The Treasury's Non-modelling of the Stimulus

John Humphreys[1]

In late 2008 the global financial crisis (GFC) sparked a boom in Keynesian economic commentary and activist fiscal policies. The Australian government responded with an immediate $10.4 billion 'cash-splash' to households (Commonwealth Treasury 2008), followed by a $42 billion 'Nation Building and Jobs Plan', which was to include $12.7 billion more hand-outs as well as a $28.8 billion increase in government capital investment.[2] In total, the government 'stimulus' was estimated to be about $52 billion. If we included all discretionary government spending that happened after the GFC then the number would be far higher.

And as it happened, Australia came through the GFC without much trouble. While the GDP/capita did shrink by 0.8 per cent in 2008/09, this was hardly noticed since the government and most media failed to discuss the per-capita statistics and instead reported that total GDP grew by 1.4 per cent. However you report it though, Australia did better than many other countries.

The proponents of the Keynesian policies and the politicians and bureaucrats who implemented them were quick to claim success. The American micro-economist Joseph Stiglitz said of Australia: 'What your government did was exactly right'.[3] Our Treasurer, Wayne Swan, proudly claimed 'rapid fiscal stimulus measures shielded our economy and jobs from the worst consequences of the global financial crisis' (Swan 2010).

In part, these glowing reports are based on modelling done by the Commonwealth Treasury, which is often treated by the media as the gold-standard of economic advice in Australia. The government says that Treasury modelling shows thousands of jobs saved and billions in extra tax revenue (Peatling 2009), and Keynesian commentators have used Treasury as their evidence to justify the stimulus.

It is therefore alarming that Treasury never released any proper modelling of the stimulus package. The best it offered was a short note outlining the methodology for their budget forecasts (Treasury 2009), which will be discussed below.

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1   Human Capital Project, john.humphreys99@gmail.com
2   Announced in February 2009: Commonwealth Treasury (2009).
3   As quoted in Hagan and Gruen (2010).

Treasury 'modelling'

In modelling fiscal policy it is necessary to factor in a number of different impacts. These issues will be explained and discussed shortly, and include:

- The impact on private savings
- The impact on net exports (that is, international crowding out)
- The impact on domestic investment (that is, domestic crowding out)
- The response of monetary policy
- Costs of government debt.

Of these different impacts, the Treasury methodology only considered two, and one of those it got totally wrong. Its methodology was so simplistic that a critic can walk you through it in about a minute.

- To calculate the private savings response, Treasury estimated that 30 per cent of cash transfers would be saved, while the direct government investment would not lead to a private savings response. Given the roughly equal split between transfers and investment, this equates to a total savings offset of only 15 per cent of the total stimulus. The calculation is somewhat simplistic and low compared to many studies, but it is possible.

- Second, Treasury considered the impact on net exports. To quote from its report: 'We apply an import share of 0.15 which is the economy-wide average share of endogenous imports in Gross National Expenditure.' This methodology is dead wrong, and creates a drastic underestimate of the impact on net exports.

- Based on the above two assumptions, Treasury then calculated its fiscal multipliers. For transfer payments, it concluded that 70 per cent would be spent and 85 per cent of the spending would go on domestic production, giving a multiplier of 0.6 (=0.7*0.85). For direct government spending, it concluded that the multiplier would be 0.85, with the other 0.15 being spent on imports.

- The total stimulus package is adjusted for the fiscal multipliers above to calculate the apparent benefit from the stimulus (see right-hand column in Table 1 below). Then to calculate the 'no stimulus scenario', Treasury simply take the budget forecasts and subtract the estimated impact of the stimulus. Note that the benefits are additive, so that by the end of 2009/10, Treasury estimates that GDP is 2.6 per cent higher than the counter-factual.

Table 1: Benefit of the stimulus according to Treasury (annual GDP growth)

	Budget forecast	No stimulus scenario	Benefit/cost
2008/09	0.1%	-0.9%	1.0%
2009/10	-0.4%	-2.0%	1.6%
2010/11	2.1%	3.4%	-1.2%

Source: Australian Government 2009, Treasury Briefing Paper for the Senate Inquiry into the Economic Stimulus Package.

- To estimate an employment response, Treasury then assumes that a 1 per cent increase in GDP leads to a 0.75 per cent increase in employment. That means a 2.6 per cent boost in GDP equates to a 2 per cent increase in employment, which was just over 200 000 jobs.

Open-economy macroeconomics and the impact on net exports

There are several problems with the Treasury non-modelling, but the biggest problem is the way it treats the change on net exports. To understand how the modelling should have been done it is necessary to recall some basic open-economy macroeconomic theory.

Money flows in and out of our economy through two channels; the current account (trade in goods and services) and the capital account (savings and investment). These two flows offset each other, so that a capital account surplus (KAS) is always matched by an opposite current-account deficit (CAD) (Makin 2002). For countries with a floating exchange rate, the mechanism for matching the financial flows is the changing value of the currency. For example, if there is an increase in foreign investment then there will be an increase in the demand for Australian dollars, putting upward pressure on the exchange rate. The higher dollar will then put downward pressure on net exports until the inward and outward cash flows equalise. The result will be a higher capital-account surplus (more foreign investment) but also a higher current-account deficit (lower net exports).

Put simply, if we need to borrow more money from overseas, then our net exports will decrease by the same amount. This isn't necessarily a bad thing, but it is something that we need to remember.

When the government runs a budget deficit, it finances some of that deficit by borrowing from overseas. To the degree that government borrowing increases

net foreign borrowing,[4] then that change will be offset by a decrease in net exports — which can be called 'international crowding out'. To measure the size of this effect, we need to consider what percentage of government debt is financed internationally.

Under the standard Mundell-Fleming model (Fleming 1962 and Mundell 1963) with highly mobile international capital and a floating exchange rate, it is assumed that a small open economy will finance all of its government debt from international markets. This would mean that international crowding out would be 100 per cent and fiscal stimulus would be completely ineffective. However, the government will get less than 100 per cent of its financing from international markets when there is a rising supply price of foreign capital (Makin 2009), so we are once again left asking how much of government debt will be internationally financed.

According to a report written by Treasury officials, about 60 per cent of recent government debt has been financed by foreign borrowing, though the exact percentage fluctuates from year to year (Di Marco, Pirie and Au-Yeung 2007). Warwick McKibbin also finds international crowding out of about 60 per cent for Australia from his modelling work.[5] This is obviously far in excess of the 15 per cent that Treasury used in following its flawed methodology. The mistake made by Treasury is assuming that government stimulus can only impact net exports when people directly buy foreign products, but in reality the stimulus will have an impact on all trade-exposed sectors.

Interestingly, in a different context the Treasury Secretary recently admitted that Treasury got its economic modelling wrong, in part because it was overestimating net exports (Parkinson 2012). Treasury had not predicted the rising dollar associated with international crowding out. It is interesting then to note that at the beginning of the GFC the Australian dollar dropped to US$0.61 in October 2008, but after the introduction of the stimulus the dollar rose strongly to over US$0.90 by October 2009, and then reached parity by November 2010 (Reserve Bank of Australia 2012). Without the stimulus, the dollar would have been lower and net exports would have been higher.

The only attempt from Treasury (or any pro-Keynesians) to respond to this point has come from David Gruen, who points out that international crowding out is a bigger issue for countries more exposed to international trade and financial flows, and Australia is in the middle on this score (Gruen 2009). This is certainly true, and it can be picked up in a model by adjusting the estimate for foreign-financed government debt (whether 15 per cent or 60 per cent or some

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4   It is possible for public foreign borrowing to displace private foreign borrowing, which will not change total foreign borrowing. However, this will then mean higher domestic interest rates and lower domestic investment, as discussed in the next section.

5   McKibbin, Stoeckel and Lu (forthcoming), and personal correspondence.

other number). In making his case, Gruen cites a paper by Mendoza, Vegh and Ilzetzki (2009) that shows fiscal policy is more effective for economies with lower international trade flows. What Gruen failed to mention was that the paper in question also showed that for countries with a floating exchange rate, the fiscal multiplier was actually negative.

For the Treasury estimate to make sense, we must believe that only 15 per cent of new government debt will be financed by international lenders. That estimate is unbelievably low, meaning that the Treasury approach is going to significantly overstate the benefits of any stimulus because it has misunderstood the impact of stimulus on net exports.

Domestic crowding out

While the Treasury approach to international crowding out was totally wrong, it did not even attempt to provide an estimate for domestic crowding out, where extra government spending comes at the expense of domestic investment.

While 60 per cent of stimulus spending may be financed internationally, that leaves 40 per cent to be financed by domestic lenders. The increased demand for loanable funds will then drive up the price of loanable funds (interest rates), which will decrease private borrowing and therefore private investment. Makin (2009) argues that this form of domestic crowding out is actually more costly than the international crowding out discussed above.

However, while increased foreign borrowing is perfectly matched by falling net exports, domestic borrowing is not perfectly matched with falling private investment. If the government is able to borrow money from domestic savers who were previously unwilling to lend out their money, then the government borrowing will not crowd out private investment and will create the intended stimulus effect.

The relevant question then is the degree of domestic crowding out. In a Treasury paper from 10 years ago, it was suggested that domestic crowding out might be a real concern for Australia, with the authors concluding that 'significant discretionary fiscal policy movements may have large associated costs' (Comley, Anthony and Ferguson 2002). In normal economic conditions, there is a good argument that domestic crowding out would be nearly complete.

Proponents of stimulus policies often claim that domestic crowding out is relatively small in times of crisis, and that may well have been the case for this stimulus. However, it is very difficult to believe that it was zero, as implicitly assumed by Treasury.

Monetary policy response

Treasury also entirely neglected to factor in any monetary policy response to its fiscal expansion.

As suggested above, the only way for fiscal stimulus to be effective is for the money to have been sourced from Australia, and for that money to come from savers who were previously unwilling to lend money. Since fiscal stimulus relies on new money coming into the system, it is important to note that it is actually a form of 'monetary expansion' similar to when the Reserve Bank of Australia (RBA) increases money supply by reducing interest rates.

In Australia, the RBA is independent and it is required to target price stability. It does this by controlling the total amount of base money supply in the economy, trying to ensure that money-supply growth is roughly similar to GDP growth.[6] If the RBA observes that money supply has reduced significantly in one part of the economy and this may lead to deflation (as happened with the GFC when banks reduced their lending), then it responds by lowering interest rates and increasing its own money supply.

Conversely, if the RBA observes that something has caused an increase in the money supply (such as the government stimulus), then it should respond by having marginally higher interest rates, so as to decrease its money supply by the same amount, and ensure there is no risk of inflation.

If the RBA perfectly offset the money expansion caused by the fiscal stimulus, then that would mean that the fiscal stimulus cannot increase economic activity. However, monetary policy is not always fully effective.[7] It could be argued that monetary policy was not working fully in Australia, and so fiscal stimulus was necessary. Indeed, McDonald and Morling (2011) make the argument that the nature of the GFC weakened the effectiveness of monetary policy, since banks and borrowers were becoming more cautious.

That being said, it is unreasonable to argue that monetary policy was absolutely ineffective, as is the implicit position of Treasury. Indeed, Treasury Secretary Parkinson later admitted: 'While the GFC significantly impeded global financial markets, it did not materially impede domestic monetary policy once

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6   The RBA controls the money supply by targeting the overnight cash rate using open market operations. It does not directly target a money-supply level, but the ultimate consequence of its behaviour is to control the base money supply. Inflation occurs when money-supply growth exceeds output growth, while deflation occurs when output growth exceeds money-supply growth. The RBA doesn't actually aim for perfect price stability, but an inflation rate of between 1–3 per cent.

7   In situations where banks want to lend money but people are unwilling to borrow, traditional monetary policy through low interest rates can be ineffective. Also, while fiscal policy can be for any amount, monetary policy tends to only move in jumps of 25 basis points.

bank borrowings were guaranteed by the Commonwealth government.'[8] To the degree that monetary policy was still partially effective, then the fiscal stimulus would have been partially offset due to marginally higher interest rates (albeit with a lag).

Repaying the debt

Another cost of the fiscal stimulus that needs to be included is the increased tax required to pay for the ensuing debt. In their recent analysis of fiscal stimulus, Guest and Makin (2011) use a macroeconomic model to consider the long-term consequences of stimulus, assuming that the debt will be repaid through higher taxes in the following years.

Their model does not include international crowding out, but it does factor in both the standard domestic crowding-out mechanism and also an extra economic cost caused by the tax needed to pay off the debt. After adding this extra element, Guest and Makin are able to estimate a long-term multiplier of -1.43, which means that for every $100 spent on stimulus, the economy will contract by $143.[9]

The above result is dependent on the timing of the debt repayments. Guest and Makin assume that the government will start to repay the debt the year following the end of the stimulus. An alternative assumption is that the government will only pay the interest on its debt and will not repay the principle. As the second approach pushes the costs further into the future, it will reduce the present value of the costs, and provide a more sympathetic result when evaluating the stimulus package.[10] However, the Treasury modelling does not even include this more sympathetic approach, and instead seems to assume the debt away.

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8   Parkinson (2012).

9   Guest and Makin (2011) note that the negative multiplier is robust to a variety of sensitivity analysis, and is consistent with other long-term analysis. Interestingly, in a later paper Guest and Makin show that the size of the multiplier depends crucially on how the stimulus is spent — with unproductive stimulus having a long-run multiplier of -3.3 and productive stimulus having a long-run multiplier of -0.5.

10   If the interest rate on the debt is the same as the discount rate, then the timing of the debt repayment becomes irrelevant. If the interest rate is lower than the discount rate (as is likely with government debt), then a delay in the payment will reduce the present value of the payment.

Private savings response

The Treasury modelling did factor in a savings response to the stimulus, with 15 per cent of the total stimulus assumed to have been saved. Unfortunately, Treasury looked at just one element of private savings by only considering the marginal propensity to consume (MPC) the transfer payments.

However, there are several other mechanisms through which government stimulus can impact on savings, and these weren't considered by Treasury. Makin and Narayan (2011) explain that when people take a lifecycle (Modigliani 1976) or permanent-income (Friedman 1957) approach to consumption, then they are likely to save a large portion of any temporary income, significantly lowering the MPC for stimulus payments — a result confirmed by Taylor (2009). Further, the theory of Ricardian Equivalence suggests that private savings may increase as a response to government deficits in anticipation of higher future taxes. Whatever the reason, private savings often increase significantly when government savings decrease.

Makin and Narayan go on to survey the empirical evidence on the relationship between private and public savings, noting that 'most of these studies have concluded that at least half of the change in fiscal balances in advanced economies was offset by an opposite change in private savings'. A paper written by Treasury officials also noted that the international evidence is for a 50 per cent savings response, though its own work suggests that the number is closer to 40 per cent in Australia (Comley, Anthony and Ferguson 2002). In their study of Australia, Makin and Narayan find an even higher private savings response — of between 75 per cent and 100 per cent — which suggests that nearly all the value of a stimulus would be saved. This result is consistent with the study by De Silva and Davidson (2009), which found a very low level of increased spending as a result of the stimulus.

Put in this context, the Treasury assumption that only 15 per cent of the stimulus will be offset by private savings seems very low, and inconsistent with its own previous research.

Conclusion

The biggest problem with the Treasury model is that because it misunderstands the issue of international crowding out, it drastically underestimates the impact on net exports. In addition, it entirely ignores the issues of domestic crowding

out, monetary policy responses, and the costs of repaying the debt. While its estimate for the private savings response to the stimulus is at the low end of the range, this is the least of the problems.

The ignorance of open-economy macroeconomics suggests that Treasury has neglected much of the advances made in macroeconomics over recent decades, and its strange assumptions on domestic crowding out and private savings response show that it has forgotten much of its own research. As Harvard economics professor Robert Barro said in 2009 when the US was debating its own stimulus policies, 'The financial crisis and possible depression do not invalidate everything we have learned about macroeconomics since 1936' (Barro 2009).

An alternative model

It is easy to criticise, but unless there is a better alternative then the Treasury approach will continue to be repeated and believed. In response, I have put together a 'fiscal policy model' that incorporates all of the key variables discussed above. The model uses stimulus spending estimates from the government budget documents, and the latest economic data from the National Accounts.

In addition, following the lead of Hagan and Gruen (2010), this model includes the positive budget-feedback mechanism, where the immediate benefit of the stimulus leads to higher taxes, which improves the budget position compared to the counter-factual. As Hagan and Gruen explain, the marginal budgetary cost of the stimulus will be less than the headline figure. The budget feedback mechanism is assumed to occur with a one-quarter delay.

The assumptions used in the 'central scenario' of the model are:

(1) private savings response = 15 per cent

(2) degree of international crowding out = 60 per cent

(3) degree of domestic crowding out = 20 per cent

(4) monetary policy response = 50 per cent

(5) the repaying of debt interest at 2 per cent, augmented by a 30 per cent efficiency cost of the tax.

Additional assumptions were necessary regarding the quarterly breakdown of stimulus payments and the lag effect of the crowding out and monetary policy response. International crowding out is assumed to happen quickly, while domestic crowding out and the monetary response happens more slowly.[11]

Using these assumptions, the model suggests that the stimulus provided a 0.5 per cent increase in GDP in 2008/09. This benefit was entirely unwound by the end of 2009/10, and then in 2010/11 the stimulus was actually a drag on the economy, leaving GDP about $6 billion lower than the 'no stimulus' counter-factual. These outcomes can be compared with the estimates made by Treasury:

Table 2: Comparative estimates of stimulus benefits (annual GDP growth)

	Treasury estimate	Updated estimate
2008/09	1.0%	0.5%
2009/10	1.6%	-0.5%
2010/11	-1.2%	-0.4%

Source: Author's own analysis.

Using the Treasury approach to estimating the employment impact, then the stimulus has resulted in the loss of over 30 000 jobs.

A 'multiplier' can be calculated by finding the discounted present value of future benefits against the discounted present value of the budgetary cost of the stimulus. Using the 'central scenario' above, the early benefit from the stimulus provides a positive multiplier of 0.5, but it then falls away sharply so that the multiplier by the end of 2011/12 is -0.1. Projecting forward, we can estimate a long-term multiplier of -1.5, which is close to the estimate provided by Guest and Makin (2011).

This is also consistent with McKibbin and Stoeckel (2009), who find that the stimulus provides an immediate boost, but then becomes a net drag on the economy with a negative multiplier. In addition, these results are consistent with Barro's estimate of a near-zero multiplier (Barro 2009), the US Congressional Budget Office estimates of a negative long-run multiplier (Elmendorf 2009), and Ergas and Robson's finding that the Australian stimulus fails a cost–benefit analysis (Ergas and Robson 2009). It is also consistent with the anecdotal evidence from around the world that has shown no relationship between the size of the fiscal stimulus and economic growth (Ricardian Ambivalence 2012).

These results are robust to a wide range of sensitivity analysis, with nearly all scenarios producing a long-run multiplier of between -1.4 and -1.6. Interestingly,

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11   The relative speeds of international and domestic crowding out are suggested by the modelling work of McKibbin, Stoeckel and Lu (forthcoming).

one of the most sensitive assumptions relates to the assumed lags in crowding out and monetary policy. Longer lags increase the immediate benefit, and even though the benefits are unwound within two years, the higher initial benefit is reflected in higher multipliers: 0.7 in the short run and -1.3 in the long run.

This new fiscal policy model is still a very imperfect representation of a complex economy. However, by fixing some of the most egregious errors of the Treasury attempt, it can at least give a more accurate story about the stimulus. That story seems to be that there was some short-term benefit that was quickly unwound, leaving the Australian economy poorer for the experience.

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