Understanding construction consortia: Theory, practice and opinions

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Understanding construction consortia: theory, practice and opinions

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Abstract

Firms form consortia in order to win contracts. Once a project has been awarded to a consortium each member then concentrates on his or her own contract with the client. Therefore, consortia are marketing devices, which present the impression of team-working, but the production process is just as fragmented as under conventional procurement methods. In this way, the consortium forms a barrier between the client and the actual construction production process.

- Firms form consortia, not as a simple development of normal ways of working, but because the circumstances for specific projects make it a necessary vehicle. These circumstances include projects that are too large or too complex to undertake alone or projects that require on-going services which cannot be provided by the individual firms in-house.
- It is not a preferred way of working, because participants carry extra risk in the form of liability for the actions of their partners in the consortium.
- The behaviour of members of consortia is determined by their relative power, based on several factors, including financial commitment and ease of replacement.
- The level of supply chain visibility to the public sector client and to the industry is reduced by the existence of a consortium because the consortium forms an additional obstacle between the client and the firms undertaking the actual construction work. Supply chain visibility matters to the client who otherwise loses control over the process of construction or service provision, while remaining accountable for cost overruns. To overcome this separation there is a convincing argument in favour of adopting the approach put forward in the Project Partnering Contract 2000 (PPC2000) Agreement.
- Members of consortia do not necessarily go on to work in the same consortia again because members need to respond flexibly to opportunities as and when they arise.
- Decision-making processes within consortia tend to be on an ad hoc basis.
- Construction risk is taken by the contractor and the construction supply chain but the reputational risk is carried by all the firms associated with a consortium.
- There is a wide variation in the manner that consortia are formed, determined by the individual circumstances of each project; its requirements, size and complexity, and the attitude of individual project leaders. However, there are a number of close working relationships based on generic models of consortia-like arrangements for the purpose of building production, such as the Housing Corporation Guidance Notes and the PPC2000.

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1 Introduction

The contractual environment

Construction consortia arise in several different forms. They are one of many ways in which traditionally separate parts of the construction procurement process might be integrated. Sometimes, this integration involves a single firm taking on obligations wider than it is capable of undertaking alone, and then subcontracting elements of the work; at other times, groups of firms get together to act as a consortium to meet the needs of a client.

An example of such arrangements, which may involve a number of firms with different areas of expertise, is design-build-finance-operate (DBFO). DBFO essentially provides a complete private sector service (or the services of a building), which the public sector agrees to purchase over an extended period. In DBFO projects the commercial risk is nominally taken by the private sector operator. The public sector client only undertakes to purchase the output over a given period. At the end of the contract, the assets remain with the operator. Similar arrangements may involve the transfer of the built assets to the public sector client at the end of an agreed period, such as build-own-operate-transfer (BOOT), which has long been used to realise major construction projects, especially in less developed countries.

Public sector procurement and the construction sector

Construction procurement by the public sector has long been seen as a problematic. A recent report (Office of the Deputy Prime Minister 2003: 12) expressed concern over traditional approaches to procurement by local authorities. According to the Office of the Deputy Prime Minister (ODPM), the traditional interface between clients and contractors and the management of contracts often caused problems, which constrained innovation and inhibited the use of external suppliers. For high value and high risk projects, the ODPM (2003: p18) suggested that local government might adopt partnering as an alternative approach.

Firms often form consortia to provide large and complex public sector projects. These appear to be relatively efficient and effective. Hence, once a public sector client has decided that a major project is needed, it will often engage a consortium with sufficient financial backing and technical expertise in construction to carry out the work.

It seems reasonable to assume that, by using a consortium, a team could be employed which would work together to solve problems, reduce costs and lower risks. At the same time, quality issues could be addressed; all this could be achieved in a shorter period than with traditional procurement methods. Moreover, not only could the consortium carry out the building work, the same arrangement could be used to deliver services, including facilities management, after the construction phase. One of the purposes of this report is to test the validity of such aspirations, and the extent to which they are matched in practice.

Government has encouraged construction firms to work in teams and has involved private sector finance in the funding process through its Private Finance Initiative (PFI). In response to this approach, Special Purpose Vehicles

(SPVs) are set up to structure the delivery once a contract has been agreed. But before a contract can be agreed, informal consortia may be formed, combining banking, property and construction companies. Only when one of these informal consortia wins a bid is an SPV formally established. Several methods of public procurement have emerged under the umbrella of PFI, including Prime Contracting for MoD projects, Procure 21 for NHS projects and Framework Agreements for schools and other types of building.

These initiatives usually involve structures that penetrate the supply chain. In Prime Contracting there are clusters of firms supplying the cluster group leader or Prime Contractor. Each of the clusters has clusters of other firms supplying the specialist firms. Under Procure 21, Primary Supply Chain Partnerships (PSCPs) have been set up. These PSCPs are construction consortia, which have pre-qualified for NHS projects. There are only 12 PSCPs for the whole of England. However, in a case study of Procure 21 carried out by Proverbs and Riley (2003), caution was expressed. Proverbs and Riley found little awareness among NHS Trust staff of the supply chain companies and although NHS Estates advertised Procure 21 widely, individual members of staff were not generally prepared for the new system of procurement when it was launched.

Framework Agreements are deemed to be contracts in order to comply with EU directives. The framework sets up arrangements for suppliers to work together over a period, or over a number of building projects. These agreements enable firms to undertake a series of smaller projects, such as school building, on

In construction there has always been co-operation and a problem solving ethos; otherwise buildngs could never have been built.

behalf of the same client body or local authority.

The use of consortia in construction does not necessarily mean that construction firms could not work together outside consortia. In construction there has always been co-operation and a problem-solving ethos; otherwise buildings could never have been built. Indeed, as reported below, one interviewee argued that, in view of this traditional method of firms working together, it would be difficult to find any advantages in setting up consortia in construction: in any case, the incentives in consortia are in all the wrong places. For example, one of the major contradictions facing construction firms working in consortia with long-term undertakings is that building contractors, and even many property developers, only have a short-term interest in any project, up to the end of the construction phase, and then they sell it on.

Nevertheless, the management of risk may be one factor leading to the formation of consortia. In construction projects it is always possible to find someone else to blame. It might be argued that one of the main reasons for the formation of a consortium is because it is not possible to parcel up risks. The members of a consortium are forced into the position of trusting others to make commercial decisions on their behalf, which they are going to be held to, because in principle, though not necessarily, they are all jointly and severally liable. In practice, ultimately, the client or individual parties carry the risks at present. For this reason consultancy firms and others carry professional indemnity insurance.

Issues and questions

The Office of the Deputy Prime Minister (2003: p24) identified a number of methods of procurement of particular relevance to local government, including potential partnership models, that required further study and research. Partnership models are examples of consortia in construction. The questions raised in this discussion concern the formation, composition and operation of consortia in construction. Are construction consortia indeed effective and efficient or are they purely marketing devices adding little value to the process? This study examines questions about the working of consortia in public sector projects. The main objectives of the research are to:

- examine the formation of consortia in the construction industry,
- examine the roles and relationships of the members of consortia,
- understand the motives and strategies of firms in construction consortia,
- examine the working practices of firms in consortia,
- examine the manner in which consortia are used to mobilise productive resources,
- examine risk and sources of conflict in construction consortia, and
- consider the operational differences between integrated supply teams and consortia.

This study focuses on those situations in which several firms combine to provide a building or structure as a complete contract, or as part of a contract to provide services to government acting as client on behalf of the public. This would include those projects involving construction either financed through traditional public sector funding means or through PFI.

The public sector work undertaken by the construction industry shares many of the economic characteristics of the construction industry in general. Hillebrandt (1984) points out that the construction sector has many economic features, which it shares with other industries but in combination, distinguish it from them. Raftery (1991) points out the bulkiness and low value-to-weight ratio of materials, the high labour content of output, the low levels of fixed costs and the high level of subcontracting in construction. Gruneberg (2000) highlights the size of construction projects relative to the turnover of contractors. Each project is therefore an opportunity to generate profits but is also a threat to the survival of the firm if problems emerge. If problems emerge, such as cost overruns, delays, technical difficulties, and late payment, losses on any one project can be greater than the profits of a firm's other projects and its capital assets. These characteristics often form barriers to building efficiently and effectively both in the public and private sectors. Several public sector projects (Portcullis House and the British Library are but two examples of some of the larger projects) have encountered management and funding difficulties. These characteristics are often the main reason for cost over-runs and building delays especially in the public sector. There is no reason why they cannot be managed, but as yet they have often appeared to involve intractable difficulties.

One feature of the building production process of particular relevance to public sector construction procurement is that large construction projects are usually carried out by a number of construction firms, often as many as 30-40 specialists, and sometimes more than 70. Moreover, the size of projects often

requires a number of firms to contribute risk capital and arrange debt financing. It is these equity-contributing firms that are seen as the building consortium, but construction contractors usually remain outside the real consortium, being members of the consortium in name only, for marketing purposes.

Banks and property developers with joint contractual financial arrangements may participate in the management and production of projects by being partners in a construction consortium. But they are only part of the management and production of projects. The actual building production is undertaken by a supply chain of a number of firms. The consortium forms a buffer between the public sector clients and the technology and resources used in the process. In considering the formation, nature and behaviour of collaboration, and the risks associated with joint ventures in construction, our approach is to examine consortia in the context of their building projects as a whole.

Research method

The method of study in this report is based on a literature review reinforced with interviews with a number of leading practitioners. Interviews with selected practitioners from the demand side and the supply side of consortia have enabled us to develop clear explanations and answers to the research questions. The interviewees represent a public sector client, a developer, a bank, a financial consultancy, an independent project manager, a construction industry consultant, two main contractors, a specialist subcontractor and a legal advisor. The size of firms approached ranged from small consultancies to relatively large firms, such as Bovis Lend Lease, Symonds and EMCOR Drake and Scull. However, the responses of only one main contractor, randomly selected from those interviewed, are used in the tables to maintain a balance. The views expressed do not necessarily reflect the views of the firms and named organisations.

It is important to state that the interviewees were not randomly selected and are not necessarily representative of the industry as a whole or even their particular specialisms. However their views on consortia in construction were not known before the interviews took place. The interviews should be seen as indicative of some opinions held in the industry concerning consortia. Far more interviews would of course be needed to find statistically significant results.

The interviews were divided into an open discussion of construction consortia and a series of specific questions designed to highlight particular issues. The questions covered two areas of interest; first, the setting up and operation of consortia and second, the management of risk and decision-making.

Eight full interviews were conducted, along the lines indicated in Appendix A. In addition, two further interviews were carried out for the purposes of dealing with some specific outstanding issues. While these additional interviews are reported in the next section, they are not included in the systematic, tabular analysis shown in this section.

2 Construction consortia in general

Terminology and definitions

Several longer-term or strategic relationships within the construction industry have emerged in the last few years, including consortia, joint ventures, partnering, special purpose vehicles, strategic alliances and supply chain management. They are all examples of construction and property syndicates. Unfortunately the terms are often used loosely or interchangeably by practitioners and this leads to confusion over the definition of the terms in practice. Fortunately, the business context invariably makes the meaning clear. Nevertheless, it may be useful to propose some operational definitions for these terms in this report.

In this paper a **consortium** is defined as an arrangement between several firms, in which each firm contributes an equity stake in the form of risk capital or payment in kind in order to qualify as a member. Remuneration of consortium members may be calculated as a share of the net profits of the consortium.

A **joint venture** is characterised by a number of firms collaborating on a project, or a number of distinct projects, with a view to sharing the profits, each firm being paid on the basis of its agreed contribution in kind or in financial terms.

A **partnering** agreement involves a number of firms, usually including the client, working co-operatively to achieve a given output over one or a number of projects. Remuneration is usually based on contract terms and contribution to the work.

A **special purpose vehicle** (SPV) is a formal accounting and contractual arrangement set up by one or more firms to undertake a project or a series of projects separate from the accounts of the firm(s) comprising the special purpose vehicle. Thus, not all SPVs are consortia. However, consortia invariably set up SPVs after being selected to carry out specific work, and the members of the consortium become shareholders of the SPV.

The distinctions between consortia, joint ventures and partnering arrangements are, however, not as clear in practice where variants and ad hoc arrangements necessarily blur and confuse the boundaries of the terms because of the need to tailor relationships in response to the needs of each project. Moreover, different interviewees interpreted the terms differently, often depending on their role in the property and development process.

Furthermore, not all construction firms working closely together are necessarily working together using any of the above arrangements. Strategic alliances are formed by firms who seek to work together on an on-going basis as and when the members of the alliance win work from different clients, provided the specialist skills are required. Another example of closer working relationships between firms in the construction industry appeared in a briefing paper to the members of the Specialist Engineering Contractors' Group (2003). According to this briefing paper, Egan (1998) suggested that the Defence Estates, NHS Estates, the Highways Agency and other public sector building procurers should encourage the industry to form integrated

project teams (IPT), which are not consortia. IPTs should consist of all those involved with the design, manufacture, assembly, installation, operation and maintenance of the building. These IPTs are thus intended to work closely with the client over the whole process with a view to achieving the customer's business objectives. The SEC Group favour the selection of IPTs based on best value rather than lowest price. This is seen as providing participating firms with opportunities to provide cost-effective solutions, enhance their own profit margins and secure greater continuity of work.

The Egan Report does not mention IPTs, as such, but does discuss integrating the (construction) process and the team around the product, (Egan 1998: 16). This integration does not necessarily imply the formation of new entities, such as consortia, to undertake the work but does imply the need for greater co-operation and understanding. Supply chain management is one response, which seeks to reinforce the continuum of relationships formed by working on a project through greater communication and understanding between all the parties involved, extending upstream to include building component suppliers, where necessary.

Types of consortia

Although some construction consortia may appear to include contractors, many PFI bids are assembled by developers and financiers, only using a contractor to present a technical input to the client. In practice, the construction contractors are kept at arm's length and are not full participating members of the consortium. There is no one form that defines construction consortia. On the contrary there are several types of consortia: developer-financial consortia, developer-financial-contractor consortia, client-developer consortia and single-type-organisation consortia. Some are involved in the essential commercial risk-taking of projects while others are involved in the building production process and some combine commercial risk, construction and service provision. Variants of the consortium concept also depend on the relative size, skills and financial inputs of the various parties needed to meet the specific demands of each project, building or service requirement.

It is not always possible to distinguish ex ante the type of consortium adopted in any given project, especially where contractors are involved at an early stage. Contractors are often used at an early stage to demonstrate the existence of a team, but at this stage the contractor may have made very little commitment to the consortium. According to one contractor interviewed for this study, the membership of consortia can change between the initial presentation and the actual work on site. Much depends on the working relationships between the actual people forming the consortium.

Figures 1 to 3 show the relationships of different parties, where private sector finance is involved, during three distinct phases beginning with the initiation of the project, the selection process and ending with the procurement of the building and services. Figure 1 shows a developer-led consortium comprising a developer and a funder. The client is involved throughout the process but remains separate from the consortium, which

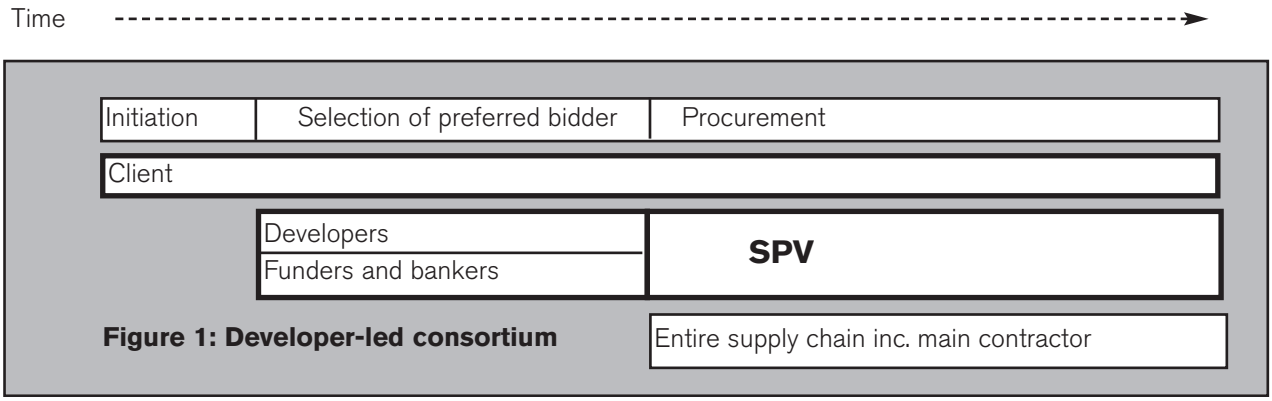


Figure 1: Developer-led consortium

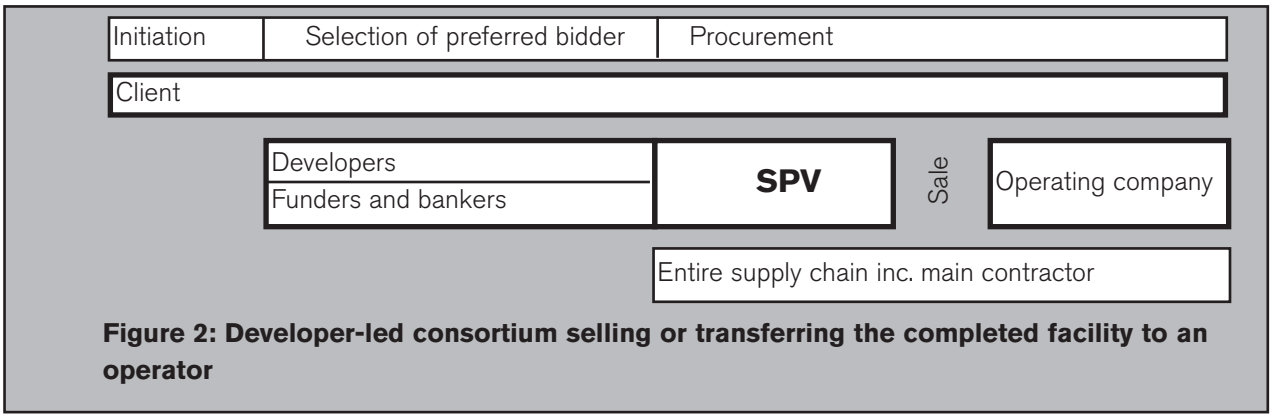


Figure 2: Developer-led consortium selling or transferring the completed facility to an operator

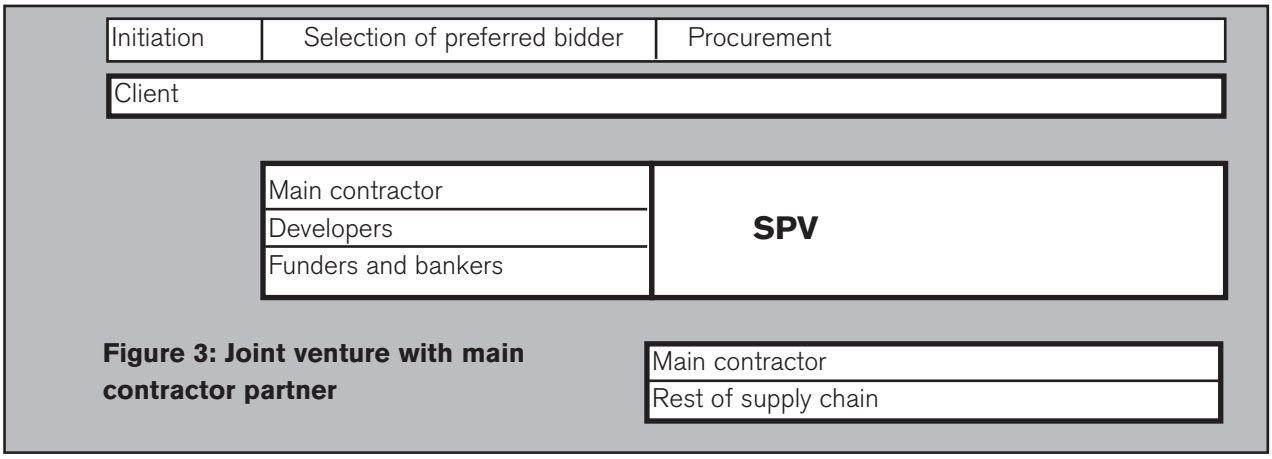


Figure 3: Joint venture with main contractor partner

in turn is separate from the supply chain. Developers and funders generally take responsibility for marketing, financial control and the commercial risk of undertaking the project. Contractors and facilities managers and other suppliers, such as component manufacturers, undertake the delivery of the project or services according to their contractual obligations. Their risk is related to production risk.

Following initiation of the project by the client, a number of consortia may compete. The point at which a preferred bidder is selected is known as the financial close. On reaching the financial close the consortium moves from an informal arrangement to forming an SPV. In Figure 1 the project is only concerned with the procurement of a building or structure. In Figure 2 the consortium is engaged to provide on-going services through an operating company. This takes the form of a project management company to which the operating contract is transferred.

Figure 3 shows an example of a contractor-led consortium. However, it is usually a financial division of the construction firm which is engaged in discussions with the other members of the consortium. Consequently,

the bid vehicle comprises the contractor's financial division, funders, the developer and the main contractor. After financial close (when a bidder is selected) the SPV is formed and the main contractor becomes both a member of the SPV and a separate member of the supply chain. As the main contractor is part of the joint venture, part of the supply chain is included in the SPV, but not all. The contractor may be a shareholder of the SPV but is also one of its suppliers.

Figures 1 to 3 illustrate the barrier formed by construction consortia, because the entire supply chain is separated from the client making it difficult for contractors and clients to communicate. This is dealt with in greater detail below.

Relationships between firms in consortia

Apart from the very smallest of jobs, construction projects invariably involve a number of firms, each providing specialist knowledge and skills. In their advice to local authorities the Office of the Deputy Prime Minister (2003) recommend a number of procurement routes or delivery models to organise the construction process, including partnering. Partnering models include public sector consortia, PFI and other forms of DBFO contracts, partnering contracts, joint venture companies and framework agreements (incremental partnering). This proliferation of terms leads to confusion but it is clear that every construction project requires a relatively large number of firms to collaborate in one way or another in order to organise the supply chain.

In their paper discussing a survey of supply chains, Akintoye, McIntosh, and Fitzgerald (2000) point out that although they found improvements in planning and purchasing, a number of barriers remained which inhibited collaborative working. They found a hostile culture in the industry, a lack of commitment to supply chain management (SCM) amongst senior managers in the top construction contractors they interviewed and organisational structures which failed to encourage collaboration. They also felt there was a general lack of knowledge and understanding of SCM. If SCM is taken as one form of consortium in construction, in which the contractors and suppliers co-operate closely, it is clear that the managers of firms have a first loyalty to their own companies rather than the SPV or the other firms in the supply chain. We consider this aspect of the behaviour of firms can best be explained in terms of game theory, which is discussed below.

Consequently, we believe consortia do not necessarily lead to vertically integrated processes in construction but simply add another layer of contractual arrangements. However, a greater degree of co-operation between main and specialist contractors would, according to Egan (1998), also reduce the adversarial nature of the process. However, in practice the underlying relationships seem to have remained essentially unchanged.

Nevertheless, it might be argued that integrated teams might reduce duplication of effort through improvements in communication between the various parties, but at a cost and

this cost may be high, if firms take advantage of preferences offered by being a member of the integrated team. It is the consortium nature of construction, according to Pearce (2003: 23), which creates major difficulties between the various participants in the building process and adds to the transaction costs of delivering 'consistent work patterns and effective communication'.

These difficulties may also vary depending on the extent to which a consortium is an equity alliance, with consortium members sharing financial risk or a non-equity alliance. In a non-equity alliance the firms simply collaborate closely on a contract as in a supply chain or partnering arrangement. One area of difficulty is trust between the participants. Langfield-Smith (2005) examines trust within alliances or consortia. According to Langfield-Smith, where there is a high level of uncertainty, control is more easily achieved if firms have equity at risk or have invested in the consortium. Langfield-Smith uses transaction cost theory and concepts of trust to describe goodwill trust and competence trust in the context of construction consortia. Again transaction costs are discussed in more detail below.

Figures 4 to 6 show different kinds of relationship between clients and members of consortia and between the members of consortia. The terms ìarchitectî and ìengineerî are used to indicate the different professional inputs which may be included within a consortium. Figure 4 shows the client outside a consortium faced by a number of firms which

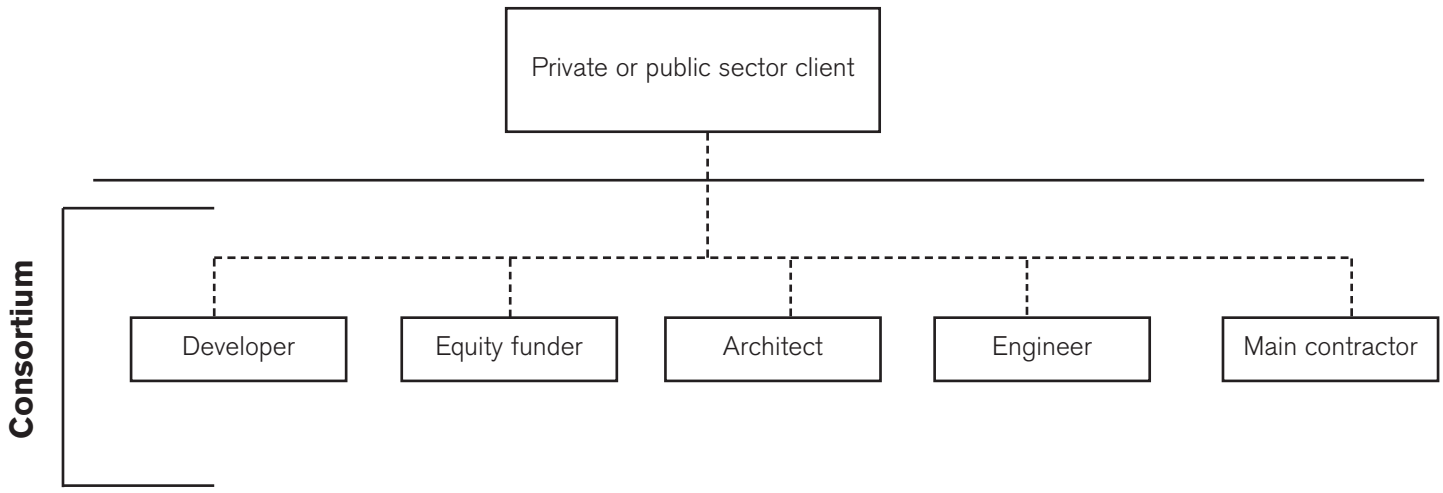


Figure 4: Consortium showing external client and lines of communication between individual members of a consortium and the client, with little or no communication between members of the supply chain

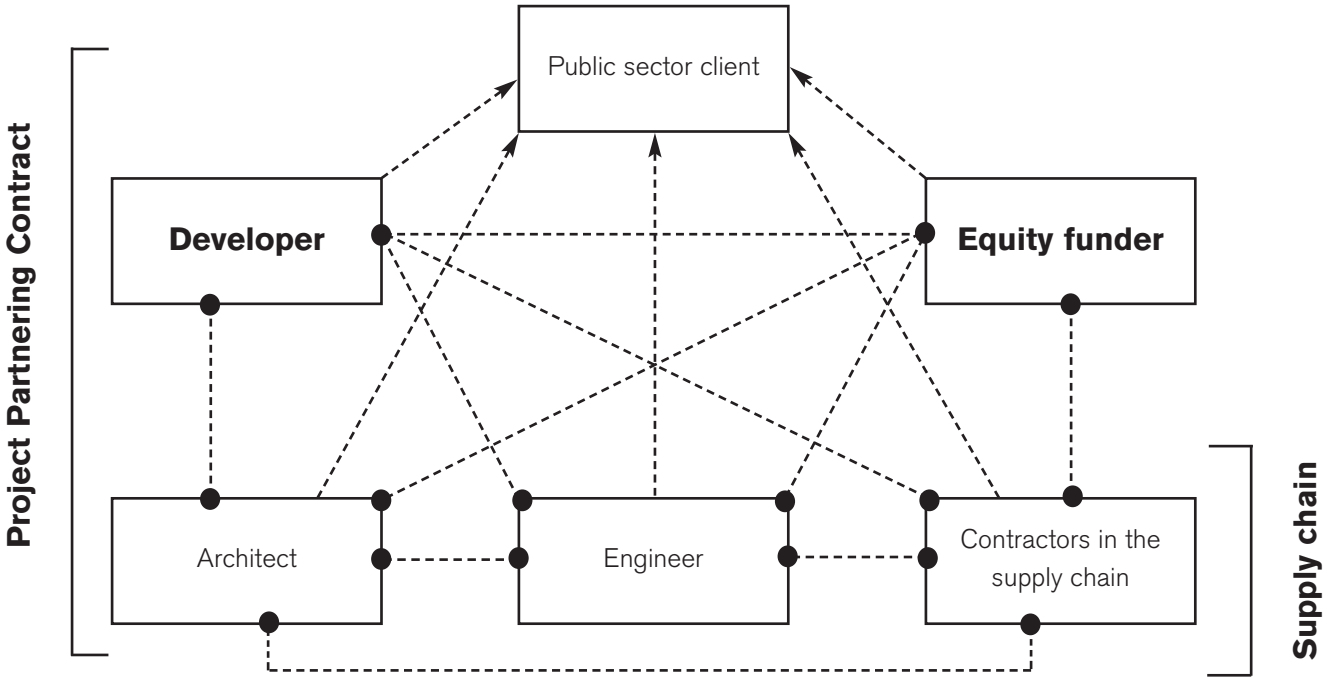


Figure 5: Project Partnering Contract showing the client within the contract arrangements and lines of communication between individual members of a consortium and the client and between members of the supply chain

combine to negotiate with the client but do not necessarily have close working relations with the other members of the consortium. Nevertheless the consortium presents a unified approach to the client in order to win the tender process although the arrangements between the consortium members remain informal until financial close.

In partnering arrangements, the firms agree in principle to form a partnering arrangement at the pre-tender stage. If the consortium is successful, the bidders are joined by the client. Figure 5 illustrates the assumption that all parties to the project, ranging from the client to specialist contractors, are able to communicate freely. Only a relatively few unimportant contractors may remain outside the partnering arrangement. This specific arrangement appears to model the social housing sector where Housing Associations work with private sector developers and contractors to build social housing and houses for sale. This also appears to be the model assumed in the PPC2000: Project Partnering Contract (Mosey 2000) .

PPC2000 requires the active involvement of the client with full and open communication between all parties. As shown in Figure 5, lines of communication are seen to exist between all members of the partnering agreement and especially between the members of the supply chain and the client. However, this mode of working is not common in projects for public sector clients. More generally, in recent consortia which have been established to serve public sector clients, the

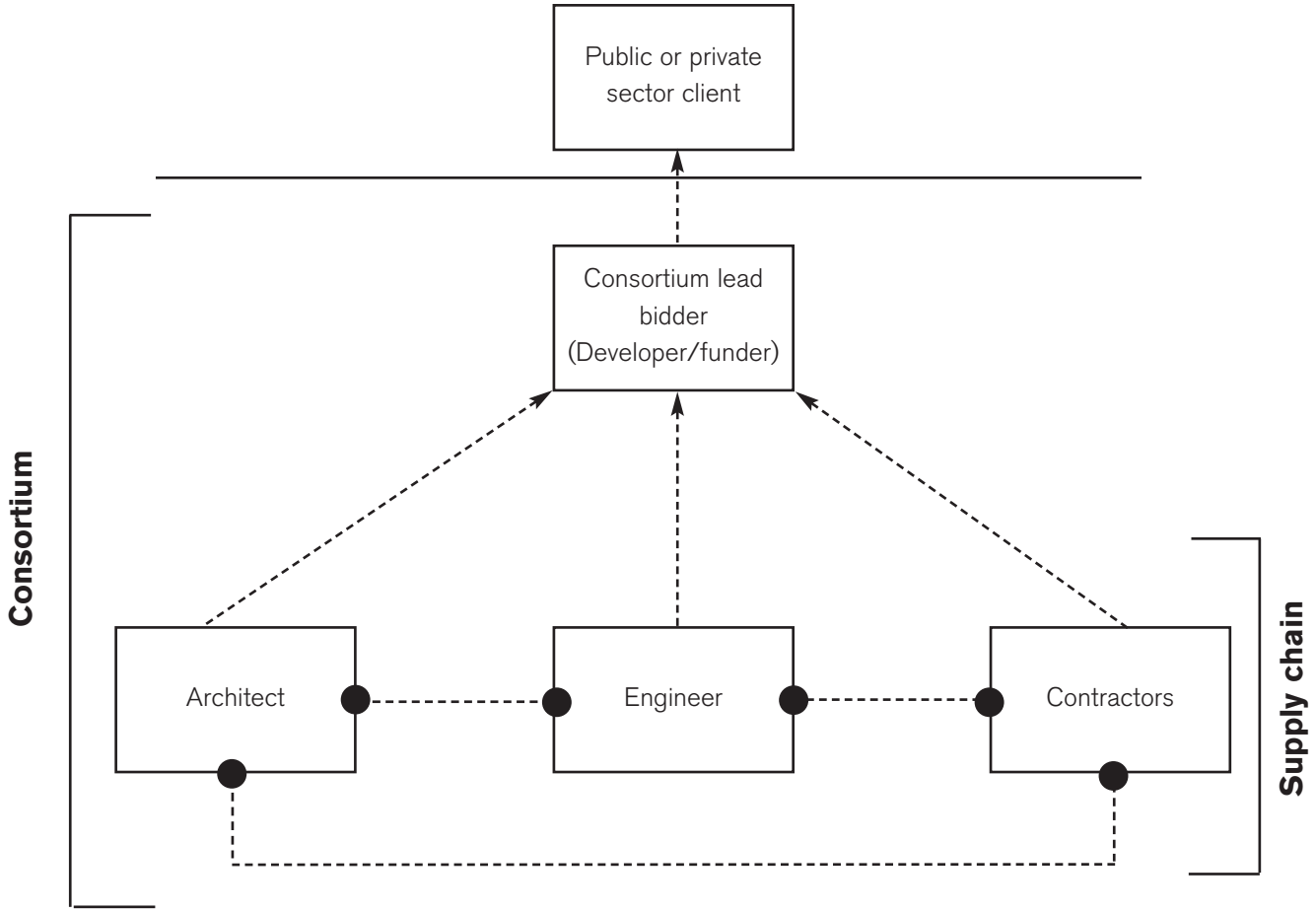


Figure 6: Consortium arrangement showing lines of communication between individual members of a consortium including the supply chain but excluding the client

client is not contractually part of the consortium.

In Figure 6 the consortium lead bidder directs the supply chain and negotiates with the client. The lead bidder is usually the partner contributing the greatest share of the bid costs, a role usually taken by the developer, contractor or facilities manager. The client thus remains outside the consortium, which can form a barrier between the client and the supply chain.

This pattern of consortium arrangement appears to predominate. In effect, the core of the consortium is comprised of the lead bidders, who are usually the developers with their financial backers. They take the initiative with the client and act as a catalyst for the supply chain, which they control. The supply chain is seen by the lead bidders as separate from the core of the consortium. In this model the presentation of the consortium to the client may include the contractors. But, in reality, the supply chain is at best an integrated set of some of the suppliers (as illustrated in Figure 6), working for the consortium lead bidder.

Reasons for consortia in construction

Construction consortia are an attempt by property and construction firms to integrate vertically, while remaining separate entities. This contradiction in terms leads to many misunderstandings and difficulties.

Nevertheless it is an attempt to respond to market pressures caused by the size and complexity of projects put to the industry that require more than a specified building on completion. The continuity of responsibility after the construction phase, and into the building-in-use phase, has led to a need or desire to integrate the firms engaged in the provision of the built environment.

This section deals with the reasons that firms may choose to work in consortia rather than as fully vertically integrated firms providing a full construction and facilities management service in-house.

Many consortia are formed in anticipation of client requirements or in response to pre-contract qualification criteria set by the client. There may be several reasons for the belief in the efficacy of consortia both from the clients' point of view and from the point of view of the members of the consortia. Indeed the Office of the Deputy Prime Minister (2003: p35) suggests a number of benefits to be gained by local authorities from partnering arrangements, defined as the 'the creation of sustainable, collaborative relationships with suppliers in the public, private, social enterprise and voluntary sectors to deliver services, carry out major projects or acquire supplies and equipment.' Although the ODPM do not say so in their report, it could be argued that these advantages may also be applied to consortia in general. According to the ODPM report, these benefits include better designed solutions, integration of services for customers, access to new and scarce skills, economies of scale and scope and investment. However, no evidence is given in support of these assertions in the report.

Size of firms relative to projects

One reason for the existence of consortia in construction is given by Pearce (2003: 23), who shows that one of the consequences of the predominantly small size of specialist firms in construction is that they must co-operate with other small firms in order to undertake relatively large building projects. For firms entering consortia-type arrangements the shortage of in-house expertise and the high cost of tendering can lead firms to collaborate on projects.

Risk management

A second reason for forming consortia in construction is implied by Hayes, *et al*. (1987), who discuss risk management from the contractors' point of view. Although Hayes *et al*. are not concerned with the issue of consortia they discuss the issue of risk management, arguing that an appropriate contract strategy involves consideration of the organisational structure needed to control both design and construction and the relationship between them. The allocation of risk between the various parties may not be best served by traditional contracting arrangements in undertaking high risk complex projects. When difficulties arise on site or when there are major cost overruns it may be too late to avoid the costs of delay, arbitration or litigation. They advocate 'active management of a risk by all parties.' (Hayes *et al*. 1987: 24)

We argue that the idea of active risk management should be taken further in proposing that a construction project should begin with an analysis of the main objectives

and risks in a project, followed by the identification of roles and responsibilities, and only then the identification of contractual terms which bind the parties in legal relationships. This is the opposite of the more usual practice of starting with a standard-form contract and adapting it to suit particular circumstances. Consortia may be viewed as organisational structures which take risk into account at the earliest stages in a project rather than waiting for problems to arise at a later stage. They therefore signal a clear move away from traditional approaches to the procurement of construction work. An even more direct approach to dealing with the early identification of risk and design issues may be provided by recent developments in partnering arrangements as defined by the PPC2000 partnering contract which is discussed below.

The management of risk through the use of consortia may be viewed as an industry response to demand put to it by the public sector and very large private sector clients. Demand is put to the industry in the form of project proposals. These projects tend to be very large and complex. At any one time construction firms hold a portfolio of discrete projects on which they are working. Only firms of a certain capacity can undertake work over a certain size or complexity. When the workload exceeds that size firms have no option but to seek partners. Otherwise the exposure to risk represented by one project contradicts the need to balance risk in the firm's portfolio of projects. In this way the relative commitment of any one firm to any particular project is limited. Few firms would devote all of their resources to one project. Nevertheless, each project still constitutes both a source of revenue for the firm and a threat to its profitability and even its continued survival.

Transaction costs

A third reason for consortia in construction concerns the cost of transactions. Williamson (1975), Dietrich (1994), Winch (1989) and Gruneberg and Ive (2000) refer to a number of hidden expenses subsumed in the transaction process. Transaction costs are caused by a number of different factors, which impinge on decisions to buy or sell. These factors include 'bounded rationality' which refers to the complexity and uncertainty associated with decision making. Secondly, 'information impactedness' refers to the limited knowledge of the parties to a transaction which denies them the ability to make correct purchasing or selling decisions. Williamson refers to opportunism, which occurs whenever firms take advantage of the information impactedness of the co-transactor. Winch also notes the existence of asset specificity which refers to specialised plant and other capital equipment which may only occasionally be required in unique circumstances. The problem of costing the use of specialised plant in unusual conditions allows firms to take advantage of the lack of an established market price.

Transaction costs occur even when consortia are engaged. One symptom of high transaction costs associated with the Channel Tunnel project, for example, was the fact that, according to figures in The Sunday Times of 8 October 1989, there were approximately 400 men actually digging the tunnel and at least 800 people monitoring their progress in the

headquarters of Transmanche Link, Eurotunnel and Atkins/Setec, the Maitre d'Oeuvre. There were also several advisors to the 200 banks funding the project.

Nevertheless the formation of consortia may be seen as a rational response to the economic and commercial environment in which firms operate. Production processes in construction are highly fragmented and specialised. Many separate firms must come together in order to construct and operate buildings. These complex relationships are determined by the markets for the various services and components needed: design, management, piling, steel erecting, cladding, facilities management and many other specialisms. Before a contract can be signed the product or service must be defined and understood by both parties; both sides to the deal must have confidence that the order will be carried out and duly paid for. A consortium is often seen as one solution for discussing and overcoming the uncertainties which may arise and for facilitating negotiations with the client. However, in reality the process remains fragmented; both within consortia and through the supply chain. Indeed, the discussions between the consortium members and the client rarely, if ever, include members of the supply chain.

Nevertheless, von Branconi and Loch (2004) provide a strategic checklist-framework for dealing with transaction cost aspects which may arise in project contracts before more detailed considerations are discussed. This checklist consists of eight key areas, namely:

- Technical specifications, including use, operation and maintenance
- Price, consistent with the technical specifications allowing for contingencies and profit margins
- Payment terms which recognise the cash flow issues facing contractors
- Schedule with key milestones clearly defined and understood
- Performance guarantees including those to be undertaken by the client
- The period of warranties specifying the re-performance of services and or the replacement or repair of building defects
- Limitation of liability to protect contractor by providing a maximum exposure
- Securities, such as bank guarantees, may be used to offer a limited degree of assurance to both or either party

Von Branconi and Loch (2004) argue that these key areas are all sources of transaction cost, with associated areas of uncertainty as described by Williamson (1992), Jarillo (1988) and Stinchcombe and Heimer (1985). The first four key areas specify the project while the second four give assurances to both sides.

Jarillo (1988) discusses strategic networks of partners, which require partners to agree their goals through continuous collaboration and interdependency. As construction involves discrete projects, with future collaboration

uncertain, if not unlikely, firms may be tempted to take advantage of short term opportunities. Stinchcombe and Heimer (1985) discuss a possible solution to transaction costs caused by clients' changing requirements during a project's construction. They suggest that the relationships between the separate firms should be organised much more along the lines of relationships found inside organisations. A higher degree of co-ordination and information-flow between the firms should help a network of companies to be more responsive to changes. Indeed, the practical operation of construction consortia provides the very command structures, authority systems, dispute resolution procedures, standard operation systems and incentive schemes that are called for by those who seek to improve inter-firm collaboration.

Game theory

We have noted that project size and complexity influence the way firms collaborate. This response is an application of game theory. According to Hargreaves, Heap and Varoufakis (1995) the situation facing firms in the construction and property sectors appears to comply with the conditions of game theory. These conditions are that there should only be a limited number of players, that the players expect the behaviour of the other players to be based on a similar rationality to their own and that the actions of one player impact on the other players.

Three types of game may be identified: hawk-dove, co-ordination and prisoners' dilemma. In the hawk-dove game, the share of profits is unequal but all lose if the players fight. In the game of co-ordination, if firms co-operate they win but if they fight they all lose. In the prisoner's dilemma, individual firms act in their own interest but are worse off as a result.

In brief, different games are played out in construction consortia. The different scenarios of winners and losers depend on the terms and conditions affecting the project that each consortium undertakes. The advantages of co-operation may be the initial driver towards setting up consortia.

It may be assumed by firms and organisations that the members of a consortium combine to their mutual advantage in a form of co-ordination game. However, unexpected events may adversely affect all the parties and can create conflicts, which lead firms into confrontation, to their mutual detriment. An alternative game is presented by the prisoners' dilemma in which the members of the consortium each act in their own interests with the result that the gains from the consortium are lower than they would have been had the firms been able to co-operate. In the hawk-dove scenario firms combine to form consortia but some members are far more powerful than others and are in a position to take advantage of their position. The result is that some firms are worse off than they would have been, had some members not taken advantage of their relative strength. From this brief summary of applied game theory it is clear that conflict is inherent even within consortia, even where co-ordination games are being played, due to the impossibility of predicting all the eventualities that may arise.

Conflict and dissent in the production process

Consortia are formed by a number of diverse organisations in order to undertake projects. These projects are therefore shared amongst the members of the consortium. However, Ive and Gruneberg (2000) argue that members of joint ventures do not share the same goals. In construction projects it is typical for each member of the team to have distinct goals often in conflict with the other members (Murdoch and Hughes, 2000). Moreover, not all members of the team are of equal importance or have equal power (Greenwood, 2002).

Nevertheless, a consortium (as distinct from the project itself) may be deemed successful if participation in the joint venture is sufficiently profitable for each member and each member perceives his or her reward to be commensurate with his or her contribution. But where firms collaborate, these conditions are almost impossible to find. In the course of any project, disagreements between the parties invariably emerge as disputes arise over payments for unplanned, unexpected or unavoidable additional work. Of necessity these disputes must arise as each organisation seeks to promote its own interests within the context of a zero sum game, in which one party can benefit only at the expense of another.

This is not to say that conflict is necessarily destructive. Indeed conflict may be expected and even welcomed as part of a creative process or as a result of care, passion and involvement by people representing different firms. For example, it is quite possible that a quantity surveyor (QS) may be concerned with controlling costs while the contractors are

....conflict may be expected and even welcomed as part of the creative process....

concerned with delivering a building according to specifications. If costs are escalating to the point where cost overruns become inevitable, then the conflict between the QS and the contractor may be used to find a compromise solution.

Management of conflict

Lawrence and Lorsch (1967) suggest three methods for dealing with dissent within complex business organisations, namely: confrontation, smoothing and force. The terminology of Lawrence and Lorsch can be applied to disputes within consortia. Confrontation involves presenting the relevant facts and seeking a solution to a problem through discussion and negotiation. Smoothing relies on emphasising the commonalities between the parties to a dispute and the costs of failure to both parties. The third method is force and depends on the relative power of the firms in dispute. One of the problems with firms adopting force is that they may benefit themselves at the expense of the totality of the consortium. Unfortunately, the use of force in construction disputes is common. Consortium members may use these three methods to achieve their individual objectives but the resolution of any argument depends on the relative economic power of the participants. For this reason the use of confrontation and force will tend to be more effective than smoothing, as Lawrence and Lorsch showed in their empirical work. The danger to be avoided is a tendency not to leave forcing as the technique of last resort, with the effect of impairing openness and trust between the parties in a consortium.

One of the problems with firms adopting force is that they may benefit themselves at the expense of the totality of the consortium

3 Results from the interviews

The formation of consortia

Four of the eight interviewees questioned for this report had long-term consortium relationships, four did not. Those who tended to have long-term relationships, such as the financial consultant, were not the major speculative risk takers, whereas those who took on the major financial risks, such as the developer and funder, tended to rely on new arrangements for each project. Consultants may have long-term relationships with their clients but as consultants would not generally be expected to take on financial risks. They may however, hold a relatively small proportion of the equity unless their commitment to the consortium was based on payment following final account, and success. Consultants do not generally invest any risk capital in consortia with which they are involved.

In Table 1 the reasons for entering into consortia are given vertically according to each point of view and grouped horizontally by approximate type of reason. The main reasons for entering into construction consortia, whether on a one-off basis or on an on-going basis, are related to a lack of skills in-house, the need to engage specialists at an early high-risk stage when projects were still highly speculative, and the need to apportion risks where they belonged. Moreover clients often require firms to enter into consortia arrangements, which therefore improved the likelihood of sales and increased their profit margins. From the point of view of public sector clients, consortia provide access to private sector funding as an alternative source of finance to grants funded by the Treasury.

In Table 2, the circumstances that give rise to the formation of consortia are shown vertically according to each point of view and grouped horizontally by approximate type of economic driver. Consortia are often formed in response to the complexity of development proposals, while the size of projects also plays an important role in the need for firms to collaborate. However, for banks, the drive to participate in consortia comes from competition in financial markets. By joining a consortium, banks can ensure a funding role for themselves before the project leaders require debt finance and approach financial competitors. One of the most important conditions leading to the formation of consortia is the set of requirements of the client. These may include specific terms and conditions relating to environmental provisions or a requirement to demonstrate and provide sustainable urban communities. Often these requirements can only be met by close collaboration of a number of firms, which then respond by forming a consortium.

In the social housing sector, the Housing Corporation Guidance Notes are frequently used as the basis for standard arrangements. However, in other construction sectors, while many firms may not use a standard partnering agreement, there is a general contract, PPC2000, available through the Association of Chartered Architects (ACA) and produced by Trowers and Hamlin. However, the contractual arrangements do not determine the economic interests of the members of consortia before the consortium is formed. Rather, contractual agreements are determined by the economic interests of the firms joining the consortium.

Type of reason	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Lack of in-house skills	Develop and share problems		Special tedering workload	Lack of skills of the client	Reduce financial exposure			
Risk management			Apportoin risks where they belog	Spread financial risk of client				Less risky
Client instruction				Commissioned by the client	Client set condition for gerant aid	Client set condition		
Continuity of work					Surety of output		Source of secure sales	More certainty
Financial strategy	Independence from public sector grant regime							Beneficial to the bottom line

Table 1: Reasons for entering into consortium agreements

Business context	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Project complexity		Spread construction risk		Complex project			Complexity	
Client-led priorities					Commitment to sustainable communities	Bespoke requirements of projects		Client set condition
Project size	Scale of problems				Size of project			
Other	Potential development opportunities		Competition between banks		Management style		Lack of in-hous skills	

Table 2: Circumstances behind the formation of consortia

At the early stages of the formation of a consortium, for example, banks rely on a loose, ad hoc memorandum of understanding rather than a rigid contract. The same may be said of developers.

Participants and roles in consortia

The left hand column in Table 3 lists a number of roles in the development process. The responsibility for each of these roles is allocated according to the responses given vertically by each of the interviewees. There is little consensus concerning the allocation of a number of responsibilities. The table is indicative of a confusion of roles and a lack of clear definition. This lack of prescribed roles may be one cause of conflict and misunderstanding between firms within consortia. This is particularly the case with regards to design, management and financial control, where responsibility for the function can be seen to range from the SPV, as a whole, to different individual members. However, responsibility for financial provision, property development and actual construction are more clearly defined.

Although it might be argued that consortium arrangements such as SPVs might be used to offload risks and responsibilities, the developer can be seen as accepting overall responsibility for almost every aspect of the development, in return for the profit arising out of the project. The public sector client was not informed about the allocation of responsibilities in the consortia working for the local authority. Although developers may see themselves as the main risk takers, according to the vertical column labelled Developer in Table 3, the consultants and contractors do not necessarily share this view. As far as responsibility for design, management and financial control were concerned; the consultants considered risks were shared between several parties. In fact, while overall responsibility may rest with the developers, even the developer conceded that those in the supply chain, the contractors, took the construction risk.

The management of risk in consortia

This apparent contradiction arises out of the position of the developer who is responsible to funders for the delivery of a building as far as the funders are concerned but then the developer offloads that responsibility on to the contractors. Similarly overall responsibility for the project may be assumed by the project lead banker, responsible for the financibility and deliverability of the project because it is the lead bank, which is responsible to the underwriters of the finance. Again the bank protects its exposure to risk by ensuring the developer takes responsibility for the delivery of the project. Thus each member of a consortium fulfils both a supplier and a purchaser role. As a supplier, the member undertakes a responsibility but then passes the risk down the supply chain when it acts as a purchaser of its own inputs.

In the light of the difficulties of allocating risk and responsibilities after a consortium has been formed, Table 4 shows the general conditions sought by firms even before entering a consortium and before contracts are signed. These terms and conditions are shown vertically according to the point of view of each interviewee and grouped

Role	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Financial provision	Not told	Property developer	Bank	Fund manager and bank	Lead Housing Association	Developer/ funder	Developer or even the public sector as underwriter	Bank
Design	Not told	Property developer			SPV	Each party manages its own responsibilities	Architects	M and E and architects
Actual construction	Not told	Property developer			Contractor	Contractor	Contractor	M and E and main contractor
Management	Not told	Property developer		Residential managers	Developer	Each party manages its own responsibilities	Project manager or lead bidder	M and E and main contractor
Financial control	Not told	Property developer		SPV as a whole	Lead Housing Association	Developer/ funder	Lead bidder or jointly appointed independent certifier	M and E and main contractor or funder
Property development	Not told	Property development			Lead Housing Association	Developer		

Table 3: Responsibilities of consortium members

horizontally by approximate type of condition. As the developer is usually the initiator of a consortium, any terms and conditions agreed by the parties prior to setting up a consortium would be required as a concession made by the developer. The developer does not generally begin the process with prior conditions as such, and therefore the Developer column in Table 4 is empty. Table 4 also shows the diversity of requirements partners might seek prior to joining a consortium.

Before entering into a consortium commitment with other firms, the project finance advisor suggested that firms should seek access to the management accounts of key partners. This is seen as vital because of the interdependence of the members of a consortium and the shortcomings of the historical nature of annual accounts.

Up to the point when a group of firms bidding for a contract is given preferred bidder status, partners are free to leave a consortium. In the early stages agreements may be based on general understandings as far as the bank is concerned. Nevertheless contractors may require more specific terms and understandings such as a commitment to cost reimbursement during construction, plus a fee at financial close. Even at the beginning of the tender process, some firms, such as specialist contractors undertaking detailed design work and seek guarantees that they will be appointed if the consortium wins the tender.

In the social housing sector one prerequisite is that the consortium must be a local authority (LA) preferred bidder. Local authority preferred bidders are housing associations and their partners, who have pre-qualified for LA grant support. Local authorities may, for their part, seek consortia, which are willing to provide improvements in facilities and the urban environment.

Additional risks in consortia

It may be argued that consortia reduce risk. Different firms working together with different specialist skills, and more diverse management expertise than any single firm, appear to offer lower risk solutions. However, far from reducing uncertainty, consortia can also be seen as increasing some firms' exposure to risk. This apparent paradox can be resolved by thinking in terms of overall risk reduction and individual firms' risk exposure. While each firm may experience additional risk factors, many of these risks are part of a zero sum game, in which the total risk to the client is reduced. For example, value engineering implies that solutions can be found which reduce the total cost of construction. At the same time, design changes brought about by the value engineering exercise may mean that one or more members of the consortium may find their services are no longer required.

Table 5 shows the additional risks faced by members of a consortium. The major group of identified risks is concerned with the implications of working very closely with other firms or organisations. This area of risk associated with consortia may be called reputational risk. Reputational risk is not limited. In any case all respondents stated that limited liability makes no difference where large projects are concerned. In effect any

Type of condition	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Clear financial arrangement			General understandings	Access to management accounts			Cost plus fee at financial close	
Certainty of gaining work				Must be LA preferred bidder				Guarantee of work on winning tender
Risk management system						Allocation of risk and responsibility	Dispute resolution procedure	
Other	Long term partnership Improvements in facilities and urban environment							

Table 4: Additional terms and conditions sought by respondents in negotiations prior to the formation of a consortium

firm that fails to perform to the satisfaction of its public sector clients will find it extremely difficult to continue to supply services to public sector organisations. Indeed if any firm consistently underperformed, it would find it difficult to win more work, especially in the public sector. This reduces demand for the firm's output, depending on the ratio of public to private sector work the firm carries out. Even private sector clients may be deterred by a firm's tainted reputation.

local authorities (where projects overlap into neighbouring council territories) and between local authorities and central government can also lead to difficulties for consortia members.

A further risk for firms in consortia is the changing capacity of fellow firms to fulfil their obligations to the consortium. Given that each firm is engaged on a number of projects outside the consortium and because of the lumpiness of demand facing any one firm in property and construction, each member firm's

A further risk for firms in consortia is the changing capacity of fellow firms to fulfil their obligations to the consortium

The interdependence of firms in consortia has the potential to break up working relationships between members, leading to a significant loss in a firm's turnover. As consortia often work closely with local authorities, an additional risk facing firms is the lack of understanding of commercial risk by many in the public sector. Indeed political disputes between different

capacity available to the consortium can vary widely over the life of a consortium.

There are other soft issues, for example the tying up of resources, such as expensive senior management, which interferes with the smooth running of the organisation, especially as there is no guarantee of success. This

Type of risk	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Non-commercial expectations of	Public sector lack of understanding of commercial risk			Impact on reputational credibility	Political differences in LAs can lead to difficulties			
Dependance on others				Assessing and monitoring capacity	Failure of one mmber can lead to collapse of project	Lack of control Joint liability	Attitude of individuals may cause failure	Potential to break business relationships
Mis-use of resources			Tying-up of scarce resources					Resource allocation of expensive people

Table 5: The additional risks of being in a consortium

would also apply where no consortium is formed but selection for many public sector projects is not based on a single firm's strengths or offer, but on the combined strengths and merits of the consortium as a whole. Success, for example from a consortium funder's point of view, is also dependent on the selection process, which may be based on design or facilities management features and not just the banking aspects of the bid.

Risks within consortia may be classed as attributable and non-attributable risks. Attributable risks may be taken by members according to their skills and roles within the consortium. Non-attributable risks may be taken by the consortium leader or the funder.

Although property developers may argue that it is they, who accept responsibility for projects, risks are borne by those in the weakest negotiating position as they can be most easily replaced. Therefore those who offer non-differentiated services are in the most vulnerable position. The firms in the weakest negotiating position are the contractors and their sub-contractors. Perceived risk is taken by the developers and constructional risk is taken by the contractors. Perceived risk, which may be speculative or commercial risk, is rewarded with the profits (net of construction costs). The constructional risk is therefore left to contractors to price correctly and profitably (while still winning the auction for work). Risks are thus identified and allocated to the firm best able to manage them. That firm then owns the risk. Construction is seen as a high risk, high volume and low-margin business.

The contractor is usually responsible for cost overruns as construction contracts are usually fixed price unless design changes are delivered late. If the design changes originate in the consortium, the consortium would then be responsible for the delay and additional costs. Otherwise, the bank, according to one banker, still carries the main responsibility for costs because it is the bank that provides 90% of the funding. However, the bank usually holds collateral security and manages actual cash flow and, hence, controls the contractual arrangements of the constructor or facility manager. Risks other than construction risks may be seen as residual risks. Residual risks are taken or assumed in proportion to the consortium shareholdings of partners, or by the lead bidder. Alternatively, the client may carry the risk rather than waste or lose time.

Reduced risks in consortia

Nevertheless, several interviewees pointed out a number of factors relating to consortia, which actually reduce the level of risk, because they reduce uncertainty in the process (see Table 6). This is partly achieved by making use of a broader knowledge base than could be afforded by one organisation working alone. Risks are also reduced because consortia can make use of the experience of the different partners who may have worked on similar projects.

The sharing of bidding costs and the spreading of financial risk over a number of firms and organisations also reduce risks faced by members of a consortium. The larger the asset base the easier and cheaper it is to raise finance, assuming all else remains the same. As a number of firms combine to form

Type of risk	Public sector client	Developer	Banker	Consultant (Project finance)	Consultant (Project man)	Consultant (Industry)	Contractor	Specialist M and E
Breadth of knowledge	More substantial companies with a bigger range of skills		More ideas and experience from different partners.		Broader experience and knowldge base to deal with diverse		Broader knowldge base speeds up solutions	Early application of value engineering
Economies of size			Spread the bid costs	Spreading financial risk. More exit routes	Bigger asset base for easier and cheaper finance			Uncertainty
None		None				Cannot think of any reduced risks		

Table 6: Risks reduced by the use of consortia

a consortium the asset base may be enlarged to allow for greater access to funding at lower rates of interest and therefore lower risk. Consortia allow members additional exit routes if they wish to leave a project by finding a suitable and acceptable replacement without necessitating the abandonment of the project.

Disputes, it was claimed by one interviewee, never arise out of quality, safety or programme issues. They may arise out of differences in interpretation of the contract or over money. When disputes arise in consortia, every effort is made to resolve them without recourse to a higher body. This is a convincing argument, as most managers would wish to avoid resorting to their superiors or their company directors to resolve a dispute for them. Resorting to such action would imply a personal failure to manage the work, which may indirectly adversely affect an individual's career prospects. This pressure on managers arises because joint working in consortia entails a dispute resolution process based on a hierarchy of procedures, the first being an in-house Principals' Body, comprising the directors or senior representatives of the consortium. Failure of the Principals' Body may lead to adjudication, followed by arbitration and finally litigation. Both contractors interviewed agreed that no disputes had reached litigation from any co-operative ventures, in which they had participated. They do not tend to get that far.

From several of the interviews, it emerged that decision-making in consortia depends on effective leadership and delegation. Someone, who has to have the confidence of all the parties, has to run the project. One strong individual persuades the others and this produces the appearance of consensus. Decisions are open, but are networked in advance. The client is informed of these decisions only when necessary. However, the public sector client interviewed for this report stated that decisions were rarely passed on to the client body and often were only communicated informally or by chance at meetings.

4 Contrasting views of consortia

Overview of responses

This section of the report describes the setting up of consortia and their operational practices from the point of view of the different participants in the development and construction process. Each point of view is based on an interview with an individual representing a specific role. The order of presentation reflects the development process although it is also possible that contractors may take the lead in forming consortia. Nevertheless we begin with the client's perspective. The developer and banker then form the core of the consortium together with examples of financial consultants and property advisors. The main contractor and a specialist contractor form part of the supply chain, which delivers the building or structure to the consortium. We end with a legal point of view and a discussion of PPC2000.

The contributions below show that the interviewees present a number of useful perspectives. First, they reinforce the point made earlier; that consortia tend to be formed only when firms have little alternative. Indeed, one interviewee stated it was not his firm's strategy to enter into consortia agreements. Consortia are not seen as vehicles for improving collaborative working. Again, it was stated that best practice in construction does not depend on consortia. This is not to say that consortia inhibit best practice. Firms rely on their bargaining strengths even within consortia arrangements.

Influence and control within consortia are based on financial commitment and equity share. Even where contractors may be deemed to lead consortia, further enquiry may reveal that the contractor's financial input and control is provided by a property, investment or development arm of the same company. The examples or case studies given by interviewees tended to support the view that consortia are marketing and financially driven arrangements which take on commercial and reputational risks. A separate supply chain of contractors takes on the production risk, which may extend to the provision of services after completion of construction. In some cases a contractor may be a member of both the consortium and the supply chain, in which case it is possible for the contractor to be sued by the consortium of which it is a shareholder.

A public sector client's point of view

The public sector client saw the aim of a consortium as a group of companies brought together for a particular purpose (for example constructing a building), because of the expertise of the different firms. In joint ventures, the partners take equal liability. In consortia the consortium takes the financial risk and manages the supply chain.

As a public sector client, the interviewee would have welcomed the opportunity to establish long-term relationships with construction consortia. But this did not arise, partly because many in the public sector have a fear and distrust of the profit motive. Nevertheless, public-private partnerships enable the public and private sectors to share problems and develop closer working relationships. This enables the public and private sectors to play-off each other to their mutual benefit. Longer-term partnerships with the private sector could

be developed in return for local authority sites. This arrangement takes advantage of the private sector skills of managing procurement, while the government sector remains accountable to the public.

Because many civil servants tend to have little direct knowledge or experience of commerce, the public sector does not always have the necessary skills in managing procurement. The public sector is more concerned with non-commercial issues, such as public service provision and accountability, than commercial considerations. It is, therefore, relatively poor at making commercial decisions. The public sector cannot take on financial risks such as cost overruns, late delivery and unresolved disputes. As a result the public sector is willing to pay for the private sector to take the risks associated with projects. Nevertheless the private sector tries to put the financial risks back on to the public sector. Consortium decisions were often not conveyed to the client, but were informally communicated by chance in meetings between the client and the consortium. Distrust is played on by advisors. In spite of these difficulties in public-private sector collaboration, there is a need for a leap of trust.

These issues indicate that far from being an open method of procuring a building or structure, it is possible for members of a consortium to obscure important details of a project from the client. This highlights the self-interested behaviour of the parties in the construction process, allowing for predictable opportunistic transaction costs and game theory outcomes of the hawk-dove variety.

A developer's point of view

From a developer's point of view, a consortium that includes a contractor increases the risk for the developer and its financial backers, because the arrangements blur responsibilities for delivery when a contractor is included in the consortium. To developers, entering the world of the contractor is like entering a black box. There are simply too many opportunities for contractors' costs to rise at the expense of the developers' profits.

Developers are prepared to take commercial risk only provided they are in a position to hire or dismiss the other members of the team. Indeed although the relationship with other members of the consortium may be closer than in non-joint ventures, joint venture organisations work best when there are several projects to be undertaken. With the developer in a position to remove partners from the team, the developer has a sanction if things go wrong. At the same time there is less chance of contractors behaving opportunistically if they are at risk of losing further participation in the joint venture. This applies similarly to subcontractors.

These comments illustrate the divisions that exist within consortia, showing the level of distrust of developers towards contractors, their relative negotiating strengths and their attitudes towards risk.

A funder's point of view

Consortia are seen as business opportunities but not ones to be carried out by a single firm or funder. From the point of view of the partners in a consortium, the main aim of setting up a consortium is to win the bid.

Once this has been achieved each member of the consortium receives a contract and the bank funds the project. Consortia represent the integration of the vertical value chain by working together in collaborative teams. The consortium whole is greater than the sum of its parts. It can be argued that one of the benefits of working as a consortium on a construction project is that it improves value management. It also increases the reliability of the bid price compared to many recent public sector directly commissioned works, though this may not necessarily always be the case.

Contractors may see participating in consortia as a construction market segment. Consortia bidding for NHS and local authorities' projects may be contractor-led but usually contractors are brought in at a later stage. Perhaps as much as 70% of consortia are not led by contractors. However there may be a trend towards contractors becoming more involved. There is no incentive for contractors to invest in consortia for the long term, if they only have a construction contract. Therefore, where contractors lead, the contractor member is often a facilities management firm, which may be a subsidiary of a building contractor. The facilities manager then has an on-going interest in the operating phase of the project.

As far as funders are concerned, the distinction between developers and contractors is blurred in practice. The developer accepts responsibility for the delivery of the project, which is then undertaken by building and/or facilities management contractors. Consequently the contractors are responsible if they do not deliver as required. To the funder, the risk of poor performance is passed on to the other parties in the consortium, regardless of their particular roles in the process.

A financial advisor's point of view

In financial consortia the developer acts as fund manager and a bank as funder. However, funders are often brought in far too late, because funders are usually involved only after the tender stage, which follows the initial proposal stage.

In a delivery-plus model consortium, there is a developer, a funder and a facilities manager. Together they form an SPV. Construction contractors are only on the supply chain and have a client-supplier relationship with the SPV. The construction side is kept at arm's length by the SPV, although the SPV may insist on an open book condition in the contract allowing the SPV to monitor the construction phase closely.

One of the problems for lenders, and a limit on their willingness to form an SPV with a contractor or a developer, is that there are no credit ratings in the construction industry or property sector. The reasons for the lack of credit ratings are:

1. Property companies' valuations depend on the value of their land banks. This means their asset base is difficult to value and varies over time.

2. There is no tradition of joint ventures between lenders and developers. There appears to be an innate conservatism on the part of lenders to form partnerships with developers.

3. SPVs tend to be relatively static contractual arrangements whereas developers are essentially opportunistic firms requiring flexibility to respond to changing circumstances and market conditions.

Construction contractors have traditionally been even more difficult to value than property companies. However, Standard and Poors (2004) have recently recognised the changes brought about by the PFI undertakings of contractors, which produce income streams. These income streams create capital values and form an asset base, which can be identified and associated with construction firms. Nevertheless, from a financial point of view, significant fragmentation within consortia remains between the financial inputs and the commercial and speculative functions and the industrial processes of constructing buildings.

A housing project co-ordinator's point of view

Housing associations are regulated by the Housing Corporation. Consortia are formed to reduce competition between housing associations and to enable them to spread risk. A consortium can initiate without identifying a developer partner, using conventional contracts etc., whereas partnering involves all the parties in a risk sharing arrangement. Housing associations have a list of selected consultants and contractors they work with. This is a pre-requisite of partnering working, often using a standard set of arrangements based on the Housing Corporation Housing Methodology plus a JCT Partnering contract. They may also use the JCT Design and Build contract as a variant of the traditional building contract.

A consortium in the housing sector may, therefore, be defined as a group of like-minded organisations, which combines to provide affordable housing. The consortium decides demand and the appropriate mix of rent, joint ownership and sale. Consortia may include developers who offload their commercial risk by building social housing. This creates economies of scale for the private and public sectors. The public sector involvement is based on the public investment funds made available to housing associations through the Housing Corporation.

Consortia in the social housing sector tend to follow patterns determined by the Housing Corporation and regulations and local authority practices. Because of the more repetitive nature of the housing market these patterns of working distinguish consortia in the housing sector from those in other parts of the construction industry.

A contractor's point of view (1)

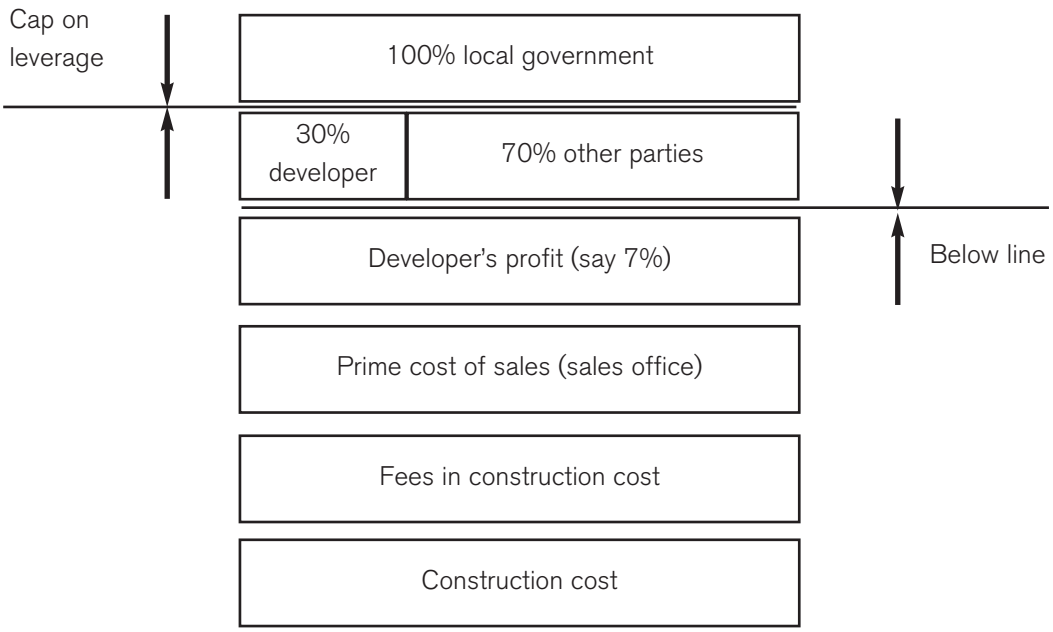
Consortia which may be led by contractors (often Design-Build-Finance-Operate) can offer a wider function than purely providing the built element. Consortia are needed to manage risk. With the early involvement of contractors there is a better handle on risk in PFI and regeneration projects. Consortia can be used to bridge public and private sectors e.g. English Partnerships, London Borough of Barnet. In one scheme, for example, as well as the involvement of the local authority, there was one contractor and two housing associations one of which, was the lead bidder for the 3,400 homes and amenities, which were being provided over a period of 14 years.

Within long-term consortia agreements, regulators may be used to mediate the mix of social housing and homes for sale. The regulator is based on the excess of house price inflation of 1.1% per annum over the construction cost index. The more profitable the scheme in terms of homes for sale the more social housing can be provided.

As much as 60% of contractor's turnover may be through consortia, which provides them with a degree of continuity of work. As a result people with broader high-level management skill sets are being taken on directly by contractors. However, packages for subcontractors remain, which implies that the actual building production process may remain detached from and is not necessarily affected by the existence of a consortium.

SPVs are formed to bid and deliver a project. The composition of a consortium can change. The partners can change. Nevertheless the returns to the members of a consortium are based on a formula for the purpose of sharing out the dividends. One such formula may be based on the model shown in Figure 7. In this model costs are seen as including construction costs, fees, the costs of marketing and a developer's profit.

Figure 7: Model of distribution of consortium profits



As there is much more shared risk, the profit element should be lower (on the developer's account). The developer may accept a base of only 7% profit margin on costs below the line and a share of the profits above the line, instead of calculating a 20% developer's margin at the beginning. Below the line is seen as the cost of delivery. Above the line an upper cap is set on profits. Profits above the cap belong to the local authority. Profits above the line and below the cap are shared between the developer and the other members of the consortium, according to agreed percentage shares, say 30 per cent to the developer and 70 per cent to the other members of the consortium..

A Contractor's point of view (2)

In the early to mid 1990s the recession in the construction industry pushed firms towards working in consortia, further encouraged by PFI projects for the public sector. Contractors decided to lead consortia in order to protect their business. For one contractor, Bovis Lend Lease, working within a consortium represented an investment interest as well as providing construction work and facilities management. Winning construction work was the major driver for contractors in consortia because construction provided the earliest returns. Government also wanted operators to run the built facilities. However, the returns on facilities management were too long-term and contractors were not geared to taking on long term investments. Nevertheless, many consortia are construction led.

Bovis Lend Lease is not typical but not unique. For example, Balfour Beatty is similar, as is Carillion in the PFI projects the latter undertakes, also providing facilities management, while Amey have tended to concentrate on facilities management. In Figure 8, Bovis Construction is shown as a wholly owned subsidiary of Bovis Lend Lease which in turn is a wholly owned subsidiary of the Lend Lease Corporation. The Lend Lease Corporation also owns Bovis Lend Lease Holdings. Bovis Lend Lease may embark on a consortium arrangement with the support of Bovis Lend lease Holdings. They insert a condition in the Memorandum of Understanding that Bovis Construction be appointed to undertake the construction work. The Memorandum of Understanding becomes the Shareholders' Agreement at financial close, if and when the consortium becomes the preferred bidder. However, Bovis construction is a separate business entity from Bovis Lend Lease.

Examples of consortia in which Bovis Lend Lease play a leading role are Catalyst Healthcare Management Ltd in the health care market and Focus Education Ltd in the education market. Specific projects involving Bovis Lend Lease include the Treasury Building where Stanhope was the developer with a 42.5% equity stake; Chestertons undertook the property management function with an equity share of 15% and Bovis Lend

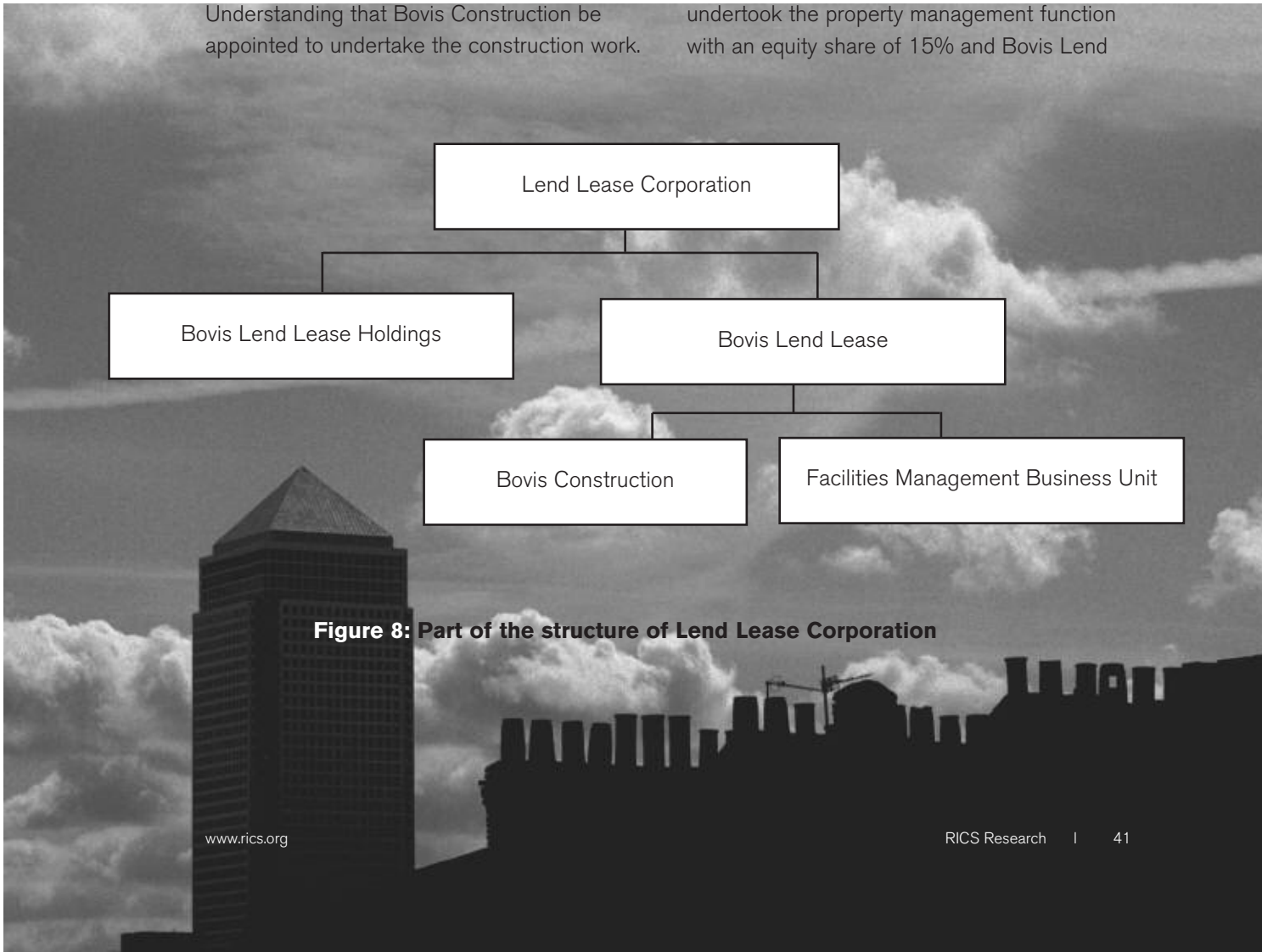


Figure 8: Part of the structure of Lend Lease Corporation

Lease construction and facilities management with 42.5% of the equity.

The Catalyst consortium currently has 3 operational projects, 3 in construction and 2 at preferred bidder stage. In the Minutes of the Select Committee on Health 15.11.01, the Chief Executive, Catalyst Healthcare, stated that Catalyst Healthcare Management Limited was a subsidiary of Bovis Lend Lease Limited. It had three functions: to lead and coordinate the PFI bids for Bovis Lend Lease and its consortium partners; to act as agent for the project company investors to manage the project on their behalf, and to facilitate the development of best practice and the transfer of knowledge.

Both the Bank of Scotland and Société Générale originally took equity stakes in the Catalyst consortium but the latter is no longer involved. Facilities management is provided by ISS. The equity stake held by Bovis Lend Lease is 50%, the rest being shared between the other members of the consortium. A 50% equity share is the maximum percentage Lend Lease are usually prepared to invest in an SPV. This compares to the industry norm of between 10 and 25% equity shares in an SPV being held by the contractor member.

SPVs may be recourse or non-recourse. A recourse SPV implies that the risk is borne by the SPV. With one point of responsibility the clients need not pursue member firms individually. The firms in the SPV must then settle claims internally within the consortium. In a non-recourse SPV, the risk passes through the SPV and is borne by the firms individually. When a non-recourse SPV is set up interest rates charges are reduced. The debt equity ratio of non-recourse SPVs can be in the region of 80:20, whereas a recourse SPV's debt equity ratio is more often 90:10.

Contractor and management consultancy's point of view

As managers of the construction process, the management ethos at one broadly-based management consultancy may be summarised as:

- questioning practice - seeking improvements,
- leadership and involvement of key senior people - Head of Engineering, Architects, and
- motivation of staff through customer feedback, published results of effort, employment based on risk and reward.

This firm did not enter into shared equity risk. There was no need to engage in consortia for the purposes of developing best practice. However, where the cost of bidding was excessive or where expertise and senior management was in short supply, a need to form a consortium may arise.

Some examples of recent working arrangements of this firm are given below:

- A head office was built by a private developer, who appointed a contractor and this management consultancy. The contractor and the management consultancy had made a joint bid to the developer. The contractor took on the financial risk and the consultancy provided the expertise.

- With another office project, the management consultancy provided a 'one-stop shop' appointing the architects and undertaking the construction lump sum contract. The consultants acted as both project manager and main contractor.

- A local authority appointed the management consultancy under a five year Framework Agreement to provide new build schools, adult care centres, fire stations and other county public buildings. The role of management consultants was to project manage taking responsibility for professional services such as design and quantity surveying. Under the Framework Agreement contractors had to pre-qualify and this enabled the management contractors to reduce the number of contractors in the supply chain. The selection of contractors then depended on the size of the project. The county council took the commercial risk. The management consultants had no equity risk in the projects. It would therefore appear that the use of management consultants was necessitated by the lack of local authorities' in-house staff and expertise rather than a lack of funding.

A specialist contractor's point of view

The purpose of a consortium is to meet the total needs of the client. In principle forming a consortium allows communication of clients' needs to subcontractors, which improves client satisfaction. Most consortia are put together for the public sector or a few private sector clients e.g. BAA. A consortium is usually set up in conjunction with an open and transparent partnering agreement. To achieve this, the consortium requires partners to have common aims and objectives. All the constituent parts should make up a coherent whole. Although the arrangements can be loose or formal, there should be a culture embodying a belief in the aims of the project and a belief in the other members of the team and the value they bring. Moreover, there are three elements that form or glue a consortium. They are mutual risk, trust and money. But these elements can also create major friction within consortia.

The builder and the operator may or may not be part of an SPV but the client often assumes builders and operators are part of the consortium. The main contractor and the mechanical and electrical (M&E) contractor may have a good relationship, but the M&E is not usually part of the consortium. The M&E contractors, therefore, have no direct access to, or relationship with, the funders or financiers. The specialist firm is in the supply chain but not in the consortium. The client liaises with the SPV, which assumes responsibility for legal and financial aspects. The SPV then commissions a contractor for the construction phase and a facilities manager or operator (if required) during the building-in-use phase. Both the contractor and the operator are seen as leading their supply chains to the SPV. The supply chains extend to the subcontractors and material and component suppliers. In this model, the SPV acts as a client of both the contractor and the facilities manager, even though both may be shareholders in the SPV. The SPV therefore comes between the client and the supply chains, which actually undertake the work.

Specialist sub-contractors can, therefore, experience the same difficulties encountered in many construction projects whether they involve consortia or not. The early stages are based on trust with builders, but after winning a tender the main contractor may ask for a price reduction. In one instance, the interviewee was asked for a £3m reduction on an £18m tender and this concession was followed with very late payments by the main contractor. Consequently the firm, which is a subsidiary, is no longer allowed by its parent company to join consortia on the basis of trust alone. The extent of reliance on good faith forms part of the risk analysis of any given project.

A lawyer's perspective

There is no single definition of the term 'consortium'. A consortium may or may not be formed of like organisations, such as all-architect members or all-contractor members, and it may or may not be jointly or severally liable. The formation of a consortium would be unnecessary, if a client did not want any involvement in the construction process. The contractor would simply undertake all the work.

A consortium, which is separate from the client, can lead to distrust. One measure to overcome this distrust is a single open contract for all team members. This pre-contract requirement would not only reduce the inherent distrust which arises when a number of firms are needed to work together on construction projects, but it would also reduce the time spent on negotiations. If a client participates in the building team, the arrangement may be seen as conventional partnering or a consortium, which included the client-developer. This distinction would depend on the equity nature of the alliance. More direct involvement by the public sector in projects is indeed encouraged by the ODPM (2003). The National Procurement Strategy recommends local authorities to streamline their procurement processes, by eliminating unnecessary red tape and reducing dependency on external advisors. While the elimination of unnecessary red tape may be difficult to achieve, a reduction of dependency on external advisors can be arrived at by employing more professional staff directly.

PPC2000 (recently amended), is the only multi-party contract covering the entirety of the project up to the end of defects liability. The aim of PPC2000 is to form a complete team for a project by including the client: to integrate the team. The integration of the team implies that there are no gaps or duplication between team members' roles. The integration of the process implies buildability and affordability. This process of integration includes the selection of a constructor and specialists at an early stage, which aids contractual programming, value engineering, an environment for risk management, and open book pricing.

While PPC2000 is project specific, partnering can also be on a longer term basis. Firms can rise above corporate self interest which may be seen to be short-sighted. If only for marketing purposes, firms want to prove their own credentials, establishing mutual duties of care under PPC2000 rather than sheltering behind the limited liability of a separate consortium joint venture vehicle.

PPC2000 may be seen as a standard form of contract used as an alternative to a client-excluded consortium arrangement. PPC2000 has been used extensively with only a very few variations occasionally being inserted and these have mainly been concerned with minor issues, such as the time scale used for decisions.

The PPC2000 partnering agreement itself is risk neutral. Firms would carry these risks in any case. Risks are borne by all the participants individually. Responsibilities within a consortium depend on the project. There are no additional risks associated with the PPC2000. There have been no objections by funders, constructors or professional indemnity insurers. There is no extra liability. Through partnering arrangements, PPC2000 allows for more direct means of recovery and more ways of influencing the other members of the project team. This leads to improved communication. This, in turn, reduces risks such as problems associated with programming, or problems arising out of misunderstanding. There is an option in PPC2000 which permits the dividing up of liability irrespective of blame but this clause has not as yet been taken up.

A Core Group or Principals' Body, which decides major issues, is included in the arrangements of PPC2000. Meetings of the Core Group may be called by the Client Representative, if requested by any of the Core Group members, unless a dispute can be agreed or a decision can be reached without a formal meeting. Under PPC2000 there have been very few adjudications.

Comments on interviews

It has been claimed that PPC2000 has succeeded in bringing disparate construction firms together and forged good working relationships in the supply chain. Nevertheless, there is resistance to change among industry leaders and clients, largely due to low profit margins and high risk associated with large schemes. The reluctance of project initiators to use or trial PPC2000 may be more due to this inherent conservatism coupled with the traditional characteristics of the construction industry rather than to the perceived effectiveness of the new contract.

The PPC2000 is concerned with supply chain management before and during the construction phase. However, many public sector projects now extend beyond that stage into the building-in-use phase, which is not covered by the current versions of PPC2000. For this reason PPC2000 remains an alternative approach to developer-led consortia for procuring public sector projects, but one that may prove fruitful in the future when the PPC concept is developed to include post-construction activities.

The JCT 2000 partnering contract is a non-binding add-on to JCT contracts such as the JCT 98 with contractor's design, which spells out requirements and obligations, whereas the PPC2000 is more based on mutual trust and transparency. However, partnering may not always be an attractive option. Depending on the state of the market, contractors may take advantage of the terms and conditions of PPC2000 to exploit their dominant position within the partnership, especially if margins are being squeezed.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5 Conclusions

The following observations summarise the research reported here:

- Consortia in construction are formed as marketing vehicles for developers and funders, who use contractors and project managers to provide the buildings and services. This is an important aspect of securing certain types of work.

- The roles and relationships within consortia are structured around risk. The members of consortia share commercial and reputational risks but otherwise adopt traditional roles within consortia-type arrangements.

- The motive of firms in construction consortia is to win a share of major jobs which would otherwise involve prohibitively high tendering costs.

- The working practices of firms in consortia tend to be ad hoc. The consortium arrangement itself does not necessarily lead to closer working relationships between the member firms. However, the personal relationships between the key members of the consortia are an essential component for the success of a project.

- Consortia arrangements enable firms to take advantage of the expertise of fellow consortium members especially at the tendering stage. This contributes well to the mobilisation of productive resources, usually paid for on the promise of the opportunity to win large amounts of work.

- The main source of risk and conflict is the reliance on other members of the consortium to deliver.

- Integrated supply teams are not the same thing as consortia. An integrated supply team does not necessarily share an equity risk in contrast to consortia, which do.

From the review of the literature and our interviews, we have concluded that construction consortia are primarily marketing vehicles, which form barriers between the client and the firms that carry out the work. Consortia do not in themselves add value to the construction production process. Consortia are, in general, separate entities from the construction supply chain. In the supply chain there is current evidence that firms are seeking closer working relationships. This may be as much to do with changing technologies as it is to do with a general desire to improve the working relationships within the construction industry. These changes mean that specialist firms have to be brought in to the design process at an early stage in order to be effective. As a result, although the firms remain separate, they are learning to co-operate as long as all of the parties can benefit from value engineering exercises.

Another change taking place in the management and organisation of the supply chain is the introduction and development of the PPC2000 arrangement, which implies that the client takes an active part in the problem solving processes and continues to participate

in the building team during the construction phase. However not all consortia adopt PPC2000 or even similar arrangements. Instead the construction process remains largely unaffected by the use of consortia. While there are clear advantages for firms and clients operating under consortia arrangements, the case remains to be made that consortia offer anything new as a mode of co-operation over and above conventional ways of working.

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Appendix A: Interview questions

Main business activity of firm and role in construction process

Personal role in construction process

Approximately how many people engaged directly by the firm

Approximate turnover of firm

1. Do you have any long term consortium arrangements? (Yes/no.)

2. Why do you enter into these agreements?

3. Under what circumstances do you form a consortium?

4. Do you have a standard partnering agreement? (Yes/no.)

5. Which members of the consortium are responsible for:
    - Financial provision
    - Design
    - Actual construction
    - Management
    - Financial control
    - Other roles

6. Are there terms and conditions you seek in the negotiations before entering a consortium?

7. What are the additional risks of being in a consortium?

8. What risks are reduced by the use of consortia?

9. Which parties in a consortium should carry these respective risks?
    - Cost overruns
    - Late delivery
    - Design changes
    - Unresolved disputes
    - Other

10. Why should they carry these risks?

11. Who carries these respective risks at present?

12. What difference does limited liability have on the behaviour of firms in consortia compared to firms outside and do you have any examples of firms taking advantage of their limited liability to avoid financial difficulties?

13. What disputes if any have arisen?

14. How are decisions taken?

    - Jointly following discussion at regular meetings
    - By one party (developer, bank, contractor, architect, other decides,
    - Consultation with all parties concerned
    - Ad hoc discussion.
    - Other

15. How open are the decisions - is the client informed? (Yes/no) If so, rough percentage.

16. How open are the decisions - are decisions circulated in any form? (Yes/no.) If so how?

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