The 2008-09 Fiscal Stimulus Packages:

A Cost Benefit Analysis

Submission to the Senate Inquiry into

the Government's Economic Stimulus Initiatives

by Henry Ergas and Alex Robson*

Executive Summary

Over the course of the 2008-09 financial year the Australian Government took a series of significant fiscal policy decisions, the bulk of which were designed to stimulate economic activity. In all, the government took fiscal policy decisions that will reduce the Budget bottom line (the difference between revenues and expenditures) by $97.1 billion over four years. However, not a single policy decisions was subjected to a cost-benefit test (or if such tests were conducted, they were never disclosed and hence allowed to be tested).

This paper presents a simple cost-benefit framework for evaluating these fiscal policy decisions, and applies this framework to the 2008-09 stimulus packages. In the framework, the four features of fiscal stimulus packages that determine the size of net benefits are the (in)efficiency of government spending, the size of the fiscal multiplier; the cost of employing otherwise unemployed resources, and the costs of taxation.

Using assumptions that are completely consistent with those of the government and Treasury, we find that the fiscal policy decisions will create large welfare losses. In particular, even assuming that the stimulus packages have employed (and will continue to employ) otherwise unemployed resources (with a fiscal multiplier of one), and even assuming that government spending is productive with a rate of return of 10 per cent, we find that the stimulus package, if allowed to continue, will result in welfare losses of between $10 billion and $48 billion, depending on the deadweight cost of taxation.

* Visiting Fellow, Crawford School of Economics and Government, Australian National University, Canberra, ACT, 2600.

"Only public infrastructure projects which at least meet a minimum benchmark social rate of return — determined through rigorous cost-benefit analysis, including ex post evaluation and review — should be funded, and relative social rates of return above the minimum benchmark should be used to prioritise the funding of projects."
- Budget Paper No. 1, 2008-09, page 4-6.

"Where governments invest in infrastructure assets, it is essential that they seek to achieve maximum economic and social benefits, determined through rigorous cost-benefit analysis including ex post evaluation and review."
Budget Paper No. 1, 2008-09, page 4-13.

"Efficient public infrastructure investment requires the development of coordinated, objective and transparent processes for decision-making based on thorough and rigorous cost-benefit analysis."
Budget Paper No. 1, 2008-09, page 4-15.

"Government spending that does not pass an appropriately defined cost-benefit test necessarily detracts from Australia's wellbeing."

Dr Ken Henry, Secretary to the Treasury, Address to the ARACY Conference, 3 September 2009.

"If you take a stick and poke it in an ants' nest, the ants will suddenly become fully employed. But they won't be any better off."

- Anonymous

1. Introduction

Over the course of the 2008-09 financial year the Australian Government took a series of significant fiscal policy decisions, the bulk of which were designed to stimulate economic activity. Not a single dollar of these stimulus packages was subjected to a (publicly disclosed) cost-benefit test. Instead, the government seems to have designed a package with multiple objectives in mind, without actually rigorously assessing or justifying whether its decisions actually met (or could be expected to meet) any of those objectives.

This has led to policy confusion and a confused debate about policy objectives and outcomes. The debate has also been accompanied by claims that Australians need not be concerned about budget deficits, as we have such a small public debt relative to previous levels and to other advanced economies. But the critical point in evaluating the stimulus and its associated budget deficits is the incremental cost of these deficits and debt increases, relative to the incremental benefits. That is, policymakers need to ask the question: what is the burden of the change in net debt relative to the gain from it? To do otherwise is like saying that if one has a low level of debt to begin with, nothing is lost by buying a house that is worth less than its purchase price.

This paper presents a simple cost-benefit framework for evaluating the government's fiscal policy decisions, and applies this framework to the 2008-09 stimulus packages. The framework, which uses standard microeconomic analysis but which was originally proposed by Kevin Murphy of the University of Chicago earlier this year in his analysis of the US fiscal stimulus packages, identifies four features of fiscal stimulus packages that determine the net benefits:

1. **The (in)efficiency of government spending** : The rush to get stimulus money out the door quickly will mean that a fraction of resources may be directed towards dubious projects, with low or possibly negative economic value;
2. **The multiplier**: If government spending simply redirects already employed resources, then there will be no effect on GDP or aggregate employment, and the multiplier will be zero. Thus, the Department of Finance's own *Handbook of Cost-Benefit Analysis* recommends that for most public sector projects, the multiplier should be set to zero.
3. **The cost of employing otherwise unemployed resources**: Resources that would otherwise be "idle" are **not** costless to employ. Their opportunity cost is their value in alternative uses.
4. **The costs of taxation:** Government spending must ultimately be funded by taxation. Higher taxes create disincentives and have a cost over and above the amount of tax revenue that is collected. This is the deadweight cost of taxation.

Using a range of assumptions for these key parameters, we find that very few, if any, of the measures that have been announced by the government will create net economic benefits.

The paper is structured as follows. Section 2 briefly outlines in aggregate terms what has been spent so far, and what is planned on being spent. Section 3 examines the welfare-analytic foundations of countercyclical macroeconomic policy. Sections 4 and 5 draw on an analysis by Professor Kevin Murphy of the University of Chicago and develops an analytical framework for assessing fiscal stimulus packages, and discusses some examples of how this framework could be applied to fiscal policy decisions. In section 6 we present and discuss our results, and section 7 concludes.

2. What Has Been Spent So Far, and How Much Has Yet to be Spent?

For a variety of reasons, this is not as easy question to answer as it should be. Money that is expected to be spent on programs may not actually end up getting spent; and cost overruns on some programs mean that sometimes more money is spent than was initially expected. The actual amount that has been spent will not be known until the release of the Final Budget Outcome later this year (and even after that in some cases, as adjustments and reconciliations are made).

As a rough guide, however, consider Table 1 below, which uses data from this year's Budget Paper No. 1, page 3-11. It shows the Commonwealth's projected fiscal position in last year's May 2008-09 Budget, relative to the new updated projected position that was presented in this year's Budget (12 May 2009).

Table 1: The Budgetary Effect of the Government's Policy Decisions in 2008-09.

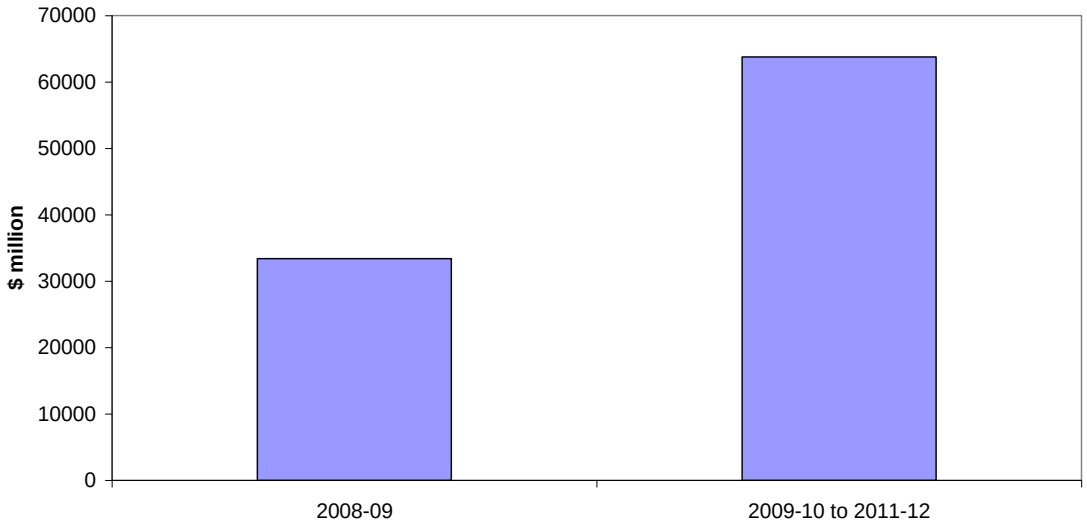
	2008-09	2009-10	2010-11	2011-12	Total
2008-09 Budget	21,703	19,669	18,996	18,870	79,238
MYEFO Policy Decisions	-11,093	-1,634	-966	-810	-14,503
MYEFO Parameter Variations	-5,244	-14,440	-15,390	-11,371	-46,445
MYEFO Bottom Line	5,365	3,595	2,640	6,689	18,289
UEFO Policy Decisions	-18,037	-18,365	-11,655	-5,435	-53,492
UEFO Parameter Variations	-9,816	-20,753	-25,314	-26,937	-82,820
UEFO Bottom Line	-22,487	-35,524	-34,330	-25,683	-118,024
2009 Budget Policy Decisions	-4,254	-11,961	-5,993	-6,952	-29,160
2009 Budget Parameter Variations	-5,373	-10,108	-16,727	-11,901	-44,109
Total Policy Decisions Since Last Budget	-33,384	-31,960	-18,614	-13,197	-97,155
Total Parameter Variations Since Last Budget	-20,433	-45,301	-57,431	-50,209	-173,374
2009-10 Budget Bottom Line	-32,114	-57,593	-57,051	-44,535	-191,293
Turnaround from 2008-09 Budget	53,817	77,262	76,047	63,405	270,531
% Turnaround Due to Policy Decisions	62.03%	41.37%	24.48%	20.81%	35.91%
% Turnaround Due to Parameter Variations	37.97%	58.63%	75.52%	79.19%	64.09%
% Deficit Due to Government Decisions	103.95%	55.49%	32.63%	29.63%	50.79%
Budget Balance Without Government Decisions	1,270	-25,633	-38,437	-31,338	-94,138

The table shows that in the twelve months to June 30 2009, the government took policy decisions worth $33.384 billion to reduce the size of the budget bottom line in 2008-09, relative to what was expected in May 2008. There are also parameter variations of $20.4 billion, which could be regarded as the (approximate) manifestation of "automatic stabilisers" or changes in the budget bottom line that are not due to explicit policy decisions.

Note that in 2008-09 most of the projected deterioration will be due to policy decisions, not parameter variations. Indeed, if the government had taken no policy decisions, the 2008-09 Budget would have been slightly in surplus. Putting it another way, the fact that there was a budget deficit in 2008-09 is entirely due to government policy. Most of the deficit in 2009-10 (55.5%) could also have been avoided, but for the government's policy decisions.

It is also important to note that the vast bulk of fiscal policy decisions that were taken in 2008-09 are yet to take effect. As the data (shown in the figure below) suggests, of the total of $97.1 billion in fiscal policy decisions, there is roughly a 1/3 – 2/3 split between the effect on budget bottom line in 2008-09 and the effect over the next three years.

When is the Money Scheduled to be Spent?
The Timing of the 2008-09 Fiscal Policy Decisions



Source: 2009-10 Budget Paper Number 1, page 3-11

3. Why Have A Stimulus? The Basic Welfare Economics of Countercyclical Macroeconomic Policy

Before evaluating the government's actual policy decisions, we first consider the more general issue of the benefits of countercyclical macroeconomic policy. Is macroeconomic stabilisation policy actually even desirable, assuming that policy works as intended i.e. perfectly smoothes out business cycle fluctuations?

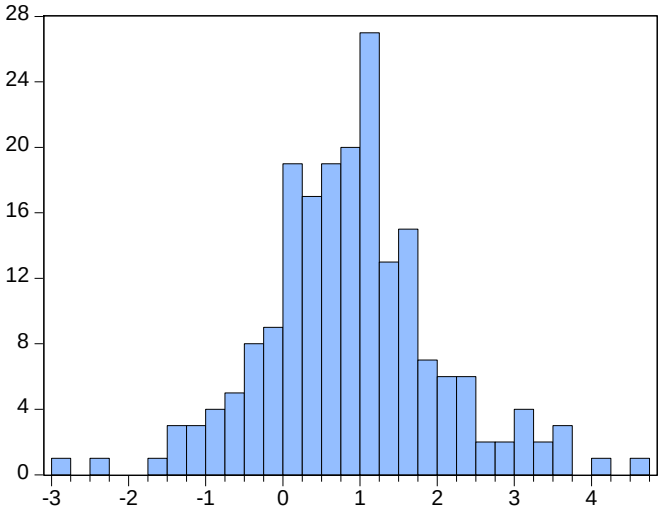
One way of analysing this issue is to consider the desirability of countercyclical policy from an *insurance* or *risk management* point of view, and ask the following question: how much would the average consumer be willing to pay to *completely eliminate* business cycle fluctuations?[1]

This is an important question because stabilisation policy is never costless. For example, even in the simplest instances, running a debt-financed deficit in any one period implies a greater burden of taxation in subsequent years. That taxation will distort decisions, and hence reduce future output. The valuation of this trade-off will depend most simply on the extent to which the community is willing to opt for a smoother, but somewhat lower, path of income relative to one that is higher but more variable. As a result, from an economic perspective, stabilisation policy can be seen as similar to an insurance or risk-management decision, where higher but more variable income (as shocks are absorbed rather than offset) is traded off against some degree of smoothing.

To examine the contours of this trade-off, we first need to examine the distribution of macroeconomic fluctuations in Australia. We have examined Australia's quarter-on-quarter GDP growth rates from Sep 1959 to June 2009. The average q/q growth rate

[1] The analysis in this section follows Gollier, C. (2001) *The Economics of Risk and Time*, MIT Press, page 32-34, who in turn follows Lucas (1987) *Models of Business Cycles*, Blackwell, pages 22-24.

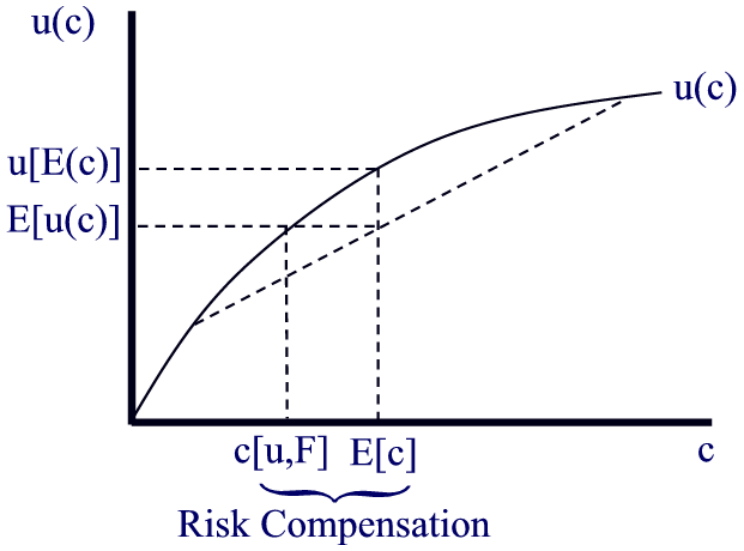
was 0.89 per cent, with a standard deviation of 1.14. The histogram of the data is shown below.



Series: YDIFF	
Sample 1959Q3 2009Q2	
Observations 199	
Mean	0.885170
Median	0.873002
Maximum	4.633585
Minimum	-2.949391
Std. Dev.	1.139084
Skewness	0.222287
Kurtosis	4.042792
Jarque-Bera	10.65530
Probability	0.004855

To analyse the welfare costs of macroeconomic fluctuations, we consider a risk averse, representative consumer and ask how much such a consumer would be willing to pay to avoid macroeconomic risk.

Conceptually, this is illustrated in the diagram below. The consumer has a utility function over income, and faces risky income (GDP) with a mean of E(c). This gives the consumer expected utility of E[u(c)]. The amount c[u,F] is the certainty equivalent of the macroeconomic risk – it is the amount of certain income that the consumer could receive and still remain just as well off as he or she would be facing risky income. The difference between E(c) and c[u,F] is the consumer's *risk compensation* or *risk premium*, and is a measure of the consumer's maximum willingness to pay to avoid risk. This willingness to pay is, in effect, a measure of the cost of macroeconomic volatility.



In what follows, we have constructed an empirical distribution using actual Australian data, and assume a constant relative risk aversion utility function, using various parameter values for the coefficient of relative risk aversion (denoted by gamma).

We then consider the following thought experiment: suppose that the representative consumer's initial income is $100 and that that consumer's income risk was the same as the *actual* macroeconomic risk we observe in the Australian data. That is, suppose that consumer's income has an expected growth rate of 0.89 per cent (i.e. 89 cents) and a standard deviation of 1.14, and has exactly the same distribution as found in the actual data. We then ask the following questions: what is the consumer's expected utility from this uncertain income, what is the certainty equivalent, and how much would the consumer be willing to pay to eliminate the risk (i.e. the risk premium)? The results are summarised in table 2 below.

Table 2: Willingness to Pay for Eliminating Macroeconomic Risk

	γ (Coefficient of Relative Risk Aversion□)					
	0	**0.5**	**1**	**4**	**10**	**40**
g_c	0.89	0.88	0.88	0.86	0.82	0.63
ρ	0.00	0.00	0.01	0.03	0.06	0.25

In Table 2, g_c is the certainty equivalent, and ρ is the risk premium (or risk compensation), which is a measure of willingness to pay to avoid risk. The parameter γ is the coefficient of relative risk aversion (for γ = 1 the utility function is the log utility function).

The results show that the cost of macroeconomic risk is not large: for γ = 10 (which is a very high degree of risk aversion), *a consumer with initial income of $100 would be willing to pay 6 cents* to completely avoid the risk. That is less than one tenth of one percentage point of quarterly growth.[2]

We do not claim that this is a completely watertight measure of the actual cost of macroeconomic risk. For a start, there are several assumptions (such as expected utility maximisation and constant relative risk aversion) behind our calculations which may not be reasonable. Additionally, we have examined the question as if the impacts were evenly spread through the community, so that our 'representative consumer' was indeed a good reflection of the wider effects.

On the other hand, we regard this approach as the most sensible starting point for thinking seriously about the possible benefits of countercyclical macroeconomic policy from an aggregate welfare-analytic point of view. There is, in particular, a choice to be made about how much stabilisation is worth pursuing and at what cost. Most plausible economic models suggest that while the community will value some

[2] This result accords with that found by Gollier (2001), who performs the same calculation using US annual growth rates.

income smoothing, that valuation will be quite low, especially in an economy where incomes are relatively high.

Of course, if the costs of stabilisation are not obvious, and if governments do nothing to make them known, then stabilisation may appear to be "free", and hence be demanded well beyond the point at which it in fact makes the community better off. This is all the more likely to be the case when the distribution of the gains from stabilisation is very unequal and opaque. In that case, the benefits may be far more obvious to the favoured constituencies (such as tradespeople in the current government's package) than the costs are to those more diffuse groups that will ultimately have to bear them.

There are, here, two important mechanisms at work. First, taxpayers may not fully anticipate the future tax burden associated with the stabilisation policy: if they did, discretionary fiscal policy would likely be completely ineffective, as its impacts would be offset by changes in individual's savings decisions (a situation known as Ricardian equivalence). There is, as a result, a degree of fiscal illusion, which means that the costs of stabilisation are under-estimated.

Second, the actual incidence of stabilisation interventions may be very different from their apparent incidence. For example, crash programs of spending on schools and on installing insulation in homes seem to benefit education and home-owners. However, much of the actual effect is to increase the earnings of tradespeople, both in absolute terms and relative to the rest of the community, as their supply is relatively limited.

Combined, these factors can readily lead to a political economy of stabilisation decisions that takes stabilisation interventions well beyond the point at which the community actually values the gains from income smoothing at more than their cost. The questions discussed above are therefore the questions that policymakers should have asked before tens of billions of dollars of taxpayer funds were committed on stimulus packages. As far as we are aware, this was not done for any of the fiscal policy decisions taken in 2008-09.

4. The Costs and Benefits of Fiscal Stimulus Packages: An Analytical Framework

Professor Kevin Murphy of the University of Chicago has recently developed a useful analytical framework to examine the costs and benefits of government spending in general, and of government stimulus packages in particular.[3] Murphy's framework uses standard principles from cost-benefit analysis. It is largely an accounting framework – a way of thinking through the component elements of an impact assessment – rather than a fully specified model of how outcomes are determined. This tends to make it more favourable to finding benefits from fiscal stimulus than such a fully specified model would be, as it does not explicitly take account of offsetting behavioural reactions (for example, taxpayers anticipating future liabilities from a stimulus package, and hence reducing their consumption). Rather, those behavioural reactions need to be captured in the estimates of the framework's key

[3] Murphy, K. "Evaluating the Fiscal Stimulus," University of Chicago, January 16, 2009.

parameters. This section applies Professor Murphy's framework to the Australian case.

The framework is static and identifies four features of government spending that will influence the net benefits of fiscal stimulus packages:

1. The (in)efficiency of government spending
2. The fiscal multiplier
3. The cost of employing otherwise unemployed resources
4. The costs of taxation

Murphy argues – and we agree – that most debates about the efficacy and desirability of fiscal stimulus packages turn on assumptions about these parameters. We consider each of these parameters in turn.[4]

4.1 The Economic Value of Each a Dollar Government Spending (*v*)

One justification for much of the government's planned spending has been that a dollar of government spending creates more than a dollar's worth of economic benefit, abstracting from both the costs of taxation and from the issue of whether the spending "soaks up" otherwise unemployed resources, relative to a baseline of no policy change. Put another way, the argument is that such spending will address some market failure and yield social returns in excess of private returns, relative to a baseline scenario of no policy change, even if there was no unemployment.

Thus, Murphy's analysis (and ours) begins with an assumption about the economic value of each dollar of government spending in a fully employed economy, measured by the parameter *v*. If a dollar of government spending has an economic value of more than a dollar (because the project might be particularly productive), then $v>1$. If a dollar of government spending has an economic value equal to a dollar, then $v=1$. Finally, if each dollar of government spending has an economic value of less than a dollar (because, for example, projects selected are of low value, or resources are used up in the process of managing bureaucrats, administering programs, and allocating pure transfers) then we would have $v<1$.

In short, the parameter *v* measures the efficiency of the government spending relative to a baseline of no policy change, assuming that resources are fully employed and also assuming that there are no distortionary costs of taxation. Usually this value would vary from project to project; hence the need for rigorous cost-benefit analysis of each government project or spending program.

Note also that the concept of the "multiplier" does not enter directly into discussions about *v* for each project. The multiplier is dealt with separately. As discussed below, this is a standard assumption in cost-benefit analysis. When resources are assumed to be fully employed, the fact that a project creates or reduces economic activity or employment is fully incorporated into *v*, and does not need to be reported separately. As we will see below, it is only when resources are assumed not to be fully employed that the multiplier matters, and even then it only matters if the opportunity cost of otherwise unemployed resources is less than the cost of employed resources.

[4] Our notation differs from that used by Murphy, but the framework is identical.

Unfortunately, there has been no public information released on the size of *v* for the stimulus packages as a whole, nor for individual items in each package. Much has been said about the *efficacy* of the programs, but efficacy is not the same as economic efficiency. A program may be may be very effective in attaining its objectives, but if the objective is poor and effective implementation would yield large social costs and small benefits, then the efficacy with which it is implemented is a minor consideration.

Indeed, the failure to distinguish efficacy from efficiency has plagued the discussion of the stimulus package. In particular, a package may seem effective – it may, for example, lead to people being employed in the programs it funds – without being efficient: i.e. without increasing the community's long run well-being. One of the benefits of the framework we use is that it does allow these concepts to be distinguished.

4.2 The Government Spending Multiplier (*m*)

Another justification used by the government for its stimulus spending has been that such spending will employ otherwise idle or unemployed resources. There has been a great deal of discussion regarding "fiscal multipliers", which are defined as the increase in aggregate economic activity (GDP) that occurs as a result of each additional dollar of government spending.

In a fully employed economy, the usual assumption in project evaluation is that increases in government spending will draw resources away from other activities, and the fiscal multiplier will be zero. As Treasury Secretary Ken Henry argued in 2007:

"But in a full employment economy it will almost always be the case that government activity that doesn't expand the economy's aggregate supply potential will indeed reallocate resources from higher to lower productive areas, and in so doing reduce aggregate output – by definition."

The government has assumed a range of fiscal multipliers in its public statements. For example, the measures announced in the Nation Building and Jobs Plan (NBJP) add up to $12.7 billion for 2008-09, around 1.1 per cent of GDP. The Prime Minister's press release accompanying this announcement stated that "the Plan will add around ½ of one per cent to GDP growth in 2008-09". We interpret this to be an assumed multiplier of around 0.43.

In 2009-10, the NBJP spends an additional $17.4 billion, around 1.55 per cent of GDP. The press statement accompanying the plan states that this will add "around ¾ to 1 per cent to GDP growth". If we assume the upper bound and call it 1 per cent of GDP, this gives a fiscal multiplier of 0.63. The 2009-10 Budget assumes multipliers between 0.5 and 1 (see page 4-6 of Budget Paper Number 1).

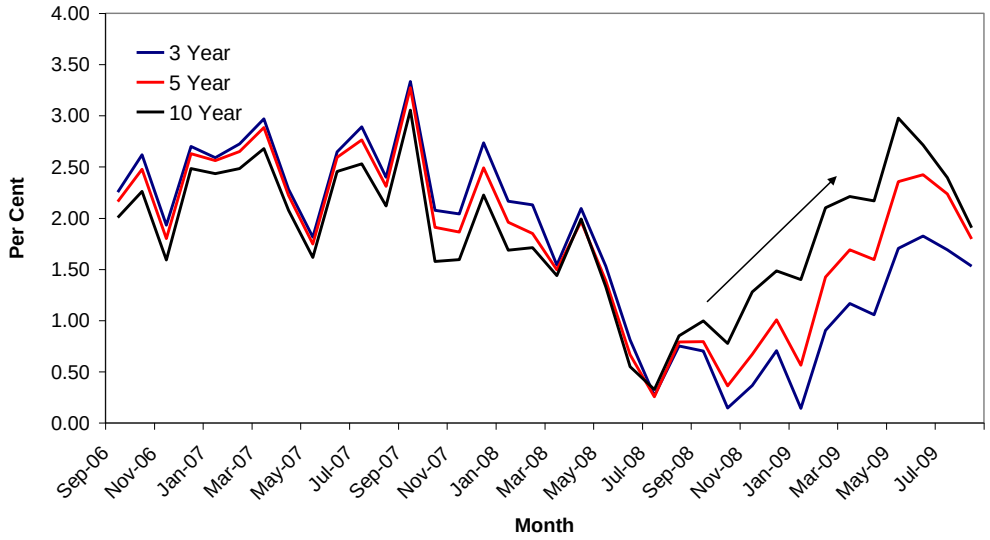
4.2.1 The Effectiveness of Fiscal Policy Versus Monetary Policy in a Small Open Economy

In a world in which some resources are unemployed, how large should we expect the aggregate fiscal multiplier to be? Taking the policy decisions of other countries as given, in a small open economy with perfect capital mobility and a flexible exchange rate such as Australia, ***the usual open economy Keynesian result is that the fiscal multiplier is zero, even if government spending "soaks up" otherwise unemployed resources.*** This happens because an increase in government spending increases

interest rates and attracts capital inflow, pushing up the exchange rate and completely crowding out any increase in domestic activity via a reduction in net exports.

It is interesting to note that qualitatively speaking, Australia's recent macroeconomic experience is not inconsistent with some of these predictions. First, at the longer end of the yield curve (where monetary policy has a relatively modest effect on real interest rates), real rates initially fell in line with short term rates, but since the end of last year they have risen again and have roughly reached the same levels as before the global financial crisis.

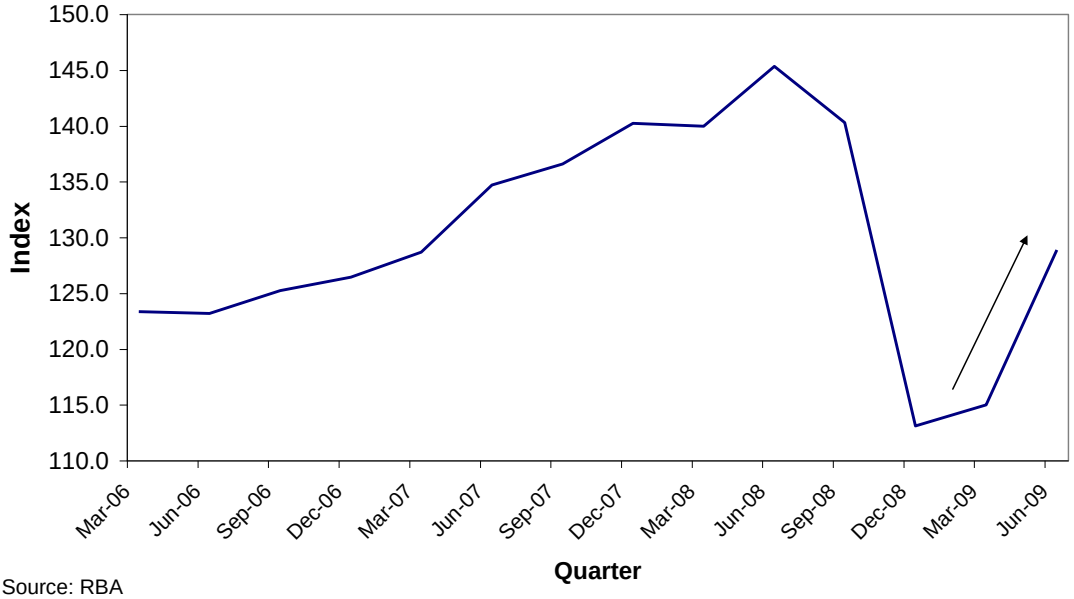
Real Long Term Interest Rates, 2006-2009



Source: RBA, Melbourne Institute Survey of Inflationary Expectations, own calculations

Second, the real exchange rate, after having depreciating by 22 per cent relative to its June 2008 peak at the end of last year, has subsequently appreciated by 14 per cent from its December 2008 low.

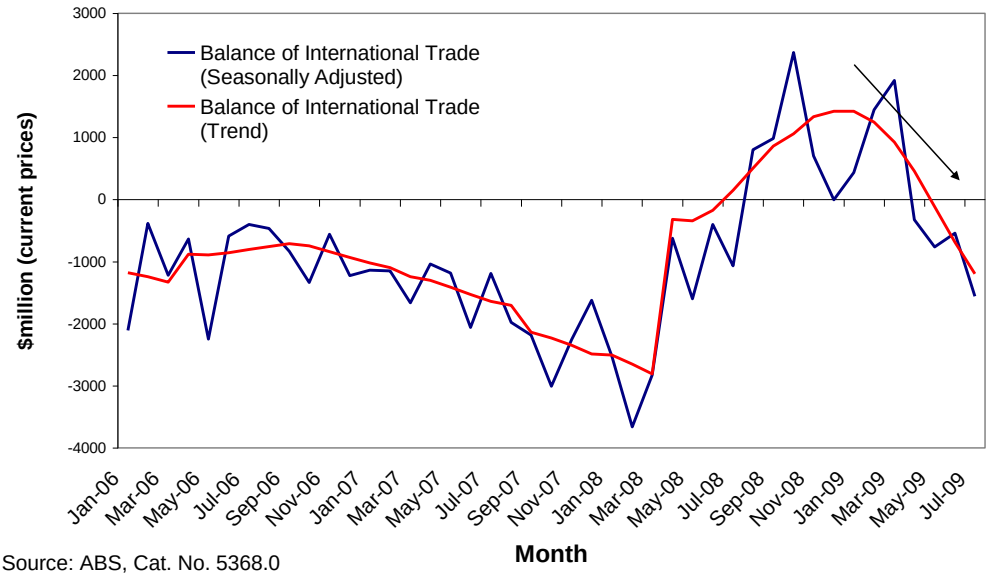
Real Trade Weighted Exchange Rate (March 1995=100)



Source: RBA

Finally, net exports of goods and services, having increased throughout 2008 to reach record surplus levels, have subsequently reverted back into deficit.

Balance of International Trade in Goods and Services



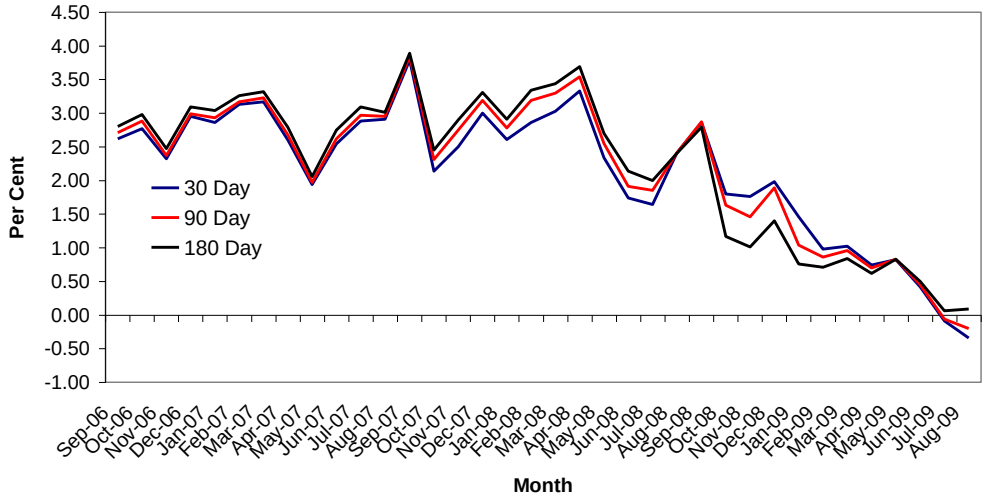
Source: ABS, Cat. No. 5368.0

In an open economy Keynesian model with a flexible exchange rate, monetary policy, in contrast to fiscal policy, is extremely effective in increasing output. A loosening of monetary policy results in lower interest rates, capital outflow, a lower exchange rate, and a *crowding in* of net exports.[5]

In the context of macroeconomic policy, this potential for crowding out and crowding in via the external sector has been pointed out by a number of commentators and is not controversial. That is why it is so important for any overall assessment of the effectiveness of the mix of macroeconomic policy settings in Australia to also investigate the effect that monetary policy has had (in particular, the effects of the large fall in short term real interest rates that has occurred over the last twelve months, as shown in the figure below). Additionally, the relative effectiveness of monetary and fiscal policy in an open-economy setting (with the first being far more effective than the second) needs to be taken into account in determining the desirable balance between these instruments in any macroeconomic strategy.

[5] Both results are standard. See, for example, Dernburg, T. (1989) *Global Macroeconomics*, New York: Harper Collins.

Real (Inflation Expectations Adjusted) Australian Short Term Interest Rates, 2006-2009



Source: RBA, Melbourne Institute Survey of Inflationary Expectations, own calculations

It is also important to note that these theoretical results are all relative to a baseline in which the rest of the world is not engaging in stimulus measures. If the rest of the world *is* also engaging in stimulus measures - as has occurred over the last 12 months - a *foreign* fiscal stimulus would have the *opposite* effect on the Australian economy of a domestic fiscal stimulus. That is, a fiscal policy expansion by (say) China or the United States would induce a depreciation of the Australian dollar and an expansion in Australian net exports.

Furthermore, a foreign monetary expansion would induce an appreciation of the Australian dollar and a reduction of Australian net exports. Thus, an internationally coordinated monetary easing (including easing by Australia) may have little or no effect in shifting output to Australia's export sector.

In summary, in the Keynesian open economy model, when the rest of the world is engaging in both monetary and fiscal stimulus measures, the optimal policy mix for a small open economy would seem to be to:

(i) Not undertake a domestic fiscal expansion, and instead "free ride" on the export-creating effects of fiscal policy actions of other countries; and

(ii) Match or better the monetary expansion of other countries.

Australia has largely implemented part (ii) of this mix, but not part (i).

4.2.2 The Multiplier and the Permanent Income Hypothesis

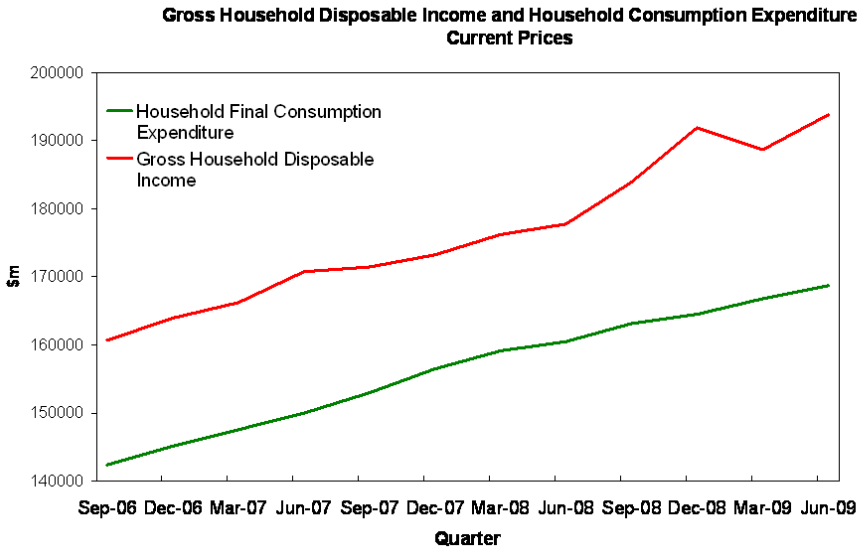
Many empirical claims have been made about the effects of the stimulus packages' temporary cash transfers on consumption and retail sales. There are several points to note here.

First, retail sales are ***not*** the same as consumption. Historically, retail trade estimates contribute around 55 to 60 per cent of household final consumption expenditure in the national accounts.[6]

[6] See the Explanatory Notes of ABS Cat. No. 8501.1 *Retail Trade*, July 2009.

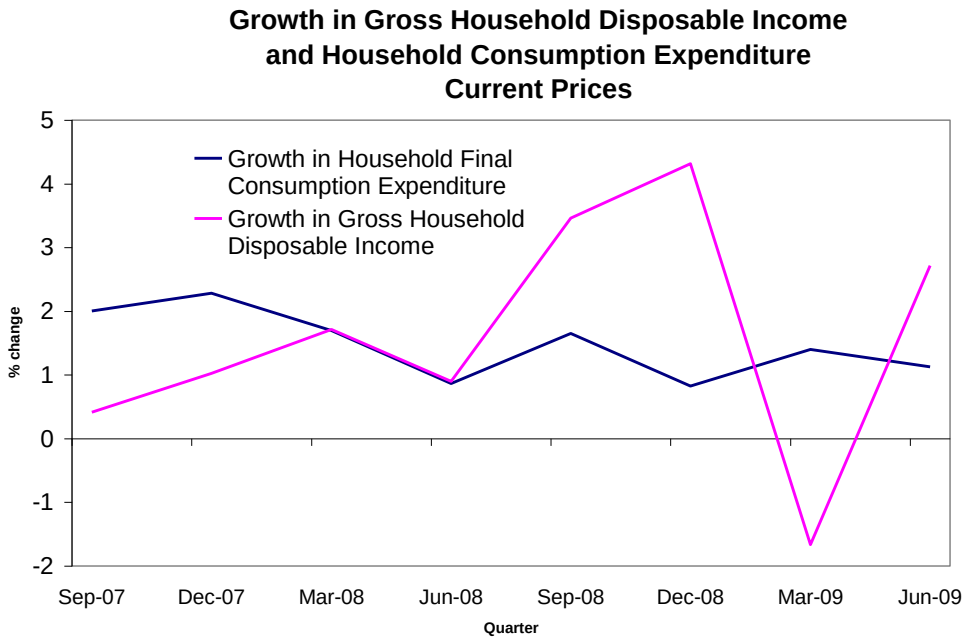
Second, a significant proportion of consumption (and retail sales) is made up of imports of goods and services, which are subtracted in the national accounts to obtain GDP, which (according to the expenditure definition of GDP) is equal to expenditure on domestically produced final goods and services.[7] Thus, an increase in retail sales is neither a necessary nor sufficient condition for an increase in GDP.

Third, the effect on permanent income or wealth of such transfers will be relatively small, and standard economic theory predicts that consumers tend to increase consumption in response to changes in permanent income more than changes in temporary income.[8] To see this, consider the figure below that plots household disposable income and household consumption in Australia. The data shows that while the former increased in response to the cash transfers, the latter has increased in a smooth fashion and did not enjoy a similar "one-off" increase. This lends support to the permanent income hypothesis.



[7] In volume terms, imports of goods and services in the June quarter were $60.5 billion, whilst household final consumption expenditure was $155.7 billion.

[8] For a similar analysis of tax rebates in the US, see Taylor, J. "The Lack of an Empirical Rationale for a Revival of Discretionary Fiscal Policy", Paper Prepared for the Annual Meeting of the American Economic Association, January 2009.



Critics of this view point to a counterfactual scenario in which consumption would have fallen substantially but for the fiscal stimulus. In particular, the government has claimed that consumption would have fallen considerably in the absence of its fiscal stimulus (see, for example, page 4-8 of Budget Paper No. 1, 2009-10). But these claims are impossible to refute or verify unless the assumptions of the counterfactual predictions are fully laid out and scrutinised. To date, this has not happened.

Other researchers have used polling data and survey results to make empirical claims about the extent to which stimulus transfers were spent rather than saved.[9] The problem with this approach is that it takes no account of the significant fall in short term real interest rates that has occurred over the last twelve months as a result of a loosening of monetary policy, and the ensuing reduction in mortgage interest rates. In other words, an income change *and* an intertemporal relative price change occurred at the same time. Simply asking respondents how much of the cash transfers they spent is obviously incorrect as it fails to control for or take account of the intertemporal relative price change. Presumably their decisions would have been quite different if interest rates had not fallen. Therefore, empirical identification of a parameter representing the Keynesian marginal propensity is not possible from such survey data (or at least not in the way claimed in the paper at issue).

4.2.3 The Multiplier in Cost-Benefit Analysis

To make sense of the multiplier in a microeconomic setting, let *m* be the amount of unemployed or otherwise idle resources that each dollar of government spending employs, relative to a baseline of no policy. Thus, *m* is the additional economic activity that an additional dollar of government spending creates, relative to a baseline of no policy change. Note that this is analytically and conceptually distinct from (although not unrelated to) the welfare effects (i.e. benefits and costs) of spending. It

[9] See, for example, Leigh, A. (2009) "How Much Did the 2009 Fiscal Stimulus Boost Spending? Evidence from a Household Survey," Unpublished working paper, ANU.

is simply a measure of the change in economic activity that occurs as a result of an additional dollar of government spending.

For most public sector projects, the usual assumption is that m=0, so that each dollar of public sector spending is drawing resources away from some other private (or public) sector activity where those resources otherwise would have been employed. In other words, the "multiplier" for public sector projects is usually assumed to be zero.[10] Indeed, the Department of Finance's own *Handbook of Cost Benefit Analysis* states at page 43 that:

"The existence of unemployment sometimes leads analysts to augment the benefits from government projects due to indirect effects of the project on employment and output. The reason given is that if labour which would otherwise be unemployed is used on a public project, the expenditures of the newly employed workers may raise employment and incomes in other sectors of the economy where labour and other factors of production would otherwise be involuntarily idle, and so on in a chain reaction.

The problem with this approach is that any such multiplier effect could also be achieved by alternative uses of the project resources. Instead of undertaking the project, the government could reduce taxation or increase expenditure, either of which could be expected to have an expansionary (though not necessarily similar) effect on income and employment. It should be remembered that cost-benefit analysis is always concerned with incremental costs and benefits, that is, with effects which would not have occurred in the absence of the project."

And at page 47 the Handbook states that:

" 'Employment multipliers' seldom measure actual benefits or opportunity costs and should generally not be included in cost-benefit analyses. Likewise, 'secondary benefits' are often another way of presenting primary benefits that have already been included in the analysis or that represent transfers. While secondary effects of a project may be important for distributional analysis or for planning purposes, their inclusion in a cost benefit analysis involves inappropriate double counting."

However, the full employment assumption may not always be a reasonable one. If the government project produces its output *completely* with unemployed resources (and that output does not compete with that produced by any employed resource), then we would have m= 1 (in that case, essentially the extra output costs nothing in terms of already employed resources). If this in turn stimulates *even more* use of unemployed resources (again, without competing with the output of any already employed resource), then m can even be greater than 1.

4.3 The Economic Value of Unemployed Resources: (u)

Resources may be unemployed or idle, but they will nevertheless still have an opportunity cost. For example, the opportunity cost of an unemployed person's time is the economic value that they place on the leisure that they give up in moving out of unemployment into employment, which in a competitive labour market would be equal to the market clearing wage. Thus, let u be the relative value of a unit of idle or unemployed resources. In the extreme case, where an unemployed are willing to

[10] See Barro, R. (2009) "Voodoo Multipliers," *The Economists' Voice*, February 2009.

work for free, we would have u=0. For most public sector projects it is convenient to assume that u=1, which means that the cost of employing an otherwise unemployed resource is the same as the cost of bidding already employed resources away from those uses. In other cases, where the unemployed are willing to work for below market clearing wages, we would have $u<1$.

4.4 The Welfare Cost of Taxation: (*d*)

Each additional dollar of government spending must eventually be paid for by additional taxation revenue. But raising taxes creates economic distortions by leading to disincentives to work, save and invest.[11] Thus, let d be the deadweight cost per dollar of revenue from the taxation required to pay for the spending.

5. Putting it All Together: The Net Benefit from an Additional Dollar of Government Spending and a Simple Decision Rule

Putting all of these parameters together, we can now write down an expression for the net gain from an additional dollar of government spending. In words, the expression is as follows:

Net Benefit to Australia of
an Additional Dollar of Government Spending
=
Value of Otherwise Unemployed Resources Which Become
Employed as a Result of that Spending (The Multiplier)
minus
Opportunity Cost of those Otherwise Unemployed Resources
plus
Value of an Additional Dollar Government Spending (Assuming Full Employment)
minus
Deadweight Cost of an Additional Dollar of Taxation Revenue

Or, in symbols, we have:

$$\text{Net Gain} = m - mu + (v-1) - d$$
$$= m(1-u) + (v-1) - d$$

Our parameters are defined for small or marginal changes. If government spending increases by ΔG, then the net gain is approximately:

[11] Robson (2005) "The Costs of Taxation", CIS Policy Monograph No. 68, surveys the literature and finds that the average deadweight cost of all forms of taxation in the US has been estimated to be between 18 and 24 per cent, whilst in Australia the marginal cost of income taxation has been estimated at between 23 and 65 per cent. In the analysis that follows we use a range of estimates for the marginal deadweight loss of taxation.

$$\text{Net Gain} = \Delta G\left[m(1-u)+(v\text{-}1)-d\right]$$

We now discuss some particular examples where this formula can be applied.

- **The Baseline Case: A Full Employment Economy**

In a fully employed economy, *m* (the multiplier) is 0. This means that a project will have net economic benefits only if the efficiency gains exceed the deadweight costs of raising the revenue to pay for the project. In other words, in a fully employed economy, the above equation gives us the following decision rule:

Net Benefit to Australia of
an Additional Dollar of Government Spending
> 0
if and only if
Value of an Additional Dollar Government Spending (Assuming Full Employment)
>
Deadweight Cost of an Additional Dollar of Taxation Revenue

This is just a version of the usual cost benefit test for public projects. If the government project effectively addresses a market failure, then spending on that project will, at the margin, produce net benefits if the welfare gain that comes about as a result of the market failure correction (relative to the baseline of no policy change) exceeds the deadweight cost of taxation.

- **Government Transfers**

Government handouts such as the "cash splashes" that were part of the 2008-09 stimulus packages are simply transfers of cash between different individuals, which must be financed by distortionary taxation. In the aggregate, we would expect that these transfers do not employ any additional resources that would otherwise have been idle; nor do they directly address any market failure. (Note, however, that the OECD assumes a multiplier of 0.4 in the first year for transfers, and 0.8 in the second year). Transfers do, however, have an efficiency cost because of the administrative costs that are used to carry out the transfer programs. In addition, the spending must be financed by distortionary taxes. The net welfare gain from "cash splashes" is therefore likely to be negative.

- **Personal Income Tax Cuts**

Cutting taxes is fundamentally different from "cash splashes" because tax cuts act to reduce rather than exacerbate the distortions brought about when governments spend an additional dollar, and may have further positive effects if tax cuts are funded by expenditure cuts which reduce otherwise wasteful spending. Tax cuts may also have "multiplier" effects as economic activity increases and otherwise unemployed resources become employed. The net welfare gain from a tax cut funded by reducing

wasteful spending, being the sum of two positive numbers, is unambiguously positive. Obviously, however, if tax cuts lead to reductions in public sector output that is itself valued at more than its cost (including the distortionary costs of the taxes used to finance it), then there is a social loss.

- **Infrastructure and Other Projects**

In other examples of government spending in a less-than-full-employment economy, the full rule outlined above applies, and the net benefits of the government spending needs to be assessed on a case-by-case or at least program-by-program basis. For projects to have a net benefit, it is not only the "multiplier" that matters. We also need to take into account the value of the project, net of the deadweight costs of taxation. That is, even if a project employs otherwise unemployed resources at low wages, the net economic benefit may be negative if the project is unproductive or, even if it is productive, if these benefits are less than the costs of taxation.

In summary:

- *Government spending can have a positive multiplier, but negative net benefits.*
- *Government spending can have a zero multiplier but can still have positive net benefits.*

- **The Government's Assumptions: Crude Closed Economy Keynesianism**

The government's analysis and results appear (via Treasury) to rely on a crude, closed economy Keynesian model in which the following assumptions appear to have been made:

1. Government spending is assumed to be productive ($v>1$).
2. The fiscal multiplier is assumed to be positive (between 0.5 and 0.1)
3. No explicit assumption as been made about the cost of employing otherwise unemployed resources.
4. No explicit assumption has been made about the cost of employing otherwise unemployed resources.

6. Results: The Welfare Effects of the Fiscal Stimulus Measures

This section applies the above framework to the entirety of the 2008-09 fiscal policy decisions ($97.1 billion). We consider three alternative scenarios. For simplicity we consider a counterfactual scenario of no fiscal policy change and the same monetary policy change that was actually undertaken. It is worth noting, however, that a smaller fiscal stimulus may have allowed monetary policy to be eased even more. Relative to fiscal policy, it is likely that monetary policy would likely have higher multiplier effects and fewer distortions, as monetary policy has less effect on the allocation of resources between sectors. Moreover, the stance of monetary policy can be changed relatively quickly, whereas much of the fiscal stimulus is locked in for the next three years, irrespective of how the economic recovery pans out. Finally, unlike

other countries (for example, the United States), Australia was far from the point where further monetary easing was not possible or would have been ineffective.

6.1 Scenario A – High Multiplier, Productive Government Spending, Unemployed Resources Cost the Same as Employed Resources

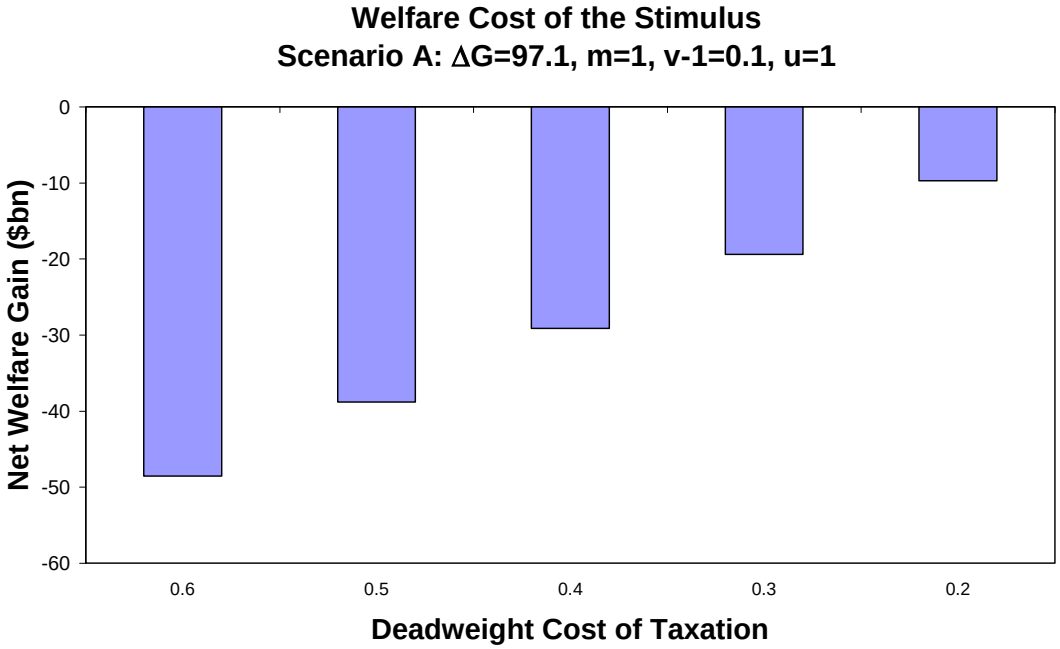
Suppose that, in accordance with the upper bound of the government's assumptions, each dollar of government stimulus spending creates an additional unit of economic activity, so m=1.

Suppose further that on average each dollar of government spending is productive, yielding a social return (gross of the cost of taxation) of 10 per cent. We believe that the actual return on the government's spending will be much lower than this, and hence we believe that this is a very conservative assumption. None of the projects in the government's stimulus package have been subjected to cost benefit tests, which leads us to believe that actual rates of return may be quite low. Furthermore, in 2008-09 a large fraction of the stimulus payments was in the form of transfers, which after taking into account administrative costs are likely to have a negative social return – and that does not include the costs of distortionary taxation required to finance them.

Finally, anecdotal evidence suggests that much of the government's stimulus spending (for example, the "Building the Education Revolution" and "Local Infrastructure" spending) has been characterised by projects of dubious economic value (perhaps inversely related to their political value), cost overruns, and sheer waste and bureaucratic and political mismanagement. Thus we believe an assumption of $v\text{-}1$=0.1 is very generous in the circumstances.

We also assume that the unemployed resources must be paid market clearing wages, so u=1. In other words, we assume that government spending employs otherwise unemployed resources and so the multiplier is positive, and that government spending is productive – each of these assumptions is entirely consistent with the government's assumptions.

The results are reported the figure below for a range of deadweight costs of taxation. They show that the net benefit of the spending is negative for all but the smallest of assumptions about the deadweight cost of taxation (d<0.1).



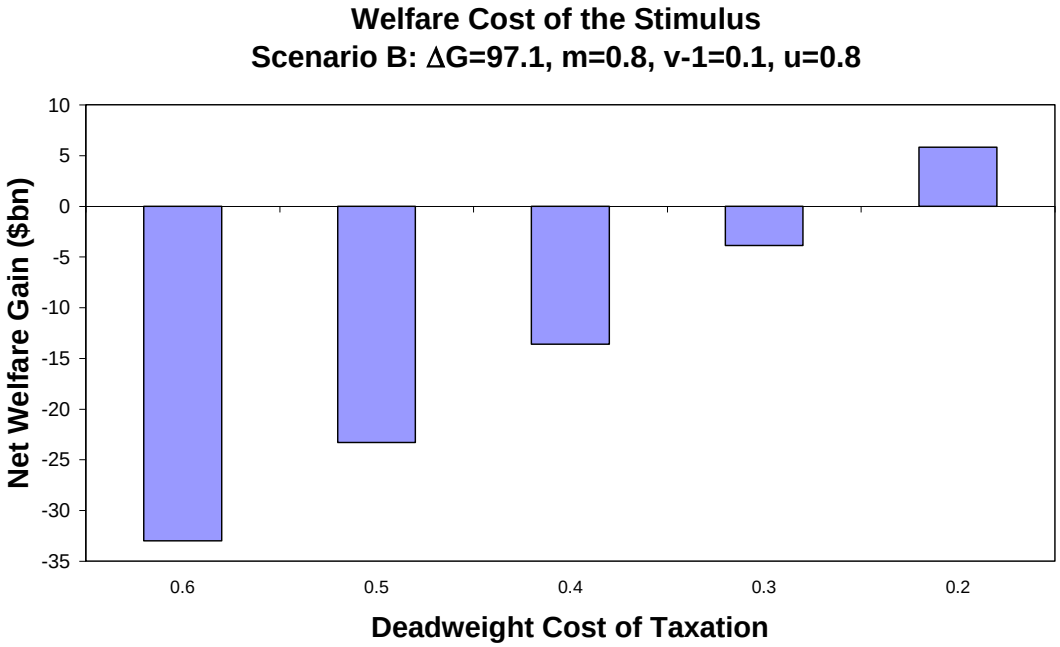
In particular, the results show that even if we assume that government spending is productive (with a gross return of 10 per cent) and employs otherwise unemployed resources (with a multiplier of 1), the government's fiscal policy decisions over the four years will create an (undiscounted) net welfare loss to Australia of between $48.5 billion and $9.7 billion, depending on the deadweight cost of taxation.

The results here are driven by the costs of taxation and the assumption that otherwise unemployed resources cost the same as resources already employed. The costs of taxation are sufficiently large to offset the benefits of the public spending, and the fact that government spending has a multiplier effect is rendered irrelevant because the opportunity cost of unemployed resources is the same as resources that are already employed; hence there is no welfare gain from employing those resources.

If, under these assumptions, the government cut its losses and ended the planned stimulus today, this would reduce these losses by roughly two thirds. Moreover, if the government accompanied this with a tax cut over the next three years that was equal to half of the spending that would have taken place, it would exactly offset the losses that have already built up and would break even, with far lower deficits and borrowings.

6.2 Scenario B – Lower Multiplier, Productive Government Spending, Unemployed Resources Cost Less than Already Employed Resources

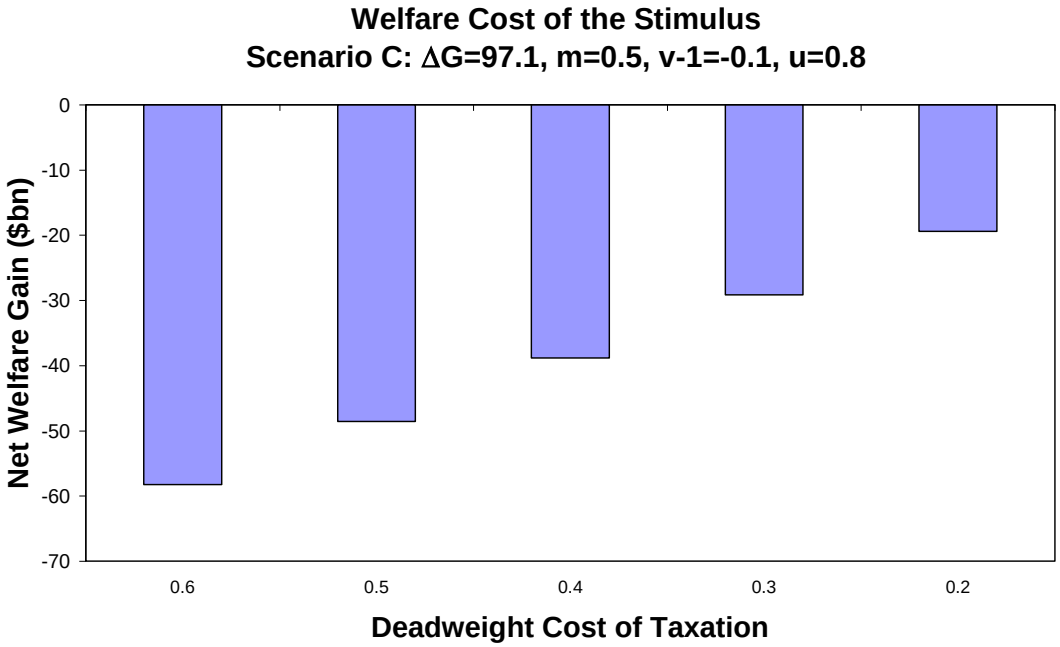
We also consider a second scenario, where unemployed resources are paid only 80 per cent of the market wage, where the multiplier is 0.8, and the social rate of return is still 10 per cent. These results are reported below. Again, the package yields net losses, except if we assume that the deadweight cost of taxation is very low.



The net welfare effects are between a loss of $33 billion and a gain of $5.8 billion. The results are again driven by the size of the costs of taxation, relative to the benefits of spending and the effect of the multiplier. The multiplier, whilst positive, only has a modest effect on welfare when combined with the assumption that the cost of unemployed resources is lower than the cost of employed resources.

6.3 Scenario C – High Multiplier, Some Government Spending Unproductive, Unemployed Resources Cost Less than Employed Resources

Finally, we consider a third scenario, in which half of the projects have a benefit-cost ratio of 1.3, and the other half have a benefit cost ratio of only 0.5. This results in $v=0.9$. Consistent with the government's assumptions, the multiplier is assumed to be 0.5, and the cost of otherwise unemployed resources is again assumed to be 80 per cent of the cost of already employed resources.



The results, reported in the above figure, show that the net costs are between $58.2 billion and $19.4 billion, again depending upon the deadweight costs of taxation. The net welfare gains here are very low because the multiplier is assume to be lower (although still consistent with the government's assumptions), and the aggregate benefits of government spending (assuming fully employed resources) are negative. Once again, the multiplier only has a modest effect on aggregate welfare when combined with the assumption that the cost of unemployed resources is lower than the cost of employed resources.

7. Conclusions

The 2008-09 fiscal stimulus packages were unprecedented in size. Yet, despite all of the lip service paid to rigorous cost-benefit analysis in the 2008-09 Budget Papers, not a single dollar was subjected to cost-benefit analysis (or if such tests were conducted, they were never disclosed and hence allowed to be tested). Moreover, although many claims are made as to the *effectiveness* of the packages, no account seems to have been taken of whether the packages are *efficient*.

Using assumptions that are completely consistent with those of the government and Treasury, this paper has found that the 2008-09 fiscal policy decisions will create large welfare losses. In particular, even assuming that the stimulus packages have employed (and will continue to employ) otherwise unemployed resources (with a fiscal multiplier of one), and even assuming that government spending is productive with a rate of return of 10 per cent, we find that the stimulus package, if allowed to continue, will result in welfare losses of between $10 billion and $48 billion, depending on the deadweight cost of taxation.