

Financing transport infrastructure: Public finance issues

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Contents

Financing transport infrastructure: Public finance issues	1
Introduction	2
Instruments for Raising and Servicing Capital	2
Capital Raising, User Charges, Risk and Ownership.....	4
Capital raising and user charges.....	4
Capital raising and risk	5
Raising Capital for New Transport Infrastructure	6
Using current tax revenues.....	6
Public borrowing.....	7
Private sector financing.....	9
Privatisation: Re-financing Transport Infrastructure	9
Conclusions.....	11
References.....	12

Introduction

This paper discusses methods of financing transport infrastructure and the implications for public finance. ‘Financing’ in this paper refers to the raising of financial capital to fund infrastructure. However, financing infrastructure is not a self-contained issue. As will be seen, the optimal way to raise capital cannot be separated from the question of how capital is serviced and repaid. Also financing has implications for the ownership, organisation and management of infrastructure.

The distinction between raising capital and servicing and repaying capital is important. The term ‘financing’ is often used to refer not only to raising capital for infrastructure but also to payments for the services provided by the infrastructure. The latter use of the term can produce confusion. Although the concepts of raising and paying for capital are often linked, they are not synonymous. In general, different parties are responsible for financing transport infrastructure and for paying for it.

Likewise the raising of finance is linked to the ownership and performance of the infrastructure. The provision of capital often confers, or should confer, ownership or property rights, which in turn have implications for the management of assets. The optimal method of raising finance is the method that delivers overall the best value for money inclusive of the performance of the infrastructure. It is not necessarily the method that provides finance at least cost.

This paper takes as its starting point that the proposed transport infrastructure represents an efficient use of resources, generally as determined by cost-benefit analysis. We assume that the expected social rate of return generated by the proposed capital formation exceeds the rate of return available from other uses of scarce capital. This is a necessary condition for the efficient allocation of publicly or privately financed resources. It is of course possible that the social viability of a project depends on how the project is delivered. However, discussion of cost-benefit analysis and related issues of resource allocation are outside the scope of this paper.

This paper has the following four main sections. Section two describes instruments for raising and servicing financial capital. This provides a structure for the rest of the analysis. Section three discusses some general issues concerning the relationships between raising capital, the nature of infrastructure, user charges, risk and ownership.

Section four discusses the advantages and disadvantages of the main methods for raising finance for new infrastructure, including public-private partnerships and full private ownership and finance. A key issue is whether the financial structure for each major piece of infrastructure should be determined by the merits of each case or whether there are broader macroeconomic considerations, for example with respect to national net debt, which should determine how capital is raised. This paper argues that the financial structure should generally be determined by the needs of the case rather than by macroeconomic considerations.

Section five discusses the re-financing of infrastructure that has been financed by the public sector, which is generally referred to as privatisation of publicly owned assets. Some issues are similar to those that arise in the raising of capital for new infrastructure. However, it may be desirable to develop an asset with public funds and later to sell the asset to private ownership. In any case, there is the question of how to deal with existing transport assets.

Instruments for Raising and Servicing Capital

Table 1 shows the main instruments available for raising and servicing capital. There are three main ways to raise capital: by taxation, public sector borrowing, or private sector financing. For each main way, there are important subsets. Importantly, for each method of raising capital, there is often a prime instrument for servicing it.

Tax revenue may be derived from consolidated (general) tax revenue or from specific infrastructure-related taxes. Sometimes part of general revenue, notably revenue from fuel taxes, is hypothecated to

fund transport infrastructure. Capital may also be raised by development taxes levied on either developers or households, or both. For example, a value-capture tax may be levied on the estimated increase in land value due to the development of related infrastructure. Another infrastructure-related tax is a levy on developers. In Sydney, land developers are required to pay the state government \$15,000 per lot developed as a contribution to transport infrastructure. Of course, when capital formation is financed from any form of taxation, there is no capital servicing requirement.

Table 1: Instruments for Raising and Serving Capital

Capital raising	Capital servicing
Taxation	
Consolidated revenue (taxation)	No servicing required
Infrastructure levies	No servicing required
Public sector borrowing	
Borrowing – general bonds	Taxation / user charges ^a
	Sale of asset
Infrastructure funds	Hypothecated tax revenue
Infrastructure revenue bonds	Project revenue
Public trading enterprise borrowing	User charges ^a / taxation supplements
Private sector financing	
Private debt	User charges ^a
Private equity	Government contributions (taxation)
Mixed private instruments	Shadow tolls
	Subsidies – community service payments
	Guaranteed repayments

^a May include access charges.

The most common form of public sector borrowing is via long-term bonds. Bonds are interest bearing certificates of debt. They entail the payment of interest to the lender as well as repayment of the principal at a nominated future date. Government bonds often have a maturity of 10 years or more. In some cases interest payments are indexed against inflation. These ‘inflation indexed bonds’ eliminate significant uncertainty for potential investors about the impact of inflation over the long life of a project. Government bonds are usually serviced out of general taxation spread over the life of the bond, although user charges may provide supplementary revenue.

Government may also raise capital via specific infrastructure funds or infrastructure revenue bonds. These instruments are similar in that in both cases government raises money from the public via bonds for the purpose of constructing infrastructure. However, an infrastructure fund may allocate its capital to a variety of infrastructure projects. It may not be project or revenue specific. Also the capital may be serviced from general tax revenue or from a hypothecated tax source, such as a fuel levy. An infrastructure revenue bond is more likely to be project specific. The revenue raised by the bond issue provides capital to a specific project and this capital is serviced from project revenues, albeit with a government guarantee backed by government’s tax powers. However, there are no precise general definitions of these concepts.

Another feature of infrastructure funds or revenue bonds is that they may be tax advantaged. In such cases, a bondholder typically receives a tax concession on the interest from the bond. The Australian government offered tax concessions on infrastructure bonds for a period in the 1990s. In the United States municipal bonds (from which funds can be applied to various uses) are tax advantaged.

The public sector may also raise capital via borrowing by public trading enterprises (PTEs), such as airport or seaport corporations. The PTE usually services and repays this capital from user charges for the services that it provides. However, when a PTE incurs a deficit, government may be required to fund the deficit from tax revenue.

On the other hand, the private sector may finance transport infrastructure quite separately from government by issuing private debt or equity, or by some complex composition of financial instruments. Private companies usually expect to service and repay most of this debt or equity from user payments for the services provided by the infrastructure.

However, government may contribute to the servicing and repayment of capital. It may do so by paying for particular services or by paying shadow tolls, which are payments for services when no user charge is levied. Government may pay transparent subsidies for services provided, which are sometimes described as community service payments. In other cases it may make unconditional guaranteed repayments. For example, the NSW Government guaranteed repayments to the companies that constructed the Sydney Harbour Tunnel.

When payments are guaranteed and unconditional, it is questionable whether there is any real difference between public and private borrowing. Ownership implies the right to the residual income stream of an asset. Other parties may have claims on part of the income stream, but the owner has the claim to the surplus (or bears the loss). When government guarantees surplus income and takes the risk for shortfalls in income, nominal ownership may be private but the real effects are borne by the public sector. Income shortfalls affect public net worth and borrowing requirements. Although the transport infrastructure may be financed by the private sector, the government bears the ongoing risk. The effect on the government's fiscal position is the same as if the government itself had borrowed the money (at private sector rates) and incurred the liability for servicing and repaying the capital. The instrument used is a de facto government loan.

Of course, there are many permutations of the instruments shown in Table 1 and described above, including public-private partnership options. For example, infrastructure revenue bonds may be securitised and sold to the private sector. Alternatively, government may permit a private provider to issue revenue bonds that are entitled to the revenue stream that the asset provides.

Another mixed form of financing is user contributions and contracts. For example, in the United States airlines sometimes contribute some of the finance required for an airport development, such as a runway upgrade, and the airport agrees a long-term contract with them for charges that reflect the contributions made. The users have a direct input into the choice of standard and the capacity of the facilities and the contract protects the interests of the users.

In any event, the policy objective is to find the preferred capital raising / capital servicing option, including public-private partnership combinations.

Capital Raising, User Charges, Risk and Ownership

Before considering the merits and demerits of each capital-raising instrument, some general issues can usefully be examined.

Traditionally, public sector involvement in the financing of infrastructure was justified by the characteristics of the infrastructure (Access Economics, 2003). Infrastructure assets are generally long-lived, capital intensive and part of a wider network. The pay-back periods are long. Also, infrastructure assets often provide essential services, whose disruption can impose significant costs on the community. However, in recent years, increasing sophistication in public-private arrangements, especially in relation to contract design and pricing, has facilitated more financing options.

Capital raising and user charges

A key issue is the relationship between the capital-raising instrument and user charges. As we have seen and would expect, where capital is due to be serviced by taxation in the short or long run, capital is usually raised by the public sector. Other things being equal, this is appropriate. The party that has

the financial obligations (liabilities) to service and repay the capital also has the power to ensure that these obligations are met. Private firms do not have the power of taxation and so would be reliant in any case on public subsidy and support.

On the other hand, where a high proportion of the capital is serviced from user charges, there are stronger arguments for private sector financing. The private parties that have raised the finance and incurred the liabilities have both the means and the incentive to ensure that all or most of the capital is repaid. As we have seen, the government may provide contribute to capital servicing and repayment costs. However, where government is responsible for servicing a high proportion of these costs, it bears the real liability for the capital and may be regarded *de facto* as the real financier of the infrastructure.

Given that the methods available to service financial capital, especially user charges, are a significant determinant of the method of raising capital, it is important to consider when user charges are feasible and appropriate. When user charges are feasible and there are few externalities, there is a strong case for them. User charges, especially charges based on marginal costs, encourage an efficient allocation of resources because they provide signals to producers and consumers about the cost and value of services provided. They also provide incentives to management efficiency. When charges based on marginal costs fail to cover full costs, mark-ups or two-part tariffs can be applied to meet cost-recovery financial objectives. When charges are inconsistent with equity objectives, the charges can be combined with transparent public subsidies. In such situations, there is a prima facie case for private finance combined with user charges and limited and precisely targeted public subsidies.

User charges also have the advantage that they minimises the tax revenue required and the related problem of the excess burden of taxation. Excess burdens are the costs associated with taxation that distorts voluntary behaviour, for example income taxation that causes people to reduce work hours. The total burden of taxation is the tax paid plus the excess burden. Australian studies suggest that the excess burden of taxation is in the order of 20-40 cents in marginal dollar of tax raised (Abelson 2003).

On the other hand, there are many situations in which user charges are either not feasible or not appropriate. For example, user charges may not be technically feasible at a reasonable cost in congested urban areas with limited technology. User charges may not be appropriate when there is excess capacity and the marginal cost of use, of say a bridge in a rural area) is very low. Full marginal cost pricing may also be inappropriate because of positive externality or safety equity reasons, for example when public transport is safer than private vehicle use. In such circumstances, public financing of transport infrastructure is usually preferred.

Capital raising and risk

Another general issue relates to risk. Here again there are two sub-issues. The first is whether government or the private sector can *generally* handle risk better than the other party. This is a contentious area. Some economists, for example Arrow and Lind (1970) and more recently Quiggin (1997), argue that the public sector can handle risk better than the private sector because it can *pool* risk over a large number of projects and *spread* risk over a large number of taxpayers so that there is little risk in the long run to any individual taxpayer. Thus the real cost of risk is lower for government borrowing than for private borrowing. This is reflected in the differential between the government bond rate and the market rate for private borrowing, where the latter is often several percentage points higher.

The contrary argument, put for example by Domberger (1995), is that the private capital market can and does diversify risk efficiently. The comparison between the bond rate and the market rate of interest fails to allow for the risks that are implicitly borne by taxpayers. The bond rate is lower only because government can resort to tax to repay loans. The risks of projects are borne by taxpayers who receive no compensation for the risks.

Both arguments have merit. It appears that government can spread project risk better than can the private sector and that part of the differential between the bond rate and the market rate of interest for a risky project reflects an advantage of government funding. However, following Domberger, the full interest rate differential may overstate the benefit of public funding. It is hard to quantify real economic benefit of the lower nominal borrowing rate of government.

The second sub-issue relating to risk is control over project specific risks. Some project specific risks are specific market risks. They relate to traffic forecasts, marketing, construction costs, operating efficiencies and so on. It appears that private firms generally deal with such risks better than government does, especially when there is competitive tendering. The fundamental reason is that members of private firms have an incentive to confront these issues and deal with them by allocating risk and responsibility in effective principal-agent relationships. Public officials bear less responsibility for market risks. Thus private firms are more experienced in handling such risks. For large and complex construction works, competitive tendering, which ensures that builder bears the project specific risk associated with construction, has usually proved superior to construction by government departments.

On the other hand, when enterprises are heavily regulated, because of monopoly power or because they generate significant externalities, public ownership may be preferable. In such circumstances an unregulated private owner cannot be expected to act in the public interest. When businesses are regulated, profits depend on the nature of government decisions. As Quiggin (1997) observes, the profits of say an airport depend heavily on decisions with respect to aircraft noise, international aviation agreements, transport links, and so on. Similar risks arise in government-managed transport networks. For example, the traffic flow on a toll road depends on government decisions on land uses, public transport and other road projects. A private operator must demand a risk premium over and above the normal equity premium or obtain some guarantees of favourable treatment. In such cases, other things being equal, the optimal solution is for the risk associated with network management to be internalised through public ownership. Public ownership in turn implies some form of government finance for transport infrastructure.

Raising Capital for New Transport Infrastructure

We now consider more specifically the advantages and disadvantages of the various ways of raising capital shown in Table 1.

Using current tax revenues

The first option shown is raising (and paying for) capital for transport infrastructure out of current consolidated tax revenues. Of course most government borrowing is also paid for ultimately from tax revenues. However, the incidence of the payments is different. When capital for transport infrastructure is provided from current tax revenues, the tax payer pays for the full cost of the infrastructure while receiving only a small part, if any, of the benefits of the services that will be delivered often many years later. Thus funding infrastructure from current general tax revenues does not satisfy the beneficiary principle of equity — that the beneficiary of a service should pay for the benefit. Nor are there significant efficiency arguments for funding infrastructure from current consolidated revenue.

Similar objections may be raised to transport-related tax revenue, such as fuel tax revenue. As a revenue source, excise taxes on fuel are as much part of consolidated revenue as are taxes on tobacco, alcohol, other consumption goods, or indeed as income tax. Certainly, fuel taxes may be hypothecated to transport infrastructure, as they are to road construction in New South Wales (Australia). This hypothecation provides a stronger nexus between the tax base for the infrastructure and the beneficiary. Nevertheless, current taxpayers bear the burden for provision of future services and again there are no clear efficiency benefits from financing transport infrastructure from excise

taxes on fuel. (There may be other efficiency benefits from fuel taxes operating as a correction for pricing failures).

There are stronger equity arguments for raising capital via special development taxes (or levies) that are specifically related to the infrastructure development. As we have seen, these taxes may be levied on landowners or on developers. As shown by Abelson (1999), taxes on developers are usually passed back to landowners because development is a competitive activity. The assumption here is that the infrastructure will be provided in any case, so that property prices reflect the present or future availability of infrastructure services. If payment of a development levy enables the infrastructure to be provided when it otherwise would not be, the levy may be passed forward to house owners. However, this reflects essentially the provision of services that would not otherwise be provided. In principle, value-capture levies on landowners, developers or house owners for the provision of infrastructure that results in increased property services and prices are equitable. Even though many services are provided only years into the future, in most markets the expected benefits are capitalised into current property prices. Thus, if applied accurately, development taxes may be construed as user charges.

However, caution is needed. It is easier to identify the beneficiary of a bus or car trip when it occurs than to identify the proportion of the benefits occurring over the next 30 or so years that will accrue to a specific property or development before the infrastructure is even constructed. Nor is it easy to define the range of beneficiaries. Value-capture levies are inevitably based on judgements that may turn out to be inaccurate.

Moreover, there are significant inefficiencies associated with development levies as a method of raising capital to finance infrastructure. The authority that receives the levies typically has little incentive to provide the infrastructure in a cost-effective or expeditious manner. The incentive to cost-effective provision is reduced when an authority has coercive tax powers with which to raise finance. Importantly, the authority has no incentive to spend the funds quickly when the authority can accrue interest from the funds and when there is no obligation to service the capital. At the time of writing, local government authorities in Sydney hold A\$750 million in developer levies that are pledged to the provision of facilities but which have not been provided. In this situation, there is no discipline from external financiers on the delivery and performance of infrastructure.

Public borrowing

As we have seen, *general government borrowing* has the advantage that government can borrow at relatively low nominal and real cost. Private finance is generally several interest points more expensive. On loans of \$100 million, public borrowing may save \$4 million or \$5 million. Also, by spreading out repayments over many years compared with funding from current taxation, borrowing spreads out the burden of repayment in line with the receipt of services.

However, in recent years many governments have been very cautious about borrowing to fund infrastructure expenditure. The United Kingdom introduced the Private Finance Initiative in the early 1990s primarily to circumvent strict fiscal constraints. The European Union has an arbitrary and not strictly enforced rule that fiscal deficits should not exceed 3 per cent of GDP. A fiscal deficit is the excess of all expenditure, including current and capital expenditure, over current revenue. In Australia, the Commonwealth Government and several state governments have made debt reduction a major policy objective. Indeed in 1995 the New South Wales parliament passed legislation requiring the government to aim at debt elimination.

The European Union rule dealing with deficits may be justified as a short-term policy against inflation when economies are buoyant. When demand for goods is high, there may be a macroeconomic case for limiting deficits or indeed for running a fiscal surplus. However, the EU rule is an expedient one that has no long-run justification. There is no general economic reason why capital expenditure should be funded out of current revenues. The Golden Rule of public finance is that governments should achieve a *net operating balance over the business cycle*. The net operating balance is current revenues

less current expenses including depreciation. The Golden Rule requires current revenue to cover *the use* of capital but permits borrowing to finance productive investment. Indeed over the business cycle of typically about five years, public borrowing will equal public investment.

The Golden Rule implies maintenance of net public worth. There is no microeconomic problem with financing productive capital investment by borrowing. Public borrowing increases net debt but, if the investment is productive, borrowing has no effect on net public worth. Public debt per se is not relevant to social welfare. The variables that matter to social welfare are public sector net worth and public sector contingent risk. Moving debt off the current budget by borrowing off-budget does not reduce the real liabilities of the public sector if the public sector has the obligation to service the capital in any case – it merely disguises real liabilities of the public sector.

The two main arguments put forward for reducing debt are (1) a high debt may raise public borrowing rates and (2) the debt may not be sustainable. These arguments may apply when there is a high level of indebtedness. A sustainable level of liabilities is one that can be readily serviced when there is a sharp downturn in economic activity without seriously compromising the provision of regular public services. However, they are exceptional arguments for avoiding *excessive* levels of debt. They are not general arguments for debt reduction in normal circumstances.

The issuing of *special purpose public infrastructure bonds* may be attractive to private lenders. They may provide a catalyst for mobilising private sector money and for some public-private partnerships. Also, the greater accountability and the hypothecated nature of such funds may make them more attractive to lenders. However, the issuing of such bonds does not relieve the government of any obligations that would attach to other borrowing arrangements. Investors are more interested in the nature of the risk than in the purpose for which the bond is used. Such bonds usually do not provide any cost savings or efficiency benefits to government and may duplicate funding processes for conventional public projects.

As we have seen, infrastructure bonds may also be tax advantaged. When a public agency issues tax-advantaged bonds, it should achieve cost savings. It can raise funds with a lower interest rate because lenders equalise their expected after-tax rates of return. However, overall the public sector does not gain because it loses tax revenues.

Government may also allow private firms to issue tax-advantaged infrastructure bonds. The aim is to compensate investors in infrastructure projects for the long lead time before receipt of income, especially when the tax system is biased against infrastructure projects. In Australia the income tax system does not allow claiming of losses incurred in generating accessible income, including depreciation and interest, until there is other taxable income against which such losses may be offset. This means that losses may be deferred for many years with declining present value levels. On other hand, such enterprises usually benefit because tax is not levied on accrued capital gains.

However, tax subsidies such as tax advantaged infrastructure bonds have significant disadvantages. They are a crude way to deal with biases in the tax system or any project related externalities. They do not reduce real economic costs and they may increase investment distortions. Moreover, such tax concessions often provide large opportunities for tax minimisation for individuals on high marginal tax rates.

The idea behind infrastructure revenue bonds is that they authorise and hypothecate an income stream to service and repay the debt. However, when government issues such bonds, it is responsible for repaying the debt. Revenue bonds may be valuable where private investors are unwilling to accept project risks. As a rated instrument, revenue bonds can be attractive to institutional investors unable to accurately assess or manage project risk. Also, it may be possible to sell the debt to the private sector (securitise the debt).

There is little difference between borrowing by general government and borrowing by state-owned trading enterprises (SOEs). Although SOE borrowing may appear to quarantine the effect of the borrowing from general government, when an enterprise is wholly publicly owned, the change in net worth of the SOE is part of the balance sheet and net worth of the government. In most cases, general government is responsible for meeting any financial deficiencies of a SOE. The main advantage of SOE borrowing is that the risks are sheeted home more directly to management and this tends to engender greater management discipline.

Private sector financing

The arguments for and against private financing of major transport infrastructure are essentially the mirror image of previous comments. Financing should be a function of ownership and the allocation of ownership.

The core issue is whether the benefits of the incentive structure provided by private construction and management offset the higher real cost of finance. NSW Treasury (2002) notes that integrating design, construction, operation and maintenance over the life of an asset within a single project finance package can encourage maximum innovation from the private sector to improve the design and performance of the infrastructure and to reduce the whole of life costs. This presumes that clear and explicit contracts can be written for all aspects of the work. Moreover, external financiers can provide an essential discipline for the efficient delivery and operation of infrastructure. However, these general benefits of private ownership need to apply in particular cases and to offset the higher costs of privately raised finance.

The allocation of risk is a related issue. Transferring risks (and financial responsibility) to the private sector is desirable when the private sector is better placed than government to manage those risks and can thereby improve the cost and quality of infrastructure. As we have seen, the private sector is better than the public sector at managing many kinds of project risks. However, if the private sector requires the public sector to underwrite the operation of the infrastructure and effectively to insure it against risks of various kinds, private finance may be an expensive option.

Privatisation: Re-financing Transport Infrastructure

The transfer of assets from the public to the private sector, which is generally described as privatisation, has been a common phenomenon over the past 20 years and the subject of a great deal of analysis. This paper does not attempt to enter into the whole debate. However, privatisation can be viewed as the refinancing of infrastructure by replacing public finance with private. Indeed this financial motive for privatisation is often the pre-eminent one. Thus I briefly discuss some of the main economic and financial implications of privatisation.

Specifically the paper discusses the implications of three scenarios:

- Privatisation is efficient and the infrastructure assets are sold at the market price.
- Privatisation is efficient and the infrastructure assets are sold at below market price.
- Privatisation is not efficient and the infrastructure assets are sold at the market price.

The main reason for selling publicly-owned infrastructure assets is efficiency. Economic theory and evidence suggest that, *when a market is effectively competitive*, assets are managed more efficiently under private ownership than under public (Abelson, 2003; Megginson and Netter, 2002). Efficiency here means that private firms will provide more of the goods and services that people want at lower cost than will a publicly-owned operation. There are therefore benefits to consumers or producers, or both. When the assets are sold at market price, the existing owner can capture much of this improvement in value. Financially government gains because the capital income obtained from the sale exceeds the present value of the revenues that government foregoes as a result of the sale. Thus public net worth rises as a result of the sale. This net worth can be used to finance other infrastructure, to reduce government debt, or for various other causes.

In our second scenario, privatisation is still efficient. The total benefits from privatisation exceed total cost and net social benefit is positive. However, if government sells assets at below market price, it passes some benefits of the privatisation to future owners of the asset. This does not reduce the overall economic benefits from privatisation, but it changes their distribution. In this case the capital income from the sale may be less than the present value of the surpluses that government foregoes as a result of the sale. Thus public net worth falls as a result of the sale. However, public debt may not fall. Government can still use the income from asset sales to reduce debt. What has fallen is the equity component of public net worth.

It should be noted here that there are transaction costs of selling assets. The costs of sales include the real resource costs associated with the transaction, for example marketing costs, and the payment to underwriters for taking the risk of picking up shares that are not sold on the market. Total transaction costs can be between 2 and 5 per cent of revenue from the sale.

In our third scenario, privatisation is not efficient. For one or other reason, most likely in a monopolistic market, services after privatisation may be less attractive to consumers or produced at higher cost, or both. In this case the primary economic arguments favour continued public ownership. Moreover, even if the assets were sold at market price, public net worth would fall unless the sale exploits a monopoly market power that government would not exploit if it were the provider of ongoing services. These implications suggest that privatisation should not occur when it is inefficient.

But, as we have seen, although public net worth may fall as a result of the sale, debt may not fall. Government can still use income from asset sales to reduce debt or to provide short-term electoral presents. Undoubtedly this happens. Moreover, there are second-best situations in which sale of assets would be justified in this kind of situation. A second-best situation exists when government cannot adopt optimal fiscal policy because of some constraint and is forced to choose between second-ranked options. If government faces major constraints on the revenue that it can raise from taxation or from borrowing, the sale of assets may be justified as a revenue measure to provide say more schools or more public transport than would otherwise be possible. However, the optimal policy would be to remove the constraint, say to public borrowing, rather than to sell the asset.

Conclusions

Transport infrastructure can be financed by current taxation, general or infrastructure-specific public borrowing, or by privately organised finance. The preferred method of finance depends on overall value for money, equity and efficiency considerations not just on the cheapest source of finance. Thus the choice of method depends partly on the cost of finance but also on the role of user charges and on the ownership and management of infrastructure assets associated with each form of finance.

Table 2 summarises the main advantages and disadvantages of the main methods of financing transport infrastructure.

Table 2: Advantages and Disadvantages of Instruments for Raising Capital

Capital raising	Advantages	Disadvantages
Taxation		
Consolidated revenue		Limited source of finance Inequitable Lacks efficiency incentives
Infrastructure levies	Can be equitable	Lacks efficiency incentives
Public sector borrowing		
Borrowing – general bonds	Low cost of finance Suitable for public projects	Inappropriate if debt is high
Infrastructure funds /bonds	May attract private funds	No cost advantage
Public enterprise borrowing	May encourage efficiency	May be a cost penalty
Private sector financing		
Private debt /equity	May encourage efficiency	Often high cost option
Mixed private instruments	Can combine advantages of public and private sectors	Requires clear contracts and efficiency allocation of risks

Current taxation measures are generally not effective, efficient or equitable methods of raising finance for infrastructure. Current taxation can raise a limited amount of funds, imposes high tax rates (with consequent economic distortions) on current households, and imposes a large burden on the current generation of taxpayers.

General public borrowing is a low cost method of borrowing that spreads the burden of payment equitably. It is appropriate when user charges are not feasible (and so private financing is difficult) and when government carries a high proportion of project cost and risk. It may also be appropriate when the market is not competitive. Specific infrastructure bonds have few advantages, although revenue bonds may be useful in some situations.

Privately financed infrastructure is a high cost form of finance. However, when user charges are feasible, private ownership and management may produce goods and services more efficiently than does the public sector. These ownership and operational efficiencies may offset the relatively high cost of finance.

Similar arguments apply to refinancing existing transport infrastructure (privatisation). This is worthwhile economically and financially when there are efficiency benefits and the assets are sold at market prices. Privatisation is more difficult to justify in the absence of economic benefits, though there may be occasions when the financial benefits justify it.

In general, financing instruments should be chosen on the microeconomic merits of each case rather than on macroeconomic considerations. In parlous economic times, avoiding fiscal deficits and reducing debt are desirable objectives. At other times they are not sensible objectives.

References

- Abelson, P., 1999, 'The Real Incidence of Imposts on Residential Land Development and Building', *Economic Papers*, 18, 85-90.
- Abelson, P., 2003, *Public Economics, Principles and Practice*, Applied Economics, Sydney.
- Access Economics, 2003, *Financing Infrastructure for Residential Development*, report prepared for the Housing Industry Association, Canberra.
- Arrow, K.J. and R.C.Lind, 1970, 'Uncertainty and the evaluation of public investment decisions', *American Economic Review*, 60, 364-78.
- Domberger, S., 1995, 'What does privatisation achieve – a comment on Quiggan'?', *Australian Economic Review*, 95, 43-8.
- Megginson, W. and J. Netter, 2002, 'From state to market: a survey of empirical studies of privatisation', *Journal of Economic Literature*, XXXIX, 321-89.
- NSW Treasury, 2002, *Private Provision of Public Infrastructure and Services*, TRP 02-3, Sydney.
- Quiggin, J., 1997, *Inquiry into Road Funding*, Submission to House of Representatives Standing Committee on Communications, Transport and Microeconomics Reform, Parliament of Australia