

Impact of the Capital Market Collapse on Public-Private Partnership Infrastructure Projects

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Abstract: The collapse of capital markets is having an impact of the funding arrangements for economic and social infrastructure projects in Australia. Bearing this in mind, this paper seeks to examine whether the current volatility and uncertainty in capital markets in Australia affects the feasibility of privately financed infrastructure and specifically the public-private partnership (PPP) method of procurement. This paper examines the role and dependency that capital markets play in funding PPPs, current market conditions, and how they will affect PPP viability. In addition, alternative funding and procurement mechanisms that can be used for short- and medium-term infrastructure deliveries are presented.

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Introduction

The quest for increased efficiency in public service delivery, the budget difficulties of many governments, and the growing receptivity of public opinion to the discourses rehabilitating market regulations have led to a growing number of forms of association between the public and private sectors (Pongsiri 2002; Bult-Spiering and Dewulf 2006; Akintoye and Beck 2008). These forms of association are generally referred to as public-private partnerships (PPPs) and have become an integral part of the Federal and State Governments procurement strategy in Australia (Allen Consulting Group 2007). The concepts underlying PPPs have been used for decades and are used worldwide to procure economic and social infrastructures. Various forms of PPP have been found to exist such as operation and maintenance and build own operate (BOO) and transfer (BOOT) (Reijniers 1994). Such terms are often used interchangeably, and sometimes they are subject to differing interpretations. For example, private participation in infrastructure is the term used by the World Bank, and private finance initiative (PFI) is used in U.K., Japan, and Malaysia (Yescombe 2007). The governments with the most developed PPP markets focus on using them to enable the public sector to achieve value for money (VfM).

The main reason why some governments pursue PPPs is to access finance that would otherwise not be available to them. However, this is not the case in practice, as access to finance by simply deciding to use a PPP is not possible, especially considering the prevailing economic climate. If an infrastructure provider is not assured user fees and government subsidies, it will not be able to recover its costs; the provider will simply be unable to raise the capital needed to build the project. PPPs have been critical for procuring social and economic infrastructures in Australia and with the collapse of capital markets new challenges are being faced by the Federal and State Governments. Considering the significant role of infrastructure (i.e., facilitation of economic and social activity) and the multiplier effect it has on the economy the Australian government has initiated an economic stimulus package to bring forward new projects to encourage activity within the economy and prevent a recession from occurring.

In examining the potential future role of PPPs for procuring infrastructure within Australia the typical funding sources are initially discussed. It is suggested that funding methods previously used are no longer (as of May 2009) applicable in the current economic climate and as result alternative procurement and finance arrangements need to be considered. Such arrangements are examined and future recommendations for the use of PPPs and other forms of procurement for infrastructure delivery are proposed.

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PPPs

Critical infrastructure has been reliant on investment from the public sector and the use of PPPs for procuring projects. During 2008, international capital markets experienced high levels of instability with a sharp fall in the share market prices of listed infrastructure securities, a sudden and acute contraction in structured and project debt markets, and institutional restructuring that saw state bailouts or acquisitions of a large number of privately owned financial institutions. These events were quickly felt in Australia and reflected in sharp falls in security prices, a decline in business and asset-based lending, and a sharp rise in lender

spreads for corporate, project, and structured finance. Capital market observers suggest that current market conditions are the worst they have been since the great depression and economic forecasters are predicting continued capital market instability in the short to medium term and a long recovery period.

In Australia, PPPs account for around 10% of state capital spending in Victoria, around 7% in Queensland, and lesser proportions in the other States and the Commonwealth. PPPs are highly leveraged in listed or private forms and rely on capital markets for both equity and debt capital. A significant body of evidence points to the advantages of PPPs over traditional procurement methods [Mott McDonald 2002; Fitzgerald 2004; Allen Consulting Group 2007; National Audit Office (NAO) 2005]. The benefits include the following:

- The delivery of projects on time and on budget;
- Reduced procurement costs and improved VfM outcomes;
- Improved project management—integration of design and construction processes and full life-cycle costing;
- Adoption of an output specification to encourage design and construction innovation and new technologies; and
- Improved public services and qualitative user outcomes.

Evidence suggests that PPPs are improving government infrastructure performance in following ways (Bult-Spiering and Dewulf 2006; Akintoye and Beck 2008):

- They are an important innovation in the evolution of the science of major project procurement and they are a more efficient method of project delivery than the alternatives;
- Along with alliance contracting and the input specification models, they provide favorable VfM outcomes and form part of the diverse procurement tool box available to government for appropriate applications; and
- Private capital markets provide an important alternative source of capital for governments hard pressed to meet the high levels of investment needed to renew Australia's aging infrastructure.

A detailed review of the merits and international experiences associated with of PPP projects can be found in Akintoye et al. (2003), Bult-Spiering and Dewulf (2006), and Akintoye and Beck (2008).

PPPs and Capital Markets

The past 12 months have been a turbulent time for global credit markets. In Australia, there has been a dislocation in the asset-backed and corporate bond markets with rating downgrades for monoline bond insurers and calls on guarantees for recently commissioned projects. This has affected both distribution and credit guarantee pricing [Reserve Bank of Australia (RBA) 2008]. Nevertheless, Australia has fared better than many Organization for Economic Cooperation and Development (OECD) countries with exposures confined to relatively few projects although full and partial refinancings of a number of mature projects in the next 18 months will test this (Debelle 2008). Fig. 1 provides a structural overview for a typical Australian PPP capitalization.

Equity Capital

In 1995 an infrastructure sector index was created on the Australian Securities Exchange (ASX) and within a brief time, infrastructure achieved recognition as a distinct asset class. By 2001, market capitalization of the sector reached \$18,557 million and within 12 months, this had increased to \$25,632 million (Regan 2004). The early practice of forming diversified multisector port-

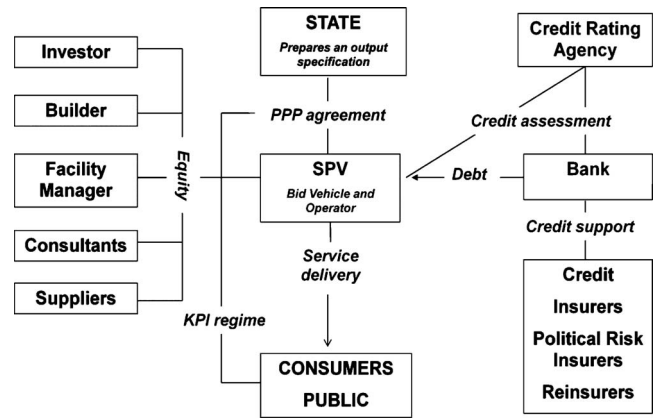


Fig. 1. Typical Australian PPP capitalization

folio funds (Infrastructure Trust of Australia 1996; Australian Infrastructure Fund 1997) evolved to a sector-specific focus within a few years with the listing of Macquarie Airports Group and the creation of Macquarie Infrastructure Group. The Transurban and Hills Motorway initial public offerings (IPOs) were the first single asset property vehicles. The market experienced considerable “churn” in the period 1995–2003 with few of the original companies in the sector surviving in the same form eight years later.

Australian superannuation fund managers became the largest investor group in this asset class. The long-term investment horizon and low demand elasticity offer a good match for the fund manager's liabilities and yield requirements. In 2001, institutional investors accounted from 75.8% of listed infrastructure vehicles, a greater level than for other sectors of the ASX at that time (Regan 2004). In recent years listed economic infrastructure entities exhibit distinct asset class characteristics (Regan 2004). In the relatively benign market conditions of the 1990s, these investments offered effective countercyclical properties avoiding the return volatility of other leading sectors such as manufacturing, transport, telecommunications, and indirect property. Additionally, infrastructure offers different reactions to movement in leading economic indicators such as United States and domestic gross domestic product (GDP), short- and medium-term interest rates, inflation, and stock price movements (Regan 2004; Garling and Foster 2006). Recent events in capital markets may have removed some of the insularity to market volatility previously believed to be a characteristic of this asset group and infrastructure has revealed a vulnerability to delivery risk, high leverage, and patronage risk in conditions of uncertainty.

Examples of Capital Market Dependency: Equity Capital

The three recently procured Queensland PPP projects were large by Australian standards and commenced with the Southbank Institute in 2004 to be followed by the North-South By-Pass Tunnel in 2006 and the Airport Link Project in 2008. The latter projects were listed on the ASX prior to commencement of construction. PPP projects are capitalized with high levels of debt which is well suited to long-term capital-intensive projects. Infrastructure is a specialized asset class possessing investment characteristics not commonly found in other asset classes. These characteristics include the following (Regan 2004):

- Stable indexed revenue streams;
- Low variable cost structures;

- High earnings before interest tax and depreciation (EBITDA) margins; and
- Limited tenure (a wasting asset).

Infrastructure also features low demand price elasticity although toll roads may be the exception (Bult-Spiering and Dewulf 2006). These assets are well suited to high levels of debt which has the effect of lowering the sponsor's weighted cost of capital and improves return on equity. Several early PPP toll road IPOs employed stapled security structures and high leverage compared with other capital-intensive asset classes such as the resources sector and direct and indirect properties. The market appeal of these assets was their robust and indexed revenue stream, strong debt service coverage, and the long-term investment horizon which matched the long-dated liabilities of pension and fund managers.

The important role that capital markets play in the capitalization of these assets is demonstrated by the early toll road PPPs. For example, the Hills Motorway, Transurban, and Sydney Harbour Tunnel projects were BOOT transactions and not implemented under State Government PPP policies. However, for these purposes, the wider definition of PPP is used and this includes outsourcing as well as the BOT and BOO procurement methods (Regan 2008). Australia's first toll road was the Sydney Harbour Tunnel commissioned in 1988 and this was followed by Hills Motorway in 1999 and the Transurban City Link project in Melbourne which was commissioned in 2001. Transurban listed in the ASX in 2001 and undertook a program of expansion in recent years which included the acquisition of Hills Motorway in Sydney, an interest in other Australian toll roads, and new projects in North America. The Eastlink project was listed as ConnectEast Group in November 2004 prior to construction commencing in early 2005 and included completion risk in the parcel of risks transferred to buyers of its securities.

The Eastlink project in Melbourne was listed on the ASX by Macquarie Bank in 2004, ABN Amro followed with the North-South By-Pass Tunnel in Brisbane in 2007, and Macquarie Bank with the Airport Link project in Brisbane in 2008. The collapse in equity prices for both these projects in 2007–2008 was partly a result of the sharp fall in stock prices and highly leveraged infrastructure stocks in particular. Falling stock prices is also attributed to concern about traffic forecasts and high energy prices which adversely affect the patronage and financial economics of these assets. The veracity of traffic forecasts has been a problem for transport projects for many years and attracted wide publicity with the troubled Sydney Airport Rail Project, Brisbane's Skytrain, and the Cross City Tunnel in Sydney.

In 2008, the recently opened Land Cove Tunnel and Eastlink projects also failed to achieve forecast revenue within the early ramp-up period. Recent research suggests that 65% of security price contraction in 2008 for listed infrastructure motorway stocks is due to systematic or market risk factors common to the sector (Regan 2008). The balance of the loss of value mainly reflects unsystematic or project-specific risk concerns. Research by Standard and Poor (2002, 2004) using 282 international transport projects identified systemic overestimation of patronage with land transportation projects. The average error rate was 30% (projects on average achieved 70% of forecast revenue in the first three years of operation). Previous research has revealed that (Flyvbjerg et al. 2006; Standard and Poor 2004)

- 25% of projects had an average forecasting error of $\pm 40\%$;
- 50% of projects had an average forecasting error of $\pm 10\%$;
- and

- If the error is evident in Year 1, it will continue during the revenue "ramping up" period.

It is disconcerting that optimism bias has been a problem with transport forecasting for over 25 years despite significant changes in measurement methods and the benefit of precedent. The study suggests that forecasters are not learning from experience. For PPPs in the transport sector, an alternative view is that these are long-term investments and early-stage patronage error does not necessarily mean projects are not viable in the medium to long term. The recent purchase of Sydney's Cross City Tunnel by Leighton Contractors Pty Ltd., financed by ABN Amro, indicates that even at patronage levels around 60% of those originally forecast, the investment is viable to the new owners. Few other PPPs are listed on the ASX as single asset investments although most are dependant on off-market bond issues and debt syndication for the limited recourse finance that they require.

Debt Capital

Most infrastructure debt in Australia takes the form of bank loans, the issue of bonds, or private placements with institutional investors and fund managers. The stapled security offerings of listed infrastructure groups are treated as equity for these purposes although a significant component of the subscription price is structured or distributed as a loan to another entity within the group. Many listed and unlisted PPP projects raise debt by issuing bonds. The capital structure of the Southern Cross Station project in Melbourne, for example, employed three tranches of bonds:

1. U.S. dollar denominated 11.5-year fixed-rate bonds (A\$126 million);
2. Australian dollar denominated 12-year floating-rate bonds (A\$200 million); and
3. U.S. dollar denominated 30-year indexed bonds (A\$135 million).

The composite bond method of financing PPPs is widely used in U.K. and Canada and is based on project finance principles and high leverage. An advantage of this financing method is the opportunity to structure financial risk management into the tenor, currency, and pricing of the bond issue. European PPP projects, for example, in the period 2004–2006, indicate initial debt capitalization averages from 76 to 82% increasing to 85% at the first refinancing [National Audit Office (NAO) 2005; Standard and Poor 2004, 2005].

The pricing of debt is largely determined by credit ratings for the larger Australian projects and by credit evaluation for privately sourced senior, junior, and mezzanine finance. Present tight liquidity in capital markets, higher spreads, and tighter credit standards suggest that sponsors of new PPPs will need to adjust overt leverage levels more in line with the average debt levels of the market as a whole. In March 2008, average debt capitalization of the ASX All Industrials stood at 64.3%. Such a figure is non-weighted and fails to take account of the important relationship between stable, indexed revenue, and debt servicing capability that are characteristics of mature infrastructure investments. These properties suggest that infrastructure has the capacity to support debt levels over and above ASX sector averages and the appropriate level of leverage is best determined on a case by case basis. Nonlisted investments are generally more highly leveraged than either listed infrastructure or ASX market averages.

Intermediation and Credit Enhancement

Credit enhancement or credit wrapping is a technique for reducing investor's cost of debt for a PPP project. The underlying credit

rating of most Australian PPP projects is BBB (Standard and Poor 2004, 2005). Credit wrapping is essentially an AAA guarantee of the borrowing consortium's debt obligations to lenders purchased for a fee which is less than the difference in borrowing costs between the two rating standards. This can be significant over the life of a PPP with the spread of five-year corporate bond swap rates at 30th June 2008 standing at 159 basis points (1.59% pa) for BBB and 106 basis points for AA [Reserve Bank of Australia (RBA) 2008]. At 30th September, the spreads were 251 basis points and 135 basis points, respectively. The monoline insurer guarantees against default in the payment of both bond interest and principal.

In June 2007, the Australian credit-wrapped bond market stood at A\$27 billion, accounting for around 7% of the domestic non-government bond market [Reserve Bank of Australia (RBA) 2008]. This market has increased dramatically in size in recent years, doubling since 2004 largely as a result of strong growth in the number of motorway PPP projects commissioned in this period. In June 2007, over 60% of this market was shared by two institutions—MBIA and Ambac. At that date, the guarantees of all six firms in this market were rated Standard and Poor AAA. In August 2008, only two of the firms retained their AAA status with MBIA, Ambac rerated to AA, and FGIC and XL/Syncora rerated to BB and BBB, respectively [Reserve Bank of Australia (RBA) 2008]. The rating downgrades are reflected in increased margins between credit-wrapped bonds and other nongovernment unsecured AAA-rated bonds in the secondary market. Average margins increased from average 25 basis points (0.25% pa) in July 2007 to 130 basis points (1.3% pa) in July and 240 basis points in November 2008. The recent revised ratings for credit insurers followed a general repricing of risk on international and domestic capital markets and will impact both the cost and availability of future debt raisings and financial risk management tools for PPP projects.

PPPs: Capital Market Dependency

PPPs are generally concerned with the production of economic and social infrastructure services. They are heavily dependant on capital markets. This dependence occurs at five levels.

1. *Equity capital*—Australian PPP projects draw their equity capital from the ASX, listed portfolio investors, banks, private equity, fund managers, and institutional investors. Three of Australia's largest and most recent toll road projects were listed on the ASX and listed portfolio investment vehicles hold significant interests in ports, airports, toll roads, energy production, and distribution within Australia and overseas. The ASX is the single largest source of PPP equity capital in Australia.
2. *Debt capital*—PPPs are highly leveraged using medium-term bank debt, project finance, or long-term bonds. These securities are placed in debt markets and with private investors. Australian PPPs also make greater use of medium-term corporate debt than traditional long-term project finance. This permits investors to take advantage of short-term revaluation and refinancing although it requires consortia to assume refinancing risk and more frequent visits to the debt market than would be the case with conventional project finance.
3. *Financial services*—The financial economics of PPPs place strong reliance on capital markets for fragmentation of risk and services that include intermediation (debt and equity un-

derwriting), credit enhancement (monoline insurance), credit rating, and financial risk management.

4. *Market drivers*—In Australia, the drivers of the PPP bid market are the financial service providers. Their selective participation or withdrawal from future bids combined with barriers to entry created by softer market conditions may lead to some realignment of the bid market. Whether building and facility management contractors are willing to assume a greater equity and mezzanine finance role in their bids remains to be seen.
5. *Capital market innovation*—PPPs benefit from capital market innovations such as the stapled security, unit trust structures, and credit enhancement. Recent credit rating downgrades for financial intermediaries including credit insurers will adversely impact competition in PPP bid markets, weaken VfM outcomes, and affect the fast tracking of infrastructure projects which are major attractions of the PPP procurement method.

The level of dependency of capital market dependency however varies across industry sectors, projects, and the nature of the revenue stream. As previously noted, in present market conditions, capital will generally be harder to find, it will be more expensive, and stricter credit standards may require bidders to take a more conservative approach to risk acceptance. This suggests some weaknesses in bid depth, private sector appetite for Greenfield projects, and those involving patronage risks. A less competitive bid market may also have an adverse impact on VfM outcomes. In summary, debt markets have become strongly risk averse. This is reflected in low debt to equity capitalization ratio. For example, the average debt equity ratio for PPPs on the ASX in 2007–2008 was 81:19 which was consistent for projects in U.K. at that time (Standard and Poor 2008a,b). The leverage ratio for Australian industrials on the ASX in September 2008 was 72:28, down from 76:24 a year earlier (Smartinvestor 2008). In December 2008, the desalination PPP project in Melbourne, one of the nation's largest PPP undertakings, failed to meet the 78:22 capitalization requirement and the Queensland Government offered debt when consortia failed to reach a 73:27 debt to equity ratio. For projects involving the refinancing of existing debt against mature revenue streams, availability payment streams, and sponsor-provided equity, bid market depth and debt market activity levels are expected to remain buoyant albeit with stricter credit standards.

Market Conditions and PPPs

The present conditions in debt markets follow 12 months of instability that had its origins in the U.S. subprime mortgage market and suboptimal risk pricing in international capital markets. The asset write downs, lack of liquidity, and low confidence in the market that followed, led to a repricing of risk, a significant increase in spreads (risk premiums) in interbank markets and higher corporate borrowing costs. These conditions were recognition of the deterioration in risk management practices in the financial services industry and lack of trust in financial institutions and capital markets over the preceding 12 months. A decade of low interest rates, bank asset disintermediation, and high leverage in buoyant market conditions created circumstances for a procyclical correction that was amplified by tighter liquidity conditions [Reserve Bank of Australia (RBA) 2008]. Capital markets in Australia and overseas are presently characterized by

- Historically low share prices;

- Limited opportunity for new on-market capital raisings;
- Reduced activity in mergers, acquisitions, and divestments; and
- A fall in asset values at odds with underlying fundamentals.

The instability in debt markets has spread to equity markets with sharp falls in share prices experienced in all OECD countries. The ASX's 200 share price index fell 29.95% in the 12 months to 30th September 2008 and ASX market capitalization stood at \$1.333 trillion on 31st August 2008, a fall of 14.98% over the previous year [Reserve Bank of Australia (RBA) 2008]. In the past 12 months, uncertainty in capital markets was accompanied by volatile currency exchange rates. In the 12 months to 27th October 2008, the Australian dollar fell 27.4% against the U.S. dollar and 38% against the Japanese yen [Reserve Bank of Australia (RBA) 2008; Market Wrap 2008]. Market conditions have stabilized in recent weeks although a survey of capital market executives suggests that asset price and exchange rate instability may be the predominant market characteristic in the medium term (Regan 2008).

In tandem with uncertainty in the equity market, international and Australian debt markets are experiencing a liquidity squeeze following the collapse of the U.S. property market and write downs in subprime debt that has threatened most U.S. financial services corporations. Additionally, risk has been repriced and distortions introduced with state interventions. For example, cash deposits in Australian banks guaranteed by the commonwealth are now, in effect, risk-free. This has effectively altered the cost of capital for individual and portfolio investors. International portfolio investment in the subprime debt market has produced a default risk in other capital markets and led to a crisis in confidence.

A consequence of present market conditions and reduced liquidity is the reduced availability of corporate and project finance, increased borrowing costs, and by extension increased cost of equity capital. Project finance is a specialized form of finance although not commonly used for Australian PPP projects where the benefits of short-term revaluation and refinancing of assets favor medium-term corporate finance (Regan 2007, pp. 21–24). There will also be significant demand for medium-term corporate finance in the infrastructure sector with the refinancing of existing listed assets in the period 2009–2012 including Transurban, the ConnectEast, and RiverCity Motorway Groups.

A further difficulty is refinancing. Australian PPPs in toll road and urban rail projects employ medium-term finance for terms of up to seven years. The refinancing points are used to revalue assets against mature revenue streams and reduction in project risk, especially early-stage patronage risk. The revaluation permits a reduction in equity and a return to equity investors and an increase in debt levels against higher asset value at lower cost (ConnectEast Prospectus 2004; RiverCity Motorway 2006). Present capital market conditions have created three new concerns for projects that fail to achieve forecast patronage.

First, land transport projects cannot buy AAA credit insurance with the consequence that refinance will attract higher risk premiums. This is partly a result of the more conservative lending practices now being implemented and the withdrawal of credit insurers accounting for 80% share of this market in Australia [Reserve Bank of Australia (RBA) 2008]. Second, the ASX has no appetite for listed land transport projects in present market conditions. Third, sourcing refinance of transport projects is proving a major problem for ConnectEast (the Eastlink toll road in Melbourne) and Lane Cove Tunnel Finance Company (Sydney) both of which are trading below their forecast traffic volume. Listed toll roads that fail to achieve forecast revenue are trading at

a significant discount to replacement value and are takeover targets. This occurred with the Hills Motorway in Sydney in 2006.

Capital market uncertainty in the past six months has also had a significant impact on the ASX infrastructure sector. The major Australian investment banks actively packaging and managing assets experienced sharp declines in share price with consequential impacts on portfolio debt structures, borrowing covenants and asset liquidity. The IPO model is not presently an option for PPP projects and the ASX is unlikely to be a source of equity capital for some time yet in this country.

Influence of Market Conditions on PPPs

It is suggested that the prevailing capital market conditions are expected to have the following effects on PPP bid markets:

- Risk is in the process of being repriced but has not yet stabilized. This will place sustained short-term pressure on the pricing of debt capital for PPP projects;
- A reduction in the availability of debt capital in the short to medium term;
- Tighter credit standards including lower debt to equity ratios (leverage), higher debt service coverage ratios (interest cover), and wider use of capital reserves and sinking funds to manage revenue volatility risk; and
- Limited availability and increased cost of credit enhancement services and tougher credit rating standards.

A further effect will be the disappearance of the IPO capital-raising model for transportation projects in the short to medium term (one to five years). The Australian equity market has demonstrated a long-standing appetite for infrastructure securities. The many innovations include the single asset investment vehicle, sector-specific investment vehicles, and the stapled security. Nevertheless, present uncertainty suggests that the IPO method of raising capital is not feasible in prevailing market conditions and unlikely to make a reappearance in the new future. It would appear that a number of issues are at play which includes the following:

- The market is wary of high debt levels and distress premiums are greater now than at any time in the past 15 years;
- The market has demonstrated a reluctance to carry delivery risk. Promoters may need to revert to quarantining the delivery risks for future large-scale construction projects. The investment grade credit rating given to the Lane Cove Tunnel project by Standard and Poor in 2006 was influenced by the underlying credit rating of the constructor, Leighton Group, and a qualitative assessment of that company's capabilities and track record; and
- New IPOs will need to address the question of optimism bias in forecasting and the perception of systemic forecasting error.

Financial advisers and lenders in late 2008 suggest that PPP transactions will be harder to finance in present market conditions (Regan 2008). The degree of difficulty increases with projects that carry patronage risk and those that require investors to absorb high levels of delivery and operational risk. Thus, raising capital for future PPP projects can only be determined on a case by case basis. The factors that should mitigate the finance risk associated with PPP projects in present market conditions include the following:

- Conservative leverage;
- High debt service coverage ratios;
- Adequate reserves;
- Source and stability of the payment stream;
- Underlying credit rating;

- Benign abatement regimes;
- Availability of appropriate credit insurance;
- Capabilities and track record of consortium members; and
- State risk allocation.

Refinancing risk is also a potential difficulty for existing projects although mature projects with strong revenue streams, staged or composite debt maturities, and availability-based payment arrangements should mitigate this risk. For projects not featuring these covenants, refinancing risk presents are considered to be a more serious problem. The 2008 survey of finance executives suggests that the cumulative effect of recent events in capital markets can be expected to have the following long-term impacts on the PPP bid market (Regan 2008):

- Equity will be difficult to source. The demise of the IPO equity-raising option will also mean the end of other equity-raising techniques employed with this model such as the dividend reinvestment plan and deferred equity subscription arrangements. Firms will find it increasingly difficult to meet new minimum equity capital standards and the short-term outlook is for higher cost of equity pricing.
- It may be increasingly difficult for small firms and noncredit rated market participants to find a place in consortium lineups. In tighter capital market conditions, this is expected to result in a reduced number of players in the bid market.
- The construction industry will be reluctant to provide long-term equity capital for PPPs when the alternative is relationship contracting and lower project risk absorption.

A contraction of the PPP bid market has important implications for the future provision of infrastructure in Australia. These include the following:

- Decline in the number of PPPs with the loss of benefits available from this procurement method;
- Slowing of the roll-out infrastructure plans and programs with consequential effects on both transitional and long-term economic development particularly in states such as Queensland and Western Australia; and
- Greater emphasis on state provision of infrastructure financed through state debt or taxation with associated “deadweight” costs.

Regan (2008) also revealed that financiers and advisers suggest that new PPP transactions over the next 12 to 18 months will attract significantly higher spreads or risk premiums. As previously identified, this is especially the case with Greenfield projects that carry market or patronage risk. Projects where the revenue is by way of state availability payments such as projects in health, justice, and education and the refinancing of mature market risk projects should be easier to finance although risk pricing, leverage, and debt servicing criteria are expected to be tougher throughout 2009.

A further factor influencing the financing of PPP transactions is the relative maturity of the industry and the allocation of risk. Research by the Regan (2006) suggests that some infrastructure industries attract lower lending risk premiums than others. Mature tollway projects, energy generation and transport hubs (airports and ports), and social infrastructure generally attract lower debt funding margins, on average, than projects in higher risk categories such as in the water and urban transport industries.

Medium-Term Future Outlook for PPPs

The difficult conditions presently being experienced in overseas and domestic debt markets are not expected to continue indefi-

nately. Anecdotal evidence from industry suggests that equity and debt finance will continue to be available for PPP projects in the sub-\$300 million capitalization sector of the market (Regan 2008). However, as noted, lending criteria will be tougher and projects with lower delivery and operational risk profiles are more likely to raise capital than those with projects carrying greater risk burdens.

A significant part of the problem for PPPs in Australia is the wide use of IPOs and medium-term corporate finance as opposed to long-term project finance more common in Europe and United States (Regan 2007). The IPO may not be an option in the foreseeable future and medium-term corporate debt may be difficult to source. However, financiers and credit rating agencies report that larger projects with lower overall credit risk will continue to attract long-term project finance. Project finance creates a problem for the Australian PPP financing model for several reasons including the early-stage refinancing to capture shift in the risk and return profile of the project, the preference for early-stage contractor withdrawal, and an inability to extract the preferred risk and incentive framework favored by local firms.

Adverse market conditions also present opportunities and Australia’s capital market has proven adroit in developing innovative financial solutions designed specifically to facilitate investment in this asset class. The stapled security, deferred equity contribution, and composite group structure are examples of this. Superannuation fund managers and institutional investors are attracted to this asset class because of its investment characteristics which include the following:

- High capital intensity and earnings before interest, tax depreciation, and amortization (EBITDA) margins;
- Low variable costs and high yield in maturity;
- Indexed long-term cash flows; and
- A long-term investment horizon that is well matched to the tenor of fund liabilities.

This group of investors has a reduced appetite for delivery and forecasting risks associated with land transportation projects. However, as projects shed early-stage risks and revenue streams mature, these projects are more attractive to fund managers. Further innovation in structuring PPP projects for listed and unlisted investments may well target the quarantining of early-stage project risks with a view to attracting earlier participation by fund managers. Further innovation in the PPP model is also a possible response to present market conditions.

PPPs are a hybrid procurement form that has proved remarkably resilient since its first use in Australia with the Sydney Harbour Tunnel in the 1980s. Continued refinement can be expected to meet changed circumstances including the early withdrawal of franchisees, the equitable apportionment of windfall gains, and the extension of the model to deliver complex social infrastructure services such as specialized applications in corrective services, the health sector (Royal Children’s Hospital and Royal Women’s Hospital), and education (school projects in NSW, Victoria, and Queensland).

Alternative Mechanisms

Procurement Method

If new infrastructure projects are harder to deliver as PPPs, the options for privately financing state infrastructure services are few. Alternative procurement methods that could be considered are *traditional* and *relationship contracting*.

Table 1. Procurement Outcomes 1999–2006 (Reprinted with Permission from Regan 2008)

Survey of procurement outcomes ^a				
		On budget (%)	On time (%)	User benefits ^b
Traditional procurement	^c	25	34	27%
	^d	27	30	35%
	^e	55	63	55%
Gateway programs	^d	69	73	65%
Alliance contracting	^c	77	78	Refer notes
PFI (U.K.)	^e	78	76	n.a.
PPP (Australia)	^f	79	82	74%
U.K. defense contracts	^g	17 (14)	8 (24)	Met requirements

^aSources as noted. Sample sizes vary. Parenthesis denotes average overruns for sample.

^bQualitative assessment from independent reports of National Audit Office (NAO) (2004a,b, 2006). Defect reporting.

^c1999 results: Improving services through construction Part B of National Audit Office (NAO) (2005).

^d2000–01 results: Modernizing construction of National Audit Office (NAO) (2001). Delivered on or undertime and price.

^e2004 results: Improving services through construction Part A of National Audit Office (NAO) (2005).

^fFitzgerald 2005; Audit office reports Victoria and NSW 2004–08 (Allen Consulting Group 2007).

^gMOD defense contracts of National Audit Office (NAO) (2004a,b, 2006).

Traditional procurement or adversarial contracting is a relatively flawed procurement model with recent evidence suggesting that it is not an appropriate method for managing the delivery of infrastructure projects and services (Allen Consulting Group 2007). A number of studies employing comparative analytical techniques suggest that traditional procurement fails to meet VfM assessment criteria and is prone to cost, time overruns, and disputes. This method often also fails to address the key considerations of whole-life costs, future maintenance, and tighter standards for sustainability and energy usage.

Relationship contracting is a form of project delivery designed around the shortcomings of traditional procurement. The reports of Latham (1994) and Egan (1998) were reviews of the poorly performing U.K. construction industry and both identified weaknesses in the adversarial basis of lowest price tender procurement. Both reports pointed to the benefits of alliance contracting and were influential in its wider use for government projects in Britain and Australia. Relationship contracting is a collaborative approach to procurement under which there is agreement on price and method, a sharing of risk and rewards, and an avoidance of adversarial methods to project manage delivery, resolve disputes, and settle claims. Relationship contracting may take the form of a long-term project articulated into a series of separate contracts with the same contractor group. However, it does not offer the life-cycle costing and delivery performance characteristics of PPPs, outsourcing, or BOOT delivery. Accordingly, performance is mainly measured on the basis of delivery time and cost. Evidence from several research studies as identified in Table 1 suggests that relationship contracting improves procurement and service delivery outcomes [National Audit Office (NAO) 2005] (Table 1). Contractors in Australia have long expressed a preference for nonadversarial contracting over both the traditional and PPP procurement models.

Financing of PPPs

Besides the dependency on capital markets several alternative financing mechanisms presently under evaluation or use in Australia include: *state and municipal bonds, credit guarantee finance, a supported debt model, and debt guarantees*. These mechanisms are not subject to capital market volatility due partly to high state and federal government AAA credit ratings and low levels of public debt. These financing methods do not necessarily present the best option to finance PPPs because of high deadweight cost but offer certainty in an unstable capital market when private finance is increasingly difficult to source.

State and Municipal Bonds

The Australian Government introduced an infrastructure borrowings taxation scheme in 1992 which was designed to stimulate private investment in infrastructure with a tax exemption of interest derived from qualifying loan facilities. The program was modified and extended in 1994 as the Infrastructure Borrowings Taxation Concession and replaced in 1997 with the Infrastructure Borrowings Tax Offset Scheme. The latter program was limited to large-scale land transport projects and was not widely used. Each of these programs granted a tax benefit to secured private lenders but not the unsecured risk-taking equity investors. Accordingly, the scheme was mainly employed by promoters to develop hybrid tax advantaged debt securities with wide appeal to high net worth and highly taxed individual investors. The scheme was phased out in 2004 but could be considered once again.

The United States has long supported tax exempt bonds as a method of raising private infrastructure finance for state and local governments. The program authorizes state and local governments to issue tax exempt bonds for investment in ports, urban transport, public schools, waste management systems, energy, water, intercity rail services, public housing, and airports. The scheme has been criticized for many years as an inefficient method of attracting private infrastructure investment. The major objections pertain to the following (Regan 1999):

- Low equivalence between the tax benefit granted to corporate and high net worth individual investors and interest savings to state and local governments (average marginal tax rate saving 35.7% and interest rate savings of 1.80% per annum);
- Tax exemption to investors with high marginal rates of tax fails the test of Pareto efficiency;
- The arrangement operates as a transfer payment to state and local governments with authority to issue the bonds at the discretion of state and local governments;
- Extension of the program to quasi-social infrastructure such as sport stadiums and public entertainment facilities; and
- Eligibility for the tax exemption is denied to lending institutions, public and private pension funds, and institutional investors.

Alternative arrangements include direct federal government interest rate subsidies for state and local infrastructure borrowings and the issuance of tax exemption debt securities which permit the separation of the tax exemption component for sale in capital markets which is a variation to a carbon trading scheme.

Credit Guarantee Finance

Credit guarantee financing (CGF) was introduced in U.K. in 2003 to provide a mechanism for using public debt capital to finance PPP projects. The nucleus of the transaction is the guarantee furnished by the consortium's bankers or a credit enhancement agency (monoline insurer) to the state as security for a senior debt

facility provided by Treasury. The objective of CGF is to reduce the consortium's cost of capital and thereby improve the long-run and overall VfM outcomes for the state. This arrangement is a departure from traditional project finance principles whereby senior debt is secured only by recourse to the underlying project assets. CGF is, in fact, full recourse debt and this does affect the traditional incentive mechanisms that are a feature of conventional project finance and PPP arrangements.

The CGF model was trialed in U.K. with two PPP projects in the health sector in 2004 at Leeds (DLA Piper 2006) and in Portsmouth in 2005 (H.M. Treasury 2006; Minter Ellison 2007). In the Leeds project, the consortium's financiers provided the credit guarantee and for the Portsmouth project, the guarantee was furnished by a monoline insurer. An assessment of both projects identified life-cycle interest cost savings to be in the range of 8–16% of aggregate finance costs. The CGF model can lower the cost of capital and improve VfM. It may also create a number of practical problems, which include the following:

- The spread in funding costs at the AAA credit rated level between Commonwealth and U.K. governments, Australian state governments, and private firms. The effective saving in interest cost may be around 50 basis points per annum in average market conditions although the implicit risk transfer back to central government is of similar dimension.
- Application of CGF requires Treasury to assume the role of an arm's length lending bank which involves loan administration, legal and advisory fees, oversight and industry-specific technical knowledge, and the transaction and/or agency costs involved.
- CGF introduces another layer of contractual complexity into the PPP transaction which contributes to additional transactional and decision-making friction and incurs time and cost delays.
- Volatile capital market conditions have reduced the number of AAA-rated monoline insurers issuing credit guarantees in Australia and U.K. which effectively transfers this role to consortium bankers. This is not the core business of banks and not the optimal method for them to leverage their balance sheets to maximize interest spreads, underwriting, and transaction fees.
- PPP consortia are generally a collection of entities with different incentives and timing objectives. Therefore, flexibility is of high importance and it is common for them to lock in on medium-term debt with a view to potential refinancing windows where risk has diminished and asset value improved. The CGF model with its long-term debt obligations inhibits this flexibility, which may reduce competitive tension in the bid process.
- PPPs are an incomplete contract—commercial and financial settings change, risk profiles are dynamic, opportunity may arise for revaluations and refinancings, and real and embedded options may change the marginal return on investment or underlying financial economics. Long-term debt arrangements may inhibit sponsor flexibility.
- Economies of scale suggest that for the CGT program to derive large-scale benefits for the state, it would need to be applied to a large number of industry-specific projects. A further criticism of the CGF model is that it does not offer the incentive mechanism available with conventional PPPs whereby senior debt providers possess a right of subrogation in the event of default and are incentivised to negotiate a commercial and operational rescue of the project while maintaining service delivery. Under CGF, the incentives are less clear.

The CGF model has not been applied beyond the Leeds and Portsmouth hospital PFI contracts. Guidelines have been put in place together with standard form documentation (H.M. Treasury 2003). There is no commitment to proceed further with CGF although it remains an option for the future.

Supported Debt Model

The Queensland Government is presently running a pilot program for a PPP in the education sector using a hybrid variation of CGF, which is described as the *supported debt model* (SDM). The SDM has several distinguishing characteristics which include the following (Lester 2008):

- State refinances a predetermined level of project debt when the PPP is commissioned and operational;
- Level of state debt employed is calculated using a formula that equates to a minimum asset value (or recoverable amount) in the event of consortium default;
- Construction and residual (junior) debt finance needs of the project will be met by private financiers. SDM preserves traditional *ex ante* incentives and does not require credit enhancement or supporting private guarantees; and
- Lower cost of state debt reduces life-cycle finance costs which are passed on to the state through an improved VfM outcome.

The SDM takes advantage of the significant change in risk profile that accompanies the commissioning of a PPP project. The SDM is calculated against a notional risk-free minimum value for the project against which the state can make debt capital available to the project at cost. The SDM has *three* distinctive characteristics:

1. SDM financing is attractive from a VfM perspective, particularly given the recent increased spreads for private sector debt following the global credit crisis.
2. The SDM model attracts high initial administrative tasks although this reduces once the project is commissioned. Overall contractual friction should be less for SDM than CGF with lower transaction and agency costs.
3. The state debt is senior in status and private junior debt providers assume a stronger role in the administration of the transaction preserving the important incentive framework that underpins life-cycle contractor performance.

SDM has parallels with conventional project finance but shares little in common with the short- to medium-term corporate finance employed in most Australian PPPs. An implication of the model that may adversely affect improved VfM outcomes is the requirement for higher levels of privately sourced junior or mezzanine debt or equity capital which carries high risk premiums. Research suggests that the average state contribution to PPP debt capitalization will be around 70% which means that the mezzanine/junior debt participation will be 30% in addition to an equity contribution (McKenzie 2008). The overall cost of debt will be determined on a project basis and particularly on the underlying credit strength of the consortium and its members. The use of higher levels of private mezzanine/subordinated debt and equity capital in prevailing market conditions may, in fact, increase a PPP project's average cost of capital. The break-even point for SDM is narrow and estimates suggest that this may occur when average private debt spreads exceed 500 basis points (McKenzie 2008). Depending on the unsystematic risk profile of the underlying transaction, this is most likely to occur in prevailing market conditions. SDM may raise the sponsor's overall cost of capital and this could offset a significant part of the cost savings achieved with lower cost senior state debt. A second issue is the likelihood that SDM may remove the incentive for the con-

sortium to revalue the contract and refinance. Refinancing has several important advantages for mature projects—it permits an increase in senior debt (thereby reducing more costly subordinated debt and overall cost of capital); it permits higher leverage and an early withdrawal/return to equity. Refinancing gains are shared with the state under Australian PPP guidelines.

Debt Guarantees

An alternative form of state support for PPP projects not widely used in Australia is the use of state guarantees to support privately sourced project finance in adverse capital market conditions. Debt guarantees, unlike the CGF and SDM approaches, are a contingent liability of government for borrowing limit purposes and do not attract the “crowding out” and deadweight cost disadvantages of direct state capital contributions. They can also reduce the overall debt funding costs and improve the VfM outcomes for PPP transactions. Other advantages include the following:

- Preservation of traditional incentive frameworks which are important to the effectiveness of the PPP procurement method;
- Flexibility—guarantees may be full or partial and may be withdrawn over time;
- Refinancing option remains available to private investors;
- Cost of a state guarantee is small;
- Transactional and agency costs are less than under the CGF or SDM; and
- Method of support does not require the state to assume a loan administration role.

Research in developing countries points to the relatively low risk of state guarantee support for project senior debt compared to other forms of assistance for PPP projects. A review of state support for Indonesian BOT toll roads measured the contingent liability of five forms of support—revenue guarantees, interest subsidies, tariff guarantees, minimum traffic guarantees, and guarantees of debt (Wibowo 2004). The study by Wibowo revealed that the probability of a guarantee being called in projects with an average 80:20 debt to equity ratio was 5% compared with 89% for tariff guarantees, 54% for interest guarantees, and 39% for traffic guarantees. On a risk payoff basis, project debt guarantees were found to be the least risky form of guarantee for government (Wibowo 2004).

Market Opportunities

Financiers, advisers, and the credit rating agencies indicate that present market conditions favor PPP projects with strong credit attributes. Many of the characteristics of these projects are highlighted above but can be summarized here. PPP projects have a greater chance of success in attracting private *debt and equity finance* in present market conditions if they possess more of the following characteristics (Standard and Poor 2007, 2008a,b):

- An availability-based revenue stream;
- Equitable and not wholesale risk allocation by the state;
- A benign regulatory framework with a graduated abatement regime, incentives for high performance, and robust mechanisms for dispute resolution;
- Low leverage or equity contributions commensurate with actual project risk;
- Strong debt service coverage and adequate standby liquidity;
- Manageable technology and life-cycle risk;
- Strength in the underlying financial covenants;
- The experience and track record of contractors and subcontractors; and

- Adequate measures for project and financial risk management.

Projects that meet these criteria are generally PPPs in the social infrastructure sector especially noncore service delivery in health, education, public buildings, law courts and police stations, corrective services, waste management, energy, and the water resources sector. Project size is not a barrier to raising capital for PPPs with these characteristics. Governments keen to maintain a strong bid market should consider fast-tracking projects that meet these criteria. Governments should also consider a more equitable cost-based approach to risk transfer and guarantees to support privately sourced senior debt in projects that are suited to delivery by PPP but cannot be financed in present market conditions. This may not be a significant number of projects and will mainly concern those with complex construction or patronage risk. Such a measure will also have the advantage of preserving VfM outcomes in an environment of higher costs for private capital.

Conclusion

PPPs are being used across a wide variety of economic and social infrastructure projects in more than 85 countries. They have become a procurement methodology that brings a rigorous risk-weighted approach to major projects using an output specification, a competitive bid process, and private sector expertise and innovation. PPPs are fast-tracking state infrastructure programs without the side effects of fiscal policy pressure; they transfer delivery and operational risk away from the state, deliver VfM, and take into account full life-cycle costing. In addition, the involvement key stakeholders can enable high levels of design and construction innovation to be achieved. PPPs are highly leveraged and a number of major assets are either listed on the ASX or controlled by listed portfolio investment funds. Thus, PPPs are highly dependent on capital markets for many services including:

- Raising equity capital through IPOs;
- Debt finance;
- Financial risk management;
- Intermediation, credit insurance, and related services; and
- Innovation from financier-led competitive bids.

Yet, prevailing conditions in international and domestic capital markets are unstable and volatile. A consequence of these market conditions is limited availability of equity and debt capital and a higher cost of capital. This condition is exacerbated in Australia where projects listed on the ASX make greater use of medium-term corporate debt and periodic refinancing than other countries. Revaluation and refinancing, once revenue maturity is achieved, are key elements of investment economics through increased leverage, a return to equity, and a reduction in the cost of debt. Present market conditions would indicate that these opportunities will be considerably reduced over the medium term. However, the Australian economy has not been adversely affected to the same degree as other developed economies with GDP growth diminished but not reversed. There are also early signs of recovery in the domestic capital market with improved liquidity although the major banks have foreshadowed strict credit standards, a continued aversion to risk fragmentation, the use of derivatives, and lower debt to equity ratios in the medium term. Changes to bank governance, regulatory frameworks, and the restructure of international banking are expected to set new standards for bank lending practices and establish new benchmarks for risk reporting and repricing [Reserve Bank of Australia (RBA) 2008, pp. 20–25].

The outlook for international and domestic foreign markets suggests that future PPPs will be subject to new disciplines—

lower leverage, higher reserves, stronger underlying credit credentials, higher debt service coverage criteria, and higher cost debt. This will affect both bid depth and state risk allocation with lenders expected to take a tougher approach to the support of delivery and operational risks. This may adversely impact the VfM outcomes for the PPP model in the short term.

PPPs with positive credit characteristics will fare much better regardless of size. To maintain a PPP bid market and to maintain a flow of PPP transactions in present market conditions, government has several policy options including the issue of state bonds, the credit guarantee finance model, the SDM, and the direct guarantees. Bonds remain a state option at any time although they are treated as state debt for Loan Council purposes and carry both deadweight and, to the extent that they offer tax deductibility of bondholder interest receipts, revenue costs. Direct guarantees are a contingent liability for the state and offer a relatively low-cost support mechanism for PPP projects. The credit guarantee and supported debt models are interim measures that can reduce the cost of capital and improve VfM. However, the effectiveness of these options is limited by the need to introduce higher levels of equity or mezzanine capital, agency costs, higher transaction costs, and impairment of the incentive mechanism that is critical to the success of this procurement method.

Existing market conditions do not close the door on PPPs but do provide an opportunity for both government and industry to develop a more refined model that is more appropriate for the new environment. This may require a more scientific cost approach to risk allocation, state guarantee support, improved underlying credit credentials, and a rethinking of patronage risk. It is a shared responsibility. It may also be a further step in the continuing evolution of alternate major project procurement mechanisms.

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