



FACULTY OF
BUSINESS &
ECONOMICS

Melbourne Institute Working Paper Series

Working Paper No. 30/13

Vision Versus Prudence:
Government Debt Financing of Investment

John Freebairn and Max Corden



MELBOURNE INSTITUTE®
of Applied Economic and Social Research

Vision Versus Prudence: Government Debt Financing of Investment*

John Freebairn and Max Corden
Department of Economics, The University of Melbourne

Melbourne Institute Working Paper No. 30/13

ISSN 1328-4991 (Print)

ISSN 1447-5863 (Online)

ISBN 978-0-7340-4324-5

September 2013

* Corresponding author: Professor John Freebairn, <j.freebairn@unimelb.edu.au>.

Melbourne Institute of Applied Economic and Social Research
The University of Melbourne
Victoria 3010 Australia
Telephone (03) 8344 2100
Fax (03) 8344 2111
Email melb-inst@unimelb.edu.au
WWW Address <http://www.melbourneinstitute.com>

Abstract

This article explores the arguments for and against the use of government debt to finance large-scale public investments. Relative to the options of higher taxation or lower other expenditures, debt finance means that both the costs and the benefits of the investment fall on future generations. Debt funded public investments can be an important component of a fiscal stimulus policy package, especially when the effectiveness of monetary policy is limited. While the vision arguments presume socially beneficial investment projects are chosen, political choices often involve projects with low benefit cost ratios. More debt involves higher and higher costs, not only interest costs, but also laxer fiscal choices, a weaker basis for macroeconomic policy to counter future economic shocks, and in extreme cases a loss of policy autonomy. An independent and transparent body to undertake benefit cost assessments of investment projects, and with public release and scrutiny, would support a higher level of debt finance.

JEL classification: E62, H54, O43

Keywords: Government investment, fiscal policy, debt finance

1. Introduction

Australian governments, and particularly at the state level, appear to have a backlog of investment projects. Examples include transport infrastructure, expansion of the quantity and quality of services provided by utilities, education, R&D, and protection of the environment. To a large extent, these investments involve costs today to achieve a more productive economy and benefits tomorrow. Many of the benefits will flow to future generations and a much larger population, both the children of today's generation and also migrant families¹. The investments might be funded by additional own government debt, reducing recurrent expenditures, increasing current taxation, or a combination². State governments are reluctant to fund some of their backlog of investment projects with debt finance. This article explores the pro or vision arguments and the con or prudence arguments for the use of debt to finance valued public investments.

2. Vision: Borrow to Finance Public Investment³

One set of vision arguments for debt financing of government investments involve consideration of the inter-temporal pattern of costs and benefits. The options of higher taxes or lower recurrent expenditure to fund investment fall on the current generation to fund investments. By contrast, using debt to fund the investments moves payment of the cost of the investment from the current generation to future generations. These same future generations reap most of the investment benefits of a more productive economy and higher income levels. An aversion to debt financing of socially productive investments by government means either higher taxes on the current generation to fund the investment, or deferral of investment and lower incomes for future generations.

An important assumption is that the future benefits will be enough to cover debt service costs and eventually to repay the debt. Meeting this assumption requires governments to carefully and publicly follow processes to choose investment projects which would not otherwise be enacted by the private sector and which would pass a social benefit cost assessment.

3. Who Gains and Who Loses

The benefits of an investment may not accrue wholly to the level of government which funds the investment. Some of the benefits of an investment by a particular state government may accrue

¹ ABS (2008), for example, in its average or scenario B population projections project population to increase from 21 million in 2007 to 35.5 million by 2050, with about a half of the increase by immigration and an increase in the share living in the large cities.

² Another potential funding option goes under the banner of public private partnerships (PPP). The PPP option raises a large and interesting set of new issues which are not considered in this paper in the interest of brevity.

³ Musgrave (1959) provides one of the early statements of the vision argument based on intergeneration costs and benefits.

partly to the federal government, or also to other state governments. Or, some of the benefits may accrue to businesses and households in the private sector. Such dispersal of the benefits across different groups will affect incentives of a state government to invest and to borrow.

Suppose government has a number of socially productive investment options. For simplicity and with no loss of general results, the investment costs are assumed to be incurred in period one, namely C_1 , and the benefits of the investment are not realised until period two, namely B_2 . A socially productive investment means

$$B_2 / (1 + d) - C_1 > 0 \quad (1)$$

where, d is the discount rate, or opportunity costs of funds redirected from the private sector to the public sector.

Benefits of the investment can be disaggregated into those accruing to the investing level of government, B^i , other levels of government, B^o , and the private sector, B^p , so that

$$B_2 = B^i + B^o + B^p \quad (2)$$

To illustrate (1) and (2) and the diverse pattern of distribution of benefits, consider two examples. One project category involves investment to increase the capacity of transport infrastructure funded by a state government. The state government incurs all of the cost C_1 , and it receives some of the benefits B^i in the form of, say, additional toll road and motor vehicle fees, and in extra payroll and land tax revenue from a larger and more productive state economy facilitated by the additional transport capacity. The commonwealth government gain B^o includes extra fuel excise revenue and higher income tax revenue from a larger and more productive economy. Private sector gains of B^p would include higher disposable incomes for businesses and employees flowing from a more productive economy net of the additional state and commonwealth government charges and taxes.

A second example is state government investment in primary education leading to increased human capital, and then higher personal incomes and any external benefits. Individuals and the economy with a larger stock of human capital gain from higher incomes. The expanded economy means larger tax bases and revenues for the different levels of government. Individuals gain with higher after tax incomes. Compared with investment in physical infrastructure, investment in education likely will involve longer time lags, a smaller share of returns to the investing state government, a larger share of the benefits to the commonwealth government, and an even larger private share.

Consider next the incentives for a particular level of government, and in particular a state government, to invest in investment projects with different mixes of the distribution of benefits in

(2). Three scenarios distinguished by the mix of benefits relative to the investment cost are evaluated. For the first scenario, assume the investment funding government receives all the benefits, i.e. $B_2 = B^i$, or more generally $B^i > C_1(1 + d)$. Not only is the investment socially worthwhile, but also the funding government has the incentive to invest, and over time debt financing will be a financially viable strategy. In effect, the future generations who benefit from the investment also pay for it. Both efficiency and equity across generations favour debt finance rather than higher taxation on the current generation. This polar case with the investing government gaining a sufficient share of the extra future benefits to cover the costs of investment and of debt finance may apply to some state government investments in transport, communications and other utility physical infrastructure.

For the second scenario, suppose that (1) holds and the investment is socially beneficial, but that the investing government receives only a share of the total benefits and that $B^i < C_1(1 + d)$. Even in the long run, the investment project is not self-financing for the state government, although socially desirable. If a combination of additional state government and commonwealth government benefits exceed the costs, i.e. $B^i + B^o > C_1(1 + d)$, a desirable strategy would involve a funding contribution from the commonwealth, and in an ideal world in proportion to its share of the benefits. From an “all of government” perspective, the investment project over time is financially self-funded, and debt financing would accord with efficiency, equity and financial viability criteria. Given the importance of commonwealth taxation in total taxation, over 80 per cent, and often that there are spill-over benefits of investments in physical infrastructure from one state to others, a policy strategy involving joint commonwealth and state funding will be required.

A third scenario is one where a significant share of the benefits of a socially desirable investment accrue to the future generation private sector, B^p , and the investment is not self-funding for “all of government”, i.e. $B^i + B^o < C_1(1 + d)$ and (1) holds. Many government investments in education, R&D, and others, are likely to fall into this scenario. Further along this spectrum might be investments in national parks to preserve flora and fauna, and protection of heritage sights, which provide non-market benefits to future generations to justify the investment as an increase in net national welfare, but not a net increase in measured national income. Even for this third scenario, the use of debt finance supported by application of the beneficiary of the investment pays principle has desirable efficiency and equity properties. The investment by the current generation which raises productivity and incomes for the future generation would be debt financed initially. A part of the debt would be repaid by higher government receipts collected from the larger general tax bases on

income, consumption and assets. In addition, a portion of the repayment of the debt requires higher rates of tax in the future on the enlarged tax bases of the better-off future generations.

For each of the above three scenarios, the alternative investment funding strategies of raising taxation on the current generation, reducing recurrent expenditures, or of delaying the investment to ensure a balanced budget, rather than funding the socially beneficial investment with additional debt, have second best properties in terms of efficiency, long term financial viability, and equity criteria. Delay of the investment leads to lower future incomes for future generations by the surplus $B_2 - C_1(1 + d) > 0$ and no welfare change for the current generation. Additional taxation on the current generation to fund the socially efficient investment generates a large gain for the future generation of B_2 and a loss for the current generation of C_1 . Further, taxation involves not only a transfer of income from the private sector to government, but also efficiency costs caused by tax distortions to private sector decisions. The Henry Review (Henry, et al., 2010, page 13) estimate marginal efficiency costs for state taxes of 50 cents per dollar revenue or more. Future generations are expected to have higher real incomes than the current generation as a result of private sector investment and technological change (Swan, 2010), and as income increases the marginal utility of income falls. Given these circumstances, debt funding investments to increase the incomes of future generations rather than extra taxation funding on the current generation involves an efficiency gain, the debt can be repaid and so the investment project is financially viable, and on most criteria of inter-generation equity there is a gain.

4. Vision: The Keynesian Case

Another set of arguments for debt funding government investment projects is as a component of macroeconomic policy to stimulate the economy during the recession phases of the economic cycle. In a form of automatic stabiliser, a substantial component of the investment would be funded by debt during a recession period to increase aggregate demand, with a smaller debt component during other phases of the economic cycle. During very buoyant stages of the economic cycle debt should be reduced, and perhaps even some form of investment fund, or sovereign wealth fund, be accumulated. A more activist Keynesian fiscal strategy would involve also the timing of the actual investment activity. With a rolling pipeline of society beneficial investment projects, the investment level would be increased during a recession and slowed during a boom.

Policy options facing Australia in adjusting to the mining investment boom of the early twenty first century can be used as an illustration. It can be reasonably expected that the private sector investment boom in the resources sector which started around 2007 will peak around 2013 and tail

off substantially from up to 8 per cent of GDP to around 2 per cent or less (BREE, 2013, Sheehan and Gregory, 2013). Clearly there will be some offsetting factors to the decline of mining investment, including the boost to mining production and exports, and with a fall in the exchange rate a gradual reversal of the adverse Dutch disease effects on other export and import-competing industries. A net deflationary effect is a serious possibility, and it is a possibility governments should prepare for.

The normal, indeed orthodox, policy reaction to the prospect of a recession would be for the Reserve Bank to reduce interest rates. This would stimulate business investment generally, and possibly the non-traded sector more broadly. In addition, it would add to the exchange rate depreciation and its associated stimulus to the traded sector, including mining. Since the 1980s and ending with the 2008 world financial crisis, monetary policy has been the principal or only instrument of macroeconomic management. Discretionary fiscal policy became unfashionable, but automatic stabilisers continued to be important.⁴

But, from 2008 in many countries (though not Australia) monetary policy reached its limits. Impotency of a monetary stimulus arose as a consequence of reaching the zero bound on nominal interest rates, well-known difficulties of the financial sector, and the deleveraging processes by the private non-financial sector in reaction to the preceding boom of asset price inflation and growth of private debt. For a limited time at least, fiscal policy as an instrument of macroeconomic management came back into fashion. Could monetary policy fail to stimulate the Australian economy when the mining investment boom fades? Let us consider two scenarios.

In the first (and most likely) scenario, interest rate reductions brought about by the Reserve Bank would be sufficient to maintain overall employment when the mining investment boom fades. The lower interest rates and associated lower exchange rate stimulate investment in the rest of the economy, and perhaps also some consumption. There would be no need for a fiscal stimulus, including one involving debt funded government investment, to maintain overall employment. In this scenario of effective monetary policy and close to full employment, an increase in debt funded government investment would squeeze the private sector boom induced by lower interest rates. The foregone private spending would represent the opportunity cost of the additional government investment.

In the second scenario, a flexible monetary policy would not be sufficient to maintain overall full employment when the mining investment boom ends. We call this scenario the “Keynesian case”. It has similarities with the situation in 2008 and later (and perhaps through to 2013 and beyond) in the

⁴ Elmendorf and Mankiw (1999), and references therein provide an excellent supporting discussion.

US, Japan and the UK. With sticky factor prices, especially of wages, and unemployment, the opportunity cost of additional government investment would be much lower than actual market factor prices, and thus increasing the benefit cost ratio.

If this second scenario was thought likely, there would be a strong case for advance planning to provide a pipeline of socially beneficial government investment projects. Governments should invest in such advance planning even if one expected a mixture of the two scenarios. Advance analysis and planning of potential government investment projects as a component of a Keynesian fiscal stimulus in the event of a recession would improve both the timing of the stimulus and its longer term contribution to national productivity and income.

For a number of practical reasons, the justification for the timing of debt funded government investment projects as a Keynesian stimulus might be restricted to extended and relatively severe recessions. Because of lags in data collection and the inherent uncertainties with economic forecasting there is imperfect information about the time of start, the duration, and the magnitude of each recession. There is uncertainty about whether monetary policy will be able to restore full employment, or in our preceding analysis which scenario will unfold. Even with a pipeline of approved quality projects, government investments take time to initiate and often they are costly to slow down as the economy recovers.

Perhaps of greater attraction is deliberate variation of the method of finance for government investment projects over the economic cycle. In a type of capital investment stabilisation fund, during recession phases much of the finance would be debt finance, and during the boom phase a much higher proportion of the finance would be taxation revenue. Possible prototypes include the Building Australia Fund, Education Investment Fund, and the Health and Hospitals Fund established by the commonwealth government in 2006. Some of the government revenue windfall from the demand driven mining boom was placed in these funds for future investments. These funds were largely drawn down in the government's fiscal policy stimulus package responding to the global financial crisis of 2009.

5. Prudence: Efficiency and Independent Analysis to Choose Investments

Critical to good government budget policy at all levels should be the processes or institutional arrangements to choose government expenditure programs and their levels. Investment expenditure choices are an important part of government expenditures.

In order to achieve national efficiency in the use of the nation's limited resources and to gain the confidence of the financial market to support deficit funding of investment projects, a sequence of

at least two sets of questions should be asked. First, are there good reasons for government investment rather than leaving the decisions to the private sector and competitive market forces? Second, have chosen investment projects passed explicit, transparent and robust benefit cost assessments, and then if funds and resources are limited, have the higher yielding projects been selected? Presumably, government of the day has the freedom to use other criteria, and to argue its case, but also against the background of a public benefit cost assessment.

It needs to be recognised that application of the two questions is made in a world of imperfect information and that there will be room for ambiguity and debate on details. Imperfect information about the future inevitably means some choices will not turn out as well as planned, and some better. Assessments of market failure, and especially relative to government failure, and specific details of benefit cost assessments, are both contentious and subjects for legitimate debate. Even if different analysts and assumptions reach different conclusions regarding the sign of the benefit cost assessment of (1), the alternative realistic choice process based on short term political judgements is much less likely to generate national wealth. Systematic and open processes to provide assessments of the two questions should facilitate government choices of socially beneficial investment projects.

The rationale for government investment projects, rather than leaving the decisions to the private sector and the productivity enhancing forces of competition, is a market failure, and further a more serious market failure relative to failure of the political way of making public policy decisions.⁵ For much physical infrastructure, including transport and some parts of water, energy and communications utilities, natural monopoly and system-wide coordination external benefit arguments are invoked. In the case of education and early childhood health, rationales for government intervention, including investment, include a mixture of arguments about external benefits, asymmetrical information and concerns about the early age and lack of decision control by children, and equity of opportunity. Public good market failures lie behind government investment in: R&D; the collection and analysis of information such as meteorological data and forecasts, and general statistics: and, investments to warn about, to reduce the effects of, and to provide emergency services in the event of, natural disasters. Government investments to protect the natural environment and heritage sites reflect public good properties of these investments and the services they provide. Clearly, the dividing line between the adverse efficiency effects of market failure and the gains of government intervention in a world of government failure is a thick grey line where different analysts, political parties, and individuals can hold respectable alternative views.

⁵ Market failure arguments for government intervention in a mixed economy are set out in public economics texts such as Stiglitz (2000), Rosen and Gayer (2010), Gruber (2011) and Abelson (2012).

The next step entails a formal, transparent and public benefit cost assessment of each investment project to establish (1).⁶ In many cases assessment across a range of scale, location and time line investment options may be valuable, as well as sensitivity assessments for key uncertain parameters and variables.

Arguments often used by politicians to avoid the public release and scrutiny of the benefit cost assessments for reasons of “business in confidence” lack credibility.⁷ It is common in announcing investment projects for governments to release broad numbers of costs derived from engineering businesses, often as a part of the budget processes. Further, it seems unlikely that a condition of tendering for the construction of government investment projects that requires that broad details of the investment project and its costs be made available to the public would deter private firms from tendering for the construction of government funded investment projects. In most cases, the information about government investment projects which is not made public involves estimates of the benefits of the investment. Here, it is common that the benefit estimates, and their combination with costs in a benefit cost assessment, if undertaken, are prepared by government departments and agencies. There seems no good reason for this secrecy. To the contrary, confidence in good government decisions almost certainly goes along with transparency.

It is important to avoid purely political or populist decisions in choosing government investment projects. Sometimes the political focus seems to be just on the benefits with little consideration of the costs. Great development projects such as the Snowy Mountains Scheme, the Alice Springs-Darwin rail line and the national broadband network have been promoted as desirable nation building blocks or visions, but with no formal benefit cost assessment. Some projects muted for the future, such as very fast trains, and investments in more dams and transport infrastructure for a northern food bowl, should confront formal, explicit and public benefit cost assessments. The resolution of a current dispute between opposing political parties regarding the relative ranking of investment in an east-west road tunnel verses a south-north rail tunnel in Melbourne provides another example.

In their self-interest of re-election, political parties and governments often choose investment projects with reference to pork-barrelling marginal electorates, and they respond to the pressures of special interest lobby groups. These short-term vote attraction criteria can dominate the choice of projects at the expense of the national benefit in allocating scarce resource among competing uses.

⁶ Well established procedures for benefit cost assessments, together with areas of contention, are provided in numerous texts such as Layard and Gaiter (1994), Mishan and Quah (2007) and Boardman et al. (2011).

⁷ Recent examples for the Victorian government, and involving both parties are the Wonthaggi desalination plant and the proposed East-West road tunnel.

As well as adding to the budget deficit in the short run, there are important adverse long term consequences of the choice of government investment projects with a negative benefit cost outcome of a smaller future income stream than otherwise and a larger long term or structural debt.

An important parameter affecting the results of any benefit cost study is the choice of discount rate, namely term d of the benefit cost formula of (1). The appropriate discount rate for decisions spanning different generations is a complex and ambiguous issue.⁸ Models taking the position of philosophical and ethical equity of treatment across different generations arrive at much lower real discount rates, often around the 1-2 per cent per annum. By contrast, models premised on observed market rates reflecting current generation decisions which equate inter-temporal time preferences for consumption and the returns from investment reach higher rates, and sometimes above 5 per cent per annum.

In the context of making decisions about government investments, both in terms of efficiency and financial viability of investment projects, a discount rate reflecting the real cost to the borrowing government over the life of the investment seems appropriate. Applying this rate across all investment options would support an efficient mix of the different available options. Since there is likely to be competition for limited savings funds for private investment and for government investment projects, the market rate reflects the society opportunity cost of funds, and more generally of resources, reallocated from the private sector to the public sector. Given that Australia is a net international capital importer and approximately a price taker in a much larger global capital market, the world market real interest rate is an appropriate choice of discount rate. Then, estimates of future world interest rates require assessments of the global supply of savings and the global demand for investment.

For long life investments, combined with the reality that most government borrowings are for shorter time periods, governments will refinance at least some of the debt several times over the investment project life. Hence, a longer term average borrowing cost rate is appropriate, rather than a short term relatively high or low rate. With short term bonds and the need for refinancing over the life of most investment projects, there will be some uncertainty about the world interest rate, and appropriate discount rate. Alternatively, long life infrastructure bonds of, say, 20-50 years might be offered.

⁸ See, for example, the public finance and benefit-cost texts noted in footnote 4. The ongoing analysis of policy mitigation to reduce climate change has re-invigorated old debates, for example, Weitzman (2008) and Garnaut (2008).

Another consideration is the sensitivity of the cost of government debt finance to the size of the stock of debt. If Australia was considered to be a small country net capital importer, and in the extreme case facing a perfectly elastic supply of capital at a world required rate of return price, and it was assumed that both the Australian government borrower and the marginal non-resident lender were risk neutral, the government borrowing rate would be insensitive to the stock of debt and equal to the world required rate of return. Relaxing any one of these special case assumptions would mean a rising supply function for debt finance for government investment.

Specific and independent institutions to undertake the assessment of the two questions of market failure and a benefit cost assessment would seem necessary to ensure that government investment projects are likely to be valuable public uses of limited resources and to support debt financing. The assessments should be made public. The commonwealth government's Infrastructure Australia, asserts in its documents the importance to undertake comprehensive cost benefit assessments (Infrastructure Australia, 2009, page 5, and 2013, page 97). However, to date it has not released to the public any benefit cost assessments, and nor does it confirm that benefit cost assessments have been undertaken. Some state governments claim to have had their departments undertake benefit cost assessments of some investment projects, but finding detailed published versions of these studies is a challenge.

A genuinely independent institution along the lines of the Productivity Commission offers a useful model. The institution would be charged with answering the question of market failure and to provide a benefit cost assessment for major investment projects. It would be open about its processes and the collection of relevant information, with a public inquiry process, and then make public its report. Of course, governments would retain the right to accept the findings, or to argue their reasons for different decisions.

6. Prudence and the Costs of Debt

In general, the real world for debt financing of government investments is more complex and diverse than the one implicitly assumed in the vision arguments. World financial markets are sensitive to levels of debt and can impose very high costs on governments with a large debt stock in the event of economic shocks. Providing a rationale for debt financing of government investment expenditure can provide easier opportunities for a laxer fiscal policy strategy and opportunities for politicians to spend more, and on less socially valued programs. These factors work to reduce the attraction of debt financing of investment projects.

As discussed in Section 3, some government investment projects which pass a society-wide benefit cost assessment result in a net cost for the investing level of government, with other levels of government and the private sector being net winners. Where other levels of government share some of the benefits, both efficiency and equity require an appropriate investment funding contribution by the different levels of government. In practice, decisions about both the time and level of contribution from other levels of government will be subject to political debate and haggling, and they add another element of uncertainty for the budget of the investing government. Where an important share of the society benefits of government investment accrue as higher disposable incomes for future generations of businesses and households, government debt funding of the investment project will require higher income, consumption or asset tax rates on the future beneficiaries if net contributions to long term budget deficits are to be avoided. Since it is not possible for current governments to bind future government taxation and spending decisions, debt funding of these types of government investment projects increase the probability of structural deficits into the future.

Given the predilection of politicians to promise more and more government goods and services, a change in strategy to use more debt rather than current taxation revenue to fund investments will, as a second round effect, support a more relaxed strategy to containing recurrent expenditure programs. An unintended outcome of debt funding can be: a larger government; less attention to cost control; and, a combination of greater incentives and reduced restrictions to spend more on lower society welfare enhancing government provided goods and services (see, Elmendorf and Mankiw, 1999, and references therein).

All government investment projects, as is the case with private investment projects, are made under imperfect information. Among other things, some projects will generate lower returns and revenues than anticipated, and extra revenue from government charges and taxes will be less than required to refund debt; but other projects likely will be more successful than planned. Many government investments are large scale and cost billions of dollars. As a consequence, only a small number of large projects can be funded at any one time, and the ability of a government to hold a diversified portfolio and operate as a risk neutral investor is constrained. The risk of financial failure of a specific major project has serious consequences for funding future budgets and the government's reputation.

A larger budget deficit, even when it funds socially productive investments (as specified in Section 5), in reality is likely to have important second round or indirect costs. The favourable special case of the government facing a perfectly elastic supply of capital as a component of a small open economy

story depends on unlikely assumptions. Additional government debt, regardless of its origin, in practice comes at a higher interest cost. The reasons include a combination of a rising supply price for capital to the country (and competition from private and other government investors), borrowers require a risk aversion premium which increases with the stock of debt, and ratings agencies who place weight on debt to income and similar ratios. The higher interest rates also have a pecuniary diseconomy effect by raising the cost to government for all its borrowings, including the refinancing of previous debt funded investments, and so adding to future budget expenditure.

It is inevitable in modern mixed economies which are closely integrated into the global economy that governments at national and sub-national levels will face domestic and international economic shocks which adversely affect their revenues and expenditures. Business cycles, natural disasters, irrational exuberance and policy failures experienced over history almost certainly will occur again in the future, but with their own idiosyncratic features. Both the timing and the magnitudes of future economic shocks are subject to large forecast or prediction intervals. Relatively low debt levels generally are considered to favour the ability of governments to manage their own budgets and to provide effective macroeconomic policies to assist their economies recover from the adverse economic shocks.

Further, it seems that the relevant measure of debt is not just government debt, but also private debt. While it might be argued that debt accumulated by households and businesses involves voluntary and mutually beneficial trades between savers and investors (Pitchford, 1990), governments in the end for political if not also legal reasons can find themselves with “lender of last resort” responsibilities.⁹

The experiences of Australia in the 1930s and of Europe in the late 2000s illustrate the high costs faced by governments entering a crisis economy with a high level of debt.¹⁰ As the level of debt increases relative to income, lenders become reluctant to refund debt as it matures, and they may impose very stringent budgetary conditions. At an extreme level of borrower concerns, autonomy of government is at risk. Of course, there is on-going debate and analysis about the threshold levels of debt where very large costs are imposed by lenders, and how these thresholds respond to other economic and political variables. However, there seems little doubt that economic, political and social costs over and above the interest cost of servicing debt rise with the levels of government and national debt.

⁹ For example, one of the policy responses of the federal government to the global finance crisis was to provide government guarantees, at a price, to deposits with the banks and other financial institutions.

¹⁰ For Australian economic history, see, for example, McLean (2012).

7. Balancing Vision and Prudence

Choosing an appropriate level of debt financed investment projects for the net benefit of future generations involves a trade-off between the marginal benefits of extra investments funded by debt against the marginal costs associated with the extra costs and risks of higher debt.¹¹

The marginal benefits, MB, derive from the benefit cost assessment of (1). Among other things, the MB declines as lower priority projects are funded. The MB function shifts with such variables as the discount rate or cost of borrowed funds, the current stock of public investment, the expected rate of economic growth with increases of population and income per capita, and the stage of the economic cycle.

The marginal cost of additional debt to fund government investment projects, MC, rises with the level of debt. A rising MC reflects rising interest and other costs of borrowings, bigger governments and a less rigorous fiscal policy, and greater risks to successful economic management in the event of future shocks to the economy. Better institutional and political arrangements to increase the weight attached to formal and public assessments of chosen projects relative to short term political criteria, and well-understood and meaningful cost sharing arrangements across different levels of government, would shift the MC function out. Other MC shifting factors include the maturity and depth of the capital market, including access to international funds, and the beginning stock of debt.

In equilibrium, the efficient level of debt funded government investment equates

$$MB = MC \quad (3)$$

Then, neither of the extreme vision model or the extreme prudence model is likely to be optimal. The extreme vision model implies $MC = 0$, and every investment project with a positive benefit less cost assessment should be debt funded. The extreme prudence model implies a MC above the best project's internal rate of return and zero debt funding of socially productive government investment projects.

Better institutional arrangements to evaluate the economic merits of government investment projects, and to rank different projects, would shift the MC function to the right and justify a larger optimal level of debt financing of desirable investment projects to benefit future generations. Any net addition of worthwhile projects means higher incomes for future generations, and a lower tax burden on the current generation to fund the projects raises current generation disposable income. Favourable institutional changes include greater reliance on formal, transparent and public

¹¹ A more detailed model is provided in the appendix.

assessments of socially beneficial investment projects, and stronger inter-government arrangements for sharing the benefits and costs of investment projects. A genuinely independent agency, along the lines of the Productivity Commission, would support better project choices and provide transparent information to support greater borrower confidence.

8. Conclusions

Debt funded government investments in, for example, infrastructure, education, R&D and other information, and expansion of environmental capital can increase social welfare if it is established that because of a market failure the project would not be undertaken by the private sector and the project passes a transparent and public benefit cost assessment. Australian governments have yet to establish appropriate independent institutions and decision processes to apply these tests. Socially beneficial government investments involve current period costs, with most of the benefits going to future generations.

A system by which future generations who receive the benefits of today's investment also pay for the costs with higher charges and taxes meets efficiency, equity and government financial budget viability criteria. Such a system includes the use of debt to fund the investment.

However, increases in government debt are not cost free. In political reality, many investment projects are chosen not according to the criterion of net society benefit, but rather for short term re-election reasons, and the greater use of debt finance can loosen vigilance on other budget decisions about recurrent expenditure programs and taxation. History, and in particular government experiences in the event of economic shocks, shows that larger stocks of government debt result not only in higher interest costs, but also a decline in ability to adjust policy to assist economic recovery from a recession, and in the extreme a loss of independence over fiscal policy.

Government policy therefore has to trade off the benefits and costs of debt financing of government investment projects. In principle, the balance of vision and prudence would choose a quantity of projects which are debt financed to equate the marginal benefit and marginal cost. In the shorter run context of economic cycles, incurring a higher debt share of finance during recession stages relative to boom stages represents a type of automatic stabiliser.

The aversion of Australian state governments to debt financing their investments would seem to reflect the dominance of the prudence arguments. These include the absence of explicit and transparent processes to select socially beneficial investment projects, concerns with greater laxity in both recurrent and investment expenditures against tight own taxation revenue and dependence on commonwealth transfers, and concerns with the risks and higher interest and other costs of more

debt. The reality that a significant share of the society benefits of many state investments go to the commonwealth and the private sector means these investments are not self-financing without commonwealth contributions and higher future taxes. Institutional reform - both procedures for assessing major public investment decisions proposed in the paper and more explicit and transparent commonwealth-state funding arrangements for funding state investments - would favour placing greater weight on the vision arguments for debt funding of society's potentially productive state government investments.

References

- Abelson, P. (2012), *Public Economics: Principles and Practice*, 3rd edition, Sydney, McGraw-Hill.
- Australian Bureau of Statistics (ABS) (2008), *Population Projections, Australia*, Catalogue No. 3222.0, Canberra.
- Boardman, A. et al. (2011), *Cost-Benefit Analysis: Concepts and Practice*, 4th edition, Saddle River, Pearson/Prentice Hall.
- Bureau of Resources and Energy Economics (BREE) (2013), *Resources and Energy Quarterly*, BREE, Canberra.
- Elmendorf, D and Mankiw, G. (1999), "Government Debt", in Taylor, J and Woodford M. (Eds.), *Handbook of Macroeconomics*, Vol. 1, Elsevier, 1615-1669.
- Garnaut, R. (2008), *The Garnaut Climate Change Review*, New York, Cambridge University Press.
- Gruber, J. (2011), *Public Finance and Public Policy*, New York, Worth Publishers.
- Henry, K., Harmer, J., Piggott, J., Ridout, H. and Smith, G (2010), *Australia's Future Tax System*, Report to the Treasurer, Commonwealth of Australia, Canberra.
- Infrastructure Australia (2009), *National Infrastructure Priorities: Infrastructure for an Economically, Socially, and Environmentally Sustainable Future*, Infrastructure Australia, Australian Government, Canberra.
- Infrastructure Australia (2013), *National Infrastructure Plan: June 2013*, Infrastructure Australia, Australian Government, Canberra.
- Layard, R. and Gaister, S (1994) (Eds), *Cost-Benefit Analysis*, New York, Cambridge University Press.

- McLean, I. (2012), *Why Australia Prospered*, Princeton University Press.
- Mishan, E. and Quah, E. (2007), *Cost-Benefit Analysis*, London, Rutledge.
- Musgrave, R. (1959), *The Theory of Public Finance*, McGraw-Hill, New York.
- Pitchford, J. (1990), *Australia's Foreign Debt: Myths and Realities*, Sydney, Allen and Unwin.
- Rosen, H. and Gayer, T. (2010), *Public Finance*, New York, McGraw-Hill.
- Sheehan P. and R. Gregory (2013), "The Resources Boom and Economic Policy in the Long Run", *Australian Economic Review*, 46(2), 121-139.
- Stiglitz, J. (2000), *Economics of the Public Sector*, New York, Norton.
- Swan, W. (2010), *Australia to 2050: Future Challenges*, Treasurer of the Commonwealth of Australia, Canberra.
- Weitzman, M (2008), "A Review of the Stern Review on the Economics of Climate Change", *Journal of Economic Literature*, 45(3), 703-724.

Appendix: Choosing a Level of Debt Funded Investments

A benefit function for debt funded government investment projects would be based on the benefit cost ranking of the different options. Figure A shows the marginal benefit function

$$MB = f(Q, X)$$

where, MB is marginal benefit, Q the quantity of additional debt, and X a set of shift factors.

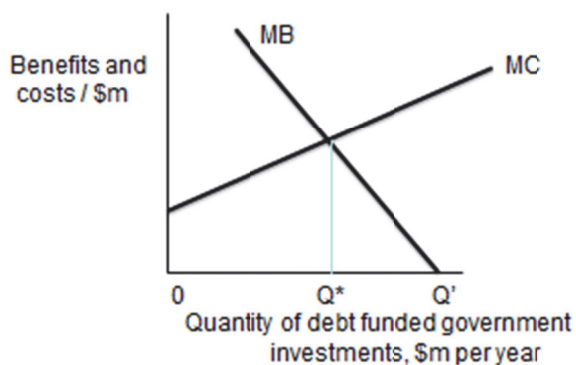
Different X variables may be important. In a longer term structural economy context, the MB function would shift out the lower the cost of funds or discount rate, the smaller the historical level of investment and maintenance, and the greater the expected rates of growth of population and income per capita. In a shorter run and macroeconomic policy management context, the MB function would shift out the deeper and more prolonged the economic recession, and the less effective is monetary policy.

A debt cost function reflects the real and perceived cost of using debt finance for government investments based on the prudence arguments. Figure A shows the marginal cost function

$$MC = f(Q, Z)$$

where, MC is marginal cost, Q is the quantity of additional debt, and Z a set of shift variables which affect both the elasticity and the position of the function. The more open the economy to foreign capital, the deeper the government bond market, and the greater the confidence in government and its fiscal policy the more elastic the MC function. The Z variables include the maturity and depth of the capital market, including access to international funds, and the beginning stock of debt. Independent institutions to rigorously assess projects rather than short term political criteria for selecting projects, and established and robust institutional arrangements for sharing the costs and benefits of investments across the different levels of government, would shift the MC function outwards.

Figure A: Benefits and Costs of Debt Financed Investments



An optimal quantity of new investment projects to be funded by additional government debt would equate the MB and MC functions at Q^* . Factors that shift outwards either the MC or MB curves would increase the quantity of debt funded projects.

Figure A also can be used to assess the policy decisions on debt funding for the extreme vision and prudence arguments. Under the extreme vision argument, so long as investment projects cover the

opportunity cost of borrowed funds, that is in formula (1) of the text $B_2 / (1 + d) - C_1 \geq 0$, and by implication there are no other costs associated with the prudence arguments and MC is horizontal at 0, then all projects to Q' would be debt funded.

Dominance of the prudence arguments to imply a zero debt funding of government investment projects means the MC curve cuts the vertical axis at a higher level than the MB curve. This implies a cost of more debt exceeding the internal rate of return, or discount rate, on the most productive available investment project.