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# 10 Towards efficient financing

## Key points

- The total cost of financing is made up of the return paid to investors in interest payments or return on equity, the cost of contingent liabilities to the government (taxpayer) and/or investor, the transactions costs and any costs of delay.
  - For tax exempt bonds, the forgone tax revenue must also be included in the cost calculations.
  - While the deadweight costs of raising taxation revenue for funding revenue gaps must be included in the cost of the project, they are not a financing cost.
- The return paid to investors is not a good indicator of the total cost of financing as it depends on the investor's exposure to financial risk and the compensation they require for bearing this non-diversifiable risk.
  - The government bond rate is lower than the project bond rate because the lenders in the former case face only a very low risk of default and no project related financial risk.
  - The required return on equity under PPP arrangements depends on the gearing (ratio of debt to equity), with a higher gearing associated with a higher required return on equity.
- The greatest scope to reduce the total cost of financing is likely to be through minimising the cost of project risk — by assigning risks to those best able to manage that particular risk.
  - PPPs allow for construction and operation risk to be borne by the private partner who is best able to manage these risks
  - Improving policy certainty about the regulatory environment and funding of CSOs reduces the risk premium required by private investors.
- The transaction costs of arranging PPPs can be considerable, and the success in minimising the cost of project risk will depend on the:
  - comprehensiveness of the information available to government and the private sector bidders on the project as well as the regulatory and operating environment more generally
  - skills of the government and private sector negotiators, and the government's capacities for monitoring and contract enforcement
  - extent of competition for the project

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**Key points (Continued)**

- whether risk can actually be transferred (for example it may be difficult to successfully transfer all operational risk to the private supplier for essential services).
- Utilising capital markets in the financing of public infrastructure may also:
  - expose project selection to greater pressures to apply sound cost benefit principles
  - reduce the cost of financing where infrastructure projects returns have a lower covariance with market returns providing gains from portfolio diversification
  - stimulate the development of long-term investment products that offer greater choice for superannuation funds and life insurance companies
  - encourage greater transparency and disclosure, and the development of infrastructure management skills in the private sector.

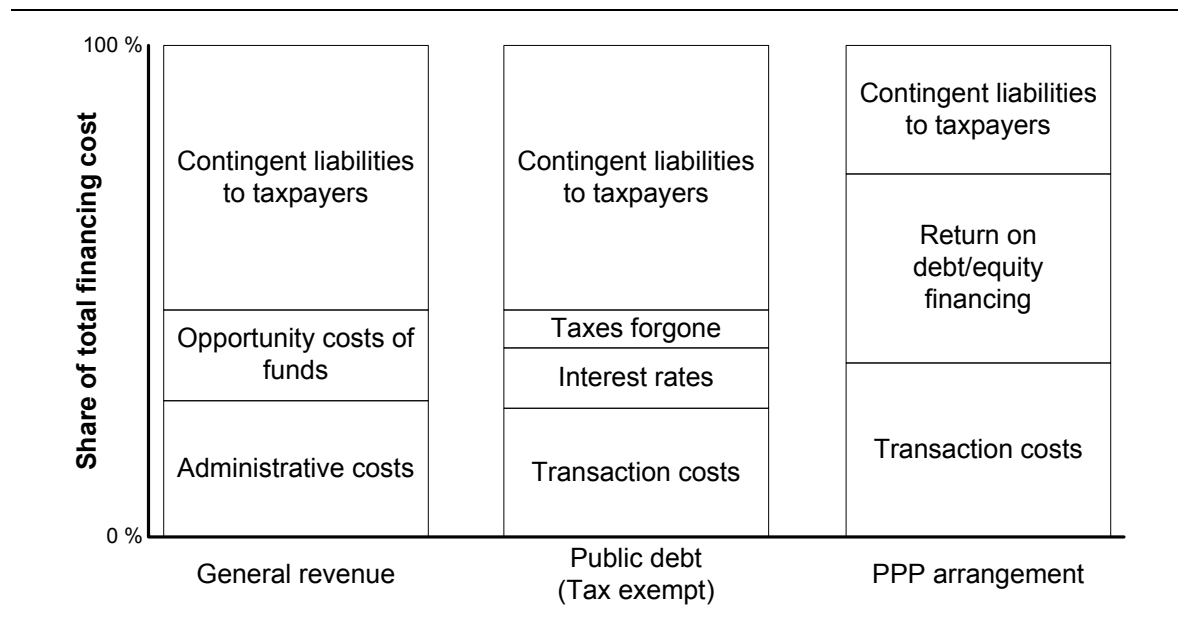
The diversity of financing vehicles for public infrastructure, ranging from funding from consolidated revenue to PPP arrangements, raises the question of whether, and under what circumstances, one is superior to the others. This chapter describes the sources of costs making up the total cost of financing and discusses how these costs are allocated under different financing vehicles. It then explores the conditions under which the total cost of financing might be lower for particular financing vehicles. Apart from the general market interest rate, the main determinant of the total cost of financing is the cost of project risk — with the lowest cost of financing usually associated with a financing vehicle that allocates project risks to those best able to manage these risks. There can also be small savings in the cost of financing where financial risk is allocated to those better able or willing to bear (in contrast to managing) these risks. In addition, transaction costs and costs of delay can influence the total cost of financing. Finally, there may be scope for the financing vehicle to deter investments that do not meet stringent cost–benefit tests. The chapter concludes with a summary of the strengths and weaknesses of the different financing vehicles and some related issues that may affect the choice of financing vehicle.

## 10.1 The total cost of financing

The total cost of financing is made up of the return paid to investors, the cost of contingent liabilities to government arising from project risk, the transaction costs of the financing arrangement, and any costs of delay that might be associated with a particular financing vehicle. The cost of financing does not include the deadweight loss associated with the collection of this revenue, although this is an important cost

of the project (chapter 2) that must be taken into account in the cost-benefit assessment. For financing from consolidated revenue, there is however, an opportunity cost as these funds cannot be used to support other programs. For projects funded from tax exempt bonds, the cost of the forgone tax revenue must also be included in the cost of financing. Figure 10.1 sets out the major costs to be considered in comparing the total cost of financing vehicles.

**Figure 10.1 Stylised breakdown of total cost of financing public infrastructure by different types of financing vehicles**



The return paid to investors is the interest rate on public or private debt, or the return on equity required by investors to commit their funds to the investment. The cost of contingent liabilities arise from the call on owners — investors and/or government — to fund cost overruns in construction, and/or shortfalls in operating revenues or overruns in operating costs. Given the potential for the infrastructure to be destroyed or stranded (rendered worthless by events — for example, a port facility build to ship live cattle when a ban on such shipments is enacted), or for make good provisions to be applied on decommissioning, these risks also add to the contingent liabilities. Contingent liabilities are realised with requests for additional capital from the owners and/or losses arising from inability to pay dividends, interest or release the capital invested.

Other costs associated with financing an infrastructure project are the costs of negotiating and contracting the financing of the project and management of this contract. There are also potential costs of delay where finance is not available in a

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timely manner. This may result in bridging finance costs, but alternatively could reflect the value of lost services arising from slower delivery of the project.

These financing costs apply whether the project is commercially viable in that the revenue from user charges is sufficient to cover the full costs of the project (capital and total cost of financing) or whether it needs to be subsidised from general government revenue. The need for such subsidies could be due to public good characteristics such as difficulty in levying fees for service, or the provision of services below cost for a section of the population. Ideally such requirements are formalised in explicitly funded community service obligations (CSOs). In the case of social infrastructure, government may bear the full responsibility of purchasing the services to be provided by the infrastructure. In evaluating the net benefits of such public investments the deadweight and administrative costs of raising general revenue through taxes or other means to pay CSOs and other subsidies must be taken into account. However, this cost is independent of the choice of financing vehicle, depending only on the government's decision about the extent to which full cost recovery will be applied. Hence the deadweight costs of taxation associated with these financing obligations are not included in figure 10.1, or the following discussion.

### **The cost of contingent liabilities**

Contingent liabilities arise from project risks. Some risks can be managed, others just have to be borne. For example, construction risks arising from poor work flow planning can be managed by improving the incentives for the construction company through imposing financial penalties for delay. On the other hand, demand risks associated with the level of use related to general economic activity that affects revenue cannot be avoided. The risk of an optimistic bias in GDP projections used to estimate revenue flows, however, can be avoided through aligning the incentives of the private operator with unbiased projections of revenue.

Project risks were discussed in detail in chapter 2, which identified four broad dimensions of risk — construction, operational, demand and policy. Construction risks are associated with bringing the project construction phase in on time and on budget. Operational risks are associated with uncertainties in the ongoing costs of service provision which include unforeseen maintenance needs. Demand risk arises from the realised level of demand relative to expectations and is the result of market forces and the quality of service provided. Policy risks are associated with changes in the policy environment, including payment of CSOs, price and service regulation, third-party access requirements, and other policies that impact on the costs of supply or demand facing the service provider.

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The cost of contingent liabilities could be estimated if the probability of various risks eventuating and the financial costs arising from such events were known. Unfortunately, the information required to estimate the expected cost of risk is rarely known. The best estimates available are what the market charges to take on such financial risks. Construction insurance might be available in some situations, but insurance markets do not exist for most of the risks associated with major infrastructure projects. This leaves the cost of private equity above the market average rate, where the owners bear the full contingent liability, as the best estimate of the cost of the project's undiversifiable risk.

### **Public debt financing options leave all contingent liabilities with government**

Public debt financing mechanisms, whether tax exempt bonds or the more familiar government bonds, expose the lenders to sovereign risk — arising from the risk that the government will default on their bonds. This risk is generally considered to be low (box 10.1) so investors price in only a small risk premium for holding public debt in most OECD countries. Most debt instruments also expose investors to inflation risk and some to liquidity risk. In countries with a history of high and/or volatile inflation the return may also include a premium for inflation risk, which would apply to all debt and equity instruments.

Project bonds issued by the government often attract a relatively small risk premium, reflecting the expectation of an implicit government guarantee. This also tends to be the case for borrowing by a GTE. As the government is the equity holder, it is expected that it will bear most of the project risks — the risk of default, even if the infrastructure becomes stranded, tends to be low.

### **PPPs may enable the transfer of some of the contingent liabilities to the private sector investor**

There are trade-offs between some of the costs making up the total cost of finance, most notably between the return paid to investors and the cost of contingent liabilities to government. Trade-offs also occur between the contingent liabilities taken on by different types of investors. Investors will price their exposure to contingent liabilities into their required return, so the greater the share of project risk borne, the higher this required rate of return.

The private sector can invest in public infrastructure through debt, equity or a combination of both. The exposure to contingent liabilities depends on the gearing

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### Box 10.1 **Sovereign risk and the return on public debt**

The interest rate on government debt has been found to be sensitive to fiscal imbalance, liquidity, market appetite for credit risk, governance discipline and public-debt management practices. On the other hand, governments' tax-raising capability was found not to have been a consistent and compelling influence on the default risk of government bonds from an investor perspective (Alesina et al. 1992; Bernoth, von Hagen and Schuknecht 2006; Lemmen 1999; Lemmen and Goodhart 1999).

In Australia and Canada, budget rules and other market discipline indicators appear at times to exert modest influences on the yield spreads between subnational and federal government bonds, especially when global investors have had strong aversion to credit risk (Balassone, Franco and Giodano 2004; Lemmen 1999). In the US capital markets, there has been relatively strong sensitivity of yield rates to indicators of the creditworthiness for individual government bonds.

Within the European Economic and Monetary Union (EMU), government bond yield spreads attributable to sovereign default risk have been found to have varied significantly between countries and over time (Lemmen and Goodhart 1999). These yield spreads were differences between the 10-year government bond yield and the corresponding 10-year interest rate swap yield.

The rate of return for bearing the risk of government default in EMU countries was estimated to be less than 0.4 per cent in most cases — although measures of default risk in excess of 1.5 per cent have been common. This compares with common estimates of the default risk with high-grade corporate debt at between 0.5 and 1 per cent (KMV 2001).

There are cases where bond investors have been aware of the default risk but the bond rates have remained relatively low. For example, no national government within the Economic and Monetary Union has the sole authority for printing or creating Euros. As such, they cannot halt a process of falling bond prices by 'monetising' their debt.

Revenue bonds issued in the United States have no government guarantees. Further, the credit has little collateral protection because the courts are unlikely to allow project assets to be liquidated in the event of default in order for bond investors to be repaid (chapter 5; Francis 1986). Nevertheless, these bonds have relatively low yield rates averaging around 4 per cent as at September 2007. After adjusting for the effect of tax exemption, the cost of borrowing through this vehicle would be modestly higher than the concurrent rate of return on tax-backed general obligation government bonds (at around 5 per cent).

— the debt to equity funding ratio. A higher gearing (the share of debt to equity), magnifies the risk to the equity holders so they require a commensurately higher return on their equity investment. As a result, the measured rate of return paid to investors in a PPP arrangement will depend on the gearing of the investment. The premium investors require is the valuation of the risk of ownership that is being transferred to the private sector. This will depend on the nature of the investment

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and the contractual arrangements. Box 10.2 reports on some estimates of the premium required for assuming some of the contingent liabilities.

According to some analysts, a reason for the increased equity premia in PPPs is the contractual complexity associated with using private-sector equity to finance a public project (Jenkinson 2003; Spackman 2001). In many situations, it is difficult to precisely define the scope of contractual responsibilities and achieve a clean split of operational and policy risks. This mirrors the difficulty of writing a ‘complete’ contract to specify the legal and financial consequences of every possible situation. In addition, to the extent that the risk is overvalued this will increase the financing costs of using PPPs (Asenova, Beck and Toms 2007; Grant and Quiggin 2003; Quiggin 1997; Vickerman 2004).

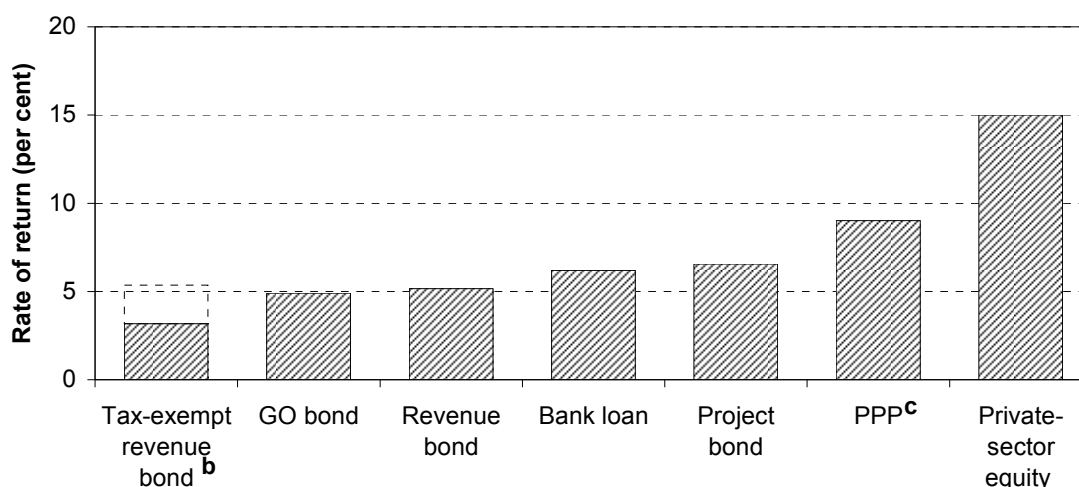
Figure 10.2 shows a stylised picture of the return to investors under the different financing vehicles. It highlights the danger of looking only at the interest cost component of the cost of financing in selecting the financing vehicle. For government what matters is the total cost of financing and this includes the combined cost of the return to investors and the expected cost of contingent liabilities (ACG 2007; EPAC 1995; Klein 1996). The potential to choose a financing vehicle that is efficient, in that it reduces this combined cost, is explored in the next section.

**Box 10.2 PPPs and the premium for assuming contingent liabilities**

Subject to potential limitations of financial modelling, the cost of PPP financing in the United Kingdom has been estimated by some to be, on average, between one and three percentage points higher than the public-sector borrowing rate (Arthur Anderson and Enterprise LSE 2000; HM Treasury 2003a; PwC 2002). The PwC (2002) study examined the financing arrangements of 64 projects that reached financial close between 1995 and 2001. For this sample of PPP projects, the post-tax internal rates of return were estimated at 7 per cent on average. By comparison, the relevant government bond rates were at around 4.5 per cent in December 1999.

Over the past decade or so, the gap between the costs of PPP and conventional public-sector financing appears to have narrowed. Different explanations for this trend have been offered. Arthur Anderson and Enterprise LSE (2000) attributed this to the maturing of PPP as a procurement process and increased competition in British capital markets — particularly as a result of the entry of equity funds and building societies into infrastructure investments. Other reasons, made prominent by recent developments in broader financial markets, include the cyclical variation in investors’ risk appetite and the prevalence of financial engineering and asset leveraging (chapter 8). Another possible explanation is that the market is learning how much of the contingent liabilities associated with revenue shortfalls end up remaining with the government.

Figure 10.2 Indicative relative estimates of the return required by investors<sup>a</sup>



<sup>a</sup> Estimates are based on market data on bond yield rates, and published data on project financing costs from Arthur Anderson and Enterprise LSE (2000), Carey (2006), Credit Suisse (2006), HM Treasury (2003a) and PwC (2002). <sup>b</sup> The rate of return for tax-exempt revenue bond is exclusive of tax revenue forgone, which is indicated by the dotted-line bar in this figure. <sup>c</sup> The PPP rate of return represents the weighted average cost of finance for a representative capital structure comprising bank loan, project bond and private-sector equity.

Source: Productivity Commission estimates.

## 10.2 Minimising the total cost of financing

A particular financing vehicle can reduce the total cost of financing where it can:

- better align the incentives for managing non-diversifiable project risk to those who have the capability to better manage this risk
- improve the portfolio balance for the investors, reducing the market risk through diversification, consequently lowering the return required to hold this asset
- reduce the life-time transaction costs of financing and/or the costs of delay.

Of these three avenues for lowering total costs of financing, the most powerful is usually the potential for a financing vehicle to reduce the cost of contingent liabilities through aligning the incentives to better manage project risks.

### Aligning the incentives to better manage project risks

As a general principle, efficient allocation of risk requires that those with the best (lowest cost) capability to manage a risk are exposed to the costs of failing to manage that risk. This alignment of incentives suggests that the construction company should bear construction risks, the operating firm bear operational and

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demand risks, while the government should face the risks it creates from regulatory uncertainty. There can be trade-offs between the four types of risk. For example, operation costs are dependent on the quality of the construction, as well as the design. Hence combining design, construction and operation can internalise this type of operational risk. Similarly, the quality of the service impacts on demand; so it is sensible to ensure that the operator faces revenue implications if they do not deliver a quality service. As discussed in chapter 8, this linkage across construction, operation and demand risks is a primary motivation for PPP as the firm will have an incentive to build an asset at a scale and quality that maximises the (discounted) difference between user revenues and life-time costs.

In forming a PPP, the government aims is to minimise the cost of project risks, by shifting construction, operational and demand risk to the private sector. It also aims to bring in private sector expertise that has specialised skills such as better asset management; but, here too, incentive alignment matters for outcomes. The key question is whether government is successful in transferring risk to the private sector where the private sector is better able to manage, and hence reduce the cost of, this risk. Experience to date with PPPs (chapter 8) and franchising (chapter 9) is not yet compelling, but both the private sector and governments are learning from experience.

A crucial weakness in the past has been failure of governments to adopt a no-bailout policy for investments in the public sector. The prospect of a government bailout can lead to the ‘soft budget constraint’ phenomenon, whereby a GTE, PPP operator or lower-level government faces attenuated disciplines. That is, there are expectations of being able to receive assistance from the owning or higher-level government in event of financial distress (box 10.3). Where continuity of service delivered by the infrastructure is essential, it is very difficult for a government not to bail out the PPP operator.

Clearly the contracting is critical to the allocation of construction and operation risks. The government can, however, contribute to problems where they have unrealistic expectations of the efficiency gains to be had from involving the private sector. Bailouts may be precipitated by the acceptance of unsustainable bids in contract tendering whether for construction, operation or under a BOOT arrangement. It is important for governments to evaluate bids for infrastructure investment carefully and realistically to ensure that the winning bid is financially sound. A bid should not be accepted simply because it represents the most optimistic forecast of particular cost or demand conditions, which could turn out to be unsustainable.

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### Box 10.3 Debt leverage and government bailouts of PPPs

Public-private partnerships have features contributing to the increased likelihood of financial distress and, in the event of potential debt default, government bailouts through unscheduled tariff increases or injections of public funds (Ehrhardt and Irwin 2004). These features include: operation by highly leveraged companies; regulation of service conditions and tariff charges restricting an operator's flexibility in responding to unanticipated market conditions; and monopolistic provision of essential services.

The true allocation of risk in a PPP project can differ from the apparent risk allocation embodied in its underlying contract or capital structure because of significant equity stakes implicitly held by the public sector. Taxpayers or service users bear the potential burden of government bailouts, the cost of which tends to vary with the likelihood of equity holders bearing the residual risk and the extent to which regulation restricts the pricing flexibility of the project operator.

Government franchises that do not require franchisees to invest substantial own capital to purchase or build infrastructure assets are an extreme case of the private-sector equity-thin capital structures used in PPPs. The franchisees typically do not have to take on major debt to finance capital and operating expenditures. However, the combined value of their equity and the performance bond (that is, the security deposit to be retained by government on default) is less than the potential loss in the event of adverse changes in their business prospects. Consequently, when encountering financial difficulties they have little at stake, putting them in a more powerful position to renegotiate contracts.

In the early 2000s, a number of PPP or privatised infrastructure businesses required temporary government support or intervention because of financial distress. Notable examples include the Melbourne transport franchises, and the National Air Traffic Services and Railtrack in the United Kingdom.

On the other hand, there is some evidence of governments avoiding bailouts. For example, the NSW Government neither bought out nor provided financial assistance to Sydney's Cross City Tunnel when it became insolvent in December 2006. Instead, the tollway was subsequently sold to a syndicate, with the original equity investors realising considerable financial losses.

The difficulty that government often displays in transferring risk to the entity with the best ability to manage that risk raises the question of whether there are particular project characteristics that lend themselves well to transferring risk. Box 10.4 lists some of the main characteristics of public investments to be considered in the financing decision. As a rule of thumb, those projects that have the greatest potential for user payments to fully cover the operating (including financing) costs are best placed for transferring risk to the operator, whether under a franchise or PPP arrangement.

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#### Box 10.4 **Project characteristics affecting financing decisions**

Before deciding how best to finance an infrastructure project, a range of basic project characteristics and their attendant risks have to be identified, including:

- physical profile — size, complexity, construction time, asset life
- cash flow profile — revenue potential, up-front costs, future commitments, payback period, asset marketability
- user profile — public awareness, demand projection, price affordability
- network profile — integrated or stand-alone, new or replacement, economic or social, community-wide or localised
- policy profile — priority, regulatory approach, essentiality of services.

*Source:* Adapted from Ploeg (2006).

### **Scope for gains through portfolio diversification and other capital market instruments**

While the main source of risk for an investor is the project risk associated with cost overruns and revenue underperformance, deepening in the market for infrastructure-based assets could reduce several other risks faced by investors and hence reduce the required return on such assets and hence the total cost of capital. It is likely, however, that any such gains would be small.

The first possible gain arises from the contribution that public infrastructure based assets might make to the diversification of the market portfolio<sup>1</sup>. The required return on an asset is higher the greater the covariance of the asset return with the market return. Put another way, to the extent that the asset returns are high when the market returns are low, this provides insurance for the investor so they are willing to accept a lower expected return on the asset. Over time, adding assets that reduce the overall variance of the market portfolio will lower the equity premium.

The second possible gain comes from reducing liquidity risk — whether the asset can be converted to cash whenever this is required. Infrastructure projects, by their nature are usually long lived, but in recent years new financial products have made investment in infrastructure assets more liquid, lowering the required rate of return. As the volume of infrastructure-based financial assets grows, the liquidity of these assets should improve.

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<sup>1</sup> This refers to the measured market as infrastructure assets already are part of the broader 'market'.

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Related to liquidity risk, is refinancing risk. Generally, the cost of financing is lower where the maturity of the financing vehicle matches that of the asset. Hence infrastructure investments ideally draw on long-term investment funds. Fund sources with a shorter investment horizon than the expected economic life of the assets introduce refinancing risk — the possibility that the refinancing of maturing loans becomes difficult or more costly than expected. Refinancing also results in higher transaction costs with multiple capital raisings.

The difference between the government bond rate and the rate of return on project bonds and equity reflects the additional compensation required for investors to take on these risks. The equity premium points to a high average level of risk aversion in the investor population as well as a quite high exposure to market (non-diversifiable) risk (box 10.5). According to the Colonial First State Asset Management (CFS 2006, 2007), the risk-return profiles of Australian listed and unlisted infrastructure funds are different to those of other asset classes, offering higher risk-adjusted returns to attract investors.

### **Transaction costs and costs of delay**

There is evidence to suggest that transaction costs are significantly higher for PPP financing than for conventional sources of finance used in the public sector. According to the study by PwC (2002), 1 percentage point of the average return on PPP finance (7 per cent) is attributable to investors' recovery of tendering costs incurred in unsuccessful bids. This cost estimate excludes the tendering costs in a winning bid and the substantial contracting and administrative costs incurred by governments.

The transaction costs of accessing finance from government bond markets are considerably less. Relatively high credit ratings and large, trade-size bond issues by the public sector help reduce transaction costs such as underwriting fees and credit rating agency charges. For lower-rated, smaller-sized bond issues, transaction costs can be reduced by pooling bond issuance through central borrowing authorities (chapter 4). According to a study by Gilbert and Pike (1999), transaction cost savings from pooled bond issuance could amount to 0.4 percentage point on average in the bond rate relative to stand-alone issues.

It can be difficult to compare like with like for transactions costs. With a PPP the costs of contracting and management may be more transparent, but alternatively could be opaque and instead included into a margin on the required rate of return. For projects managed by government agencies, these costs too may not be transparent as they may not easily be separated from other agency costs.

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**Box 10.5 The compensation for equity risk — the equity premium puzzle**

The equity premium depends on the level of market portfolio risk and the compensation required by investors to take on this risk. The so called equity premium puzzle is the finding that the average difference between the rates of return on risky equity and on low-risk debt (public-sector or corporate) is much greater than can be explained by standard theoretical modelling of intertemporal risk response behaviour in capital markets (Mehra and Prescott 1988).

By assuming that capital markets are perfectly efficient and investors are rational, standard economic models of asset-price determination would predict that equity stocks pay investors more than bonds — to reward them for bearing the higher risk of equity investment — but that the average risk premium should be no more than 1 per cent. Although individual stocks tend to have distinct risk profiles reflecting the nature of their underlying business, most of the associated equity risks have been found to be ‘non-systemic’ (company- or project-specific). In the presence of perfectly efficient capital markets, investors would have been able to substantially neutralise these risks through a well-diversified portfolio of stocks. Such an outcome would be consistent with capital markets providing an effective means of risk spreading, reducing the required rates of return on individual stocks and hence the costs of equity raised to finance their underlying business.

Nevertheless, there are many empirical studies producing results that contradict the prediction of an insignificant risk premium under the scenario of efficient capital markets. These studies, using diverse data sources and sample periods, produced estimates of the equity premium mostly at between 6 and 8 per cent (Allen and DeMello 2004; Brailsford, Handley and Maheswaren 2008; Dimson, Marsh and Staunton 2003). An equity premium of such a magnitude implies a very high degree of risk aversion among investors, or that they face larger portfolio or market risks, or that there are major inefficiencies in capital markets.

Various explanations have been put forward, but until recently none claimed to explain the full premium. Building on Barro (2005) and Rietz (1988) who argued that market risks are much greater than previous studies have recognised, Weitzman (2005) demonstrated that when uncertainty is explicitly addressed the high equity premium, low risk free rate and the excessive volatility can all be explained. This is because of the way infrequent but catastrophic events are factored in. Indeed, the measured equity premium may decline going forward as it is larger in the United States (and Australia) than in most other countries (Jorion and Goetzmann 1999). In line with the Weitzmann explanation this may be simply because at the time of measurement, the United States was yet to suffer a catastrophic event of a magnitude to drive down the measured premium.

A substantial proportion of transaction costs are likely to be independent of the scale of the project. This suggests that more complex financing vehicles such as one-off PPPs that have high transactions costs are only justified for large investments.

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Financing vehicles can also affect the timeliness of an investment. Delays impose real costs where the benefits have been assessed as exceeding the costs. Reliance on internal resources for GTEs or financing from general revenue may restrict cash flows, slowing construction. The shift to PPPs has been seen in part as a response to limits on the government's ability to raise revenue due to restrictions on debt accumulation.

## **10.2 The effect of the financing vehicle on investment discipline**

The financing vehicle can introduce investment discipline through enforcing government fiscal responsibility and governance, or through bringing market scrutiny to bear. Such investment discipline reduces the probability that projects go ahead that would not meet rigorous cost-benefit thresholds.

Investment discipline can be imposed on government through their own governance mechanisms for fiscal responsibility. They may also be able to utilise the capital market to improve due diligence required for good public investment decisions. These two drivers of investment discipline reinforce each other.

### **Government fiscal responsibility**

A fundamental tenet of efficient public infrastructure investment is that projects compete for capital funds on the basis of their worthiness. Achievement of this objective requires an effective budget and financial management system in the public sector. On-budget investments have the advantage of parliamentary scrutiny, while for off-budget investments the scrutiny depends on the governance arrangements for the GTE or the treatment of a PPP arrangement.

Transparency and disclosure are central to effective fiscal control and to the provision of the information necessary for governance discipline. For investments financed through budget appropriations and intergovernmental transfers, fiscal disciplines have depended on the integrity of budget preparation and execution as well as the rigour of administrative scrutiny and legislative oversight.

Budget reforms have brought about an increased emphasis on the use of legal instruments to discipline governments. The design and implementation of such instruments have varied between countries, depending on specific institutional and procedural setups enshrined in constitutions, legislations, policy rules or intergovernmental agreements. For example, voter approval is required for general obligation bond issues in some jurisdictions (chapter 5).

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Organic budget laws, as another example, have been extensively introduced in Europe in the early 2000s (Ahmad, Albino-War and Singh 2005). These laws are aimed at specifying the schedule and procedure by which the budget is prepared, approved, executed, monitored, reported and audited. In Australia, the adoption of output-based budgeting has led to improved budget appropriation processes (chapter 4).

The emergence of off-budget government activity has been accompanied by changes in governance structures and processes used to monitor and regulate infrastructure provision. These have included the establishment of corporate boards or similar governing bodies to take over the primary responsibilities of governments in infrastructure procurement and operation (chapter 6).

Australian GTEs, for example, have notionally gained operational autonomy through increased access to internal and external financial resources after corporatisation. However, the levels of their capital spending and borrowing are usually subject to approval by the treasurer or the shareholder minister. The regulators also play a major role in imposing discipline, although the Commission has argued that a light hand in matters such as investment decisions is preferred (PC 2006a, 2006b). The reform of GTE capital management practices has also contributed to potential disciplines that encourage sustainable investment and efficient financing. For example, a target capital structure has to be annually approved by the board and the shareholder minister in some GTEs.

In a number of jurisdictions, PPPs have been subject to government scrutiny in the same way as other public investment proposals at the project development stage. However, the fiscal controls for a specific project would differ from those applicable to on-budget investment once a decision has been taken to deliver the project through a PPP. The effectiveness of government scrutiny also depends on their familiarity with the type of investment. Infrastructure projects that are novel and complex present a greater degree of difficulty for governments to assess the risks.

### **Capital-market discipline**

Capital markets discipline lenders and borrowers by providing ‘signals’ to motivate and reward the sustainable use of capital funds (Lane 1993). According to studies by Bishop, Damrau and Miller (1989) and Lane (1993), a number of conditions are essential for capital markets to be fully effective in exerting disciplinary influences on public infrastructure investment, namely that:

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- free and open financial markets exist to enable flexibility in interest rates for accommodating variable risk profiles of investments
  - market participants have access to reliable information for evaluating the creditworthiness of borrowers and their projects
  - governments minimise capital controls and do not support privileged access to finance
  - governments avoid creating ‘moral hazard’ by bailing out financially delinquent borrowers and troubled projects, even in event of an impending or actual default.

Empirical evidence on capital-market performance indicates that many of the above conditions for market-based investment discipline have been fulfilled in advanced economies. However, others have remained problematic (Balassone, Franco and Giordano 2004; Lane 1993; Pisauro 2001) (box 10.6). Nevertheless, financing vehicles that expose the private sector financier to risks create incentives for due diligence, which in turn imposes investment discipline. The challenge, discussed above, is to ensure that the contractual arrangements do force the private financier to fully analyse the viability of the project. Any explicit or implicit guarantee on costs or revenue reduces the risks to private capital and with it the incentive for due diligence.

**Box 10.6 Efficiency of the capital markets**

Mature financial markets, such as those in Europe and North America, are open and largely free of restrictions on capital movement and access. Reflecting the ability to induce solvent investments, these markets — unlike some others in developing countries — have been able to consistently deliver investment returns in excess of fund costs over the long term (Gugler, Mueller and Yurtoglu 2001).

Nevertheless, capital markets are subject to distortions caused by such factors as taxes and subsidies, asymmetric information, lack of depth or liquidity, regulatory rigidity as well as incentive problems that exist between and within different levels of government.

Historically, there have been many examples of corporate distress leading to the default of bank loans and systemic banking crises. In such circumstances, the resolution typically involves a government bailout of the banking system — not necessarily the defaulting corporation or project — through the use of public money to subsidise bank restructuring or the disposal of impaired loans. Generally, bank bailouts can contribute to the ex post efficiency of financial intermediation by mitigating the systemic impact of loan defaults on aggregate liquidity, particularly when this involves the foreclosure of ‘healthy’ loans. However, this benefit has to be weighed against the potential moral hazard effect on lending prudence (Diamond 2001; Diamond and Rajan 2002; Gorton and Huang 2004; Gorton and Winton 2003).

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## 10.3 Developments to promote efficiency

The financing vehicles examined in this study exhibit a number of characteristics that affect different aspects of efficiency in the provision of public infrastructure services. These characteristics and their primary roles include:

- effectiveness of risk management and apportionment — which minimises the cost of finance from a whole-of-government perspective, given the project risks involved and the relative competence and capacity of bearing and managing such risks between the public and private sectors
- incorporation of incentives for efficient service production — which encourages efficient provision of services by exploiting synergies between construction, operation and financing of infrastructure
- incurrence of transaction costs — which adds to project costs, offsetting efficiency gains as contractual and financing arrangements become more complex
- availability of funding options — which affects the timing of the investment and commencement of delivery of services
- amenability to public scrutiny — which increases the accountability of government and provides an incentive to improve performance
- degree of exposure to capital markets — that discipline the allocation of financial and economic resources for capital formation
- government capacity to manage the process — which affects the relative efficiency in the public and private delivery of the infrastructure project and is a source of gain if the private sector can be involved effectively.

These characteristics determine the relative strengths and weaknesses of individual financing vehicles, as discussed in chapters 4 to 9 and are summarised in table 10.1. They underlie the tradeoffs of the costs and benefits associated with the financing vehicle that have to be made to arrive at an appropriate choice.

**Table 10.1 Strengths and weaknesses of various financing vehicles**

<i>Strengths</i>	<i>Weaknesses</i>
<b>General budget appropriations:</b>	
<ul style="list-style-type: none"> <li>• Legislative control of capital spending and financing</li> <li>• Relative transparency of financial arrangements for public scrutiny</li> <li>• Easier to enforce accountability of governments for their investment and financing decisions</li> </ul>	<ul style="list-style-type: none"> <li>• Absence of market signals on the financial viability of projects and the risks involved</li> <li>• Fiscal policies constrain ‘lumpy’ capital expenditure</li> <li>• Distortion in investment decisions by governments if intergovernmental transfers are open to cost shifting</li> <li>• Diminished opportunities for annual scrutiny in the case of special standing appropriations</li> <li>• Can result in intergenerational inequity</li> </ul>
<b>Specific-purpose securitised borrowing:</b>	
<ul style="list-style-type: none"> <li>• Access to low-cost financing in mature municipal bond markets</li> <li>• Exposure to capital-market disciplines</li> <li>• Relatively low transactions costs for bond issues, especially those of a large size</li> <li>• Opportunities to apply the ‘beneficiary pays’ principle if user charges are raised for debt repayment</li> </ul>	<ul style="list-style-type: none"> <li>• Low flexibility for debt restructuring through bond defeasance</li> <li>• Distortion in investment decisions by governments if federal or state assistance is offered in the form of tax exemption for bond interest payments</li> <li>• Rent-seeking activities encouraged when revenue bonds are used for financing private assets</li> <li>• Losses of tax revenue for governments if bond interest payments are tax exempt</li> </ul>
<b>Off-budget financing by GTEs:</b>	
<ul style="list-style-type: none"> <li>• Capacity to generate revenues from user charging for financing specialised infrastructure assets</li> <li>• Financial independence and operational autonomy from owner governments</li> <li>• Managed by people with the financial and technical expertise necessary for sound investment and financing decisions</li> </ul>	<ul style="list-style-type: none"> <li>• Poor investment performance if insulated from capital market pressures</li> <li>• ‘Soft’ budget constraints resulting from government subsidies for specific policy obligations</li> <li>• Open to ad hoc equity withdrawals by owner governments</li> <li>• Reduced accountability from a whole-of-government perspective if not carefully managed through external governance arrangements</li> </ul>
<b>Development contributions:</b>	
<ul style="list-style-type: none"> <li>• Capacity to provide adequate finances for infrastructure facilities that are well-suited to the application of the ‘beneficiary pays’ principle</li> <li>• Availability of finances synchronised with the construction of development-specific infrastructure</li> <li>• Providing partial price signals on the costs of land development</li> </ul>	<ul style="list-style-type: none"> <li>• High transaction costs reflecting the uncertainty, complexity and disputation of individual contributions systems</li> <li>• Land development ‘sterilised’ if too much of the financing cost is shifted to developers</li> <li>• Cannot be used to finance the maintenance, upgrading and replacement of existing infrastructure</li> <li>• Applicability limited by competing policy objectives</li> </ul>

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Table 10.1 (Continued)

<i>Strengths</i>	<i>Weaknesses</i>
<b>Development contributions (continued)</b>	
	<ul style="list-style-type: none"> <li>• Less effective in apportioning and spreading financing costs and project risks across all potential users of specific facilities, especially shared infrastructure</li> <li>• Vulnerable to distortion in investment decisions by planning authorities</li> </ul>
<b>Public-private partnerships:</b>	
<ul style="list-style-type: none"> <li>• Capacity to finance public infrastructure without adding to government borrowing and debt</li> <li>• Potential for whole-of-life cost savings through bundling the financing, design, construction, operation and maintenance of infrastructure</li> <li>• Strong incentives of private-sector sponsors to avert optimism biases in project planning and attain operational efficiency in service delivery</li> <li>• Exposure to capital-market disciplines through project financing</li> </ul>	<ul style="list-style-type: none"> <li>• High transaction costs reflecting a range of contractual and administrative complexities of the procurement process</li> <li>• High financing costs reflecting the shift of project risks to private-sector equity sponsors</li> <li>• Transparency and accountability diminished by limited disclosure of contract details for public scrutiny</li> </ul>
<b>Government franchising:</b>	
<ul style="list-style-type: none"> <li>• Capacity to reduce budgetary costs and promote efficiency and innovation through private-sector involvement in asset management</li> <li>• Consistency of service outcomes and policy objectives through 'regulation by contract'</li> <li>• Compatibility with integrated network or system planning</li> <li>• Retention of public ownership of valuable and strategic infrastructure assets</li> </ul>	<ul style="list-style-type: none"> <li>• High requirements for experienced and capable government staff to design and administer periodic tendering and negotiation processes</li> <li>• Critical dependence on effective contract management as well as on prudent and secure procedures to transfer and recover government-owned assets</li> <li>• Government remains responsible for financing investment</li> </ul>

### Other factors affecting efficiency of financing vehicles

While consequences of the choice of financing vehicle for the allocation of project risk and transactions costs emerge as the most important factors that affect the efficiency of project financing there are several other factors that need to be considered. These include the efficiency considerations of user charges, the availability of information to support decision making, the management skills and systems to manage not just the project but also the financing, and the extent of competition for PPP contracts.

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Where infrastructure only generates exclusive and direct benefits for a specific group of individuals, or where some individuals hold asymmetric information on the benefits and costs of a specific project, efficiency requires that these beneficiaries should bear at least some of the cost of financing the investment. For example, greenfield developments of housing estates bring amenity benefits to residents in specific areas. Accordingly, development contributions can be a more efficient way to provide certain local infrastructure facilities.

The quality of information and management capabilities available to both government and private firms will also affect the choice of financing vehicle. A key lesson learned from the global experience with PPPs over the past decade is that fiscal liabilities and resources committed by governments through long-term payment obligations, guarantees or implicit undertakings must be carefully managed. This requires appropriate information and management systems to assess and mitigate potential fiscal burden. Similarly, the market will price in the cost of uncertainty if the information provided on the proposed project is inadequate. In addition, uncertainty in relation to the regulatory regime and the commitment to fund CSOs will raise the risks for private investors and require compensation in the cost of funding.

Finally, concern has been raised as to the extent of competition in the PPP market. The high cost of preparing bids and the relatively small pool of potential suppliers may reduce the competitive pressures that are important for delivering an efficient outcome under a PPP arrangement. The extent of potential competition for any proposed PPP will be a consideration in the selection of an appropriate financing vehicle.

### **There are no regulatory impediments to the choice of financing vehicle**

Regulations that restrict the supply of savings from being deployed in the kinds of financial assets used for infrastructure financing would raise the cost of financing. This is not an issue in Australia, but until the last decade, this segment of the market was not well developed. The largest and fastest-growing sources of long-term finance in the sampled countries are life insurance and superannuation funds. The growth of funds available from these sources in recent decades represents a significant development in capital markets. Household savings have been increasingly ‘institutionalised’ through legislative pension systems and channelled into investments managed by specialised financial institutions on behalf of the small investors.

In Australia, superannuation funds have grown by 17 per cent annually on average since 2001, reaching a total of \$933 billion by mid-2007 (RBA 2007b). Over the

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same period, the funds managed by Australian life insurance companies have grown by 5 per cent annually on average to reach the current level of around \$260 billion. The combined value of superannuation and life insurance assets is roughly equivalent to annual gross domestic product and represents more than 24 times annual gross fixed capital formation in the public sector. These legislated savings increase the supply of funds available for investing in public infrastructure.

Nevertheless, to date, only a small proportion of superannuation funds have been invested in infrastructure. Statistics quoted by Nielson (2005) indicate that 4.3 per cent of Australian investment in industry funds was allocated to infrastructure equity in 2003. Anecdotal evidence, however, points to a growing interest of fund managers in this type of investment.

There are several plausible reasons why investment in public infrastructure could be attractive to life and superannuation fund managers:

- earnings stability — reflecting the monopolistic supply of public infrastructure services in specific markets that brings a dependable dividend stream and capital growth potential with a relatively low level of investment risk
- portfolio diversification — reflecting the merit of infrastructure revenues as a counter-cyclical hedge against adverse performance of other investments
- long maturity — reflecting the horizon of infrastructure investment that is comparable with the term of liabilities to fund holders.

Life insurance companies and superannuation fund managers can invest in infrastructure in various ways. These include debt instruments, portfolio investment in listed or unlisted managed funds, and direct investment through a sole proprietorship or a partnership with other entities to own and operate the asset.

Direct investment is more onerous than lending or purchasing units in infrastructure funds. However, it can keep transaction costs down — for example, by avoiding paying reward fees to fund managers — and bring higher returns (and associated higher risk of equity ownership). Generally, the diversity of these investment opportunities reflects the breath and depth of mature capital markets.

The existence and continuing development of sophisticated investment banking, credit rating, bond insurance and secondary trading services, as well as financial regulatory systems, provide the support of market institutions necessary for channelling long-term savings into infrastructure investments. Moreover, financial globalisation and the availability of currency hedging products have resulted in capital funds being mobilised across countries.

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The financial regulatory regime in Australia does not place any specific restriction on asset or portfolio allocations. The *Superannuation Industry (Supervision) Act 1993* requires, among other things, that funds be invested in a ‘prudent’ manner rather than according to specific asset-allocation rules (APRA 2006). This should not pose a barrier to investment in infrastructure if the assets are packaged in a manner that suits investors.

The typical lack of liquidity with infrastructure assets has posed a barrier to equity investment by superannuation funds (Nielson 2005). These liquidity constraints are related to the difficulties of:

- changing the amount of a fund’s holdings in project financing
- exiting from an investment, especially in unlisted assets
- determining the current market value of an investment
- distributing changes in investment value to departing members
- maintaining the capital value of a PPP asset when approaching the end of the concession term.

Inadequate availability of project investment and management skills among fund managers has also dampened investment in public infrastructure. In order to acquire a controlling interest or active management role in particular projects, direct investors have to exercise due diligence and possess expertise in infrastructure investment and management, particularly the ability to evaluate, monitor and control project risks. In reality, superannuation funds are more likely to hold diversified infrastructure backed products prepared by specialist investment banks and intermediaries, than to directly invest in infrastructure projects.

In an endeavour to overcome liquidity and skill constraints, the Australian managed superannuation fund sector has been undergoing a process of consolidation — with smaller funds merging or closing and larger funds taking over the management of most of the formers’ fund assets (Nielson 2005). The size of larger funds enables them to invest in a diverse range of infrastructure assets while maintaining the liquidity and portfolio diversification necessary to meet prudential requirements.

The trend of fund consolidation also facilitates the development of in-house skills and experience in infrastructure investment and management. Consequently, the significance of superannuation funds for infrastructure financing is not only the sheer size of financial resources under their management but also the potential of the fund managers to monitor and improve disciplines on corporate governance.

Notwithstanding these developments, increased information disclosure on the creditworthiness and prospects of public infrastructure projects could increase

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market acceptance by investors. In turn, increased investor participation could lead to the capital-market disciplines necessary for efficient financing. It could also facilitate the development of secondary markets required for asset liquidity.

### **What can be concluded about the relative cost of funds for different financing vehicles?**

In comparing the costs of funds, it is not sufficient to compare the rate of return required by investors. The cost of contingent liabilities due to project risk must be included. The transactions costs of arranging the finance and managing the contract over time have also to be taken into account. And there are other features such as the tax revenue implications, the capacity to assess the real risks and costs, and negotiating power that will affect the total cost of financing an infrastructure project.

Public debt prices in the default risk at a general government level, and even for project bonds a more general government guarantee appears to be priced into most. But these prices do not include the cost of the contingent liabilities for the taxpayer arising from project specific risks. PPP costs, however, are more likely to price in these risks. The private equity price reflects the extent of gearing and hence the exposure to project specific risk as well as the more general market risk facing equity investments. As a consequence it is unlikely that there will be one financing vehicle that has a systematically lower cost of funds as a lower required return is offset by greater contingent liabilities.

At an individual project level, if the government thinks the market is over pricing the project risk they should choose public debt as the financing mechanism. If government thinks the market is underpricing the project risk it should utilise PPPs. But this assumes that the government agencies are better at estimating these costs than the market. This may be the case for some investments where government has superior knowledge. If the market systematically under or over prices project risk there are gains to be made from arbitrage across financing vehicles. Such actions will reduce the pricing gaps as it provides the market with information.

For some PPPs, transaction complexity and commercial sensitivity have made it hard to assess the long-term budgetary implications on a comparable basis with conventional financing through appropriations or government bond issues. Consequently, the challenge for policy makers is to strengthen the capacity of reporting and managing public-sector liabilities — explicit and contingent — from such transactions. And to the extent that high premiums reflect ongoing uncertainty in the nature and extent of regulatory risks, government can reduce the costs by improving its commitment to regulatory certainty and explicit pricing of CSOs.

The major advantage of PPPs comes when projects risk can be better managed through engaging one firm to design, build and operate the infrastructure asset. This can substantially reduce the contingent liabilities to the government, and the investor. The trade-off is with transactions costs, which can be high in tendering and in negotiating and enforcing contracts that effectively shift risk to the private partner. Figure 10.3 summarises the major considerations that need to be taken into account in comparing PPP to conventional government bond finance. While this provides a guide to the considerations required, the balance of the savings in the total cost of financing with the additional costs needs to be determined on a case by case basis.

**Figure 10.3 Cost of PPP financing, relative to government debt finance**

