not considerably greater than in most projects | ↔ Major engineering difficulties can be expected and duration of work is hard to forecast | |
| Risk identification | Most risks can be identified and mainly even priced even before implementation | ↔ Risks and their impacts cannot be determined and dealing with risks requires collaboration between actors during construction | |
| | Full-price | Partial price | Non-price |
| | Appropriate alliance team selection process | | |

launching the entire project²⁰ quickly – e.g. fast completion cannot be the justification – since the used selection process is not believed to affect the completion date. In such cases the alliance agreement may be drawn much earlier than the general guidelines indicate. The very limited number of service providers with specialised know-how may also justify deviation from the basic process.

²⁰ The need to launch some early phase works is not generally sufficient justification since they can generally be implemented as separate procurements. In light of this possibility, it is not recommended e.g. in non-price selection that these works are launched by the alliance itself already at the development phase. It would pose the danger of committing to use of the preferred team already before completion of design and setting of the target cost.

3. Use of price factors

3.1 The challenge of early selection

The full-price (or lump sum) criterion is generally applied in the selection of construction sector service providers, especially contractors, either alone or together with qualitative criteria. Use of the criterion does, however, require that the uncertainty related to costs has been minimised, that is, the project design phase is largely done. Naturally, that also applies to agreeing on the TOC as illustrated at the top of Figure 2. On the other hand, the maximum price is to be fixed before a significant amount of project costs are incurred.

In alliance contracting which swears by collaboration, the key service providers, contractors included, are involved in project preparation already early in the planning. This is because it allows influencing the value and costs of a project and design changes do not cause additional costs as design is still largely unfinished (Fig. 2, bottom). Thus, the full-price criterion cannot be applied in selection (without special arrangements) at the time the collaboration between the owner and service providers is supposed to start.

Consequently, a contradiction exists between simultaneous early selection of service providers and price setting. An alternative is to engage actors in competitive tendering while providing flexibility for development in the owner's plans as the proponents carry on the planning prior to the setting of the price level. Even though competition should spur the development of a good solution, the lack of sufficient interaction may cause the result to remain far from optimal while the competitive setting locks attitudes. Alternatively, the owner may choose the partners early on without price competition, which should allow reaching excellent results through collaboration. Even then the owner cannot always trust that the actors in all cases strive for the solution that is most advantageous for the owner.

This chapter examines the performance of different selection models in light of the above setting. Under examination are specifically the extreme models from the viewpoint of functioning, that is, selection based on full-price and non-price selection. This is because the primary interest of the study, the partial price model, has been recognised more widely as a possibility only recently. The model has seen little use and no strong opinions about it have been voiced. However, the partial price model falls between two procedures on the continuum of selection models,

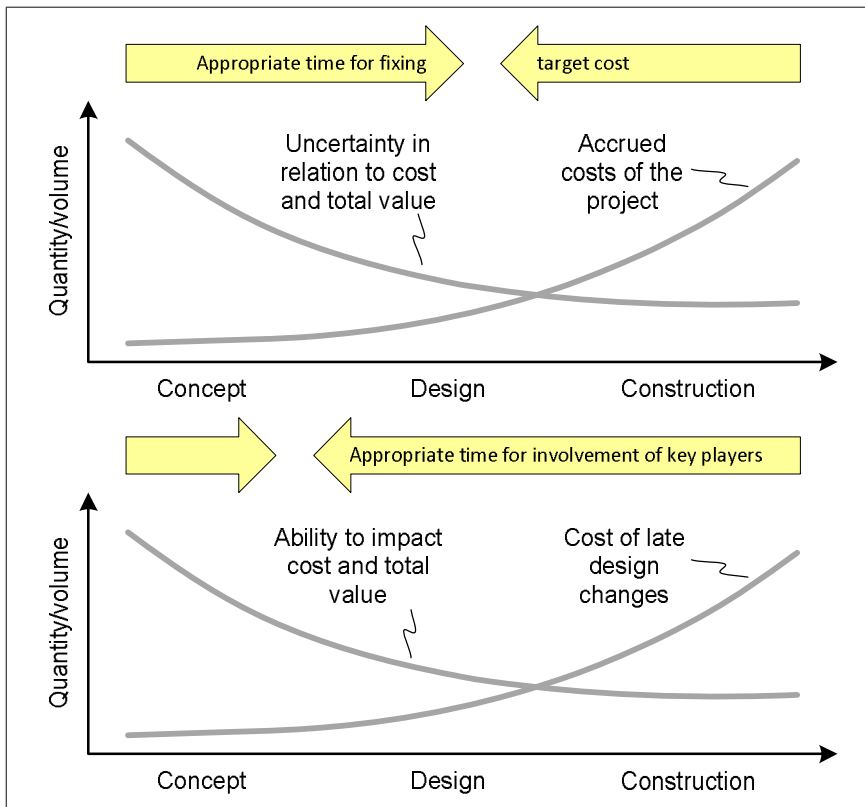


Figure 2. Illustrations of timing of start of collaboration and pricing.

and therefore the examination is expected to serve as a framework for assessing the examples to be presented later and the model's performance more generally.

3.2 Research findings

No unambiguous evidence of the performance of different selection processes has been produced by studies although strong stands have been taken on the issue. The studies have focussed on alliances in general. Yet, some cases should be examined to provide background for the discussion on the performance.²¹

²¹ In addition to the two studies presented in greater detail, the performance of alliancing has also been examined e.g. by regular mappings (Blismas & Harley, 2008; Mills & Harley, 2010; Walker & Harley, 2013), whose combined alliance project stock consists of 60 public sector infrastructure projects. Besides quantitatively analysed cost and scheduling issues, the views of owners are mapped widely by a Likert scale questionnaire and interviews. The reported general view of the performance of alliances is all in all highly positive.

3. Use of price factors

The dissertation condensed in Table 5 compared the performance of alliancing and other delivery methods in demanding projects based on their outcome data. As far as is known, it is the broadest single statistical analysis of relative project alliance performance. The study indicates that alliance performs better from the cost and schedule viewpoints than alternative methods in such large and demanding projects for which it is generally considered suitable.²² Moreover, it is stressed that in traditional delivery methods an increase in reimbursable costs (those investigated in the study) generates also costs that are not allocated to the project meaning that part of the cost effects often go unrecognised.

The value of the results in connection with this work is, however, reduced by the fact that the used comparison level for final cost outcome were contractual phase costs, which in the case of an alliance was the TOC agreed after the development phase.²³ Thus, it cannot fend off the criticism levelled at the alliancing selection process that omits price where the (unjustified) cost increase is said to occur before the TOC is fixed.²⁴

The work, however, takes a strong stand against traditional delivery methods. Price competition and the associated opportunism and confrontation are part of their problem.²⁵ The work does not address directly the use of price competition in alliancing which means that it ignores the essential question from the viewpoint of this publication of whether the weaknesses of full-price selection could be eliminated by other means that merely promote collaborative implementation, or whether avoiding full-price selection is essential.

Another significant study into alliance performance²⁶ is presented in Table 6. It also confirmed that at best an alliance produces great benefits in public infrastructure production, and that particularly the early inclusion of actors enhances value generation despite the fact that the TOC has often increased considerably from the owner's cost estimate. In alliancing the increase occurs already during the development phase whereas in traditional contracts it takes place after the contract has been concluded.²⁷

²² Though the regular mappings of alliance projects by RMIT University do not compare alliancing systematically to other procurement methods, they also emphasise that owners believe that the results achieved by alliancing are better than those of Design-Bid-Build (Walker & Harley, 2013) and Design-Build (Mills & Harley, 2010; Blismas & Harley, 2008).

²³ Another challenge is that the material includes both public and private sector projects (though public owner projects dominate in the case of alliance projects); some are also infrastructure projects while some are building projects (other than alliances).

²⁴ It is presumable that team selection in the examined projects has taken place primarily without price competition since its use has been scarce before Sweeney (2009).

²⁵ The author of the dissertation has had a long career in actual construction projects. He has represented both owners and service providers and says that his practical experiences are consistent with the results of the doctoral dissertation from the viewpoint of both parties.

²⁶ DTF (2009); the significance of the study lies especially in that it was commissioned by the same parties that contributed to the formation of the present alliance policy e.g. based on it.

²⁷ The publication notes that the data on traditional contracts derive from other studies including Duffield & Raisbeck (2007) (also Raisbeck et al. 2010). Said source suggests generally larger figures for the cost increases during a traditional project than are presented here, but its population is probably not comparable as such.

Table 5. Doctoral dissertation on performance of various delivery methods.²⁸

A doctoral dissertation compared the performance of various delivery methods based on outcome data of implemented construction projects. The theoretical framework of the study was the transaction cost theory based on which three key factors that impair specifically the performance of traditional price competition models were presented:

- The contracting parties have limited capacity to predict the future and define and communicate needs and plans, which is further limited by the increasing marginal costs of associated measures. That makes for imperfect agreements, asymmetric information and an uncertain result.
- The contracting parties are tied to each other – e.g. annulment of the agreement and switching service providers results in expenses and delays. That gives the service provider the opportunity to charge extra and consequently also to deliberate underpricing already at the tender phase.
- Self-interest sometimes guides human activities. Sketchy, incomplete or even false information are means used to pursue own goals. The other principles listed above, incomplete information and dependency are used to create preconditions for opportunistic behaviour.

As a result of a conceptual analysis based on the transaction cost theory, it was assumed that project alliance and Design-Build-Finance-Operate (DBFO) work better than traditional methods in large, complicated projects.

This assumption was tested using statistical data on 40 alliance projects and 234 so-called traditional ones. The traditional group included Design-Bid-Build, Design-Build and Construction Management contracts. Comparative data for DBFO projects was sought from other studies.

In statistical tests cost and schedule outcomes were compared to the contract price/budget and the respective schedule after eliminating the effects of alterations. The reference price for alliancing was thus the jointly agreed TOC. The results of statistical analysis are consistent with the conceptual analysis.

According to the study, the performance of project alliancing and DBFO model is superior to traditional methods (see below table). The conclusion is that in large, complicated projects the competitive tendering and contractual practice based on neoclassical economic theory should be abandoned: it does not work with current more demanding projects.

| | Implemented on budget | Av. budget overrun | Implemented on schedule | Av. schedule overrun |
|-------------|--------------------------|-----------------------|----------------------------|-------------------------|
| Traditional | 16.7% | + 25.2% | 39% | + 10.2% |
| DBFO | 79% | + 1.1% | 82% | + 0.75% |
| Alliance | 82.5% | - 0.8% | 100% | - 8.6% |

²⁸ Sweeney (2009).

3. Use of price factors

Table 6. Study on the performance of the alliance contract and its variations.

The success of alliance procurements was mapped in a study on infrastructure projects of public owners in excess of AUD 100m. The first phase involved general appraisal of 46 alliances. The second phase deepened the appraisal through 14 projects. The majority of them had applied capability-oriented selection while only two had resorted to full-price competition.

The first phase involved an inquiry directed at the alliance leadership team who were asked to evaluate the success of the work. A total of 95% of the owner's representatives felt that the alliance met or exceeded the set overall goals. Occasionally this was not the case: especially as concerns schedule (17%) and costs (14%). Yet, 97% of owners believed that better results would not have been achieved with other project delivery methods.

Provided estimates were partly found too positive during the second phase of the study and there seemed to be only little evidence of breakthrough success. The greatest challenge of alliancing with regard to costs appeared to be linked to a development phase increase in the cost estimate while in traditional delivery methods the increase occurs only after the agreement has been signed (see table below).

The fact that alliancing is used a lot in risky projects involving much uncertainty which cannot be taken into ac-

count in the budget was considered an explanatory factor. To be sure, alliancing and its capability-based selection have also been used to arouse the interest of service providers in markets suffering from a lack of resources. Even without proper preceding project programming. Sometimes works have been commenced on site under schedule pressure even before agreeing on the TOC. It is also fairly certain that the project scope has often expanded during the development phase.

However, TOCs were considered to be 5–10% lower in price competition projects. Savings came from design and development phase costs and later from site overheads and the fee. Thus, the logical conclusions of the work are the following:

- An alliance is a working procurement model for demanding projects where the extent of the risks cannot yet be determined at the early phase.
- The start of service provider selection must be preceded by sufficient project planning (esp. the aims, scope and costs of the project).
- The primary method of team selection is to be full-price competitive selection from which it is possible to deviate when necessary.

According to the study, this allows improving the cost performance level of a project alliance by 5–15% without losing the many gainable benefits.

| | Owner's budget | Contract price | Revised contract price | Cost outcome |
|-------------|----------------|----------------|------------------------|--------------|
| Traditional | 100% | | | +20% |
| DBFO | 100% | | | +5–10% |
| Alliance | 100% | +35–45% | +5–10% | +/- 0% |

The key conclusion of the study from the viewpoint of this work is that it recommends using primarily team selection based on full-price competition also in alliance projects²⁹ while admitting that it is not the appropriate procedure in all instances. That is justified by the fact that the owner and service providers have vastly different resources available at the development phase both as to quantity and know-how. The asymmetry of know-how tilts pricing in favour of the service providers since the incentives of the preparer of the cost estimate are assumed to influence its final size. After all, the parties' interests are opposite before the agreement is made. The study also expresses as its view that price-oriented selection including design is a strong incentive to innovate.³⁰

In the conclusions it is also suggested that competitive pressure be increased by using price components as selection criteria in situations where full-price-oriented competition is senseless. At least, reference prices of previous projects should be acquired so that the owner could choose the reference projects instead of leaving the selection to the proponents. As to the fee, the report recommends determining it by competitive means^{31,32} since a solution based on earlier projects rarely corresponds to the current market situation and risk level of the project.³³

An investigation of the research findings underlying the conclusions reveals claims that price competition-based selection results in a clearly lower TOC than capability-based selection. The problem is, however, that the study is not transparent to the reader in this respect and that the representativeness of projects is not assessed from the standpoint of key conclusions. Thus, e.g. the cost effects of the various factors listed below are impossible to evaluate. The projects for the second phase of the study were also subject to discretionary selection and includ-

²⁹ This recommendation of the study has received the most criticism from sector actors (e.g. AAA, 2009; Dingwall et al., 2009; QMCA, 2010). Moreover, MacDonald (2011) gave conflicting recommendations in his dissertation: alliance is selected due to the complexity and the multi-dimensional value concept of the project, and metering it merely on the basis of price cannot be sensible (also MacDonald et al. 2013). He also expresses the idea that often comes up in practical discussion (and the listed responses) that the conclusion appears to be based more on the underlying vision of a school than the research material. Wood (2010), for his part, clearly points out that it was the specific task of a consultant to choose the case projects for the actual comparison phase of selection.

³⁰ This view is not generally accepted either (e.g. Love et al., 2010). Mills & Harley (2010) also tell that e.g. Design-Build does not create as much innovation as traditional alliances based on non-price selection (also Mills et al. 2011).

³¹ It is recommended to request a fee tender already at the start of the selection process as in the case projects in the latter part of this publication. In Finnish projects the proponents have been asked to indicate their fee only in the final stages of the process (cf. Lahdenperä, 2012).

³² Later prepared guidelines (DIT, 2011b) do not, however, recommend using the fee as an element of competition, even if they would otherwise seem to be in line with the study. In Finland, on the other hand, use of the fee has been considered necessary (cf. footnotes 54 & 55).

³³ On the other hand, the owner bears much of the risk of the alliance while the service providers' loss risk has often been limited to losing the fee (cf. footnote 44). As a result, the owner assumes the fee to be smaller in an alliance than in traditional procurements, and their fee levels cannot thus be a basis for setting the fee. Lighter bureaucracy and lack of legal expenses are examples of other grounds for a reduction (RMS, 2012b; DTF, 2006).

ed only two projects involving price competition among a group of otherwise different and unique projects.³⁴

In general, the study finds several reasons for the price increase during the development phase. The main reason appears to be the use of an alliance especially in risky projects where the extent of risk has not yet been recognised in connection with budget planning. The price increase during implementation, again, is almost certainly due the expansion of the project scope.³⁵ Project programming was also found defective in many instances. In many examined projects implementation had also begun quickly, which most probably had increased the price.³⁶ Sometimes the alliance was also burdened with works traditionally done by the owner: site selection, examination of alternatives, concept design and even project programming. Owners have often also used alliancing to attract service providers to their projects when there is a shortage of resources on buoyant markets. How these factors work with the selection process of each highly different project will remain a mystery.

The study found no essential difference in the development of conditions for collaboration based on whether selection was capability- or price-oriented. Full-price selection was, however, found to create a bigger work load for the owner.

3.3 Practical observations

In the first decade following the introduction of alliancing, capability-based selection was used clearly the most in selecting the alliance team although the price competition-based model was used alongside it to some extent.³⁷ Estimates of the performance of alliances were also merely laudatory for long and non-price competition based selection was not found especially astonishing: it was a natural part of alliance contracting. The situation has changed since. Different views and arguments are voiced, and they will be examined in the following.³⁸ The potential and threats of various selection methods are listed more concretely in Tables 7–10. These assessments are, however, to be considered just comparison of two selection methods to each other, and the claims should not be generalised as applying to the alliance as an operational mode or considered as estimates of its performance in relation to other procurement methods.

³⁴ The research method has been criticised by at least AAA (2009), Dingwall et al. (2009), Feehely (2011), MacDonald (2011), QMCA (2010) and Rooney (2009).

³⁵ Cost increases during implementation have also been found to result from owner-oriented changes in the scope/content of a project in other connections: Mills & Harley (2010), Walker & Harley (2013). Both reports also reveal that significant additions to project plans and scope are often made without any impact on TOC in alliance.

³⁶ Rooney (2009) sheds light on the factors underlying emergency works launched without pre-planning. Similar (or these) projects were presumably also part of the research material.

³⁷ The selection model that involves price competition was in use already around the turn of the millennium, which means that it is not a new application (cf. Davis & Cowan, 2008; DTF, 2006), though its use has gained ground only quite recently due to the adoption of a new policy.

³⁸ Sources of the section included DTF (2009), DIT (2011a), AAA (2009), Dingwall et al. (2009), QMCA (2010), Feehely (2011) and MacDonald (2011) besides interviews.

Views in support of full-price selection

Use of the alliance gained ground along with favourable experiences, and it was soon applied to numerous projects.³⁹ Hence, its use spread also to projects that in principle did not require an alliance.⁴⁰ Furthermore, all alliance projects cannot be considered successful, at least based on traditional cost indicators, although the implementing client organisations still generally appeared to believe that capability-based selection produces the best result.

However, the increase in cost lent support to the argument of many supporters of price-based selection that such competition is a good way of ensuring value for money. Especially because they do not believe that price competition weakens the ability of an alliance to collaborate.^{41,42} They assume that in the absence of price competition the service providers have too much say in project pricing, particularly since the owner seldom has sufficiently knowledgeable resources for the project.⁴³ The owners' satisfaction with the results of projects resorting to capability-based selection is interpreted as their being blinded by uncontested execution and an effective solution which makes them turn a blind eye to the excessively high price.

The recommendations for the use of the price competition model assume that service providers manipulate the price to their advantage: preparing for risks is over-emphasised, projects are over-organised and their scope and quality-level are raised unnecessarily. It is somehow presumed that the openness and trust that are the foundation of alliancing cannot actually be fully realised. At the same time, it is believed that the smaller than traditional risk⁴⁴ borne by service providers in an alliance

³⁹ This development made the treasuries re-evaluate the operational modes (e.g. DTF, 2009). It is noteworthy that the change was launched by public financial management which is not involved in practical construction procurement/management.

⁴⁰ According to DTF (2009), alliancing was also used to attract service providers to urgent projects in markets beset by a shortage of resources. Background discussions have suggested that price was not often a critical factor; the problem was to get someone to realise projects. It was also doubted whether competitive tendering would result in reasonably priced tenders. Works were also often started before an agreement had been signed. The TOC was also raised by the fact that the team's/contractor's own estimates were accepted instead of trying to determine market prices as typically is done in the price competition procedure.

⁴¹ An interview study by Love et al. (2010) also suggests that a certain tension prevails during the definition of the TOC in capability-based (non-price) selection, which can be avoided in the price-competition model: when agreement is reached on price early on, the hindrances to good co-operation have been removed. To be sure, failure is considered possible if price is used in a straightforward manner to win the competition.

⁴² The supplement to the guidelines (DIT, 2011a) specifically notes that tension between the opposite interests of the owner and service providers exists at the TOC-setting phase after capability-based (non-price) selection, which can be eliminated by price-based (full-price) selection that shifts the tension between the proponents.

⁴³ On the other hand, full-price competition has been found to require significant resources from the owner for the duration of the competition phase (DTF, 2009).

⁴⁴ This is a commonly held view although not always true: alliances include projects with a lot of uncertainty, which means that the risk of service providers may be significant unless their share in the loss has been limited e.g. to the amount of the fee. Earlier such limitation was generally applied (cf. DTF, 2006). The underlying idea was that it would result in genuine

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will not be reflected in the fee requirements of companies: the profit targets of companies assessed by sector criteria in the investment markets are given which means that the fee targets of alliance projects cannot deviate significantly from the norm.

Further, even a low fee percentage has been found to ultimately increase since the qualitative indicators are very weak and subjective, which means that when cooperation is smooth the actors easily think that they are involved in a successful project and pay bonuses which also increases the margin of service providers. In the same vein, the development phase of the alliance lacks an incentive for development since public sector projects practically always proceed to implementation⁴⁵ and development is genuinely worthwhile only after the target price has been agreed on. Moreover, service providers gain the most by investing their best resources in projects where they bear all risks – in them they also reap all the savings.

Views in support of non-price selection

Those wary of price competition remind that originally 'a pure alliance' was used in complicated projects that could not be implemented profitably by other means. Existing known solutions, after all, were not sufficient and tenders based on price competition were so expensive due to project uncertainty that they made investment unprofitable. Profitable operation was possible only by combining resources efficiently and by developing new approaches. According to this view, the most challenging projects are best implemented by bringing the owner and service providers immediately to 'the same side of the table'.

Use of price competition in the selection process naturally tends to push the parties to 'different sides'. Price competition is also considered a threat to alliance contracting. It would most probably lead to the traditional confrontation if the price issue was given centre stage even before it has been possible to plan the project properly together. Genuine collaboration may also be difficult after selection since an actor that has come through the pressure of price competition finds later tampering with the price unjustified. The procedure would undermine the development of confidence and commitment, which, after all, are the foundation of an alliance.⁴⁶

sharing of risks (and interests) and there would be no need to argue about the causes of later cost changes. However, it transfers risks traditionally borne by the owner partly to service providers and loss limitation has made their position more equitable. More recently DIT (2011b) recommended that loss need not necessarily be limited in order to provide service providers a true incentive for efficient implementation also in less successful projects.

⁴⁵ Davis & Cowan (2008) remind that the alliance came into being in the private sector since projects could not be made profitable otherwise. There the limit value of investment costs derived from profit targets did, however, guide activity and acted as a deterrent to termination in the development phase. It was understood that a project could proceed only if its profitability could be improved. Public sector projects do not have a similar cost ceiling derived from business and they normally proceed independent of the development phase improvements.

⁴⁶ As confidence and commitment and the open exchange of information critical for their development are key success factors of alliancing (Mistry & Davis, 2009; Davis & Love, 2011; Walker et al., 2013), it is natural to think that at least the preconditions for the development

The performance of the price competition model is limited by the competitive setting itself. The competitors are cautious about presenting their ideas as they fear losing competitive advantage. On the other hand, ideas included in tenders must also be approved by the owner, but decision making can be tough since the owner is burdened by the cumbersome procedure and maintenance of competitive neutrality. Thus, collaboration is not always genuine and profitable. In price competition the scope and content of the project must also be fixed, but if that is possible, are we still talking about an alliance project. Thereby we also lose the flexibility that is considered an advantage of alliancing, and development phase costs increase if two teams are employed.

Alliancing is also used to generally provide value for money in situations where different views and motives are so multi-dimensional that they, or their target level, cannot be defined unambiguously and fixed when concluding the agreement. It would be naive to think that price competition would not then affect the realisation of these other value factors. Consequently, the looming threat consists of deterioration in other key result areas in favour of cost advantage although an alliance is often used just to manage these other difficult to conceptualise and control qualitative factors. In the full-price competition model the administration can mainly attempt to minimise quality loss – it cannot genuinely promote quality improvement.

In this connection the supporters of capability-based selection also remind that in contractual relations the formal contract is always supplemented by the human component that interprets and guides the degree to which obligations are met. There is a difference between trying to meet the letter or spirit of the contract. Yet, the latter ultimately dictates the level of activity. Professional pride and ambition have an impact on development-orientation also in non-price selection – the bigger, the more these models are used and expertise is valued in selection.

The asymmetry of information brought up by those arguing for full-price selection also becomes reversed in the minds of capability-based selection advocates. The former believe that the higher price consciousness of contractors will increase the TOC in capability-based selection processes, the latter see problems in full-price selection: the significance of possible asymmetry of information is emphasised in the price competition model since contractors are better at balancing the price/risk/fee equation to their advantage using it. The owner has laid down the ground rules in its request for proposals, and the contractors have the exclusive right to seek out loopholes in them that allow later price changes.

At the same time it is noted that the key feature of an alliance that spurs effective implementation is the sharing of risks. As price competition drives the price down, it also naturally restricts the implementation of this principle, which also tends to shift the project towards the traditional implementation model and related challenges to profit-making. With the risk-sharing model the development of a culture of co-operation is more likely and collaboration is a source of innovations as

of team spirit are in principle better in non-price selection. The works of Davis (2005; 2010) also appear to support this idea: use of the full-price competition model involves risks.

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different types of expertise are combined. A culture of co-operation can come into existence only if the actors feel that they are rewarded in proportion to the risk they bear. The view is also that full-price selection cannot attract the best resources since the time-consuming selection process (incl. development) requires reserving resources for a long time without certainty of landing the project.

Table 7. Possibilities related to full-price competition.

| Full-price selection: opportunities | |
|---|--|
| <ul style="list-style-type: none">• The opposite aims of pricing are not reflected in the relations between the parties since the price has already been fixed as a result of competition. Development of collaboration without tensions produces a better result and increases efficiency of operations.• The cost perspective is clear in the minds of the actors from the start, which allows avoiding the inclusion of costly additional features in the project solution that threaten the value for money ratio. Cost-consciousness is a strong driver of the project. | <ul style="list-style-type: none">• Use of the price component helps assessment of the profitability in an early stage. It also increases the acceptability of the project in the eyes of politicians, auditing authorities and the general public, which minimises the risk of later suspension of the project.• Competitive pressure and the aim of winning the project are strong incentives for proponents. Comprehensive completion including full price allows promoting innovative solutions so that the value for money relation guides activity and tendering. |

Table 8. Possibilities related to non-price selection.

| Non-price selection: opportunities | |
|---|--|
| <ul style="list-style-type: none">• The procedure exploits in full the overall view derived from early integration of expertise for the benefit of the project. Expertise becomes available at the critical design phase and prevents getting locked into certain basic solutions.• The model compels the team to build a collaborative relationship even before the sensitive negotiations on costs. Open, confidential relations that produce an appropriate price that both parties find to be fair motivates people to work for the good of the project. | <ul style="list-style-type: none">• Genuine, early interaction in the development phase enables challenging prevailing views and standards and seeking better than traditional solutions. Prejudices do not limit development as when competing without proper interaction.• The model provides the correct psychological basis for collaboration. A moral agreement is better for the project than negative contract management. Positive professional ambition drives the team's work effectively for the benefit of the project. |

Table 9. Threats related to full-price selection.⁴⁷**Full-price selection: threats**

-
- The price produced by competitive tendering is not one people are genuinely committed to considering the incompleteness of design. Change orientation enters the process and the TOC and actual costs increase as the project proceeds.
 - Price negotiations conducted on own terms and in self-interest before setting up the team may lock in the attitudes of the actors. They create a dichotomy between the parties which later team building cannot significantly influence.
 - For a start, price competition ensures that the activity is not truly transparent. The lack of transparency weakens confidence and is reflected in project decision making and implementation, so that many opportunities for improvement are not used.
 - The absence of collaboration and interaction at the critical phase of development decreases the potential for true innovations. Insufficient interaction in relation to project vision, know-how and implementation does not support creation of optimal solutions.
 - A price calculation made during competition without sufficient joint planning is not backed by broad enough risk analysis. The contract price is based on the different risk perceptions of the owner and supplier, which may lead to future problems.
 - The focus during competition is on reducing and manipulating the price instead of concentrating on the development of genuinely new solutions. Once service providers have passed the price competition, they no longer feel obliged to develop the project.
 - When interaction is minor (to be fair), price competition does not allow challenging the owner's views and standards and no new solutions emerge: even good solutions are rejected because their performance cannot be verified in the competition phase.
 - Price competition focuses attention strongly on price which leads to efforts to try and lower price so that the value of the difficult to measure qualitative targets is lowered even more relatively. The project's value for money relation on the whole deteriorates.
 - Emphasis on price and its reduction by means of price competition early on eliminates the flexibility of project development, which is the strength of alliancing in challenging projects that include much uncertainty and/or require innovative solutions.
 - Creation of an alliance spirit takes time and effort and does not emerge during competition or by locking in the price, which means that the chances of a collaboration relationship forming are poor. Confidence must be built before the sensitive price negotiations.
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⁴⁷ Sources for Tables 7–10: DTF (2006); Ross (2008); Main Roads (2008); AAA (2009); DTF (2009); Love et al. (2010); Feehely (2011).

Table 10. Threats related to non-price selection.⁴⁸

Non-price selection: threats

- Without adequate value analysis and budget control the actors end up realising the diverse needs and wishes of their own, the owner and users. The cost level increases and the value for money relation weakens along with expensive additional features.
 - The project is expensive since market tests cannot be conducted and reference prices do not ensure economic advantageousness. This happens when team selection locks the owner in exclusive technology that constitutes the key cost factor of the project.
 - The TOC is set so as to prepare for the realisation of most risks instead of the selection coming close to the expected cost. The model is expensive for the owner since even regular performance earns bonuses for service providers.
 - Costs increase as the owner's experts stay out of cost estimate preparation. The project builds on blind trust and neglects interaction based on openness and comprehensive external critical auditing of the cost level.
 - The credibility deficit and associated multiplier effects weaken the performance if the service provider cannot undeniably prove the appropriateness of the level of the TOC, and the owner is not convinced that the TOC based on a strong input from the service provider is firm enough.
 - The weight of actual capability is often decisive in implementation team selection, which goads proponents to offer the best possible resources. The procedure may lead to a competition on resources that are not always available at the launch of the project.
 - The aims of the owner and service providers are opposite as to the TOC, and the cost level increases because service providers are more cost conscious and the owner's resources are small. It is presumed that the estimate maker is guided by his own motives.
 - Realisation of risks is prevented by careful planning and supervision by an overly heavy organisation. That results in a high TOC. The procedure also promotes proper implementation of key result areas and payment of performance bonuses.
 - TOC negotiations ignore the impact of the economic situation on price level considered in price competition. That results in a high price in an economic downturn whereas it is easier for companies to exit a project in a boom.
 - When emphasis is on capability, resources and quality-orientation, there is the danger that the actors become infatuated with over-design and the project becomes over-resourced. Costly resources and redemption of the promises of quality-orientation lead to expensive implementation.
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⁴⁸ Sources for Tables 7–10: DTF (2006); Ross (2008); Main Roads (2008); AAA (2009); DTF (2009); Love et al. (2010); Feehely (2011).

3.4 Toward partial price selection

Views on the performance of the selection processes vary a lot. Yet, even the proponents of full-price selection realise that it is not suitable for all alliance projects. Correspondingly, most proponents of capability-based selection find that it is sensible to include some price elements in the competition. Therefore, the partial price method is a natural choice. Australian guidelines also recognise its role among different types of projects as shown in Table 4 (page 19).

In the partial price method the competitors may e.g. offer concept-level solutions which enable them to produce a total project price estimate that serves as a criterion in choosing the solution and the proponent with most potential for follow-up design.⁴⁹ The follow-up work involves only the best team which at best allows integrating an ideas competition with genuine joint development in the model. In a concept-level competition price cannot be considered fully binding. The model leans toward capability-based competition since a price criterion that is not binding is naturally otherwise problematic from the viewpoint of equal treatment.

The partial price method can also refer to competition where the tender includes only part of the price components constituting the full price. Yet, here it involves binding tenders.⁵⁰ The challenge with using binding price components is that low prices of components included in the competition may be compensated for later by higher prices of elements that are priced only at the development phase. This is one reason why the components used in competition should be as independent cost items as possible.

The formation of the costs of projects is a complex equation including many interdependencies and even overlaps where the interpretation of the content of an individual component may depend on the performer of the calculation. Competing consortia also take a stand on the allocation of direct and indirect costs in their tenders. These are some of the reasons why making tenders commensurate presents a further challenge for selection.⁵¹ It is a question of the owner's assessments which naturally means that the procedure used in making an efficiency analysis is not necessarily explained to the proponents except in principle. Thus, use of the partial price method may be even more demanding than the extreme selection methods although it eliminates many of the factors considered weaknesses of the extreme models.

Moreover, the price components of the partial price procedure should naturally be such that they play a significant role in the formation of total costs and that they would allow the competitors to stand out from the others.

⁴⁹ This approach would appear to be emphasised in DIT (2011b), specifically in the case project of the appendix, which tells about the remarkable results achieved with it. Chipman & Woodman (2010) also describe a successful application of the procedure.

⁵⁰ DIT (2011a) which revises DIT (2011b) describes also this approach more clearly than the latter. The case projects of the publication at hand also involve competitions of this category where proponents themselves do not seek/present a total price for a project.

⁵¹ Chipman & Woodman (2010) also support this view in addition to case projects.

3. Use of price factors

Examples of possible price components are presented in Table 11. A characteristic feature of most components is that they are contingency provisions or joint costs and overheads added on top of direct costs. Direct material and labour costs are also priced partially sometimes, although most of them derive from items subcontracted from the markets, which in any case ensures the competitiveness and transparency of projects. The partial price procedure has sometimes also used unit price-type competition models which are not dealt with here.

A more detailed illustration of the partial price procedure is provided in the project description of the following chapters. The descriptions focus mainly on price components, and other aspects are described only to the extent that they are linked to the use and use criteria of components. Consequently, the profound qualitative assessment to be considered along with a price estimate will not be discussed. The same applies e.g. to the role of the financial auditor and the independent estimator even though the actors are also involved in procurements based on the partial price procedure.

Table 11. Examples of partial price method's price components.

| | Guide ⁵² | Case projects (Chs. 4–6) | | |
|-------------------------|---------------------|-------------------------------------|------------------------------|------------------------------|
| | | Water treatment plant ⁵³ | Road bridge and surroundings | Arterial road with junctions |
| • Fee ^{54,55} | ✓ | ✓ | ✓ | ✓ |
| • Cost escalation | ✓ | ✓ ⁵⁶ | ✓ | |
| • Risk contingency | ✓ | ✓ | ✓ | ✓ |
| • Project overheads | ✓ | ✓ | ✓ | ✓ |
| • Preliminaries costs | | ✓ | | |
| • Direct costs (partly) | ✓ | | ✓ | ✓ |
| • Defect correction | | | | ✓ |

⁵² Use of the partial price has been elaborated slightly in the DIT (2011a) supplement to the guidelines (DIT, 2011b).

⁵³ It should be noted here that the procurement in question was made before the 2010 guidelines (DTF, 2010; later also DIT, 2011b) came into force.

⁵⁴ The guidelines (DIT, 2011a) state that the fee and e.g. staff and equipment costs are generally also requested with the non-price model meaning that use of these criteria in itself does not make the model conceptually a partial price selection process.

⁵⁵ It has been suggested in connection with the preparation of alliance projects conducted by the Finnish Transport Agency that offering of a fee is the minimum condition for procurement to meet the requirements of the regulations on public procurements (2004/18/EC; 2007/348) for 'the most economically advantageous' criterion. Due to comparison difficulties a solution has been sought for the selection situation in question also through research (Lahdenperä, 2013).

⁵⁶ Part of risk contingency; the presentation is only indicative also in other respects.

4. Case project: Water treatment plant

4.1 Starting point and overview of project

A few years ago the public sector owner responsible for the water supply and sewerage of the City of Melbourne launched a renovation project of the water treatment plant for the eastern district.⁵⁷ The plant processes 40% of the sewage of the city and thus serves about 1.5 million citizens.⁵⁸ Before the renovation, the treatment system consisted of two main stages. The renovation added a third stage, which improved the treatment result considerably, and now the water can be recycled for many purposes. The two earlier main stages of the treatment process were not modified, although the intermediary storage of water between the second and third stages and its reorganisation posed a big challenge to the project. Thus, it was a question of a complementary investment and integration of the treatment processes together. Basic information on the project is provided in Table 12.

The project was a new type of combination of technologies that is probably unique even on a global scale, which means that the implementation also involved technologically demanding development. The technical uncertainties and challenges related to its performance and verification together with the projected rapid deployment proved so demanding that it was decided to apply alliance-type delivery. The main identified risks were the following:⁵⁹

- The renewed water treatment plant had a tight delivery schedule in the context of an ongoing and complex approvals process. Planning, construction and commissioning were to take less than three years. That was also the main reason for using alliancing.
- Because of the new type of treatment process, meeting performance requirements and getting official approval constituted a factor of uncertainty. Because of the new process type, it is not fully clear what the official requirements will be and how performance will be verified.

⁵⁷ This is a procurement made before the new guidelines (DTF 2010) came into force.

⁵⁸ E.g. Melbourne Water (2012); i.e. the project's Web pages.

⁵⁹ Melbourne Water (2010).

4. Case project: Water treatment plant

Table 12. Basic data of the water treatment plant project.

| | |
|----------------------|--|
| Name of project | Eastern Treatment Plant / Tertiary Upgrade Project |
| Project type | Sewage treatment plant, renovation/extension |
| Location of project | Carrum, Victoria; 30 km south-east from the centre of Melbourne |
| Estimated cost | AUD 418 million (ab. €375m) ⁶⁰ |
| Name of alliance | Eastern Tertiary Alliance |
| Alliance owner | Melbourne Water Corporation |
| Alliance designers | Black & Veatch (B&V), Kellog Brown Root (KBR) |
| Alliance contractors | Boulderstone, UGL Infrastructure |
| Scope of liability | Design and construction |
| Procurement schedule | 9/2009–2/2010 |
| Project completion | 11/2012 (project practical completion) |

- Performing the work on the premises of a plant of critical importance that continues to operate poses special challenges to the construction work. Integration of the treatment processes, ensuring uninterrupted operation, and partial relocation of processes in the area are an additional hardship.

4.2 The selection process as a whole

Because of the new technology to be deployed in the project, the owner proceeded by applying the so-called progressive alliance procedure. At first, the owner selected only designers with whom project design proceeded as bilateral cooperation. Contractors were selected only after this stage, and they formed an alliance for further development of the project together with the owner and the earlier selected designers.

An open procurement procedure was used for the selection of designers in this project, but technical knowledge weighted heavily in the selection process. Design started with testing of alternative treatment technologies and their combinations⁶¹. Thus, it also included development work to complement conventional project programming, which initially involved testing methods on a small scale in laboratory conditions, but finally led to specification of the actual investment project. Therefore, the use of the progressive alliance approach did not mean that contractors joined the project at a late stage: they were also involved in the project programming process – yet consistent with probity requirements of the selection process –

⁶⁰ 1 € ~ 0.80 AUD (exchange rate at the time of the interviews in late 2012).

⁶¹ About 10 million dollars were invested in a field laboratory set up in the treatment plant area; because of the nature of the work, it was not sensible to select contractors this early.

before the owner had formed a final view of the financial constraints of the project. Different stages were thus overlapped due to the pressure of the tight schedule.

The contractor was selected⁶² on the basis of capability and comparative price so that the overall price was estimated based on the price components submitted by contractors and designers together. The multi-stage selection process involving many tasks and parties is presented in simplified form in Figure 3 from the point of view of the partial price selection model described below.

Contractors entered the competition by submitting written material (e.g. references, unit prices, breakdown of direct and indirect costs), which even at this stage was to include the contractor's fee requirement. On the basis of this material, candidates were initially eliminated and the proponents to be interviewed selected. The number of proponents was limited to four. The appropriateness of the fee level was also discussed already at the interviews of the first selection stage, but it was also assessed in light of the reference projects submitted by the contractors. The two best contractors were chosen for the second stage of selection on the basis of the interviews.

The actual proposal was made at the second selection stage, which also included final assessment of capability. The price components of the proponents were mainly processed and planned already in the workshops conducted with the owner at the stage preceding the submission of proposals. The fee included in the proposal was, however, to be submitted in a sealed envelope that was opened only at the final stage of the comparison when other assessments and calculations were ready. The contractor's fee could not exceed the level approved at the previous stage, but nothing prevented reducing it.

The owner did not pay a compensation to companies that had submitted a proposal. The duration of the actual competition phase from the publication of the request for proposals to the selection of the contractor was three months, and the contract was also signed three months thereafter.

4.3 Description of partial price selection

A price criterion was used besides qualitative criteria in the selection of a contractor to put cost pressure on the competitors. It was based on price components that were used in the last selection stage between the two best proponents. The components were as follows:

- **Preliminaries costs** that cover costs related to the erection and maintenance of temporary structures for launching the site (such as fences, site

⁶² It was literally question of selecting the alliance team, since the designers were team members and their price tenders and views were included in the teams' proposals. However, the designers had already been selected for the project earlier, and thus the same design firms were involved in both teams. Therefore, it was mainly a question of which contractor would get to implement the project. On the other hand, the terms and other details of the designers could differ between the teams.

4. Case project: Water treatment plant

roads, warehouses, site offices). This cost item was presented and discussed openly as tentatively priced right after the workshops that started the second selection stage.

- **Project overheads**, which here cover the management costs of running a project of this scale related to safety officers, supervisors, accountants and financial systems.⁶³ This cost item had to cover the entire project until completion. The proposed organisation was dealt with earlier when eliminating proponents; later it was discussed openly as tentatively priced already in connection with the workshops that started the second selection stage.
- **Risk and opportunity contingency** based on the risk analysis made by proponents, that is, the pricing and summary of risks and opportunities⁶⁴ constituting a risk allowance to be included in the TOC. The risk analysis was presented and the tentatively priced risk provision was discussed in connection with the workshops that started the second selection stage. A separate workshop day was reserved for the risk theme.
- **Fee percentage** which consists of company-level overheads and expected profit when the fees of designers and contractors are combined according to their work shares. The fee percentage was finally tendered in a sealed envelope that was opened only after other evaluation was completed.⁶⁵

The above price components had to be tendered as binding, which means that the selected contractor was to use the price information they submitted during the competitive tendering for specifying the TOC later on. The tenders also had to cover all risks (incl. a cost escalation allowance and exchange rate risks), and no part of the contract signed later was tied to an index. The use of the price components in the selection process is also illustrated suggestively in Figure 3 that shows an outline of the overall process specifically from that viewpoint.

In the light of the above, only the following items and aspects affecting the overall price were excluded from competition-phase pricing:

- **Hourly labour rates** that cover employees by trades (electricians, installers, etc.). The possibility of including them in the items to be tendered was also considered during project preparation, but the idea was rejected because the preconditions for locking in prices did not exist.
- **Labour input data** that refer to the required labour input by work types per unit to be produced. This is of course not a price component as such, and the unique nature of the project makes it difficult to use existing reference data in early project pricing.

⁶³ In practice, a joint project office of the alliance members was established on the site with a maximum staff of about 150. Clerical staff costs made up most of this cost item, but other office expenses also came under it.

⁶⁴ The starting point was the owner's risk register, which the proponents commented on and complemented. The owner revised his view accordingly and the proponents then priced the resulting listing of risks and made it part of their tenders.

⁶⁵ The allocation of direct and indirect costs, essential for the use of the fee percentage, was based mainly on the financial audits of the second selection stage.

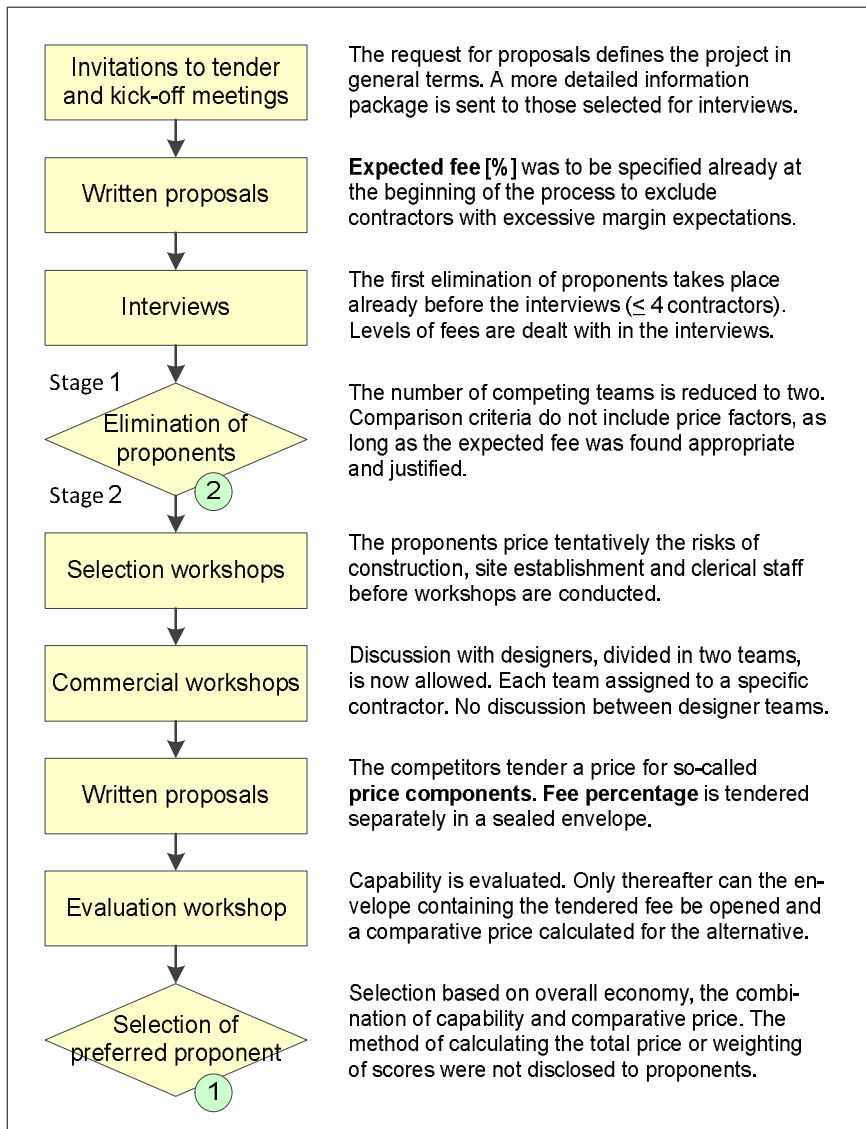


Figure 3. Simplified presentation of the selection process for the treatment plant.

- **Material costs** that cover the costs of materials, supplies, equipment and components. It was assumed that about 70% of the project costs would consist of purchases to be subjected to competitive bidding later, which ensured profitable realisation also in this respect.

4. Case project: Water treatment plant

The owner used the same – his own – direct material and labour cost estimate in comparing competitors, which thus became the basis of the assumed size of the direct costs of both proponents. The cost items priced by the competitors were added to the cost level of the owner's estimate: project overhead, site establishment costs, and risk contingency. This total cost was then increased by the share of the fee derived from this sum based on the fee percentage submitted by the competitors (Fig. 4). The result of this calculation provided a comparative price for the competitors.

In the case of alliancing, the capability of a team and its elements were also selection criteria. To calculate the combined result of price and capability, the comparative price was expressed as a score. How the owner assessed the total price was not disclosed to the proponents, which was assumed to preclude potential manipulation attempts. Non-disclosure of the calculation formula and weights of criteria was considered so important that it was emphasised in the owner's procurement strategy.

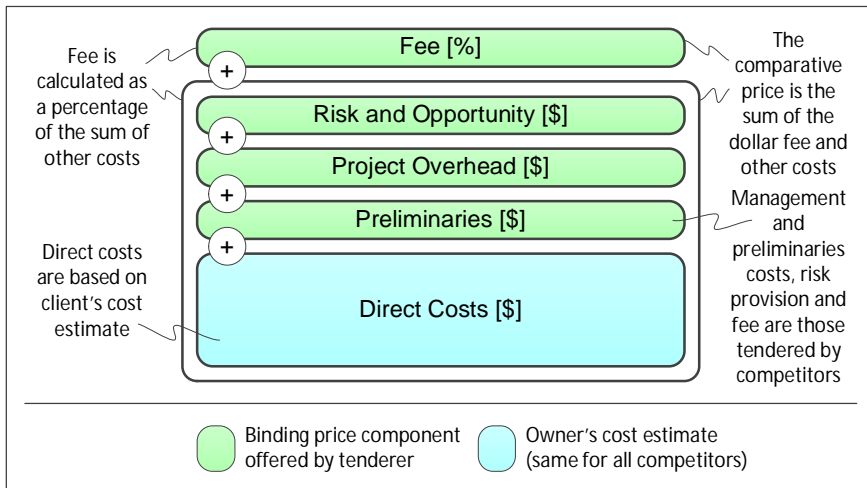


Figure 4. Formation of comparative price in the water treatment plant project.

4.4 Project implementation and incentive solution

When the preferred proponent had been selected, the owner signed an alliance agreement with that construction company and designers. At the development phase, the team continued design in terms of the technical solution and its implementation, as well as procurement preparations. This made it possible to define the TOC. The owner had reserved the right to terminate the contract if the TOC proposed by the service providers exceeded either the budget approved by the owner, or a cost level determined by probability calculations that had a probability of 50% of being underrun (so-called P50 level).

The TOC was determined using both the price components specified by the selected contractor/team in their tender and calculations on the direct costs of the project that were revised later. Regarding the direct costs, independent estimators examined the cost calculation against information on reference projects, etc. submitted by the selected proponent at the beginning of the competition, to which they had to have unrestricted access. The basis of calculating the fee remained a percentage also at the implementation phase.

After the TOC was specified and made part of the contract, the role of the price components used in the competition was reduced to virtually nought – after all, these components covered e.g. an escalation in costs. From the costs perspective, the TOC is a factor that guides project implementation, which allowed the project to proceed like any other alliance. The actualisation of the price components was not monitored separately, and their use as such did not cause e.g. additional work for project management. Although this approach may allow some kind of manipulation, it was not assumed to occur in a model based on collaboration and trust, and thus actualised prices were not monitored in relation to the price data provided in the tender, although open cost monitoring was naturally otherwise used.

According to the commercial model followed in the project, an overrun or underrun of the target price is shared between the actors. The shares are, with minor deviations, 50:50 between the owner and the service providers. However, if the target price is underrun by more than 5%, the owner gets 80% of the part in excess of this limit. On the other hand, if the TOC was overrun, the responsibility of service providers was limited just to their fee, and anything beyond that would, according to this model, be borne entirely by the owner.

As concerns qualitative key result areas, the owner reserved a separate performance fund of five million dollars for the project, which is why no money was allocated to the fund from the saving in TOC. The performance bonus could go to a few key result areas, and due the urgency of the project, the most central of them was completion on schedule. Thus, each possible week of delay reduced the performance fund by 5%. This way the realised schedule set the constraints for rewarding other qualitative result areas.

4.5 Experiences

The project succeeded in developing, implementing and getting approval for a technological solution that met the set performance requirements.⁶⁶ Challenges to the implementation were also overcome, so that in terms of all key result areas, the implementation can at least be considered a success – the goals included

⁶⁶ The accreditation of performance and gradually progressing and expanding test use were started already nine months before the project's completion/handover date. Thus, the actors had a good, informed view of the success of the implementation already when the interviews were conducted close to the practical completion of the project.

4. Case project: Water treatment plant

safety, environmental issues, quality (treatment result), stakeholder issues, and costs.

The project could also be implemented within the quick completion schedule necessitated by official requirements without jeopardising its cost efficiency by the early selection of service providers to accelerate the schedule. As a whole, the alliance and the involvement of the implementation team at an early stage of design promoted efficient implementation in the following ways:

- International procurements involving delays could be started at the development phase well before launching construction, so that construction elements were on site in good time and implementation was not slowed down by delays in procurements.
- Critical timing factors were identified better, which allowed starting the initial work stages required by them rapidly as separate assignments, which ensured project completion within the challenging schedule.
- Key procurement lots could be subjected to competitive tendering before setting the TOC, which eliminated the need to include extra risk provisions in the TOC (or actually already in the tenders).
- Price components subjected to competitive tendering together with competitive tendering on major procurements guaranteed competition also with early selection, and even without unreasonable proposal compilation costs.

On the whole, the owner estimated the alliance to have produced very good value for money in this project. From the point of view of alliancing, phasing, and price component competition, the process was also successful and no major needs to change it were identified.

More generally, the most important challenge occurred in the use of a progressive alliance, where selection workshops are arranged with the two last-stage competitors, and it is necessary to find equally competent experts for the teams in several areas of expertise. At worst, only one true expert of a given area is involved in project preparations.

5. Case project: Road bridge

5.1 Starting point and overview of project

The state owner organisation responsible for road projects in the Sydney region has for some years been preparing a project intended to replace the existing road bridge across a river with a new one. The new approx. 150 m long two-lane bridge with a separate lane for light traffic will be built in the immediate vicinity of the old bridge that is over a hundred years old. The old bridge is to be dismantled later. Basic data of the project are presented in Table 13.⁶⁷

The work also involves new access arrangements at both ends of the bridge, which are part of the same procurement entity. Besides the actual bridge structure, the work includes the implementation of walls subjected to loading from earth and erosion reinforcements as well as road connections and nearby access and intersection arrangements. Moreover, the dismantling of the old bridge and road structures leading to it as well as filling and landscaping of areas and necessary changes to utilities/services networks are part of the project.

The special challenges of the project derive from the fact that the bridge is connected to the adjacent square of special cultural-historical importance. Both the existing and the new road that lead to two different bridges cross the square, and as such form a central part of the townscape of the small urban settlement. The buildings bordering on this central square are part of the cultural heritage to be preserved. Provisions have also been made for archaeological discoveries since some finds have been previously made in the area. Stakeholder and community issues will also continue to be topical during the implementation. Citizen participation is and has been very active ever since the alternative plans were displayed publicly a few years ago. Thus, the implementation involves factors of uncertainty.

It is precisely because of these uncertainties that the owner opted for an alliance contract and partial price competition, although an alliance approach could not be justified otherwise: the project is small for an alliance project and not particularly demanding in technical terms. More precisely, the reasons for using alliancing were as follows:

⁶⁷ More information on the project can be found on the owner's Web pages RMS (2012c).

Table 13. Basic data of the road bridge project.

| | |
|----------------------|--|
| Name of project | Windsor Bridge Replacement Project |
| Project type | Road bridge with accesses; replacement investment |
| Location of project | Windsor, New South Wales; less than 50 km north-west of Sydney City Centre |
| Estimated cost | AUD 65 million (ab. €50m) ⁶⁸ |
| Name of alliance | Windsor Bridge Alliance |
| Alliance owner | Road and Maritime Services |
| Alliance designers | Sinclair Knight Merz (SKM); Contractual relationship with owner, not an alliance member |
| Alliance contractors | Boulderstone |
| Scope of liability | Construction |
| Procurement schedule | 5/2012–9/2012 |
| Project completion | 2/2015 |

- An alliance offers a better framework for flexible management of cultural heritage and environmental issues and for making co-operation with citizens/stakeholders part of the project.
- Completing the project on schedule, in just over two years, is a big challenge, but an alliance provides the greatest certainty that schedule commitments to stakeholders and the community can be fulfilled.
- An alliance offers the best preconditions for developing innovative and effective project solutions while generating more added value in many result areas compared to the alternatives.

5.2 The selection process as a whole

Because of the nature of the project, the owner selected the designer about six months before starting the contractor selection – at that time there was no decision to use alliancing. The first tasks of the designer were the preparation of the concept plan and assessment of environmental impacts. The finalising of these tasks and detail design were to be carried out during the development phase. Thereby, the alliance – and especially the contractor – has an opportunity to influence the contents of the designs, although the designer has a contractual relationship with the owner and is not a member of the alliance team. Indeed, the alliance was formed only between the owner and the contractor.

The designer's participation in the alliance was not considered sensible, because it was assumed that design would be practically completed before the end of the development phase, after which no significant changes to the designs are to

⁶⁸ 1 € ~ 0.80 AUD (exchange rate at the time of the interviews in late 2012).

be expected. This is particularly due the fact that the building of the bridge constitutes the bulk of the works and uncertainty is related mainly to the implementation of road and land areas of lesser costs. Thus, the contractual relationship to the designer is maintained by the owner even after the formation of the alliance.

Arranging a competition in the case of a progressive alliance⁶⁹ would also have been a challenge. Yet, even with the adopted approach, the competition phase and the minor services provided by the designer for the competitors required confidentiality agreements and special arrangements to ensure equal treatment and to meet the non-disclosure requirements. For example, the contractors were provided a design contact, who forwarded requests to the designers anonymously.

The selection of the alliance partner was not based on an open procurement method, but requests for proposals were sent directly to seven contractors deemed to have the required potential. Actors of different types and sizes were included on purpose. Four out of the seven invited contractors submitted the proposal required by the first stage. A simplified presentation of the multi-stage selection process that included many tasks and parties is given in Figure 5 from the point of view of the partial price selection described below.

As the process advanced, the number of competitors was reduced to two by weighting written proposals, and the actual assessment of capability took place only at the second stage of the competition while the contractors developed their proposals and had their ideas for improvement tested by the owner. Both competitors also changed the bridge solution in their proposals, although the owner saw no potential for significant improvements in the design. The proposed solutions were also deemed workable and useful and were approved as tender solutions. After this, the competitors priced the project rather comprehensively, although the price component approach was applied in breaking down the total price and specifying which parts of the project should be subject to binding and indicative tenders.

The duration of the actual competition phase from the publication of the request for proposals to the selection of the preferred proponent was about three months. The first selection stage from the publication of the request for proposals to the selection of the two best competitors (to be invited to the second stage) took a month. The tender period of the second stage was also one month, and the duration of the subsequent assessment stage was about half a month. The owner did not pay a compensation to the companies that submitted a proposal.

The alliance agreement covered the entire project,⁷⁰ which means that there was no separate contract for the development phase. The project naturally includes a development phase, but due the nearly finalised planning and pricing, it was scheduled to take only a few months.

⁶⁹ The term progressive (i.e. gradually forming) alliance refers to a practice where service providers are selected separately and not as a consortium covering design and construction services. Thus, it may be that a designer is selected before the contractor, although they both with the owner finally form the alliance. Of course, several actors/companies may perform the duties of designer and/or contractor.

⁷⁰ RMS (2012a).

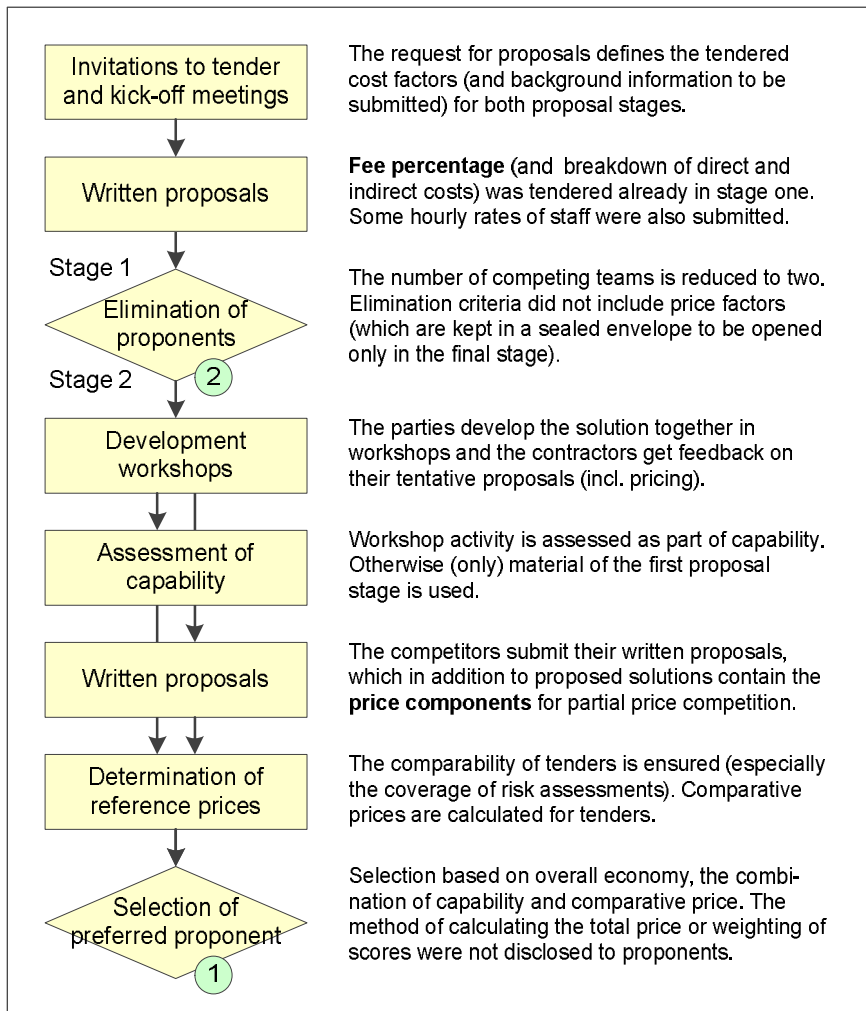


Figure 5. Simplified presentation of the selection process for the road bridge.

5.3 Description of partial price selection

The competition was based on the partial price selection model, where almost all components needed to determine the full price were tendered for. Only some relatively insignificant parts, such as the relocations of utilities/services networks, were not priced. This approach can be described as partial price competition since it lacked also other aspects of the full-price approach: some price components were indicative only while others were binding. At the same time, the model with its indicative scope and unit price data determined the way of calculating how later

changes in components tendered for at tentative prices affect the overall price. The price components to be tendered for at binding prices were:

- **Bridge TOC**, which is the total of the labour and material costs needed to build the bridge (without a specific risk provision).
- **Risk contingency for bridge**, a risk premium produced by risk analysis of bridge building to be included in total TOC.
- **Project overheads TOC⁷¹**, which cover the overheads of both the bridge and the so-called balance of works of the project.
- **Risk contingency for project overheads**, a risk premium produced by risk analysis of overheads to be included in total TOC.
- **Fee percentage** consisting of company-level overheads and profit margin. A corresponding share of the sum of all other cost items is included in the tender/TOC. To be submitted in a sealed envelope already at the first selection stage, but the envelope is opened and the information is used only at the end of the selection to calculate comparative prices.

In addition to the above binding components, the competitors were to include in their tenders the following price components offered as tentative prices:

- **Budget TOC for the balance of works⁷²**, that is, a preliminary estimate of the total cost of inputs other than those required for building the bridge.
- **Risk contingency for balance of works**, a preliminary risk premium produced by risk analysis of the balance of works to be included in total TOC.

Tenders were to be submitted including provisions such as the one for cost increases, and no part of the contract was index-linked.⁷³ Other essential aspects pertaining to the use of price components are also commented in Figure 5 which gives a simplified presentation of the entire selection process 5.

The owner also tried to evaluate the validity of the tender components by separate measures. For example, the two final stage competitors were subjected to financial audits where the level of the fee in realised projects was also assessed. This was done despite the fact that the fee percentage was a competition element that was submitted in a sealed envelope already during the first round of tendering. The competitors were also to submit daily and hourly rates paid to clerical and manual staff, which could have been used for checking the price levels proposed later, if necessary, in case of significant differences in views. In the selection under discussion they were used only for sensitivity analyses.

⁷¹ The project overheads had to cover also development-phase clerical staff costs. As the work load of the contractor during the development phase consisted of minor tasks of approving and commenting solutions, it was not deemed necessary to have a separate cost item for them.

⁷² Besides the actual construction work, the balance of works also included items such as the costs of the project office, since during the competition it had not yet been decided how the project office would be implemented (e.g. whether on the premises of a project partner or premises rented externally).

⁷³ For the sake of comparison, e.g. Design-Build projects would probably use index-linking.

The owner calculated the total prices of the alternatives on the basis of the price components submitted by the proponents as illustrated in Figure 6. Because of differences in the risk lists, the owner first needed to make the risk analyses mutually commensurable since the inclusion or exclusion of individual risks cannot usually be justified by other differences in the tenders. The breakdown of costs into direct and indirect was also the responsibility of the proponents, which is why their comparability is not self-evident even in this respect. Information on this breakdown of costs was also submitted already during the first round of tendering.

The final selection of the contractor was based on both capability and price. Qualitative/capability factors were considered by assigning them a price effect based on a predefined model, so that the calculated total price was adjusted on the basis of a capability assessment to produce a comparative price. Selection was then based on this comparative price. The proponents were not told how the owner intended to do the comparison. This also applied to the weighting of qualitative criteria, although the owner had locked them in already before starting procurement. The intention was to assign equal weights to quality and price.

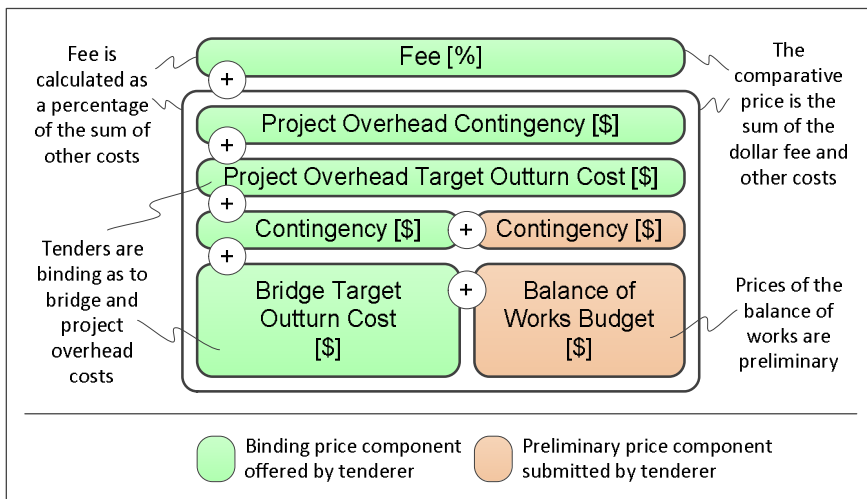


Figure 6. Formation of comparative price in the road bridge project.

5.4 Project implementation and incentive solution

When the preferred proponent had been selected (and officially approved), the owner signed an alliance contract with this contractor. In the development phase following the signing of the contract, the parties continued preparations for implementation; the so-called balance of works played a central role in it. As the contents and scope of the balance of works change with the progress of design, the TOC of this part is revised, but is expected to be in line with the tentative TOC

specified in the tender as closely as possible. In the request for proposals the owner had also stated that in order to check the appropriateness of the level of the TOC, the contractor may also be asked to submit information on recent comparable projects to determine labour inputs and output data as well as unit costs. An independent estimator and a financial auditor should play a central role here. Otherwise the preparation was more straightforward as most tender components were binding to the proponent.

A cost estimate that gets more accurate during the development phase and includes direct costs, forms the TOC when the fee is added. The fee is determined as a fixed monetary item, which is a share of the sum of direct costs corresponding to the tendered fee percentage.

When the TOC had been determined and recorded in the contract, the price components used in the competition were supposed to become irrelevant. This is due the fact that from the point of view of costs, the TOC is the factor guiding the implementation of the project. Project management is also not expected to grow in relation to other projects, but unit prices may be useful as reference data when inspecting invoices – because errors are made every now and then.

The commercial model used in the project rewards good performance and has three parts. First, TOC overruns or underruns are shared by the owner and the service provider according to a common risk-bearing principle. Possible cost overruns are split 50:50, although the liability of the contractor is limited to his fee. If the TOC is underrun, the sum is divided into three equal portions: one goes to the owner, one to the contractor, and the rest to a so-called performance pool, whose use is tied to qualitative performance through several key result area indicators.

There is an independent incentive portion for completion time (schedule), and quick completion is rewarded, as a starting point, independently of the outcome of other key result areas. The owner has reserved a sum (ab. half a million dollars) as a schedule incentive, which can be earned by completing the project four months before the agreed reference date; otherwise the reward is determined linearly in proportion to performance. Correspondingly, delays reduce the earnings of the contractors the more, the longer the project is delayed – but not more than an amount that corresponds to the sum of the contractor's share of a cost underrun and a quarter of the basic fee (calculated as a percentage).

The performance pool allows the contractor to earn additional rewards by excellent performance so that the sum of the pool seed money (1 million dollars) and the pool allocation resulting from a cost underrun correspond to 'unprecedented top performance'. The performance–reward relation is linear. On the other hand, failure to meet the 'zero level' defined as the 'best known performance of the industry' means a reduced fee for the contractor. Thus, the maximum liability consists of the loss of the (basic) fee and the share of the pool resulting from a cost underrun as well as the schedule-related reward.

On the level of the entire system, the contractor may in the worst case be left without special bonuses and lose his basic fee, but never more. On the other hand, bonus shares for qualitative key result areas may be earned even when failing to meet the TOC.

The result areas to be linked to the performance pool have been planned to include the project's impacts on nature and the cultural environment, relations to the community and interest groups, as well as technical quality. In addition to these, besides the cost and schedule aspects with their special incentives, declared key result areas of the project are safety, smooth flow of traffic, and innovative design.

5.5 Experiences

As the project is at the contract signing stage, it is of course not yet clear what the aggregate of experiences from the model will be. However, the owner believes that this model allows finding a TOC that produces good value for money. The central drivers here are a selection process based on partial price competition and use of the owner's experts: an estimator assesses the appropriateness of the TOC (evaluation of costs and justification material, determination of comparative price, quantity calculations and changes, dispute settlements) and a financial auditor verifies costs incurred (auditions of financial systems, breakdown of direct and indirect costs, audition of project economics including reporting and invoicing).

The use of alliancing in the project was not self-evident. As the project was a small one, it was prepared thinking that it could be implemented as a conventional Design-Bid-Build project. For this reason, the designer was also selected before the contractor, which would probably not have happened if the decision on the use of alliancing had been made earlier. One reason for the use of alliancing was naturally the uncertainty concerning factors related to cultural history (heritage) and interest groups. On the other hand, the fast schedule objective became clear only rather late when project planning was already well under way.

Another factor in favour of a traditional project delivery method besides small size was the owner's view that the project had virtually no innovation potential. However, the early stage competition was a pleasant surprise to the owner. Both competitors suggested significant changes to the design. In a conventional Design-Build project such designs would probably not have been approved, since the owner did not find them feasible originally. The inherent interaction of the procurement process of an alliance, however, made it possible for the owner to express his doubts to the contractors, who had the opportunity to show the effectiveness and low risks of the changes in plans.⁷⁴ Thus the competition produced solutions that were useful for the owner and even exceeded his expectations. Moreover, the actors did not identify any essential drawbacks in the selection process but considered it successful.

⁷⁴ It should be noted that mainly based on experiences from alliancing, thorough, interactive supplier selection has in recent years been applied to some extent also in Design-Build projects where liabilities and risks are, however, ultimately transferred to the contractor (Edwards, 2009; AAA, 2010). Use of this model is believed to be increasing further, and there is a growing trend to transfer, besides the selection phase, also the other procedures of the cooperative model into alternative project delivery methods (Hutchinson, 2010).

6. Case project: arterial road with junctions

6.1 Starting point and overview of project

The increased exploitation of the mineral resources of Western Australia and the success of the mining and energy industry are reflected in increasing traffic volumes in the area. This is particularly true of the airport of the City of Perth and its surroundings that are a transport hub. The airport's expansion plans together with increasing traffic volumes necessitate major new road investments for improving the main road network of the surrounding area and increasing its capacity.

The works centre around an about ten kilometre section of a freeway bypassing the airport.⁷⁵ Additional lanes are being built for this section and many junctions are being rebuilt, a few are being expanded into complete interchanges. The project also includes the improvement of many kilometres of roads intersecting the main road and some other roads in the area. The totality also includes some new connections to be built in planned areas. The works are mainly restricted by existing urban structure and the airport area. Basic information on the project is presented in Table 14.

The owner organisation responsible for state road projects decided to use alliancing, because implementation had to conform to flexible decision-making and the project involving uncertainty had to be launched quickly. The actual factors guiding the planning and selection of the project delivery method were as follows:

- **Stagewise decision-making:** The works have to be started quickly to increase the capacity of the main road network before the inauguration of the new airport terminal to be completed in 2017. The incompleteness of planning and funding decisions, however, would have enabled immediate launching of only some parts of the project by traditional delivery methods.
- **Economies of scale:** In the owner's estimate, bundling of the works in the area into a single project increases efficiency of implementation and sub-contracting. This is due, for example, the fact that a broad scope makes development profitable, and learning also plays a role there. Thus, it makes no sense to divide implementation into several separate contracts.

⁷⁵ Main Roads (2012); see also the Web pages of MainRoads (2013) and GatewayWA (2013).

Table 14. Basic data on the arterial road project.

| | |
|----------------------|---|
| Name of project | Gateway WA Perth Airport and Freight Access |
| Project type | Main road network, upgrade/expansion |
| Location of project | Perth, Western Australia; ab. ten kilometres east/south-east of the city centre |
| Estimated cost | Ab. AUD 1bn (ab. €800m) ⁷⁶ |
| Name of alliance | Gateway WA |
| Alliance owner | Main Roads Western Australia |
| Alliance designers | GHD, AECOM, BG&E |
| Alliance contractors | Leighton Contractors, Georgiou |
| Scope of liability | Design and construction |
| Procurement schedule | 2/2012–9/2012; contract 11/2012 |
| Project completion | 12/2016 |

- Smooth flow of traffic: The construction aims to relieve the congested road network, but such works always cause additional disturbance for the users. Responsibility for the performance of the traffic network during the works cannot be divided successfully by sub-projects. This is another reason why it does not make sense to divide implementation into several contracts.

6.2 The selection process as a whole

The competing teams were required to make their proposals according to a previously completed road network plan. Alternative proposals were still possible, provided that the competitor also offered an alternative conforming to the plan. Thus, the project provided some room for development, as there should be in alliancing.

On the whole, the proposals at best required rather extensive design, since the tender prices had to be binding. It was also clear that the alliance service providers would be selected as a team, that is, as groups of companies with both design and construction know-how. However, less than half of the stock of work to be finally included in the contract was subject to design and pricing. On the other hand, the exact scope of the project was still open when procurement was being started.

In the stagewise selection process the competitors had to tender the fee percentage of the team already in the first round of tendering, although it was kept in a sealed envelope until the end of the second round of selection, when it was first used to make comparisons. There were two reasons for requesting early fee percentage tendering. Firstly, the fee percentage can be calculated only if the companies participating in the consortium and their work shares are fixed unambiguously. This, in turn, requires earnest negotiations and familiarisation with the pro-

⁷⁶ 1 € ~ 0.80 AUD (exchange rate at the time of the interviews in late 2012).

ject, which was the owner's intention in order to ensure that the companies entering the competition and selected for the second round of tendering mean business. Secondly, in the case of a small group of competitors, it is possible that asked fees could even increase in the second round when the other competitors are already known – especially if some team was not seriously involved.

Proposals for the project were received from three groups of companies. All of them were deemed competent and selected for the second stage of the competition, since the plan was to reduce the number of teams in this demanding project to just three. An exceptional feature was also that selection workshops were held and a comprehensive and final evaluation of capability took place already during the first stage of the selection process. During the second round of tendering focus was on the development and pricing of the tender/design solution. The competitors made binding tenders to the owner according to the breakdown of price components. In addition, the tender needed to include such items as the unit prices used in the calculation of the price components. The multi-stage selection process involving many tasks and parties is presented in simplified form in Figure 7 from the point of view of the partial price selection procedure described below.

The owner compensated some proposal compilation costs to the groups of companies participating in round two, provided that they had been included in the tender prices and specified as a separate cost item. For the two losing groups, the upper limit had been set to half a million dollars, but the sum for the winning consortium could be bigger if the proponent had managed to include it in the tender price.

The duration of the procurement from the publication of the request for proposals to the selection of the preferred proponent was eight months. The alliance contract was signed about two months later. An alliance contract covering the entire project was made meaning that there was no separate contract for the development phase. Design at a corresponding level was naturally included in the project, in particular concerning the sub-projects excluded from the tender.

6.3 Description of partial price selection

The selection of the service provider for the alliance was based on a model that can be considered a partial price competition model due to the extensive scope of the project, although the pricing concerned a considerable part of the road network practically in its entirety, covering all costs at binding prices. The price data to be specified in the tender consisted of the following parts:

- **Total price of construction works** covering the specified part of the project (road network, package 1) based on a unit cost calculation to be submitted as part of the tender. Certain works, estimated to account for about one fourth of the costs, are excluded from the tender (utilities/services networks, etc.).⁷⁷

⁷⁷ Relocations of technical networks, landscaping and greenery planting, illumination, telematics, traffic lights, barriers, art, land acquisition and demolition of properties, etc. However, the project overheads component also had to cover related administrative tasks, etc.

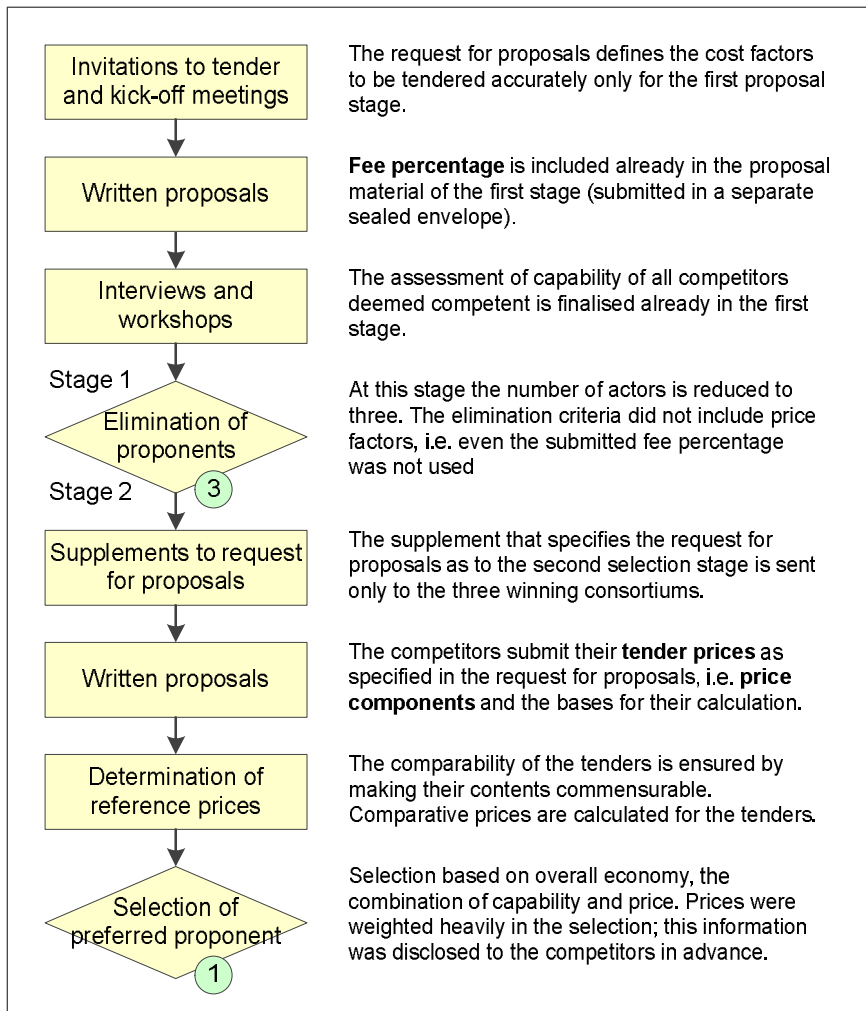


Figure 7. Simplified presentation of the selection process for the arterial road.

- **Fee percentage** that consists of company-level overheads and expected profit when the fees of designers and contractors are combined according to their work shares. The fee percentage was submitted itemised that way in a sealed envelope that was opened only at the end of the second round of selection.
- **Risk provision percentage** that describes the risk provision to be added on top of direct costs and calculated on their basis, which in the light of the pricing of the risk analysis is sufficient to cover expected variation in costs. It is priced and discussed openly starting from the workshops.

- **Project overheads** covering site overheads and other staff costs which, in the case of design and supervision, are complemented by a staff plan and a corresponding breakdown of costs. To make comparisons easier, proponents had to assume at the competition phase that all tasks would be manned by the staff of the service providers (not that of the owner).
- **Defect correction percentage**, which is a cost item reserved for warranty works, calculated from and added on top of actual construction costs. The need to show the costs of warranty work as a separate item was related to funding: being prepared for the timing of costs and the constraints of funding sources played a decisive role there.⁷⁸

All mentioned cost items were naturally binding to the proponent and had to be presented at the price level of a given point in time specified by the owner without including a cost escalation provision in the prices. Changes in costs were to be considered comprehensively in implementation by index-linking.

Besides the specified price components, the proponents were expected to include their pricing bases in their tenders. The construction programme and its schedule, draft designs, as well as planned relocations of utilities/services systems clarified the solutions to be implemented as well as their quantity data.⁷⁹ On the other hand, the manned organisation, designers' charging policies, risk analysis⁸⁰ and complete breakdown of costs (construction element-level unit costs used in calculations) complemented these from the pricing point of view.

In determining the comparative cost the owner used the unit costs submitted by the proponents as a part of their proposals to calculate the estimated magnitudes of the costs of actual construction works for parts of the project to be designed later. These parts were not subject to pricing in the competition, although they were also meant to be included in the works under the very same contract together with the section priced in the tender. Thus, we are dealing with areas 2 and 3 of Figure 8 illustrating the calculation of the comparative price (whereas only part 1 was included in proposal planning). Besides, the owner used his own cost estimate for some works excluded from tender pricing, which was the same for all competitors.

⁷⁸ The project is funded by the state and the federal government of Australia. The latter does not reimburse maintenance costs even in the case of warranty work, which will, however, be paid by the alliance. And because of the shared risk, it also affects the costs incurring to the owner, which is why this information is important. On the other hand, the owner used this method also to turn the attention of the actors to quality orientation.

⁷⁹ Presenting designs and bases for calculation is necessary to ensure that the solutions meet the requirements. After all, pricing was based on the competitors' own designs, and the development of the designs was a central element of competition, which in the selection concretised into the price of the solution. Thus, it was not a question of price-only competition. On the other hand, in the partial price selection model, the proposed solution should be known to the owner also because it helps prevent the risk of later price manipulation.

⁸⁰ Although there is a tendency to prevent exchange of information between competitors, the development of the risk register is perhaps the clearest exception to this rule. Here, all proponents at first comment on and complement the owner's register, and later price the revised version. The risk analysis to be submitted as part of proposals had to address both internal and external risks and was to be conducted, in principle, as a simulation.

6. Case project: arterial road with junctions

The total comparative price was arrived at by adding to the construction costs determined phase by phase first the cost of warranty works calculated as a percentage of them, and then the sum of project overheads also compiled phase by phase, as well as the risk provision and fee of the service providers to be calculated later on the basis of the percentages submitted by the proponents. The risk provision was calculated from the mentioned item covering direct costs and project overheads, and it was added to the cost estimate before calculating the fee from the resulting sum of costs that included the risk provision. However, the setting of the comparative price was not just mechanical calculation, but the evaluation team also had to do a lot of work in making the tenders comparable.

The final ranking of the competitors was made on the basis of both comparative price and capability. The method for the assessment of advantageousness was not disclosed to the competitors to minimise the possibilities of manipulation, but they were told that price was weighted heavily in the selection. On the other hand, the internal weights of the initial stage capability evaluation were disclosed to the competitors in the request for proposals.

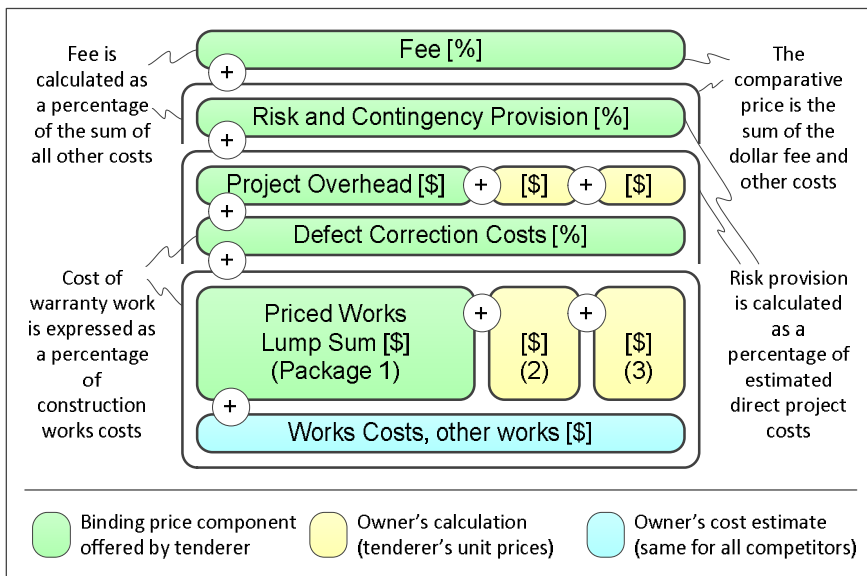


Figure 8. Formulation of comparative price in the arterial road project.

6.4 Project implementation and incentive solution

The conclusion of the alliance contract started the development phase of the alliance where things like TOC of the extensive project is determined. Concerning the first stage of the project, the implementation solution and the TOC had already been largely determined, because the price components of the tender were bind-

ing to the proponents. However, about four months had been reserved for the finalisation of the designs and getting them approved.

By contrast, the latter project phases require extensive design. Their TOC components must be in line with the estimate calculated on the basis of the unit costs of the first phase. Of course, the owner wishes the design solution and its profitability to improve, and in this respect one incentive is the owner's intention to use his share of the savings to commission additional works and expand the project. The target time for the TOC of later parts is five months after the specification of the first TOC element.

The original intention was to commission the project phases as financially separate work packages (although from the same service providers), but during procurement the plan changed so that the TOCs of the different project parts to be agreed at different times are added together to form a single, comprehensive TOC for the whole project.⁸¹ This despite the fact that the plans and costs calculations for different project parts are completed at different times. The different timing, however, allows starting the initial stage rapidly, as there is no need to complete the development phase for all sections of the network before launching the works.

TOCs are index-linked in their entirety⁸² which means that the service providers need not to bear the risk related to increasing input cost levels. This risk is particularly important because the project employs a large part of the resources in the area. However, the TOC that acts as a basis for shared risks here differs from a normal TOC because it concerns only the project's direct costs (including project overheads). Thus, the fee is excluded from the TOC and the fee remains a percentage also in the contract. Nevertheless, the fee is always calculated on the basis of actual costs (not the sum of actual costs adjusted by share of risks).

In the model to be used in the project, small cost underruns and overruns are divided 40:60 between the owner and the service providers meaning that the owner's share is smaller. However, if the TOC is underrun by more than 10%, the owner gets 80% of the portion exceeding this limit. In the case of a TOC overrun, the upper limit of the service provider's liability is set equal to the basic fee (determined on the basis of the submitted fee percentage), which means that the portion in excess of it is borne entirely by the owner.

To create an incentive solution for qualitative key result areas, the owner sets aside a separate sum independent of cost performance, which the service providers can earn by excellent performance. The commercial model, however, is symmetric by nature, so that poor performance leads to a corresponding reduction in the service provider's earnings. The preliminary key result areas to be included in

⁸¹ Because of the uncertainties in funding, the owner at first called the entity a programme alliance. During procurement funding was ensured at the same time as funding freed from other purposes could be allocated to this project. Therefore, it was possible to join parts that were originally planned to be independent under a single contract. Overcoming problems with funding was also made easier by the fact that the TOC of the initial phase turned out to be much lower than the cost budgeted by the owner.

⁸² This differs from the normal practice, which means that index linkage like this is not typical.

the incentive system are relations with interest groups, satisfaction of road users, product quality, environmental impacts, and innovative regional/urban design.

6.5 Experiences

Experiences from the competition were partly two-fold. The main observation, however, is that competition made it possible to reduce the costs of the project radically. It was not as much a question of the production solution as of changing design principles, which were questioned by the competitors. An interchange close to the runway was designed to be at a lower elevation than the runway. The production cost conscious contractors proposed moving the interchange and raising the elevation, which became possible after negotiations and discovering the exact requirements of aviation authorities. The result was a solution that was deemed workable, which the alliance team tendered at a much lower price than the owner's original cost estimate. Together with the accelerated schedule of additional funding, it made it possible to enlarge the scope of the project so that the entity of works that was originally planned as a programme alliance could be realised as a single entity and a project alliance. This way co-operation and economies of scale could be made to benefit the whole extensive project highly successfully.

However, the competition also revealed that under the pressure of price competition, the focus of the proponents was not only on the development of an excellent solution. In reality, it was not necessary to price all structures of the road network section to be priced. This, among other things, led to a situation where all proponents focussed in their design also on how to be able to even artificially minimise the part to be priced, and thus lower their own resulting comparative price (e.g. different types of retaining/gravity walls). Even the proponents felt that they wasted energy on some needless things instead of engaging in development. Correspondingly, the owner's work load was increased by the need to make the tenders comparable before decision-making.⁸³

The uncertainty about whether the various cost factors of the extensive project belonged to the part to be priced or not also caused confusion. Thus, it is evident that the focus in lightening tendering work should be on making pricing as unambiguous as possible and preventing any chance of manipulation. Among the challenges that came up during implementation, due the determination of the stage-wise TOC and the rapid launching of the works, were how the costs incurred divided in reality between the initial phase work supervision and tasks of subsequent development phases – after all, they were to be administratively separate cost items.

⁸³ The owner had already used a very similar partial price selection procedure to select the team for an earlier road project. Its components corresponded to those used in this project with the exception that in terms of direct costs only part of the pavement had to be priced, although the contract covered the design and construction of the entire road structure to an extent that was many times larger than the priced part. Both the owner and the service provider seemed to be highly satisfied with this previously used lighter model.

7. Conclusions

Alliancing has proven to be effective in delivering demanding infrastructure projects. It has also established itself in the realisation of complex transport infrastructure and water supply and sewerage projects in Australia. However, along the way the selection of the alliance team has diversified and price competition is emphasised increasingly also in the selection of alliance teams – either on a full-price or price component basis. Of course, traditional capability-based selection still has its place, for good reason, in the implementation of the most complex projects involving a lot of uncertainty.

Among the selection approaches, partial price selection, where the tender covers only part of the items that finally make up the total price of the project, would appear to be relatively new and little used. In future, however, it can be expected to play a bigger role as the pressure to include price already in the selection of the alliance teams is high in Australia, while the performance of full-price selection is in many cases questionable. This expectation is also based on the fact that the above-mentioned case projects suggest that the price component model works.

The case projects shed interesting light on both the possible applications of price component selection and the reasons behind its use. Both the reasons and applications were different in all mapped cases:

- **In the first project** the model was used mainly to determine project and company overheads and joint costs. Direct costs were determined largely on the basis of later competitive tendering on sub-contracts, so there was no need to price them during the selection of the alliance team. Thus, the use of indirect costs as competition components locked in the price determination criteria reliably enough, and use of the owner's own cost estimate for direct costs made it possible to calculate a reliable comparative price.
- **In the second project** the model was used due the genuine uncertainty related to implementation. The whole was clearly composed of different types of largely independent sections: the main part of the project could be priced and there was significant uncertainty only about the other part, which justified the use of this model. The former project part was priced in the competition, while an estimate was adequate for the latter part of the comparative price, as project overheads were included in the tenders comprehensively.

- **In the third project** the challenge was the extensive scope of the project, which is why a large portion of it had not yet been defined by the competition phase. A key part of the project was developed and priced during the competition. On that basis the owner could calculate a comparative price for each proponent using the tender prices submitted and the default project size and contents. Thus, the unit prices specified in the tender also acted as guidelines for the price level of the project part that had not yet been designed.

The models used in the three case projects differ from each other in many ways. The used price components were different, and the organisation of the selection processes also differs, for example, in the timing of the workshops. The amount and degrees of freedom of proposal planning also vary. Thus, different projects need different models derived from the properties of the projects, and clearly this limited review cannot be assumed to be a comprehensive or mature view of how selection should be made in future. One reason for that is e.g. that although the price component model has many advantages, even it does not get unreserved support in all cases as an alliance team selection method.

In the case of partial price selection models that aim at a relatively unambiguous and comprehensive comparative price, the same doubts often arise that have been found problematic in pure price competition. Besides, the use of price components may make procurement more challenging, unless the contents of the components have been clearly defined. At worst, the proponents get frustrated interpreting the contents. On the other hand, there is the risk that the design solution is manipulated to lower the comparative price without really improving the efficiency of the project. This also makes the comparison of tenders more challenging. Practice has shown that it often requires work from the owner to make the tenders commensurate to be able to derive genuinely comparable reference prices from them.

For these reasons, the price components of the partial price selection model should naturally be as independent cost items as possible. This is also required by the fact that the low prices of components included in the competition cannot be compensated by other cost items to be priced later. Moreover, price components should be defined so that they play a central role in the formation of the overall costs and that they allow the competitors to stand out from each other.

Because of the encountered challenges, some actors believe that even the extreme models, being simpler, work better than sophisticated partial price selection models involving a lot of pricing – or at least are liked better. The latter view may be the best indication that in its most demanding form the model poses just a slightly bigger challenge to actors. In many conventional projects and simplified applications this can be avoided by good planning. On the other hand, especially in the case of more demanding projects it is evident that the other advantages gained by alliancing weigh more than the challenges of competitive tendering.

However, in their totality the experiences from case projects have been highly positive and definitely also encourage considering the possibilities of using the partial price selection model in future alliance projects. Thus, the assumption of the merits of 'a happy medium' seems to be justified, albeit partial price selection is not either expected to be the answer to all situations and projects.

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Director
Alchimie

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⁸⁴ In January 2013 it was decided to amalgamate the *Alliancing Association of Australasia* (AAA) with *Infrastructure Partnerships Australia* (IPA).

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| Title | In search of a happy medium: price components as part of alliance team selection |
| Author(s) | Pertti Lahdenperä |
| Abstract | <p>In project alliancing the construction project owner and service providers assume joint responsibility for project planning and construction through a common organization; the parties also share project-related risks. That allows integrating a wide range of expertise in support of successful implementation of demanding ventures. In order to fully exploit alliancing, the key service providers must be involved in project planning from an early stage which often makes use of the full-price criterion in the selection of service providers questionable. On the other hand, selection involving no price criteria leaves it uncertain whether the project will be profitable or not. Thus, it is not immediately clear how the price aspect should be integrated in the criteria of alliance team selection.</p> <p>This publication hopes to increase the understanding of the appropriateness of using price factors by delving into the practices and experiences of the Australian infrastructure sector. The presently used form of project alliance is an Australian innovation which is why it is justified to chart their experiences. The presentation begins with a review of the Australian guidelines for team selection and the underlying motives. Research related to the subject and the spirited debate in the sector are also delved into. Admittedly, the discussion and writing have focussed on the comparison of so-called extreme models – i.e. selection based on full price and selection that totally excludes price. Consequently, the conducted discussions are included in the publication as a frame of reference although the main aim of the work is to seek solutions in-between these extremes.</p> <p>The essential goal of the publication is to determine whether it is possible to find some intermediate forms that would integrate the good features of both extreme models so that projects could be carried out based on both broad-based competition and good, creative collaboration. An answer to the question was sought by trying to find and describe the procedural solutions of those Australian projects where team selection is based on price tenders for some cost items or parts in addition to capability assessment (i.e. partial price selection). These items do not cover the total project price leaving part of the project unpriced. An estimate for the part in question is prepared on the basis of offered component prices and/or the owner's own cost-estimate items to determine the comparative price.</p> <p>Three partial price (price component) selection projects will be described in more detail. Application of this method has so far been scarce. Experiences from the projects have, however, been for the most part encouraging and support the validity of partial price selection. Yet, it must be remembered that different projects call for different selection methods derived from project properties and boundary conditions of implementation. Use of price components may also make a project considerably more challenging unless the content of components is defined clearly enough.</p> |
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In search of a happy medium: price components as part of alliance team selection

In project alliancing the construction project owner and service providers assume joint responsibility for project planning and construction through a common organisation. Correspondingly, the key service providers are involved in project planning from an early stage. Thus, it is not immediately clear how the price aspect should be integrated in the criteria of alliance team selection.

This publication hopes to increase the understanding of the appropriateness of using price factors by delving into the practices and experiences of the Australian infrastructure sector. It also examines selection based on full price and selection that totally excludes price, but the main focus is on finding possible intermediate forms to integrate the advantageous features of both extreme models so that projects could be carried out based on both broad-based competition and creative collaboration.

This challenge was met by finding and describing the procedural solutions of projects where team selection is based on price tenders for some cost items or parts in addition to capability assessment (so-called partial price selection). These items do not cover the total project price leaving part of the project un-priced. An estimate for the part in question is prepared on the basis of offered component prices and/or the owner's own cost-estimate items to determine the comparative price.

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