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PUBLIC INFRASTRUCTURE PROCUREMENT: A Comparative Analysis of Adversarial and Non-Adversarial Contracting Methods

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ABSTRACT

Most public infrastructure is provided by traditional procurement methods generally based on quantitative selection techniques and adversarial contracting principles. International evidence suggests that this method of contracting is inefficient, is often delivered late, and is often over-budget. Further, the adversarial nature of these contracts means that disputes over variations, changes to specification or renegotiation may lead to lengthy and costly *ex post* negotiations or civil action. The introduction of alternative procurement methods (APM) in the early 1990s introduced a less adversarial contracting approach in which ownership (of decision-making) and responsibility for design and operation of the service-producing asset passed to the contractor with the state adopting a regulatory role. The contract is non-adversarial to the extent that the relationship between the contractor and the state is one of long-term relationship management. Evidence suggests that APM is achieving better time and cost performance than adversarial methods and contributing to improved service delivery and lower lifecycle costs. This paper reviews the theoretical literature with a view to understanding the relationship of the parties in a non-adversarial project procurement contract. It finds that the principal and agent view of traditional procurement may not be the best way to understand collaborative contracts where the relationship can be characterised as purely transactional – the principal is a buyer of services and the contractor is the producer. The paper also reviews the empirical evidence and finds that the characteristics of non-adversarial contract models such as the output specification, qualitative selection criteria, the alignment of responsibility for service outcomes and residual control rights, incentives, life cycle costing and risk-weighted value for money measurements, are improving project delivery performance and service outcomes.

JEL Classification: H57, D73, D86.

Keywords: adversarial contracting, public project procurement, collaboration.

INTRODUCTION

In developed economies, procurement of goods and services and investment in economic and social infrastructure accounts for a significant proportion of state budgets. In the OECD, gross fixed capital formation (GFCF) averages around 17% of gross domestic product (GDP), and around 20 per cent in developing countries. Capital spending on new and improved roads, ports, urban transport systems, airports, energy production, water conservation and waste management services, health, and education services accounts for around 3.5 per cent of GDP (World Bank, 2012). Infrastructure is capital-intensive, networked, site and use-specific and delivers services that contribute to national and regional economic growth and social development (Regan, 2008).

In most OECD countries, around 65 per cent of economic and social infrastructure is owned and operated by government agencies, although this level is lower in the United States where there is a higher incidence of private ownership in the telecommunications, energy and transport industries. The private sector is also a significant source of investment in infrastructure services through outsourcing and public private partnership (PPP) arrangements with the state, ownership of freight rail, sea and air transport facilities in the resources sector, and as a result of the privatisation of government business enterprises that occurred in OECD countries from the early 1990s. In countries such as Britain, Canada and Australia, the private sector today provides around 34 per cent of economic and social infrastructure, a significant increase compared to the 15-16 per cent of the late 1990s (Regan, 2004).

In many developed economies, around 70 per cent of public infrastructure procurement is based on traditional contracting principles (Government of Victoria, 2010 pp. 63-66). These are typically short-term complete contracts in which the state as principal bears all project risks not specifically allocated to the agent, the relationship between principal and agent is adversarial, the contractual framework results in asymmetrical incentives and stakeholder friction, and an input specification may limit the agent's contribution to innovation and improved asset performance outcomes.

In the European Community, Canada, Australia and South Africa, around 30 per cent of infrastructure procurement is delivered using non-adversarial procurement methods that include franchises and concessions, build own transfer (BOT) arrangements (including public private partnerships), relationship and managing contractor arrangements, and outsourcing (collectively, alternative procurement methods or APM). In both developing and transition economies, non-adversarial contracting and private investment accounts for a greater share of major infrastructure projects, mainly because of constraints on public sector borrowings and greater dependency on private foreign investment and expertise to fast-track improved economic and social infrastructure, and boost both economic and social development (World Bank, 2011).

Evidence from a number of OECD countries in the 1990s identified systemic faults with government's use of traditional procurement methods, including time and cost overruns, poor user satisfaction levels and high transaction costs. Part of the solution was the introduction of alternative approaches to infrastructure procurement based on collaborative rather than adversarial characteristics. A further reason was the greater complexity of infrastructure services, the pursuit of innovative design and construction outcomes and the growing recognition of the importance of risk and life cycle costing to long-term investment in infrastructure services. However, non-adversarial contracting may not be appropriate for all forms of infrastructure procurement. It can require longer lead times and increase ex ante construction costs. It is more beneficial when projects are long-term and complex, when project risks are high and service outcomes can benefit from private sector entrepreneurship, innovation and new technology. In recent years, non-adversarial procurement in OECD countries has been employed widely to improve capital-intensive social infrastructure services in corrective services, public administration, health and education.¹ The importance of this development is the shift in emphasis from state ownership of infrastructure assets to that of a buyer of infrastructure services. Part 1 of this paper examines adversarial and non-adversarial contracting methods and sets out to identify those change drivers that are producing improved infrastructure service outcomes for governments around the world.

Part 2 examines adversarial contracts, specifically the ownership in the form of residual control rights), the form of contract, contractor selection, the form of specification, risk, governing policy framework, contractual relationship, and mechanisms for managing change. Parts 3, 4 and 5 examine collaborative contracting, the alliance contract model and the public private partnership in a similar manner. Part 6 examines comparative performance and Part 7 canvasses the lessons learnt from the collaborative contracting experience and how these can be applied to improve state procurement performance generally.

ADVERSARIAL CONTRACTS

Traditional contracting is the procurement of public works by governments as principal to private contractors as agents who are selected by auction or pre-qualification and negotiation. Traditional procurement of goods and services has a long history as the favoured method for the delivery of public infrastructure.² This method was first evident in the ancient Sumerian city-states around 2,600BCE whose civil codes provided for the regulation of public and private contracts, recognised a party's right to pursue self-interest in a contract and imposed penalties on parties who failed to deliver what they had promised. Traditional contracting and legal institutions that dealt with contractual disputes were also evident in Classical Greece, early Roman private law and in later European states in the western tradition. The term *traditional contract* is generally applied to contracts for government purchases of goods and services including the construction and/or delivery of assets producing public goods to, or on behalf of, government.

The term *traditional* is something of a misnomer, suggesting something of enduring cultural value or significance. Traditional contracting certainly has history on its side, but its uses and abuses over time suggest little of either value or significance. Traditional contracts are adversarial and the degree of adversity will be determined by the form of contract, the allocation of risk, mechanisms for dealing with disputes, the alignment of incentives and responsibility for decision-making. The arrangement for payment of the contractor is also important because it determines which of the parties carries time and cost risk. When carrying out work in a fixed price contract, much of the contractor's work is unobservable or either too difficult or too costly for the principal to monitor. In an adversarial contract, the incentives that drive the parties over the term of the contract are mismatched or non-aligned and *ex post* contractual disputes are common, absorb significant management time, and are costly to resolve. The principal's expectation is for the specified goods or services to be delivered on time and within budget. In a competitive bid market, the agent will bid to win the contract and if successful, the manager's focus will be on improving margins by taking advantage of an incomplete specification, change in scope of works or ambiguity in the contract, and disputes. Resolution of disputes does occur during the life of the contract, although many claims may be unresolved long after the works have been completed. Traditional adversarial contracts run the risk of time and cost delays and high transaction costs.

Elements of the Adversarial Contract

Traditional procurement is the default procurement option of government. It is a method suited to short term complete contracts for the acquisition of plant and equipment, materials, civil works and construction in which the assets may be fully specified. Traditional contracts may use standard form documentation, can be put to market quickly, and incur low transaction costs compared with other methods of procurement.³ This form of contracting has a number of distinguishing characteristics as outlined below.

Ownership

In a traditional and complete contract, ownership in the form of residual control rights or the decision-making prerogative is exercised by the principal (Estache, Limi and Ruzzier, 2009 p. 6). Control in project procurement is important because it creates the incentive framework that applies to stakeholders and influences the conduct of both the principal and the contractor over the life of the contract (Furubotn and Pejovich, 2001). Under a complete contract, the principal is also responsible for project risks not specifically allocated to the builder. This is a potential problem if the principal is responsible for *ex post* service delivery and lifecycle-operating costs such as energy, maintenance and repairs, and poor build quality, which may affect service delivery costs or, in the case of health, education and corrective services, where build quality may affect the reliability and quality of services (Besley and Ghatak, 2003 p. 246). Most adversarial contracts of short duration vest ownership and decision-making with the principal. The benefits of this include faster decision-making and lower transaction cost; the disadvantages include limited risk transfer and less opportunity for design and construction innovation. An adversarial contract is vulnerable to disputes and disagreements over changes to the specification of scope of the project and information asymmetry that is a consequence on non-aligned incentives between the parties.

The Form of Contract

Traditional contracts generally take the form of short-term complete contracts which attempt to take into account all variables which are, or may become, relevant over the term of the contract (Selanie, 2005 pp. 160-161). Short-term projects are generally written as complete contracts and contain provisions that deal with disputes between the parties, change management, and mechanisms for dealing with decision-making in conditions of uncertainty. Default mechanisms including mediation and arbitration provisions deal with externalities including force majeure events which may frustrate the contract or result in legal action, which effectively terminates the contractual relationship and may result in judicial proceedings which are a costly solution for both sides.⁴

Contractor Selection

Infrastructure contracts are commonly let by competitive auction in the form of an open tender or tender by invitation. Depth in infrastructure bid markets is influenced by the frequency of transactions (the project pipeline) and few contractors will retain the specialist skills needed to bid on complex projects if transaction flow is irregular, or if the likelihood of success in large bid fields is small. Similarly, if bidding costs are high, contractors will only bid when the chances of success are reasonable. Controlling bidder depth and bid

costs for infrastructure projects is a difficult task for government and schemes to reimburse bid costs, limit bid fields or add a pre-qualification process may increase hold-up risk, prove costly and may only be of limited value. In the case of projects requiring specialised technology or know-how, the procurement authority may select a preferred contractor from a pre-qualification process and enter into a period of exclusive negotiation for the contract. Contracts let by exclusive negotiation have a greater risk of renegotiation largely as a result of their adversarial nature and limited competitive tension in both the *ex ante* and *ex post* stages of the project.

A further characteristic of traditional contracts is the use of lowest price criteria for selection of the contractor. Critics of the lowest cost-based approach argue that the winner of a competitive auction is likely to incur optimism bias in pricing of the work (the winner's curse). Transactional evidence suggests that contractor selection should include qualitative criteria which may include the contractor's experience and capabilities, its track record with successful projects, the value of risks transferred between the parties and the wider benefits that the contractor brings to the project including new technology and innovative work practices.

Form of Specification

Adversarial procurement is generally based on an input specification issued by the principal and its advisers, which provides a definitive requirement for the work to be performed, the materials to be used and the method of construction. This approach assumes that the principal and its advisers have the best design, construction and service delivery solutions. This is particularly the case with public spending on corrective services, health and education where recent evidence in the United Kingdom and Australia suggests that non-traditional approaches to building design and innovation can deliver improved services including lower recidivism rates, higher educational standards and improved staff productivity (National Audit Office, 2005). The alternative is an output specification introduced with the BOT procurement methods in the 1990s. The output specification defines the principal's service requirement and any specific requirements but leaves the 'how to' question to the contractor. The output specification effectively allocates design, construction and lifecycle cost risk to the contractor or bidding consortium. The contractor exercises control of the project and has a strong incentive to deliver quality assets that minimise lifecycle costs. The contractor also has an incentive to employ new technology and innovative design and construction practices if their effect is to lower construction and production costs and ensure sustainable service delivery.

Risk

Control over project decision-making carries with it the burden of *ex ante* and *ex post* project risk not specifically assigned to the contractor, such as penalties for late delivery, cost overruns and post-construction warranties. The principal meets the cost of the project and variations and carries life cycle cost risk. The allocation of risk between principal and agent may be reconfigured by the form of contract and state procurement policies. Gross maximum or fixed price contracts may allocate specific time and cost risk to the contractor and reconfigure the contract's incentive framework. For example, under a fixed price contract, the contractor is incentivised to raise the cost of variations and 'cut corners' to find cost savings. These contracts are also prone to renegotiation. If the contractor has no role in future asset management or service delivery, build quality and low life cycle costs are traded for an expedient construction outcome. Conversely, in a cost plus or managing contractor arrangement under which the agent is paid an agreed margin, most construction risk resides with the principal and the agent is incentivised to extend the contract for as long as possible.

Agent remuneration provisions in the contract will also affect incentive frameworks. For example, in a cost plus or managing contractor arrangement, an incentive payment mechanism structured as a share of cost savings may also drive specific behaviours and limit the likelihood that the agent will let contract run over budget. However, it should be recognised that the two major risks in infrastructure projects are the construction and life cycle cost stages which, for service intervals of 20 or more years for conventional buildings, may be a multiple of the original construction cost (National Audit Office, 2002).

Governing Policy Framework

The procurement of public goods is governed by state procurement policies and protocols which may require the unbundling of projects into staged work parcels for construction, design, consulting, project

management and facility management. The services may be provided by different organisations; some may be public and others private. Recent studies suggest that bundling of the design and construction tasks or early contractor engagement in the design phase of a project may improve communications, delivery cost and time, and stimulate both innovation and adoption of new technologies (National Audit Office, 2005).

Policies may also limit the scope for reconfiguring tender, bid selection and form of contract parameters which are designed to improve alignment of incentives, reduce the adversarial nature of traditional contracts and encourage the agent's contribution to improved innovation and lower life cycle costs.

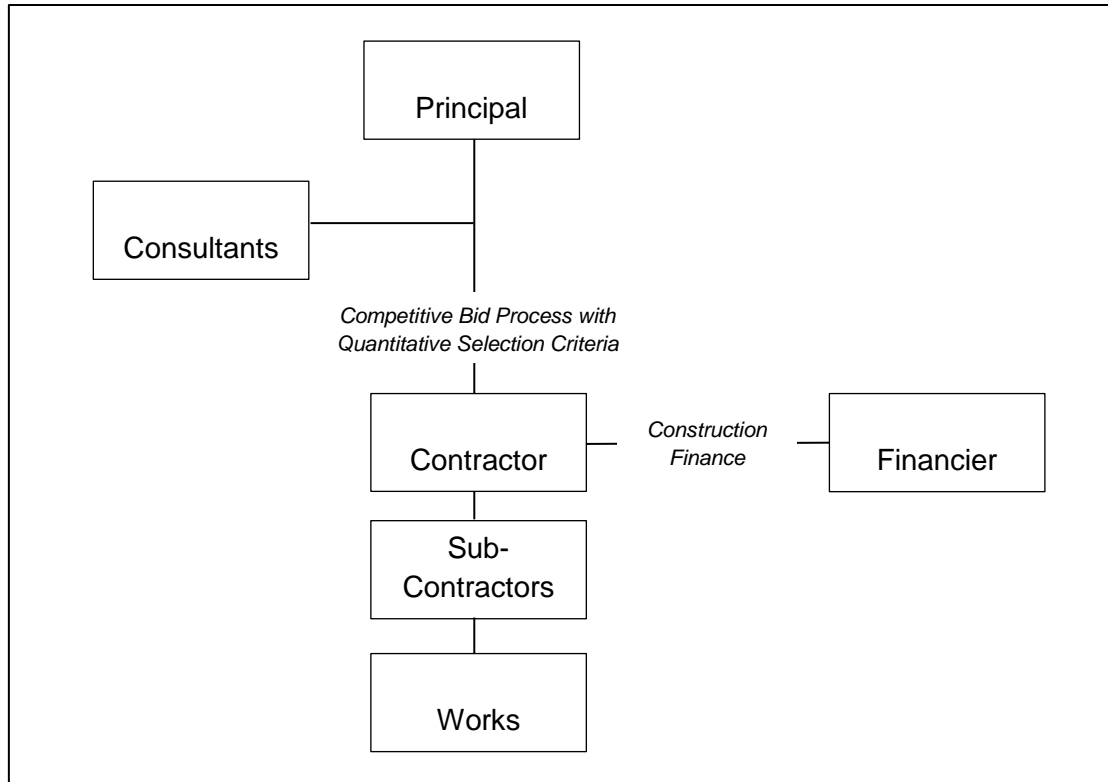
Contractual Relationships

Adversarial relationships place the principal and agent in competition for the capital available to the project with the likelihood of greater interparty friction. The principal endeavours to deliver the project at or better than the budget, and the contractor is working to benefit from changes in project scope or specification, in the manner of work and disputes over rework, faulty materials and workmanship, and ambiguity or uncertainty in the interpretation of the contract.⁵ When a contractor claims greater cost recovery for variations or specification changes than the principal is willing to pay, costly disputes follow together with risk of cost overrun, late delivery and extended post-contractual negotiations to resolve matters in dispute, or judicial proceedings, both of which increase transaction costs. Essentially, the parties to the contract are caught in a conflict between self-interest and their obligations under the contract. The adversarial relationship is not confined to the principal and contractor and where the agency unbundles these services into separate contracts, friction may be incurred in the relationships between the contractor and sub-contractors, the designer and the consultant. When a contractor has bid competitively to secure the contract, the incentive exists to auction or 'shop' the sub-contract components to the lowest bidder. This friction limits opportunities for collaboration and innovation, and can increase transaction costs.

The Incentive Framework

What incentives operate with adversarial construction contracts? Traditional contracts are used to transfer time and construction cost risk to the contractor. The agency's objective is to ensure delivery to specification, to minimise variations, and to ensure that the project is delivered on time and within budget (Songer and Molenaar, 1997). Under a fixed price contract with time constraints, the contractor will endeavour to meet its obligations under the contract, avoid penalties for late delivery, manage and, where possible, reduce costs. In construction contracts there is also a risk that contractors will bid competitively in order to 'cut corners' or exploit variations to the specification or scope of works to reduce costs and improve the margin during the term of the contract (Estache, Iimi and Ruzzier, 2009 p. 8).⁶

Table 1 - Traditional Procurement Organisation



Change Management

Complete contracts provide little flexibility for dealing with change and externalities outside the conventional alternative dispute resolution and judicial solutions. Disputes in traditional procurement may be resolved by alternative dispute resolution procedures, although full recourse to legal sanction is always an option.⁷ Competing objectives give rise to disputes over costs that are resolved by negotiation and arbitration following completion of the works. Nevertheless, unless otherwise agreed between the parties, recourse to judicial proceedings to resolve intractable disputes remains an option.

In complete construction contracts, a significant part of the contractor's performance may not be observable to the principal or it may be non-contractible. This may occur because the performance cannot be verified, is a consequence of decision-making by the contractor, monitoring is too costly, or uncertainties exist in the scope of works and the specification in relation to the quality or quantity of labour and/or materials used. Unobservable work may take several forms. In an adversarial contract, unless strong incentives induce the contractor to contribute additional investment in time, resources and/or money to improve construction performance and quality, the contractor will under-invest in non-observable works when cost saving from 'cutting corners' improves overall return.

In adversarial contracts, the sub-optimal alignment of incentives contributes to sub-optimal procurement outcomes.⁸ Traditional contracts are generally limited to production of the asset. Contracts to manage service delivery may be 'stapled' to the construction contract or, more often, are let by competitive tender.

NON-ADVERSARIAL CONTRACTS

In the early 1990s in the wake of a world recession, most OECD countries sought to improve microeconomic performance, reduce public deficits and unemployment, and renew aging infrastructure. These reforms led to wider use of outsourcing of government services, the privatisation of many state business enterprises, and the introduction of new privately-financed procurement methods. In fiscally

constrained times, the appeal of private capital was also very attractive. The role of government also began to change from the ownership and production of public services to the purchase of services from private producers. In the years that followed, a number of new methods were adopted that took a very different approach to the relationship between the state as principal and private consortia as agent. The more common non-adversarial contracts in use today include build operate transfer (BOT) arrangements and public private partnerships (PPPs), and outsourcing arrangements including concessions and franchises. This group of procurement methods are based on a very different set of principles to traditional adversarial procurement and commonly feature the following characteristics:

- Long-term incomplete contracts,
- Bundled services,
- An output specification,
- A non-adversarial contract structure that encourages long term relationship management to resolve disputes, renegotiate elements of the contract affected by change, and to maintain services,
- Significant risk transfer from principal to the agent,
- An agent selection process that places equal or greater reliance on qualitative factors than it on quantitative or price criteria, and
- Greater alignment of incentives to encourage innovation and efficiency.

In the case of alliance contracts, the collaborative relationship is based on an agreed agent's margin, open book transaction cost accounting, sharing of risk and savings and a jointly managed process designed to encourage design and construction innovation.

Non-adversarial contracting for delivery of state infrastructure services is not new. There is evidence that concessions were widely used in Ancient Greece in the 3rd Century BCE for quarrying, maritime transport and mining, the outsourcing of colonial administration in the Aegean and Asia Minor, and private control of the grain import trade. The Seleucid monarchs of Persia favoured private provision of roads and postal services and the Romans entered into franchises for the construction of bridges, punds, roads, the delivery of water in towns and cities, and the collection of taxes (Easton, 1970 282f; Lall, 1998). The opportunity existed then, as it does now, for private investment and management to deliver infrastructure services to and on behalf of the state when the state's capacity to do so is constrained or its capacity to deliver services efficiently and at optimal cost is impaired. Public failure is a characteristic of state institutions and describes state interventions whose cost exceeds the benefits in welfare terms, and activities that could be produced with greater efficiency and at lower cost by private agents (Andrews, Boyne and Enticott, 2006). Public failure is, or should be, factored into the economics of public procurement as a risk premium (National Audit Office, 2000).

The two most commonly used alternative procurement methods used to deliver infrastructure are the BOT concession (including public private partnerships) and alliance contracts.

ALLIANCE (RELATIONSHIP) CONTRACTS

Relationship or alliance contracting is used today for short-term or multi-stage construction and civil works projects. Relationship contracting is based on a collaborative approach to the preparation of the project scope and specification, sub-contractor selection, cost estimation, project management and governance. Alliance contracts are mostly employed in the delivery of long-distance railway infrastructure, port reclamation and channel deepening, road construction and maintenance, and large-scale projects in which the works specification is incomplete at the time of commissioning the contract.

Relationship contracts possess some or all of the following characteristics:

The Form of Contract

The contract is negotiated between the consultant and the principal together with a target cost estimate (TCE). The contract is designed to create a collaborative contractual framework in which the contractor and its subcontractors and consultants work cooperatively with the principal to deliver the project to specification, on time and within the TCE. The characteristics of an alliance contract may include:

- A joint project management board,

- Joint residual control and collaboration on sub-contractor selection,
- Sharing of information, innovation and technology,
- An “open book” project governance and accounting framework,
- Single source project and asset insurances,
- Contractor selection from a pre-registered panel with criteria heavily weighted toward organisational culture and the firm’s track record with similar contracts,
- A joint approach to project costing (target cost estimate) and negotiation of the contractor’s margin,
- Aligned incentives driving the conduct of the parties,
- Joint selection of the project managers, sub-contractors, consultants and advisers,
- Project risks and savings which are shared between the principal and the agent under an agreed formula; the contractor assured full payment of the actual costs and project-specific overheads; risk of cost overrun borne by both parties and the contractor stands to lose all or part of its margin and corporate overhead; cost savings and early completion gains shared between the principal, the agents and the agent’s sub-contractors,
- Disputes resolved by alternative dispute resolution methods with limited recourse to judicial proceedings, and
- The principal and agent working co-operatively to deliver their joint objective for the project and to design and construction innovation and make use of improved technology.

Alliance contracts may be implemented quickly, reducing transaction costs by eliminating tender and bid evaluation stages. For complex projects, project design may proceed concurrently with early costing work with the contractor engaged in all aspects of design and preparation of the specification. This provides opportunity for shared innovation, new technology and wider consultation on matters affecting lifecycle costs and service quality.

Contractor Selection

Contractors are generally pre-selected against qualifying criteria which includes the readiness, experience and track record of the contractor’s management team. Additionally, contractor selection also includes the contractor’s record of innovation and collaboration and a willingness to work toward joint objectives with an appropriate culture fit with the client. Contractors submit to an audit review process in order to pre-qualify for a panel from which the agency may invite a contractor to submit an expression of interest for a project. The calculation of total project cost, completion time and the contractor’s margin are achieved by negotiation without competitive tension.

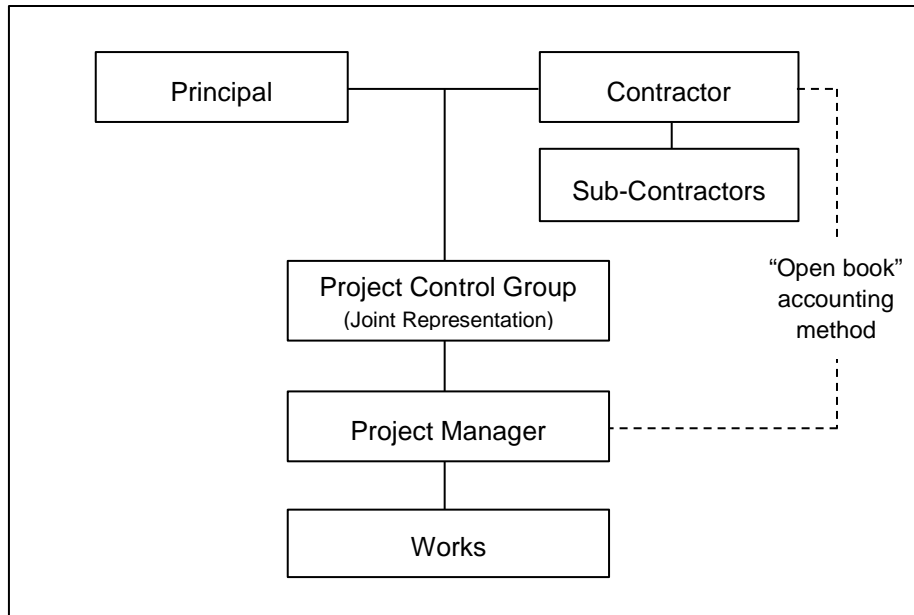
Alliance contracting is a significant move away from traditional adversarial contracting with a focus on transparency, good governance, shared decision-making and aligned incentives.

Form of Specification

Alliance contracts may be used with complete and incomplete specified projects and are employed widely with projects in which the design and specification is incomplete at the commencement of works.

Alliance contracts are also suitable for complex and multi-stage projects delivering civil works, infrastructure (interstate highways, railways), public buildings (Blyth Community College), integrated transport terminals (Heathrow Terminal 5), schools (Kingsmead School), defence (Logistics Organisation Offices), and water treatment (Thames Water) (National Audit Office, 2005b).

Table 2 – Alliance Contract Organisation



Ownership

The alliance model is managed by the project control group generally with equal representation for the principal and the contractor. The project control group creates the governance and reporting framework, recruits the project manager and monitors performance. Residual control rights are exercised collaboratively in the best interest of the project.

Risk

As a general rule, the TCE and delivery schedule are two of the primary measures of procurement performance. Risk and reward in the form of early completion or cost savings are shared and cost and time overrun penalties are carried jointly by the principal and contractor. However, in many contracts, the contractor's financial loss may be limited to project profit and corporate overheads.⁹ A consequence of shared risk and reward is that the principal and the contractor work cooperatively on a common objective with aligned incentives.

Governing Policy Framework

The ownership and control of the project is directed by the project control group. Alliance contracts are delivered under a national alliance contracting policy and guidance framework announced by the Commonwealth in August 2011 (Infrastructure Australia, 2011).

Contractual Relationship

The relationship between principal and contractor is non-adversarial; incentives are aligned in a common purpose and information is shared, minimising the asymmetries that add to transaction costs with adversarial traditional contracts. Alliance contracts are generally designed to simplify monitoring and dispute resolution procedures and, as is the case with other alternative procurement methods, enforcement may employ responsive regulatory principles. This applies a graduated penalty framework for minor breaches of the contract such as direct negotiation and minor financial penalties (or a redeemable points system) which escalates to higher penalties, warning notices and possibly contract suspension for repeated and more serious breaches (Ayers and Braithwaite, 1992). The attraction of responsive regulation is the focus on relationship management and avoidance of contract failure. Alliance contracts are designed to minimise renegotiation and time lost with disputes over changes to specification or scope of works. The transactional experience suggests that it is these characteristics that are reducing transaction cost and improving value for money outcomes. However, alliance contracts are a form of construction contract and

do not incorporate life cycle costing or the qualitative dimensions of project procurement such as service delivery standards.

Ex Post Service Delivery

Alliance contracts are typically employed for short-term construction work and may be used with long-term contracts when articulated over several stages. Alliance contracts do not generally extend to *ex post* service delivery. Where a project requires the contractor to provide asset management services, a separate management service agreement is entered into.

The Incentive Framework

The incentive framework is significantly different between traditional and alliance contracts with the distinction grounded in the ordering of the incentives. In an adversarial contract, self-interest is in tension with the parties' obligations under the contract, parties will appropriate benefits from an information advantage, and there are no mechanisms for sharing the benefits of innovation and new technology. In collaborative contracting, the risk and reward sharing formula encourages full disclosure, innovation and a joint approach to resolving problems at the least cost.

In semi-collaborative contracts such as public private partnerships, the emphasis is on *ex post* service delivery rather than *ex ante* asset delivery. The state agency is not a purchaser of the asset but is a buyer of the service. As the state agency is only paying for services delivered to specification, the sole focus of the contractor is to produce the service. The contractor may improve the marginal return on investment with better productivity or by investing more in the production process. There is no financial benefit to the contractor in cutting costs while constructing the asset, if the result is an increase in lifecycle costs or reduction in service quality.

PUBLIC PRIVATE PARTNERSHIP CONTRACTS

Public private partnerships (PPPs) were a development of the build own transfer (BOT) procurement method widely used as a vehicle for project finance in the resources industry in the 1980s. PPPs were adopted in the United Kingdom and Australia in 2001 and in other jurisdictions shortly thereafter. In Australia, PPPs were formed by state governments, administered by Treasury agencies and supported by a dedicated PPP unit and a comprehensive policy framework. PPPs were first used in Victoria in 2001, although earlier BOT transactions took place much earlier in Sydney (Harbour Tunnel project) and Melbourne (Citylink) as build operate own transfer (BOT) transactions, and a uniform national policy was adopted in 2009. PPPs are used in around 130 countries and they are the preferred strategy of international development agencies to develop infrastructure in developing nations. In Australia, only projects complying with PPP policy are described as PPPs, although in other jurisdictions, most private investments in infrastructure are described this way.

PPPs can be distinguished from other infrastructure procurement methods by the following characteristics:

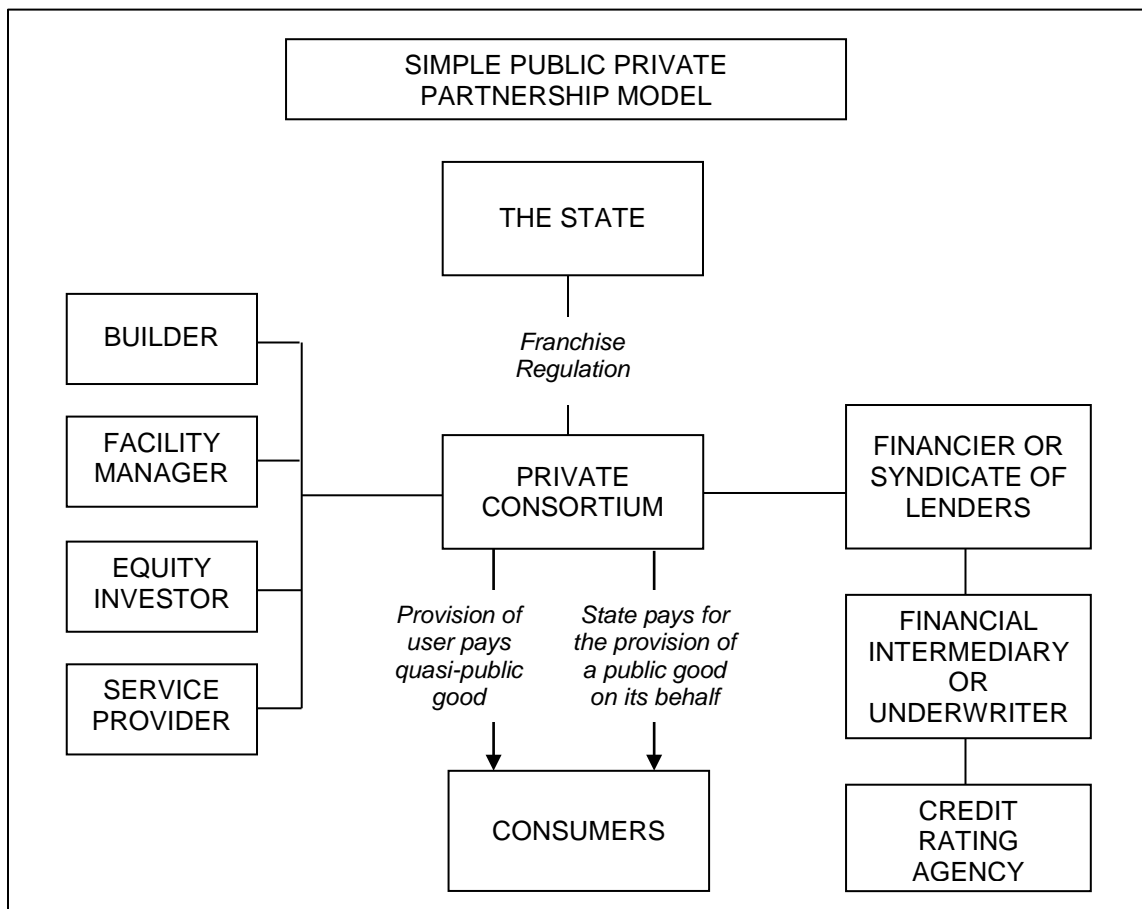
1. PPPs are implemented within a comprehensive policy framework, which operates independently of state procurement policy. PPPs are negotiated for terms of up to 40 years,
2. Projects are evaluated by the agency and modelled on a risk-weighted and lifecycle cost basis against a traditional procurement benchmark (the public sector comparator),
3. Contractors bidding for PPP projects are selected either by competitive tender or by pre-qualification and negotiation. Bidders for PPP contracts may be sole contractors or consortium bids that may include a sponsor, construction contractor, asset and/or facility manager, and possibly sub-contractors and consultants. The economics of PPPs favour high debt : equity ratios,
4. The cost of asset and service provision is met by the consortium and its lenders (see Fig. 1). The successful bidder derives income from a unitary or availability charge to the agency or accepts market (patronage) risk,
5. The agency only pays for the services it receives and payment is abated and/or penalties applied when the contractor fails to meet service delivery or quality standards or other key performance indicators,
6. PPP contracts are long-term and incomplete in the sense that it is not possible to embed in the contract document, the terms needed to deal with operating conditions, risk and uncertainty over service intervals of 20 years or more. This requires the adoption of mechanisms to resolve disputes and deal with change without recourse to legal action,

7. The contractor is selected on the basis of the best value for money proposition making use of qualitative (contractor track record and experience, innovation, technology, service outcomes) and quantitative criteria (comparison of bids with the risk-weighted public sector comparator),¹⁰
8. *Ex ante* service delivery is based on a relationship management approach with a focus on responsive regulation and a non-adversarial management framework, and
9. Investment economics favour high debt : equity ratios which contribute to greater transaction costs than traditional procurement methods. These costs concern bid and establishment expenses, long lead times to prepare bid documentation, a lengthy bid process, the conduct of post-selection negotiations which includes both contract and financial close.

The Form of Contract

The PPP transaction embodies a bundle of contracts that pass effective control of the asset and service delivery to the consortium over the term of the arrangement, and service performance is monitored by a state agency under a comprehensive contract management framework. The contract is essentially incomplete and while regulated internally, it contains mechanisms to deal with change over service intervals as long as 40 years. The agency pays for service delivery and abates payment to the extent of non-compliance or consortium failure to deliver services to the standard specified in the contract. The state only pays for the services that it receives at the required standard. The consortium has acquired a franchise to deliver services over the life of the contract that is largely protected from market competition. The opportunity exists for the contractor to improve productivity and profitability over the term of the contract and take advantage of increases in contract value to revalue and refinance assets and raise the marginal return on investment. The PPP contract is not fully collaborative but it achieves a level of transactional transparency and cooperation not found in traditional procurement methods.

Table 3 - Public Private Partnership



Contractor Selection

A contractor or consortium is selected from a competitive bidding process which may take the form of an expression of interest pre-qualification process followed by a request for tender by invitation. The PPP bidder selection process attempts to maintain competitive tension between several pre-qualified consortia while minimising bid costs which can be very high with this method of procurement.

Form of Specification

PPPs are bid as an output rather than a detailed input specification although, for complex projects, the output specification may be accompanied by detailed operational standards and requirements. The consortium meets the cost of service delivery and is responsible for the design, construction, commissioning and operation of the assets and the services that it delivers. The consortium carries lifecycle cost risk and has an interest in ensuring good build quality.

Ownership

The PPP transfers decision-making to the consortium, subject only to the agency sign-off of key matters such as final design and service commissioning. The role of the agency is to monitor construction and manage the relationship with the consortium during construction and following commissioning, during the service delivery term.

Risk

The consortium carries the full risk of service delivery and in some transport projects it may also carry market risk. In the latter transactions, market risk may be mitigated by 'take or pay' provisions in the contract, and other forms of agency guarantee, that ensure minimum revenue levels sufficient to support consortium debt servicing.

The agency only pays for the services delivered and therefore no operational risk. However, the state carries residual political risk in the sense that if the consortium fails for any reason, the agency must work with the project financiers to identify a buyer of the contract and/or resume the asset with compensation. In Australia, 12% of projects have failed in the sense that the consortium cannot meet its debt servicing requirements. The state also carries political risk and the electorate will hold government responsible for poor service quality or service delivery failure.¹¹

Governing Policy Framework

PPPs are delivered under the national policy framework with some variations adopted by the states and territories. PPPs are not subject to general state procurement policy, although they are subject to the governance and performance monitoring processes that exist in the state and territories. PPPs are not generally available to local government without the consent of local government ministers at state and territory level.

Contractual Relationship

The PPP is an incomplete and non-adversarial contract that operates with little opportunity for interparty friction. Additionally, decision-making resides with the party most concerned about lifecycle operation, service quality and the marginal return on investment. The role of the financier and the consortium is particularly important in a PPP because it provides a limited indemnity to the state against project failure: as a limited recourse loan, the financier may appoint an administrator to the development vehicle in the event of consortium default. The state requires continued service delivery and the financier's requirement is to maintain cash flow and debt servicing.¹² The financier also applies capital market discipline to the consortium by requiring compliance with the terms of the contract including service delivery standards and the debt servicing covenants in the loan agreement.

Ex Post Service Delivery

As a long-term incomplete contract, PPPs include the *ex post* service delivery stage of service provision. This creates an important connection between build quality, lifecycle cost risk and the quality of service provision. The consortium has an incentive to ensure that assets are constructed with a view to durability, low maintenance and minimal energy consumption, if it is responsible for lifecycle costs over the term of the contract. Unlike an adversarial contract, *ex post* performance under the contract is conducted under

responsive regulatory principles within a relationship management framework designed for early resolution of service delivery and compliance issues at the project level.

The Incentive Framework

A PPP aligns the incentives that drive behaviours for the three principal parties to the contract, the financier, the consortium and the state agency as buyer of the service. Each has an interest in sustained high-performance service delivery, the avoidance of protracted and costly disputes, and the resolution of change management issues. The tensions that may exist at the project level over compliance matters suggest that PPPs may not be a fully collaborative contract, or in much the same way an alliance contract. Nevertheless, the alignment of risk, incentive and objectives within the PPP arrangement suggest a cooperative approach that is a significant departure from conventional adversarial contracting.

COMPARATIVE PROCUREMENT PERFORMANCE

A growing body of evidence built up over the past 30 years points to the inefficiency of traditional public procurement practices. Reports by the UK National Audit Office in 2001 and 2003 identified late delivery and over-budget performance in around 70% of public projects (National Audit Office, 2001, 2003) and in 2007, a study of traditional contracts and PPPs in Australia found that traditional adversarial contracts for major projects were systematically delivered late and over-budget compared with PPPs (Allen Consulting and University of Melbourne, 2007). Land transport projects, in particular, attracted a high level of optimism bias reflected in overestimation of revenues and underestimation of delays, coordination problems, and costs (Standard and Poor's, 2004; Mott McDonald, 2002).¹³ The problems are significantly greater for non-standard buildings and civil engineering works, and equipment procurement (Mott McDonald, 2002 p. 14).

In 2005, the National Audit Office in Britain conducted a review of complex projects delivered with traditional and alliance contracting across a number of applications including primary, secondary and tertiary education, airports, property, medical services, water and public buildings. Contracts designed on collaborative contracting principles delivered better quantitative and qualitative ex ante and ex post service outcomes than adversarial contracting benchmarks (National Audit Office, 2005a & 2005b).

WHAT HAVE WE LEARNT FROM NON-ADVERSARIAL CONTRACTS THAT CAN IMPROVES INFRASTRUCTURE PROCUREMENT GENERALLY?

Procurement theory views project procurement in all its forms as that of principal and agent (Estache, Iimi and Ruzzier, 2009 p. 4). A difficulty with the principal-agent model is asymmetry of information and unobserved conduct. When the principal selects a contractor in an auction (tender) using criteria weighted in favour of quantitative values such as price, the principal encounters adverse selection problems because it cannot measure or verify the contractor's efficiency, embedded technology, willingness to innovate, commitment or propensity for litigation. A principal is also unlikely to know if the contractor will cut corners to improve margins and whether or not the contractor has made errors in constructing its bid. This matters if the principal is carrying lifecycle cost risk or if there is a risk of impaired service outcomes. In agency, these problems are usually resolved with incentives designed to improve build quality and a trade-off between a lower procurement costs and increased lifecycle costs over the longer term (Laffont and Martimort, 2002). In state procurement contracts, an additional problem can be the limited discretion within agencies to reconfigure selection criteria and apply incentives under procurement policy.

PPPs and alliance contracting cannot be viewed through the lens of the principal and agent model. The PPP contractor positions the state agency as the buyer of a service, and the contractor as a supplier with possession of the assets, decision-making authority and responsibility for lifecycle costs. Because the contractor can benefit from innovation and efficiency (the marginal return on investment), there is an embedded incentive in the model for the contractor to build an asset that lowers lifecycle cost and takes advantage of performance bonuses available if service delivery performance exceeds criteria. The performance advantage of PPPs over traditional contract forms is well documented (Regan, Smith and Love, 2011).

Alliance contracts cannot be reconciled with the principal and agent model either given the high level of collaboration on the TCE and shared performance incentives. The performance advantage of alliances over traditional contract forms is now better documented (National Audit Office, 2005a & 2005b).

Procurement theory suggest that complex procurement contracts deliver better performance when the contractual framework incorporates non-adversarial principles, that is, the relationship of the parties to the contract benefit from cooperation. In this sense, cooperation is the sharing of information, the alignment of objectives and incentives, the encouragement of innovation and productivity by aligning decision-making and responsibility for project outcomes, and the adoption of a responsive and relationship management approach to *ex post* contract administration.

Complete contracts for short-term construction and civil works can benefit from incentive-based contracts that place the principal and the contractor on a less adversarial footing. Delivery performance may be improved with the integration of the design and construction tasks, early contractor involvement, wider use of output objectives in the project specification to encourage contractor innovation, and specific incentives relating to build quality with a view to reduced lifecycle costing. Where possible, lifecycle contracts can lead to significant time and cost savings with complete contracts. However, it does require the redesign of state procurement policy to permit more flexible bidder evaluation criteria.

REFERENCES

- Allen Consulting, *Reducing Building Disputes in Victoria*, Final Report to the Building Commission, Melbourne, 2005.
- Allen Consulting Group, *Performance of PPPs and Traditional Procurement in Australia*, Final Report, Infrastructure Partnerships Australia, Melbourne, 2007.
- R Andrews, G.A. Boyne, G Enticott, 'Performance Failure in the Public Sector, Misfortune or Mismanagement?', *Public Management Review*, Vol. 8 No. 2, 2006, pp 273-296.
- I Ayres, J Braithwaite, *Responsive Regulation, Transcending the deregulation debate*, Oxford University Press, London and New York, 1992.
- R Bain, *Toll Road Forecasting Risk: Study Review and Update*, Standard and Poor's, London, 1992.
- W.J Bernstein, *A Splendid Exchange, How Trade Shaped the World*, Grove Press, New York, 2008.
- T Besley, 'Property Rights and Investment Incentives: Theory and Evidence from Ghana', *Journal of Political Economy*, Vol. 103 No. 5, 2001, pp 903-937.
- T Besley, M Ghatak, 'Incentives, Choice and Accountability in the Provision of Public Services', *Oxford Review of Economic Policy*, Vol. 19 No. 2, 2003, pp. 235-249.
- T Besley, M Ghatak, 'Reforming Public Service Delivery', *Journal of African Economies*, Vol. 16, AERC Supplement 1, 2007, pp 127-156.
- R Cameron, L Neal, *The Concise Economic History of the World, From Palaeolithic Times to the Present*, 4th edn, Oxford University Press, London and New York, 2003.
- Department of Trade and Industry, *Rethinking Construction (the Egan Report)*, Report of the Construction Task Force to Deputy Prime Minister John Prescott, London, 1998.
- Department of Treasury and Finance, *Project Alliancing Practitioner's Guide*, Melbourne, 2006.
- S.C Easton, *The Heritage of the Past: Earliest Times to 1500*, 3rd edn, Holt, Rinehart and Winston, New York, 1970.
- A Estache, A Iimi, C Ruzzier, *Procurement in Infrastructure, What Does Theory Tell Us?* Policy Research Working Paper WPS4994, The World Bank, Washington, 2009.
- B Flyvbjerg, M.K. Skamris Holm, S.L. Buhl, 'How (In)accurate are Demand Forecasts in Public Works Projects? The Case for Transportation', *Journal of the American Planning Association*, Vol. 71 No. 2, 2005, pp 131-143.

- E.G. Furubotn, S Pejovich, 'Property Rights and Economic Theory: A Survey of Recent Literature', *Journal of Economic Literature*, Vol. 10 No. 4, 1972, pp 1137-1162.
- Government of Victoria, *Budget Strategy and Outlook 2009-10*, Budget Paper No. 2, Parliament House, Melbourne, 2009, pp 63-66.
- International Monetary Fund, *Public Private Partnerships*, Briefing Paper, Fiscal Affairs Department, 2004.
- Infrastructure Australia, Project Pipeline, 2011, viewed 12 March 2011, <http://www.infrastructureaustralia.gov.au/project_pipeline/contracted.aspx>
- Infrastructure Australia, National Alliance Contracting Guidelines, 2011, viewed 12 July 2012, <<http://www.infrastructure.gov.au/infrastructure/nacg/index.aspx>>
- KPMG, *PPP Procurement, Review of Barriers to Competition and Efficiency in the Procurement of PPP Projects*, Report for Infrastructure Australia, Sydney, 2010.
- J.J. Laffont, D Martimort, *Theory of Incentives, The Principal-Agent Model*, Princeton University Press, Princeton, NY, 2002.
- D Lal, *Reviving the Invisible Hand, the Case for Classical Liberalism in the 21st Century*, Princeton University Press, Princeton, NJ, 2006.
- M Latham, *Constructing the Team (the Latham Report)*, Final Report of the Government-Industry Review of Procurement and Contractual Arrangements in the United Kingdom Construction Industry, London, 1994.
- Mott McDonald, *Review of Large Public Procurement in the United Kingdom*, a Report for HM Treasury, Croydon, 2002.
- National Audit Office, *The financial analysis for the London Underground Public Private Partnerships*, Report by the Comptroller and Auditor General HC54, Session 2000-01, 2000.
- National Audit Office, *Modernising Construction*. Report by the Comptroller and Auditor General, HC87, Session 2000-01, 2001.
- National Audit Office, *The PFI Contract for the redevelopment of West Middlesex University Hospital*, Report by the Comptroller and Auditor General, HC 49 Session 2002-03, 2002.
- National Audit Office, *PFI: Construction Performance*, Report by the Comptroller and Auditor General, HC 371, Session 2002-03, 2003.
- National Audit Office, *Improving Public Services Through Better Construction*, Vol. 1, Report by the Comptroller and Auditor General, Case Studies, HC 354-1, Session 2004-05, 2005a.
- National Audit Office, *Improving Public Services Through Better Construction*, Vol. 2 Case Studies, Report by the Comptroller and Auditor General, Case Studies, HC 354-1, Session 2004-05, 2005b.
- New South Wales Audit Office, *The Cross City Tunnel Report*, Auditor-General's Report, Performance Audit, 2006.
- New South Wales Parliament, *First Report, Cross City Tunnel*, Joint Select Committee on the Cross City Tunnel, 2006.
- Partnerships Victoria, *Risk Allocation and Contractual Issues*, Guidance Material, Department of Treasury and Finance, Government of Victoria, Melbourne, 2001.

- M Petrie, *Alliance Contracting*, a paper presented at the Bond University-Commonwealth Secretariat conference, PPPs in Developing Countries conference, Mantra Hotel, Gold Coast, 2007.
- M Regan, *Infrastructure: A New Asset Class in Australia*, Gilberton Press, Thebarton, 2004.
- M Regan, *The Economics of the South East Queensland Infrastructure Plan and Program 2007-2026*, Report prepared for the Department of Infrastructure and Planning, Queensland, 2008.
- M Regan, J Smith, & E.D. Love, 'Infrastructure procurement: learning from public private partnerships experiences "down under"', *Environment and Planning C: Government and Policy*, Vol. 29, 2011, pp 363-378.
- M Regan, *What Impact Will Current Capital Market Conditions Have on Public Private Partnerships?*, Research Report for the Infrastructure Association of Queensland, Bond University, 2008.
- M Regan, *Infrastructure for economic growth and development: the financing gap*, Commonwealth Finance Ministers Reference Report, Commonwealth Secretariat, London, 2009.
- S Rose, 'Valuation of Interacting Real Options in a Tollroad Infrastructure Project', *The Quarterly Review of Economics and Finance*, Vol. 38, Special Issue, 1998, pp 711-723.
- B Selanie, *The Economics of Contracts, A Primer*, 2nd edn, The MIT Press, Boston, 2005.
- A.D. Songer, & K.P. Molenaar, 'Project Characteristics for Successful Public-Sector Design-Build', *Journal of Construction Engineering and Management*, Vol. 123 No. 1, 1997, pp 34-40.
- Standard and Poor's, *Traffic Risk in Start-Up Toll Facilities*, Infrastructure Finance, September, 2002.
- Standard and Poor's, *Traffic Forecasting Risk: Study Update 2004*, Infrastructure Finance, London, 2004.
- R.M. Thompson, *Efforts to Manage Disputes in the Construction Industry: A Comparison of the New Engineering Contract and the Dispute Review Board*, Faculty of Civil Engineering, Virginia Polytechnic University, 1998.
- U.S. Department of Transportation, *Case Studies of Transportation Public-Private Partnerships around the World*, AECOM Consult Team Final Report for the Federal Highway Administration, 2007.
- The Economist Intelligence Unit, *Partnerships for Progress? Evaluating the environment for public-private partnerships in Asia, Findings and Methodology*, (forthcoming), 2011.
- The Economist Intelligence Unit, *Partnerships for Progress? Evaluating the environment for public-private partnerships in Latin America and the Caribbean, Findings and Methodology*, 2009.
- Victorian Audit Office, *Franchising Melbourne's Train and Tram System*, Auditor-General's Report number 154, 2005.
- World Bank, Private Provision of Infrastructure Database, 2012, viewed 10 July 2012
<<http://ppi.worldbank.org/index.aspx>>.

Abbreviations

APM Alternative procurement method

BOT Build operate transfer

BOOT Build operate own transfer

GDP Gross domestic product

GFCF Gross fixed capital formation

NAO National Audit Office, United Kingdom

OECD Organisation of Economic Cooperation and Development

PPP Public private partnership

TCE Target cost estimate

Endnotes

- ¹ Social infrastructure refers to services traditionally provided by government in the areas of health and education, corrective services, public buildings, community housing, judicial facilities and police stations, which provide society's social networks and resources. Economic infrastructure refers to goods and services that facilitate economic activity in an economy and typically includes public transport, airports, roads, ports, energy plants, dams and water distribution systems (Regan, 2009).
- ² Evidence of public procurement by auction is evident in Mesopotamian city states around 2600BCE, classical Greece and the Roman Empire (Cameron and, Neal 2003; Bernstein, 2008).
- ³ Contractor bidding costs for traditional contracts are, on average, around 30-60 per cent less than bids of similar size for public private partnerships and build own transfer transactions (IAQ, 2010).
- ⁴ In the common law system, in an adversarial or fault context, a court may resolve contractual disputes with several remedies including orders for specific performance, termination and/or damages. Contractual relations rarely continue beyond judicial determination of commercial disputes and the appellate process.
- ⁵ The relationship between the principal and agent is further influenced by the form of contract (a fixed price contract passes time and cost risk to the agent whereas a managing contractor or cost plus arrangement ensures the principal retains all project risk), the formula for the calculation of the agent's margin (flat fee or incentive-based) and the form of specification (an input specification limits agent liability to matters specified in the contract whilst an output specification passes design, construction and possibly operational risk to the agent).
- ⁶ These practices include poor build quality and building sustainability, non-durable fixtures and finishes, and low-efficiency plant and equipment. The risk is greater with complete and fixed price contracts than for incomplete or cost plus margin contracts (Estache, Iimi and Ruzzier, 2009).
- ⁷ Settlement of a dispute in a court of law may carry the risk of outcomes beyond contemplation of the parties, including contract termination. Legal action is also adversarial and likely to lead to a breakdown in the relationship of the parties to the contract, may take many years to resolve and is costly.
- ⁸ Information is not readily available for actual costs incurred by contractors and principles. However, estimates are provided by Allen Consulting Group (2005) and Thompson (1998). Data published by UK building firm Mowlem in 2010, suggests the average sum in dispute on completion of short-term construction contracts is 9.5 per cent of aggregate contract value. The time taken to resolve contractual disputes is an average of 7.2 months (Mowlem, 2010).
- ⁹ Few alliance contracts are similar and the agreement for risk sharing will be negotiated between the parties. The cost savings and bonus payments for early completion and improved performance are also shared between the principal, the contractor and the sub-contractors. In most alliance contracts, sub-contractors are paid directly through the project control group and the contractor is paid the cost of construction work and site overheads (Petrie, 2007).
- ¹⁰ Infrastructure Australia, *National PPP Guidelines*, Vol. 3, Public Sector Comparator Guidance, 2008, September.
- ¹¹ There has not been any service delivery failure of PPPs in Australia, although projects have been delivered late (i.e. Ararat Prison Contract II, Southern Cross Station).
- ¹² In the event of default under either the PPP or the loan agreements, the financier may subrogate an administrator to manage the PPP contract with a view to finding a new buyer of the contract. A change in control of the ownership of a PPP contractor or consortium requires agency approval.
- ¹³ The Standard and Poor's 2004 study examined patronage (forecasting) error for over 87 international road projects and identified an average 20-30 per cent overestimation. The study also compares evidence for toll and non-tolled roads and builds on the evidence of two earlier firm studies (Standard and Poor's, 2002, Bain, 2003).