Principles for Australian Infrastructure finance

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There is a widespread view that Australia has not invested sufficiently in the large pieces of infrastructure needed to ensure its continued growth and prosperity.

Such major infrastructure projects pose inherent difficulties because of the size of the investments and the range of risks involved. At first glance government is best placed to develop major infrastructure itself, because of its deep pockets, ability to spread risk, and portfolio of potentially related activities. However governments have weaknesses with managing debt, and poor track records in managing costs and delivering desired outputs.

Given the political sensitivity to public debt, it is also difficult for governments themselves to borrow to fund major projects.

Neither it is clear that direct government investment is necessary. In a market economy, the private sector should normally be able to fund desirable investments.

In their turn private investors have problems funding infrastructure: equity investors require high returns to compensate for risk; debt investors require low risk to justify investing.

The central question then for business policy is whether there are actions government can take which might make it easier for private entities to undertake such socially desirable investment either by enhancing returns or reducing risk.

This paper sets out a number of principles which might guide such government policies.
Recommendations

Recommendations relating to policies designed to enhance infrastructure investment in Australia

Recommendation One: Mature assets should be privatized

If the government is restricted in the total amount of debt it can bear, then it should focus its limited capacity on the targets which produce the greatest benefit for Australia.

In order to free up debt-bearing-capacity, governments should privatize mature assets and focus incremental capacity on the development of new productive assets. Such mature assets, those whose ability to produce revenue and cost outcomes are well known, will normally be attractive to private investors. Some assets will be sold at a ‘loss’ and some at a ‘profit’. This is irrelevant: the issue is freeing up the capacity to invest in new assets, the past is the past.

Recommendation Two: Government should focus on early stage risk

The private market struggles to finance projects whose financials are subject to a high degree of revenue or cost uncertainty. Such equity-type risk could be handled through the capital markets, but the scale of major infrastructure projects relative to the size of most investors (even superannuation funds) makes it problematic. Most investors prudently only allocate a small part of their portfolios to high risk projects.¹ Joint-ventures and syndicates provide a partial solution but have proven to be difficult to unwind making them less attractive in fact than they appear to be in principle.

While private investors will normally require a significant risk-premium to invest at this early stage, government potentially requires a smaller risk premium than other investors because of its deeper pockets and wider exposure to the economy. Government has a greater capacity to pool investment risk than any other local actor.

Recommendation Three: Early stage risk can be handled directly or indirectly

This leaves two broad options for new and immature assets

¹ Clearly this problem will become less acute as the funds managed by the superannuation sector grow over the next decade.
(i) Directly: they can be developed in the public sector or with the public sector assuming most early stage risk; or

(ii) Indirectly: they can be developed in the private sector with the state providing revenue enhancement, cost reduction, and risk amelioration.

Recommendation Four: Policy support to projects should be for limited periods

Revenue enhancement can take the form of revenue guarantees, availability payments or regulatory holidays. Cost reduction can take the form of policy changes which deepen the pool of investors, reduce bid costs through shared data rooms etc, or through subsidised borrowing as with infrastructure bonds.

In all cases, policies of these types should focus exclusively on early-stage support. As such they should only operate for a limited period with clear and explicit sunset clauses.

Recommendation Five: Regulatory changes will help superannuation funds invest in infrastructure

The current regulatory model whereby superannuants can move their accounts freely between funds means that fund trustees feel the need to maintain significant liquidity. This makes it less likely that they will be willing to invest in long-lived, and potentially illiquid, assets, like infrastructure.

A regulatory change which made funds stickier (for example, requiring a three month notice period of the intention to move) or the provided a liquidity buffer for funds (eg a Reserve Bank liquidity backstop) would encourage greater investment in infrastructure. The latter seems feasible given the fact that the funds can only move within the system and the Government's promise not to make adverse changes to superannuation in its first term.

Recommendation Six: Expect policies to be diverse

The differences between the approaches taken in NSW and Victoria to new major road projects suggest some of the approaches consistent with this strategy of taken early-stage risk into the public sector.

NSW decided to take the early-stage on itself, in the expectation that the asset would be sold off as it matured. Victoria is calling for private investors to build, own and operate the road but has taken demand and a range of other early-stage risks on itself.
Recommendation Seven: Federal government could insure rather than fund major projects

The Federal government is the natural insurer of infrastructure risk since it has the deepest pockets and the greatest ability to spread risk. Rather than fund projects directly, the Federal government might better adapt its role and provide insurance against a range of early stage risks.
Part 1: Infrastructure finance

Introduction

There is a broad view that Australia is subject to a variety of infrastructure bottlenecks and that significant investment in infrastructure over the next several decades will be important. For example the OECD found that Australia suffers from an infrastructure deficit with that transport infrastructure ranked 34th overall and port infrastructure 46th (OECD, 2011). This is reflected in a growing backlog of priority projects such as major rail projects (Melbourne Metro, North West Rail, Cross River Rail, High Speed Rail); major road projects (WestConnex, East-West in Melbourne); the expansion of ports; and much needed investment in power, water and telecommunications networks.

Infrastructure is important. High quality infrastructure will enhance Australia’s productivity performance and “efficient pricing for infrastructure services and rapid progress towards harmonisation of regulations across states would boost competition and productivity” (OECD 2013).

This paper uses three main sources. The Productivity Commission also wrote a major discussion paper on the infrastructure (Chan et al 2009). The Infrastructure Finance Working Group reviewed the issues and developed a set of recommendations for Australia (IFWG 2012). And Infrastructure Australia has also issued a consultation paper in January 2013 on the issues involved.

The paper focusses on major infrastructure projects. Smaller projects pose fewer risks and are normally handled inside public agencies because of the costs involved in externalising them. It may be possible to bundle small projects into single larger contracts, particularly since small projects are more likely to be shovel-ready, but their incremental nature means that they will cause few of the issues which arise with major projects. However when government is looking to provide quick fiscal stimulus, as in the global crisis, it would be better focussing attention on financing portfolios of smaller projects than launching into major new endeavours.

Principles

Much infrastructure is provided privately, for example with a private railway line. To the extent that the private provider captures sufficient benefits to justify the investment, there is no issue of public policy. Even where the facilities are shared with other businesses, there is no
necessary policy issue: shopping centres being a case in point where many businesses share a facility.

Monopoly-like facilities

One exception involves the case of essential facilities. At core, the proposition is that private owners of such facilities can extract too high a return for their investment to the detriment of the broader public good and hence public ownership or regulation of the private owners is preferable. To address this issue there are tests in the Trade Practices Act, which specify the conditions under which one private party must provide access to its facilities to other parties. Stephen King and I outlined many of our concerns with how the Australian regulation of such facilities is structured in an earlier book and some papers, most of which are still relevant (King and Maddock 1996a and 1996b).

It is also possible that poorly designed regulation, or the potential to be regulated, can change the economics of such infrastructure so that it is no longer profitable to build (Gans and King 2004). There are particular issues at the moment around ‘green tape’ and ‘red tape’ but the concern is broader. King and I wrote earlier about the unnecessary regulatory burden which was imposed on the Alice Spring to Darwin railway line even though it was at the very best a marginal project. It is important for regulators and policy makers to understand that it is almost always better to have a project built (and allowing the owners to extract too much rent) rather than not have it built (so there are no rents for anyone).

There are also facilities which while not fundamentally excessively profitable, are converted into monopolies as a consequence of contract design or regulation. While facilities are not inherently profitable, there is a temptation for policy makers to hamstring competing infrastructure to enhance its profitability, artificially creating a natural monopoly. The most obvious cases involve road projects where the potential for bypass is high, and by similar cases in most network industries where infrastructure assets can be stranded by the construction of competing facilities (Armstrong 2008).

Facilities which require subsidies

Of much broader interest are cases where no private party would build the particular piece of infrastructure even though the social benefits from its construction and operation (hereafter construction) outweigh the costs. The divergence between the private valuation and the public one will generally arise from one of three broad areas of concern:

Inadequate capture: In many cases the private provider is not able to capture sufficient of the rents generated to justify the investment even
though there is substantial demand. This is often because the benefits are such that it is hard to exclude people from enjoying them – roads, lighthouses, defence, immunization policies etc are possible examples.

**Bankruptcy risk:** There is a second type of problem which arises when the demand is extremely uncertain, and the costs are large relative to the size of investor, so that the risk of bankruptcy or substantial impairment makes it is difficult for a private investor to justify the investment. The Alice Springs to Darwin railway line might have been an example, the desalination plants and major roads also fall into this category. The problem is one of scale when projects are large relative to the market capitalization of the firms involved, and joint ventures are difficult to manage.

**Discount rate:** A third class of problem arises when the private provider is only able to start charging for the services provided some years after the investment has been made so that benefit-cost analyses fail due to the carrying cost of the investment.

In principle governments could provide such infrastructure:

- In cases of inadequate capture, governments can use the tax system to make sure no one escapes paying for the facility.
- Governments do not face bankruptcy risk and because of their size they can manage a portfolio of risks better than private entities.
- The government may also use a lower discount rate than private investors as part of a policy of intergenerational neutrality so that the mismatch between the incidence of costs and benefits may be less of a problem to government.

Problems with government provision

While governments could design, build, finance and operate the facilities themselves, in practice it has not always worked out well.

Three problems have been manifest:

- First, government is not particularly effective at producing many goods or services. It is now clear that private entities motivated by profit are much better at controlling costs and delivering products which are actually in demand than are government businesses (King and Pitchford 2008). This was a major driver behind the privatization of the Victorian energy assets for example with the private owners working the assets far more intensively than had the public owners.
• Second, governments can be reluctant to charge appropriate prices as they are likely to come under political pressure from user interest groups. This is very noticeable in developing countries where an unwillingness to charge sufficiently regularly leads to underinvestment and poor quality service (Eberhard 2011). We have seen cases in Australia in which considerable pressure was applied during telecommunications reform to retain untimed local calls.

• And third, governments are not very good at managing their overall financial position. Many governments, at all levels and in many countries, have accumulated large deficits which have limited their ability to provide support to their economies in times of crisis and required very disruptive adjustments. The current fiscal difficulties in Europe and the United States are cases in point, but the reduction in credit rating of a number of Australian states over recent years arises from the same concern. The fundamental driver is political myopia, driven by the political benefits from higher spending in any single year versus the long run costs of having to pay down debt (Belen Sbrancia 2011, Maddock 2013a).

Quite obviously if governments have a limited overall appetite for debt, it is essential that they make best use of their current debt capacity (Port Jackson Partners 2009). Most governments have assets sitting on their books which can operate under existing regulatory frameworks on a normal commercial basis. They face a clear policy choice between maintaining those operations inside governments and not building new infrastructure they might wish to, or selling off those businesses and constructing new facilities. While it may not be a simple decision, the choice is a very clear one.

It is also likely that the demand for some infrastructure services is exaggerated by the use of inadequate pricing schemes, as for example by not charging at all. Introducing a sensible pricing (or rationing) scheme may well slow the growth in demand for the service under consideration and reduce the need for further infrastructure investment. Un-priced infrastructure will almost inevitably be over used (Hardin 1968).

Once these steps have been taken, the central issue in funding Australian infrastructure is to find methods of providing infrastructure which would not otherwise be built making best use of private sector productivity with minimal impact on public debt.
Part 2: Funding

We can separate the process of financing the construction of new infrastructure from that of funding it. In the absence of risk, investors are (at least) fully compensated for the capital they inject as part of financing the project. By contrast, the revenue stream which provides the ultimate source of funding and pays for construction, operation and financing, comes either from

- the users of the services provided by the infrastructure
- the other beneficiaries of the service, or
- the taxpayers (through the government).

Once we introduce risk into the analysis then the entities which provide the capital run the risk of loss which means that they too have contributed to the funding of the project. Give the inherent risk of many large infrastructure projects, history is littered with examples of failed investment with the global railway boom of the nineteenth century providing many examples, investors have effectively contributed to funding not just financing. Road projects have been notorious of late for such failures.

As the residual funding agencies, governments have strong incentives to minimise their contribution, and to do so they will ensure that the service provider extracts as much revenue as possible from users (while meeting service targets).

User pays models

Where the users of a piece of infrastructure can be identified directly then some form of user-pays model is likely to be the most appropriate way to fund a project regardless of whether it is public or private. The precise form of charging will depend on issues of system design and patterns of demand but the broad principle of marginal cost pricing should apply. This is likely to involve a charge for the ‘amount’ of the service being used, and may involve a contribution to the fixed costs of service provision, and potentially a congestion charge (Productivity Commission 2009).

If the impact of marginal pricing is such that some important (to the government) users are excluded from the service, then following standard economic arguments it would generally be better for the government to either (i) directly compensate those users through the tax/transfer system rather than change the pricing system, or (ii) identify the particular users and directly fund the implied community service obligation (Hilmer 1993).
Governments are often keen to avoid such a direct and transparent approach. This might arise from a view that the social contract implies an obligation to provide equal or equivalent services across the society so that people have a ‘right’ to the service on the same terms as others. Emergency treatment at hospital might be such a service. The government’s motive might also be less pure, simply be to avoid scrutiny of an implicit transfer amongst citizens (eg through postage stamp pricing across a State as in the use of a single electricity pricing node in each State). The recent pressure on banks to provide ATM services in remote communities rather than the government funding the service directly serves as another illustration.

There is clearly a strong temptation for governments to encourage cross-subsidization between the users of a piece of infrastructure rather than pay the marginal cost price when the latter would result in the service being produced at a loss and requiring a transparent subsidization. To allow such cross-subsidization however, the infrastructure service must be provided as a monopoly. If not, other providers would cherry-pick the profitable customers (who were being charged too much) and leave the unprofitable customers to the government-sponsored provider. This in turn requires regulation of entry and the prohibition of bypass effectively locking the service in to the particular infrastructure solution regardless of alternatives. This problems arising from this are very clear around the NBN and the associated anti-cherry picking rules.

Not all of the beneficiaries from the provision of a piece of infrastructure are necessarily users of the service it provides. Much transport infrastructure for example generates positive and negative externalities which impact people and businesses located close to it. The cross-country railways in the United States were financed by granting the railway companies rights to land adjacent to the lines, and whose value would increase because of the line. It is not uncommon today for residents around infrastructure to have their local taxes surcharged in an attempt to capture some of the value created. Symmetry would require compensation if the impact were negative although this is perhaps less common (Boarnet 2002).

There will be other cases where it is too difficult or too expensive to assign charges to individual users in which case the project, if deemed necessary, should be funded directly by government.

In Australia we have not yet pushed the user-pays model as far as it probably should. Road freight is the most notorious example where we lack an effective charging system that ensures heavy vehicles pay for their specific marginal road-wear costs (they are the major contributors to wear: COAG Road Reform Plan 2011). This failure is particularly important given the forecast doubling of road freight by 2030 (BITRE 2010). The Business Council of Australia finds that avoidable urban
congestion will lead to a loss of 1.4% of GDP by 2020 and HVCI (2013) suggests significant efficiency improvements in freight transport with more effective pricing schemes. Road congestion pricing was also recommended by the Henry tax review (Henry Report 2010).

Roads are not the only area where the charges paid by users could be reformed to considerable advantage in terms of boosting national income and the returns on infrastructure investment. While important efforts have been made to improve water pricing, progress has been slow (NWC 2011). Urban water prices are now based on volumes used, although the rising block pricing structures do not necessarily produce the most appropriate outcomes either from an efficiency or a welfare point of view (Crase et al 2007; Maddock and Castano 1991). The prices charged in energy markets too suffer from a wide range of inadequacies, most notably in the price cap models, in peak-load pricing and congestion charging (AEMC 2012; McInerney et al 2007).

Addressing bankruptcy risk

Where the infrastructure services are delivered by a private sector entity, their vulnerability to bankruptcy becomes important. This is particularly the case since many Australian infrastructure projects are large relative to the size of the companies involved. Facing the risk of bankruptcy equity providers, bond holders and banks are likely to require high returns to compensate which can create political problems after-the-fact. When a particular piece of infrastructure has been completed successfully and is generating high returns, there will be a political temptation to regulate, often on the grounds that the particular project was excessively generous. It might also be that case that the facility provides insurance (for example against drought in the case of water projects, or for potential demands in the case of the NBN) which is not subsequently needed. While the project return is justifiable economically before the fact and on a risk-adjusted basis, it may look excessive given subsequent experience. Such risk of opportunistic regulation can cramp investment (Gans and King 2004).

The elevated levels of risk associated with particular infrastructure projects will lead investors to seek strategies to manage it downward. One well-known strategy is to seek to renegotiate the contract after it has been awarded in ways which reduce the risks involved. There is a standard problem in contracts where it is more efficient for both parties to sustain an existing contract as events unfold rather than break a contract and try to restart with an alternative partner. Major pieces of infrastructure are subject to this sort of lock-in. How to manage unfolding risks has been a significant problem with many PPPs. There is no clear analytical solution - both parties have the capability of hurting one another by allowing the contract to fail. The underlying contract will have allocated some of the foreseeable risks (such as movements in the underlying costs of some inputs) between the parties prior to
construction, but post-contract negotiations for issues which have not been foreseen are more difficult but the nature of the contracts can shape the range of possible outcomes (Hart 2009).

For public entities it is important to consider the potential failure of a partner while the contracts are being designed.

The private entities involved may also enter into complicated risk sharing arrangements with other entities. This is especially likely on the financing side. Banks and other financing parties will normally have limits on the maximum exposure they can undertake to any single project, limits imposed by regulators and/or management. Such syndicates for major projects will have many participants. While this helps protect the banks from risk, and normally functions effectively while the project is running as planned, it can make the resolution of difficulties more complicated (Gatev and Strahan 2009). We have seen a recent example with the difficulty of getting a clean resolution of the financial problems in the Centro group as different banks had different expectations once the company ran into problems. While there might sometimes be a secondary market for troubled exposures they are not deep. The effect then of having private firms manage their risks in an infrastructure project may produce outcomes which are not socially optimal, particularly when projects have problems.

Entities which are large enough may well be able to diversify these risks internally across a portfolio of projects. The most obvious entity which can do this is the government. This may provide a justification for some government subsidization of individual projects passing on some of the advantages it has in this ability to pool risks. There are other large entities which also have some potential to diversify their risks on a portfolio basis, sovereign wealth funds and major wealth management funds, are examples. It seems likely that the major Australian funds will be able to take more greenfield project risk as they grow, and consolidate as predicted for example in the Cooper Report (2010).

Intergenerational issues

Governments may also have a different rate of time preference relative to private investors. Since the benefit of long-lived projects impacts on the wellbeing of future citizens, and their viewpoints are not implied by current market discount rates, governments have a legitimate role in deciding how future citizens should be treated. This may well lead governments to prefer to employ a lower discount rate than used normally by private entities. The UK Stern Report into climate change policy focussed attention onto this issue by producing recommendations which were extremely sensitive to the low discount rate chosen, and justified on grounds on intergenerational equity. Thompson (2003) canvasses the ethical issues with a particular emphasis on the
The key point is that the choice of a discount rate for long lived public projects involves a moral choice which sits in the domain of politics rather than economics. Governments and private investors can be expected to have different views and governments can see projects as justifiable even if private parties do not. This may lead them to justify projects which fail normal benefit-cost tests — the NBN may be a case in point currently — but as a polity we should expect them to be explicit about the choice they are making. It is notable that, for example, Victoria uses a 4% real discount rate for social projects (such as schools) and a 7% rate normally for more commercial operations. The divergence could arise from two different lines of thinking. First, it may be a political expression of the ethical view that a commercial operation might be subsidised by 3 percentage points to produce the appropriate outcome on some form of social investment. The alternative, more confused, view would be that the benefits generated from social projects are more difficult to evaluate and a lower discount rate can compensate for a failure to include all the benefits in the analysis.

By contrast Harrison (2010) argues that all projects should be evaluated at the commercial rate as being the opportunity cost of the funds employed. This view fails a consistency test in that it suggests government would create most value by borrowing at 4% and lending to the private sector at 7%, pocketing the difference. It ignores the fact that the difference in the rate at which the government can borrow and that of a commercial entity can, is a measure of the risk involved in the latter.
Because the costs of constructing an infrastructure facility are incurred (usually) well in advance of any revenue stream, because they tend to be large, because the revenue streams are often quite uncertain, and because governments are reluctant to fund them, obtaining finance for infrastructure projects can be particularly fraught.

In many ways the state (as proxy for the taxpayer) is the natural financier of such facilities. It is large, perpetual, owns a portfolio of projects allowing it to diversify the risks of any particular project, and has immense financial power as a result of its monopoly over the taxing power. In many countries, and historically in Australia, governments automatically take on this role. However and as noted above, governments have been seen to be weak in project management, and to be poor at managing their finances through time.

The equity market should be the natural place to seek private finance. In many ways a piece of infrastructure is similar to a mine, and the equity markets have long provided finance to the mining sector to match the high-risk high-return nature of that sector’s projects. Banks and bond markets, which typically require a steady stream of dividends, are poorly matched to the funding needs for risky projects (Mulino 2013, Davis 2013).

However, since the infrastructure we are concerned about is likely to be loss making absent government intervention, there is not the upside attraction equity markets expect to compensate for the risks involved. A quid pro quo for any subsidy is almost certainly some cap on pricing or some regulation about minimum service standards. Such policies take away much of the upside.

The consequence is that infrastructure projects are likely to have equity-type risk and bond-like returns: not a very promising combination.

There are a number of ways around the problem if financing is to remain in the private sector:

- enhancing the return by boosting revenues
- enhancing the return by reducing costs
- taking out some of the risk
- broadening the set of potential investors.

Revenue enhancement
Government can enhance the return in a number of ways (Chan et al 2009). One of the simplest is to provide a regulatory holiday; that is, to undertake to restrict pricing only after a certain period, or to restrict its application to a limited number of years. Given the impossibility of binding future governments, the former seems more attractive. Providing a tax holiday would be another alternative. None of these has direct and transparent budgetary consequences, and none adds to public debt or the contingent liabilities of the public sector. One way or other they are of course subsidies, but subsidies to ensure that a piece of infrastructure actually gets built.

Cost reduction

The Australian Government (or, to a lesser degree, State governments) could provide credit enhancement by providing debt guarantees to private financiers, could on-lend long-term subordinated debt for significant projects or could provide tax benefits which reduce the cost of finance (e.g. infrastructure bonds).

A number of measures were introduced in recent years to reduce the costs involved in private sector investment in infrastructure. The 2011/12 budget modified the tax treatment of losses for designated infrastructure projects in an effort to reduce uncertainty for private investors. In particular, access to better tax treatment for losses for designated infrastructure projects will not be affected by changes in business structure and the value of any losses will maintained by indexation (Australian Government, 2011). The incentive for designated infrastructure projects came into effect in July 2013. It aims to encourage private investment in nationally significant infrastructure by providing eligible entities the benefits of uplifting the value of carry forward losses by the 10 year Government bond rate, and exempting the carry forward losses and bad debt deductions from the continuity of ownership and the same business tests. The effect should be to lessen impediments in the tax system which discourage private investment in infrastructure projects.

Since the costs of bidding for major projects can run into tens of millions of dollars, improved bidding arrangements could make the process cheaper. Government decisions to delay or cancel projects after calling for tenders are particularly expensive. Simplified procedures, providing geological and related data, requiring the sharing of some technical consultancies (e.g. traffic modelling) across the bidding parties, staging the selection process so that only short-listed contenders need to invest the full amount, and full or partial bid cost reimbursement for some or all bidders would all help make bidding more agile (Industry Super Network, 2013). Coordination amongst governmental agencies needs to be further improved (IFWG 2012).
The IFWG called for the establishment of a deep pipeline of infrastructure projects through the preparation of 20-year infrastructure strategies. The key concept is to provide a consistent framework and more predictable environment for infrastructure investment so as to make it easier for potential investors to manage their corporate strategies, to develop expertise, and to bundle different potential exposures (IFWG 2012).

Reallocation of risk

A second broad tack has been to try to take some of the risk out of the project. Some approaches have involved government contracting to provide revenues for a certain volume of traffic, or to ensure the facility is available if needed. The smoothing of the resulting revenues then can allow the project to pay a steady stream of dividends, bond-like returns which make the investment attractive to a wider variety of parties. In such cases the government is taking on a contingent liability but if it is doing it on a portfolio basis it should still be able to do it more cheaply than any individual firm.

Public Private Partnerships (PPPs) provide some basic models for risk sharing (Chan et al., 2009). Such partnerships finance around 5% of public investment in infrastructure in Australia, somewhat less than Canada’s 10% to 20% (KPMG 2010). One benchmarking study concluded that PPP contracts are more likely to deliver projects on time compared to traditional procurement contracts (Duffield et al 2008).

Some of the other risks, such as construction risk can be reduced through construction guarantees of one sort or another, as for example with protection against delays resulting from union action in response to public policy decisions, and contracts which are sensitive to movements in the price of key inputs. The current proposal for the Victorian East-West Link carefully sets out the allocation of risks in the project and notably assumes the demand risk itself. Government and construction companies might also insure bond holders specifically against construction risk while allowing them to participate in the project from the beginning. This is not far removed from the funding models used pre-crisis where early stage dividends were effectively paid out of borrowings.

In the case of East-West Link in Victoria, the government is assuming demand risk: “Stage One will be procured as an availability PPP with the State: (a) responsible for separately procuring and managing the toll collection system, toll collection services and the associated customer service interface; and (b) retaining the risk associated with traffic volumes and tolling revenue”. It is also notable that, as a trial, the government is offering to subsidize some of the bid costs of unsuccessful tenderers.
Broadening the potential investor pool

The third line of approach for governments is to ensure that existing regulations do not limit the potential pool of investors.

Clearly the superannuation funds are potentially significant holders of equity in new infrastructure and in many ways natural owners. They have long liabilities and should be trying to match them with long-lived assets. The main limitations appear to arise from the specialised nature of the evaluation process, the difficulty of benchmarking such assets, and high bid costs.

In Australia they do however face problems because of the need to remain highly liquid since their account holders are free to move their accounts at any time and many infrastructure assets are quite illiquid, particularly in large volumes. APRA’s prudential guidance has reinforced this need for funds to place close attention to their liquidity and treats infrastructure as relatively illiquid (APRA 2011). Regulations which limited account portability would reduce the problem, as would a liquidity-provider of last resort to superannuation funds. In either case APRA would be more relaxed about allowing the build-up of infrastructure within super funds.

These assets bring two desirable attributes to superannuation portfolios and are particularly appealing to larger funds with strong cash inflows and a youthful client base. One key feature of infrastructure is the match to the duration of fund liabilities but they also bring a premium to compensate for their illiquidity, and the opportunity to exercise greater control over the management of assets. The scope for funds to benefit from the illiquidity premium was supported by recent APRA research (APRA 2011).

Many funds, particularly industry funds, have tended to outsource key activities and are only now, as they become larger, reversing the trend. This trend will probably continue (Maddock 2013a). Their small size relative to the opportunities has made it expensive for them to undertake due diligence and maintain diversification when faced with large, lumpy investments. The scale of the projects is a major issue for all the parties involved: being involved in any role in a major project which turns out badly is career limiting.

The rapid growth of small self-managed superannuation funds is likely to exaggerate the problems of scale, at least until a suite of retail infrastructure bonds emerges which bundles up the range of early stage risks in a convenient package.
Foreign owners should also be welcome. Because infrastructure is immovable, and almost inevitably its revenue stream is regulated, this is an area where foreign investment should be unconstrained. Foreign sovereign wealth funds are the most likely investors since they appreciate the premium which is a reward for the illiquidity of the investment, they would normally benefit from taking on some Australian exposure, and they tend to be patient.

Splitting the funding task

It is important to appreciate that infrastructure investment has different financial characteristics at different stages of its life. Separating out the components can make it easier to fund. The simplest split is between the early (greenfield) stage where it is uncertain whether the project will be managed to produce the services required on budget and whether the revenue stream from users will meet expectations, and the mature stage (brownfield) where the project is in place and producing a predictable flow of revenues on a known cost base.

The brownfield stage is relatively easy to finance (Ernst and Young 2011). The Australian market has a strong appetite for mature, listed infrastructure. With the superannuation pools likely to continue to grow, and domestic infrastructure paying franked dividends, this demand seems likely to grow further. Unlisted infrastructure has also proven attractive particularly to the larger funds.

The greenfield stage poses more of a problem: there are three basic elements to consider, construction risk, operational risk, and demand risk.

It is natural to manage the construction phase separately through a contract. As we have seen with a number of large construction projects this does not solve the problem of risk management but it allows those potential risks to be isolated and addressed. Operational risk has to be managed whatever else is done, and continue to be managed for the life of the project. It does not pose any idiosyncratic problems. Demand risk has been one of the greatest sources of uncertainty in project finance. It is fundamentally difficult to anticipate the demand for something which has not been built and for which there are a wide variety of substitutes. Network industries, notably including transport, cause particular problems.

“Greenfield patronage risk is of major concern to superannuation funds given the recent under-performance of a number of toll road projects. Participants noted that it is unlikely they would consider greenfield investment where patronage or similar operational performance risks existed.”
Indirect government funding

There have been cases where government borrows and then on-lends to particular project on favourable terms. The model seems attractive to the extent that government can borrow more cheaply than private investors (See Appendix for discussion of US and European models).

Recent examples include the European Investment Bank which, together with a range of public and private sector institutions, has established dedicated equity funds for infrastructure investment across the EU. For example the Marguerite Fund (about Euro1.5b) is designed to support equity investments in new (greenfield) infrastructure projects in transport, energy and renewables. The EIB has also established a parallel debt fund.

In Australia we have tried a number of dedicated government owned banks charged with providing funds at privileged rates to privileged sectors at different times in our history. Most States have had rural development banks at some stage but the experience was generally poor.

The fundamental challenge has been that governments have no particular skills in running banks. It seems inevitable the specialist banks drift away for commercial principle in ways which make them susceptible to capture by the parties to which they lend. They have a particularly poor history in lending: to quote the famous aphorism “governments are not good at picking winners but losers are very good at picking governments”. The State Bank of Victoria and the Victorian Economic Development Commission provide salutary examples of the phenomenon.

Direct government funding of specific stages of specific projects

Governments can borrow more cheaply than private individuals and institutions for two main reasons: they have access to the tax base which means they can almost always repay loans, and they run a diverse range of activities which makes them much better diversified than most other economic agents (Chan et al 2009).

Rather than take advantage of this inherently cheaper funding through establishing a government bank which borrows and then lends to a portfolio of investments and is subject to severe principal agent problems, we are likely to see better outcomes when government decides to fund a particular project directly. And following on from our earlier discussion, the greatest benefit applies in the earliest stages.
when project risk is greatest. Mature projects owned by government should still be routinely sold off.

NSW is experimenting with a legal structure which allows government to fund the early years of the project, to address the discount rate problem and the demand risk, and then to pass it over to the private market when these uncertainties have been removed (Treasurer of NSW 2013). This is a particularly promising approach and one likely to be used more broadly.

The NSW model is based on developing single projects sequentially in this manner. Since it is only managing projects one at a time in this structure, it is not taking advantage of pooling benefits. On the other hand the one-by-one approach has the advantage of heightened transparency.

Risk allocation between governments

If we accept the principle that governments can provide a valuable service to the society by accepting some of the risk involved in undertaking greenfield projects, the question of how this risk might be shared between governments is still open. Since this is essentially an insurance problem, the question reverts to being one of which level of government is best placed to manage the risk involved.

The Federal government seems the natural insurer of infrastructure risk. Only the national government can offset risks in one State against risk in another. It is also the government with the deepest pockets in the sense that it has a larger revenue base and so is more able to absorb project losses. As a result of its ability to pool risks, the Federal government should also be able to provide insurance more cheaply than can any state government.

Writing such contracts will not be simple. In many ways the relevant State government which controls the project is closer to the risks and more capable of controlling them at the level of detail. This suggests that the contract will require both state and federal governments to have skin in the game.

In an environment where governments are increasingly focussed on the overall level of debt that they can manage, the idea that the federal government might take on more contingent risk on a portfolio basis could be challenged. The choice is really whether the infrastructure is worthwhile. If across the portfolio it is, then the cost of assuming the contingent risks involved are less than the value being created. This makes it sensible policy to absorb such risk.
Part 4: Conclusions

The development of major infrastructure is fraught because of the size of the investments and the range of risks involved, particularly in the early stage. Government is best placed to take responsibility it because of its deep pockets and ability to spread risk. However governments find this difficult because of debt ceilings and they have proven to be poor developers and operators of infrastructure assets.

Governments can relax some of these constraints, most notably by moving mature assets from public to private ownership so that they free up more space within their debt constraints. Pricing infrastructure appropriately can also help manage demand downward and sharpen the signals as to the most appropriate investments.

Private investors have problems funding infrastructure: equity investors require high returns to compensate for risk; debt investors require low risk to justify investing. There are two broad options:

New and immature assets can be developed in the public sector or with the public sector assuming most early stage risk.

New and immature assets can be developed in the private sector with revenue enhancement cost reduction or risk amelioration.

Revenue enhancement can take the form of revenue guarantees, availability payments or regulatory holidays; cost reduction can take the form of policy changes which broaden the range of investors, moves to reduce bid costs through shared data rooms etc, or borrowing subsidies.

Because they are inherently risky, some projects will inevitably underperform or fail. Contracts and organisational designs should be structured bearing in the mind the cost of undoing them. For example, large syndicates might seem ideal from a risk sharing point of view but can make wind-ups very difficult.

Recent proposals in NSW and Victoria around the development of major road investments appear to be close to current best practice standards. In the process those governments have assumed additional contingent risk. Intuitively the Federal government seems the more natural repository of such risks.
Appendix 1: United States and Europe – direct funding models

Transportation Infrastructure Finance and Innovation Act (TIFIA)

The program's aims leverage Federal funds by attracting substantial private and other non-Federal co-investment in critical improvements to the nation's surface transportation system. The TIFIA credit assistance provides more advantageous terms than in the financial market making it possible to fund non-commercial projects. The TIFIA credit support has become an important component of US PPP financing strategies.

There are three types of financial assistance on offer:

- Direct loans provide combined construction and permanent financing of capital costs on flexible repayment terms with a maximum term of 35 years from substantial completion. The loans also come with a repayment holiday, potentially of up to five years after substantial completion.
- Loan guarantees by the Federal Government which guarantees a borrower's repayments to non-Federal lender. In this case loan repayments to lender must commence no later than five years after substantial completion of project.
- Standby lines of credit provide a contingent Federal loan to supplement project revenues, if needed, during the first 10 years of project operations, available up to years after substantial completion of project. TIFIA credit assistance is limited to a maximum of 33 percent of the total eligible project costs. Senior debt must be rated investment grade. The project also must be supported in whole or in part from user charges or other non-Federal dedicated funding sources and be included in the state's transportation plan.

Europe: Loan Guarantee for Transport (LGTT)

The LGTT was set up and developed jointly by the EIB and the European Commission with the aim to attract a larger private sector participation in the financing of revenue-risky transport projects. The instrument enables the transfer of demand risk during the early years of operation thereby significantly improving the financial viability of the project and making the capital structure more robust. By providing the guarantee the EIB is effectively a mezzanine lender to the project. The flexibility of the LGTT structure permits a tailoring of the product to fit the needs of the project. The product fits optimally with state guaranteed senior debt.
Appendix 2: Reforms underway in Australian PPP models

There is a current move (National PPP Working Group, 2010; IFWG, 2012, BITRE 2012)

- to standardize of contractual requirements for PPPS and
- to improve approaches to managing forecasting and demand risk of infrastructure projects

As well Infrastructure Australia has identified a suite of best practice benchmarks to promote efficiency in procurement of major infrastructure projects (IA, 2012). Inconsistency in approaches across states to the selection and approval of the PPP projects was cited by the superannuation funds as a significant impediment since it raised their costs of evaluating project (Ernst & Young 2011).

The IFWG (2012) has also suggested augmenting the traditional grant-based approach to infrastructure funding with co-funding between the federal, states and private sector on major PPPs projects. While this might be desirable in principle, requiring multiple levels of government to cooperate has always been difficult and introduces another level of principal-agent problem into the project.
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