Stabilization Policy Debates:
Assessing the Case for Fiscal Stimulus

William Scarth
McMaster University
May 4, 2009

1. Introduction

According to the classical tradition in economics, fiscal policy is meant to focus on

society's equity and efficiency objectives. Concerns about macroeconomic stabilization

are either best left to the economy's self-correction mechanism or to monetary policy.

Clearly most governments today have followed Keynes and rejected this tradition, as

major stimulus packages have been the reaction to the recession. The purpose of this

essay is to review the debates that have waged on this issue, so that readers can achieve

some confidence in arriving at their own view on this central topic. Section 2 explains

why the self-correction mechanism, while reliable in many circumstances, can fail - even

when it is enhanced by monetary policy. The Keynesian response is to rely on fiscal

initiatives in these circumstances, but in section 3, we explain why such efforts may be

counter-productive. Then, in sections 4 and 5, we explain which fiscal measures are most

likely able to avoid these pitfalls, and why it important for us to pursue this strategy -

given the coordination problem that society faces. Finally, following brief conclusions in

section 6, an Appendix provides details on models that are used in sections 2 and 3.

2. The Economy's Self-Correction Mechanism and Monetary Policy

As noted, our first line of defense when a drop in aggregate demand occurs is the

economy's self-correction mechanism. Slack in labour markets should lead to lower

wages, competition among firms then induces producers to pass on these cost savings in lower prices which - assuming that the demand curve for goods is downward sloping - stimulate increased purchases. This automatic process - that deflation itself can close the initial "deflationary gap" between actual and long-run-sustainable output - is the self-correcting mechanism. But what makes the demand curve for the nation's entire output downward sloping? The standard argument that applies for an individual product is that buyers reduce purchases of other goods that have become relatively more expensive. But for the whole economy, the only "other" goods are those produced in other countries. As the prices of our goods fall relative to those in the rest of the world, demand for domestically produced goods can be expected to rise. But in the present circumstance - when there is a drop in demand in all our trading partners' economies at the same time - our prices cannot be expected to fall more. So, roughly speaking, we may as well reason in terms of a closed economy when asking how we can expect our aggregate demand curve to have a negative slope.

The traditional answer to this concern is to appeal to the existence of a wealth effect (emphasized by Pigou (1943)) - that falling prices lead to an increase in the real value of assets that are based in nominal terms. But Irving Fisher (1933) had already considered this issue - in a way that did not abstract from differences between borrowers and lenders as Pigou's analysis did. Considering private banks, Fisher focused on loans and deposits separately. With bank reserves being a very small proportion of bank assets, the loan and deposit totals are roughly the same magnitude. Since the value of *both* is increased by deflation, and since borrowers have a higher propensity to spend than do lenders, the net effect of deflation - according to Fisher - is that current spending is

decreased, not increased. That is, focusing on wealth effects alone, Fisher argued that the aggregate demand curve is positively sloped.

Standard policy-oriented macro modeling avoids this threat to the viability of the self-correction mechanism by inserting an ongoing reaction function on the part of the central bank into the system. The simplest way of doing this is to posit that the bank lowers the interest rate whenever the price level falls below the bank's target value. Then as deflation occurs, interest rates fall, and the resulting decrease in borrowing costs is what stimulates higher aggregate demand. But this avenue for achieving a negative slope to the aggregate demand curve is not available if the central bank is unable to lower interest rates, and this is precisely the concern today - since short-term nominal interest rates have reached essentially zero.

It can be shown that - in a simple model that abstracts from Pigou, Fisher and open-economy effects - this zero-lower-bound constraint on interest rates makes the aggregate demand curve become vertical in the lower price range of the aggregate supply and demand diagram. We can see the implications in Figure 1. The economy is initially in full equilibrium in the upper range of the diagram - with actual output equaling its sustainable level. We then consider an exogenous shift to the left in the demand curve's position. With prices given in the short run, the economy's observation point moves to the left along the initial short-run aggregate supply (*SRAS*) line, and a recession occurs. But then, as prices gradually fall (shown by the position of the of the *SRAS* drifting down over time, the economy's observation point shifts down the demand curve until it reaches the natural rate line again. Thus, the diagram verifies the efficacy of the self-correction mechanism - as long as the initial drop in demand is not "too big." This possibility is also

illustrated in Figure 1 by the further shift in the demand curve's position to the left. In this case, price decreases just move the economy forever down the vertical region of this demand curve, so the economy does not automatically move back to the natural rate of output. The self-correction mechanism fails in this case; deflation does not eliminate the output gap.

Can deflation actually be harmful? Keynes (1936) argued in the affirmative, and his reasoning was based on an expectations effect. He argued that people in this situation will certainly come to realize that prices can be expected to keep falling. Then, they will decide to postpone part of their spending with a view to waiting for the expected price decreases. This further reduction in current demand must be shown as yet another shift to the left in the position of the current aggregate demand curve. With this expectations effect included, then, the trajectory that indicates the economy's time path during deflation is not just south - it is south-west. Deflation actually *widens* the output gap in this case, so what was supposed to be the automatic correction mechanism has become a destabilizing force. Keynes' suggested remedy was for the government to use program spending increases, and/or tax cuts, to shift the aggregate demand curve to the right.

Interested readers are encouraged to consult the Appendix, where a formal version of this scenario is summarized. Following convention, Keynes' expectations effect is introduced by distinguishing the real interest rate (which affects spending decisions) and the nominal interest rate (which is what the central bank adjusts) since the difference is the expected rate of inflation/deflation. The algebraic analysis indicates that the automatic-correction mechanism fails if the central bank's aggressiveness parameter (in lowering the interest rate in response to a price level that is below target) is smaller than

the rate at which private agents revise their expectations of deflation. This result implies that while the zero-lower-bound constraint (which forces the bank's aggressiveness parameter to zero) is sufficient to ensure that the deflation process involves instability, this outcome emerges *even before* this absolute limit is reached.

Broadly speaking, there have been four reactions to this concern. First, the analytical structure that has led us to be concerned about monetary policy losing its power can be questioned - with the result that we may come to the view that potential macro instability worry is very much over-blown. Second, we can continue to embrace the conventional analytical framework, and - within that - think of ways of removing the zero-lower-bound constraint in the short-term financial market. Third, we can shift monetary policy so that it operates in the long-term bond markets. Finally, we can embrace an active fiscal policy approach (the Keynesian recommendation that - as noted - has been embraced by many governments today). We now consider each of these reactions in turn.

Monetarists have long been critical of the narrow view of the monetary-policy transmission mechanism that exists in conventional analysis. Their view is that households manage a portfolio of assets that includes money, financial claims and consumer durables. When portfolios become out of balance - with too much money - households reallocate by acquiring more financial claims and durables. The effect of money on the goods market does not have to "go through" the bond market. In the monetarist view there are direct money-to-goods reallocations within the portfolio. According to this view, a lower bound on bond rates is simply not relevant, and the best thing that the central bank can do is to ensure that money growth remains vigorous at

times such as the present. For example, Laidler (2009) has recommended an annual growth rate for *M1+* of about 7%, although he admits that it is difficult to be precise since the relationships that link the growth in any one monetary aggregate and the economy's performance indicators are imprecise.

Returning to the zero-lower-bound issue, Edlin and Jaffe (2009) have documented that commercial bank excess reserves in the US have skyrocketed in recent months; they rose from a "fairly normal" level of $2 billion in August 2008 to $798 billion in January 2009. It is tempting to accept their interpretation that this appears to be a Keynesian "liquidity trap" in action. Edlin and Jaffe wonder why the Fed is paying interest on these bank reserves, when the Fed would prefer that banks make more loans. They draw attention to suggestions such as that made by Hall (1983) - that interest be paid on reserves in an amount equal to the expected inflation rate. In deflationary times, this would involve a tax on excess reserves, which could be expected to stimulate lending (ending the liquidity trap problem) and to at least partially internalize an externality - that the social return of more lending exceeds the private return. With the precarious position of banks today, however, this would not seem to be the time to add a further challenge for their re-acquiring profitability. Nevertheless, as part of the new set of regulations for banks in the future, it would seem that serious consideration be given to such structural changes.

Several major central banks have recently embraced what they refer to as quantitative easing. They are trying to affect long interest rates more directly than they have in the past (when they limited their intervention to manipulation of the short rate, hoping that the yield curve would cause some of this change to be felt at the long end).

The general strategy is to operate in such a way that the zero-lower-bound problem at the

short end becomes irrelevant. One method of trying to do this involves only a small

departure from past practice. The bank can simply promise to keep the short rate low for

a significant time into the future. This is what the Bank of Canada has just recently done -

apparently committing itself to leaving the overnight rate at its present value until June

2010. Since we believe that the long rate is a weighted average of expected future short

rates, this strategy may be able to "talk" long rates down somewhat. However, if the long

rates that matter for spending decisions are for terms to maturity that exceed 15 months,

this strategy may have limited success. This would especially be the case if the bank

indicates that it may have to change the interest rate during the 15 month period - as

Governor Carney indicated in an extended interview with the CBC very recently. In any

event, as Andersson and Hofmann (2009) have documented, there has been very little

success with this very strategy when several other central banks have tried it. They

estimate that long rates were pulled down by just 4 basis points. Surely we must conclude

that if quantitative easing is to be pursued, central banks will have to do so much more

explicitly.

In the Appendix, I have extended the standard stability analysis to allow for the

distinction between short and long-term bonds, and for the expectations theory of the

term structure. This analysis confirms the intuition that the central bank cannot

completely avoid the zero-lower-bound constraint for the short rate just by conducting its

open market operations in the long market. The term-structure arbitrage condition ensures

that the constraint on the short rate still gets in the bank's way. Indeed, it macro stability

is still very much threatened. This analysis does not support the notion that quantitative

or credit easing brings sufficient new ammunition to the central bank to allow it to operate effectively when the zero-lower-bound constraint is binding.

We end this section by agreeing with DeLong (2009): "when you have only two tools left, neither of which is perfect for the job, the rational thing is to try both - credit policy and fiscal policy - at the same time." But we have yet to document the fiscal-policy part of this conclusion. How might it help - despite the "disruptive side-effects" that DeLong acknowledges. It is to this question that we turn in the next section.

3. Fiscal Policy and the Crowding-Out Problem

As already noted, the idea with fiscal policy is to bring some spending forward in time so that the current position of the aggregate demand curve can be shifted to the right - making the economy less reliant on its self-correction mechanism and monetary policy. But there are several possible impediments: If the government offers a tax cut, will households and firms choose to spend the increase in disposable income, or will they be so worried about income prospects that they choose to save these funds instead? If the government raises spending on such items as infrastructure, will implementation lags so delay the stimulus that much of it occurs well after the recession is largely behind us? Whatever the initiative chosen by the government, the resulting budget deficit will raise the national debt. If the higher debt remains indefinitely, distortionary taxes will need to be levied to cover the interest payment obligations, and these distortions will lower living standards. Alternatively, if the debt is worked down later, that contractionary stance of future fiscal policy will slow the economy's recovery. These concerns are addressed in the remaining sections of the paper. Which specific fiscal initiatives can best eliminate

implementation lags and minimize uncertain private-sector responses are considered in the next section. Questions concerning how initiatives are financed are the present focus.

Let us begin by considering a lump-sum tax cut financed by issuing new government bonds. If some households are liquidity constrained - spending their entire disposable income as they live "hand to mouth" as Mankiw (2000) puts it - the current tax cut will increase aggregate demand. Mankiw estimates that roughly half of US households live hand to mouth. But what reaction can we expect on behalf of the remaining households? If they are not liquidity constrained, and their decisions are made on an ongoing family-dynasty basis, the permanent-income theory of consumption applies. For these households, higher bond holdings represent both an opportunity to receive higher interest payments and an obligation to pay higher future taxes to cover those interest payments - with both these incoming and outgoing flows of funds having the same present value. Thus, the exchange of present taxes for future taxes involves no change in net wealth, so nothing of interest in the macro economy will be affected by such a fiscal policy - as far as these households are concerned. This particular implication of the permanent-income hypothesis is known as the Ricardian Equivalence proposition. Of course, this proposition cannot be literally true, since (as already noted) some households are not able to borrow, and others have no children. As a result, these individuals do not value future taxes as much as they do current taxes. The relevant issue is whether Ricardian Equivalence is approximately true.

Despite the direct evidence provided by Mankiw, a more common method of examining this question is by running regressions based on Blanchard's (1985) extension of Ramsey's (1928) version of the permanent-income hypothesis:

$$C_{t+1} = (1 + r - i)C_t - d(d + i)B_t$$

This relationship involves next period's consumption, C, depending on this period's

consumption and this period's non-human wealth (in this case, the stock of government

bonds held by households, B). The three parameters are r, i and d: the interest rate, the

rate of impatience, and the death probability (respectively). In Ransey's model, all agents

live forever, or it is as if they do, since they love the next-generation individuals just as

much as they do themselves, so $d = 0$. Blanchard's extension allows us to consider a small

death probability; for example if 2% is the annual death rate of members of the

population that do not value the lives of those in the next generation that replace them,

then $d = 0.02$. In addition, if all individuals have an annual rate of time preference, i,

equal to 4%, then the coefficient on the government bond variable in the above equation

can be expected to be $(0.02)(0.02 + 0.04) = 0.0012$. The standard test for the applicability

of Ricardian equivalence is whether this regression coefficient is statistically significantly

different from zero. It is asking a lot of aggregate time series regressions to distinguish a

tiny number like 0.0012 from zero, so it is not surprising that this is the result that is

usually found. This is taken as support for Ricardian Equivalence. But when pooled time

series and cross-section evidence is used (Evans (1993)), the increased variation in the

data is sufficient to reject Ricardian Equivalence. And the degree of departure from

Ricardian Equivalence is economically, not just statistically, significant.

Given this evidence, I find it curious that discussions of the relevance of fiscal

policy invariably begin with Ricardian Equivalence as the reference base. Further, it must

be remembered that it concerns only tax policy and lump-sum taxes at that. So even if

pure Ricardian equivalence were true, it would still be the case that bond-financed

changes in program spending, or in distortionary taxes, could affect the economy. So let us now focus on government spending.

The traditional concern with higher government spending is that it may simply replace pre-existing private-sector spending - instead of adding to aggregate demand. This possibility is known as the "crowding out" effect, and it is regarded as a fundamental constraint by analysts at the Fraser Institute (see Veldhuis, Lammam and Palacios (2009)). They state that "any increase in spending will be offset by less activity in other areas of the economy." Because the "stimulus" spending is financed by deficits, they argue that "the government will take money from some Canadians (those buying government bonds) who will then have less to spend and/or invest in the private market." It appears that Fraser analysts discount the relevance of Blinder and Solow's (1973) classic analysis entitled "Does Fiscal Policy Matter?" They considered what was then the standard model of aggregate demand - *IS-LM* - and combined it with a government budget constraint (bond issue at each point in time must equal the current deficit). Since they did not assume Ricardian Equivalence, Blinder and Solow focused on what had been left out of traditional Keynesian demand theory - the fact that both the *IS* and *LM* curves must shift up as more government bonds are issued. They noted Friedman's prediction (echoed by the Fraser Institute) - that the end point would likely be one that was essentially perfectly above the initial one. If true, this would mean that an attempt to provide fiscal stimulus would result in just pushing up interest rates and having no lasting effect on the level of overall spending. Blinder and Solow showed that such an outcome is not logically possible within the model. Either the fiscal policy has to be expansionary, or the economy must be unstable. Their reading of empirical applicability questions

caused them to focus on the must-be-expansionary outcome. This was unfortunate since we now know that such models - assuming as they do that the interest rate exceeds the growth rate - involve instability. Perhaps this is why critics of fiscal stimulus today write as if the Blinder-Solow analysis never appeared.

Given the disconnect summarized in the previous paragraph, it is important that we consider an updated version of Blinder and Solow, so this is what is reported in the remainder of this section of the paper. In contrast to the earlier work, the present analysis involves variable prices, model-consistent expectations, an up-to-date Taylor-rule specification for monetary policy, and dynamic stability. As a result, it is hoped that it can be less readily dismissed by fiscal-stimulus skeptics. Perhaps an additional reason to anticipate this reaction is that the support it provides for Keynesian policy is somewhat limited. The formal model is sketched in the Appendix, and more extensive discussion is available in Scarth (2007). Here, I explain just the broad outline of the analysis.

I focus on the most basic question in Keynesian economics: Should the government balance the budget at all times, or over the time frame of one full business cycle? I consider a one-time permanent drop in aggregate demand, and compare two fiscal regimes. Neither involves any change in the tax system, so Ricardian Equivalence issues do not come up. In the first regime, the government rejects Keynes and maintains its commitment to balanced budgets by cutting government spending at the very time that the private-sector drop in demand occurs. This response makes the size of the initial recession bigger. But, as the economy recovers and tax collections start rising again, the government in this regime is able to bring program spending back up, and this speeds the recovery from the temporary recession. In the second regime, the government follows

Keynesian advice. It does not cut program spending when tax collections deteriorate in the recession. By maintaining higher spending (that is, by providing stimulus) compared to the other regime, the government ensures that the initial recession is smaller. But, since the deficit has to be covered by bond issue, the government needs to work the debt level back down later on. This results in program spending being smaller than otherwise as the recovery proceeds and this slows down the recovery. Overall, the Keynesian regime involves short-term gain for longer-term pain, and this is summarized in Figure 2.

The outcome in the Keynesian regime is shown by the solid output time path, while that for the always-balanced-budget regime is shown by the dashed output time path. The Keynesian policy makes the initial recession smaller, but this recession dissipates at a slower rate. In the short run, people would prefer to live under the Keynesian regime, but later on they would prefer the alternative. Since the model can be calibrated in a simple and reasonably non-controversial way, we have used it - along with representative parameter values - to calculate the two areas shown in Figure 2 - that between each actual real output time path and the natural-rate line. The initial recession turns out to be 33% larger when the Keynesian policy advice is rejected, but the overall output loss over the entire time period is only 2% greater in this case. So, *if* the future is *not* discounted relative to the present, the short-term gain involved in the Keynesian approach is almost fully cancelled off by the long-term pain, so there is only modest support for the Keynesian approach. Nevertheless, we *should* discount, so the analysis does support Keynes, but perhaps to a lesser degree than what Keynesians would have presumed. I conclude that fiscal policy can make at least some contribution to combating today's recession, and so a prudent government would embrace at least some stimulus.

Before closing this section, it is worth commenting on the actual size of our government's fiscal initiative, and on the assumed size of the fiscal policy "multiplier" that is used in various analyses. The calibration reported above implies a one-year government spending multiplier on overall real output of 1.5. According to Barro (2009a) this is the assumption used by Team Obama, and Barro regards such a number as dramatically too big. So much so, that he borrows the "voodoo" economics label that was applied to supply-siders in the 1980s and attaches it to those currently backing fiscal stimulus. Barro estimates that the extra military spending that occurred for a few years in the 1940s resulted in a temporary rise in real *GDP* above trend equal to about 80% of the government spending increase. Thus, he thinks that 0.8 is as high as we should go with a multiplier estimate, and that we would not go too far wrong if we opted for a zero value. This would make stabilization policy analysis consistent with the standard assumption involved in benefit-cost analysis applied to a fully employed economy. Going this far is inappropriate, however, since resources are available in a recession. Barro's estimate from the 1940s can be questioned, both on the grounds that there were no idle resources in the US at that time, and on the grounds that households were strongly encouraged through an appeal to patriotism to save their incomes during the war.

The Canadian evidence on the estimated one-year government spending multipliers is summarized in Mankiw and Scarth (2008, 336-338). Early estimates were in the 1.5 range, but more recent results indicate a multiplier in the range of 0.50 to 0.75. These estimates are smaller than many analysts expect for at least two reasons. First, with monetary policy increasingly focused on targeting inflation, the Bank of Canada can be counted on to keep the output gap equal to what they think is needed to deliver the

desired inflation rate. If anything - such as an increase in government spending - closes that gap "too much" the Bank immediately takes steps to open it again. This very much limits the government spending multiplier. The second consideration is exchange-rate crowding out. The Mundell (1963)-Fleming (1962) result - that fiscal policy has very little effect in a flexible exchange rate setting - has become increasingly relevant as Canada has more fully embraced truly floating exchange rates, and the more fully mobile capital has become internationally.

I have calibrated the model presented in the Appendix so that it is consistent with the earlier multiplier estimate of 1.5 for two reasons. First, it is not reasonable to expect the Bank of Canada to offset fiscal initiatives at this time; second, with a similar recession (and similar fiscal initiatives being applied) throughout the western world, there is no reason to expect Canadian interest rates to rise along with our stimulus. As a result, the exchange-rate crowding out mechanism is not likely to be important in the present situation.

Our federal government's policy involves running a deficit of almost $30 billion in each of the next two years - compared to a policy of maintaining the pre-existing plan (a balanced budget). For a rough calculation, let us assume that half of this increase in the deficit represents discretionary policy. Thus, if their initiative is $30 billion and if the recession would have produced a fall in real GDP of 3% - roughly $40 billion, then - if the government expects its stimulus to be adequate - they are counting on a spending multiplier of about 0.75. So the government's plan does not seem to be based on a "voodoo" multiplier estimate.

4. Alternative Fiscal Instruments: Some Guiding Principles

One of the central applied questions concerns whether fiscal stimulus should involve temporary tax cuts or temporary spending increases. Once again, the permanent-income hypothesis is an important consideration. It implies that temporary reductions in income taxes will go mostly to higher savings. Since only limited higher spending can be anticipated, this initiative is not recommended. Indeed, the more temporary an income tax change is, the less it affects a household's long-run average income, so the more households use variations in their savings as a buffer that permits them to smooth consumption and avoid disruptions to their living standards. And all evaluations of the US initiative in 2008 indicate that the big effect was on saving, not on consumption. But does this clear verdict apply to all tax-policy initiatives? The answer is "no." As an alternative, the government can offer temporary changes in sales taxes. This fiscal policy is not designed to affect households by changing their perception of their long-run average income. Instead, it is designed to affect the timing of their replacement expenditures on durables. In this case, the more temporary are the tax changes - the more they affect the timing of expenditures that were going to be made fairly soon in any event.

It has been said that - to be appealing - a fiscal stimulus should be "temporary, timely and targeted." *Temporary* – since the recession will not last indefinitely, *timely* – so that the initiative kicks in now when we need it, not later on when aggregate demand has largely recovered, and *targeted* – so the government's limited funds can be directed to those most in need. It would appear that vouchers - that have value only as waivers for *GST* obligations - and that expire (say) by mid 2010 - would do the trick. They are

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temporary (and can be believed to be temporary), and they can be targeted - since they can be distributed only to relatively poor families. Finally, they can be timely as well, since they can be distributed without much lag and new administrative arrangements. With public expenditure projects, on the other hand, even though they can be temporary and targeted to very desirable goals, they are almost never timely. The evidence is that it takes an average of 18 months passing before actual spending starts (given lags in tendering, etc). In comparison, the suggested *GST* policy seems particularly appealing. It is difficult to avoid the conclusion that - by opting for unjustified permanent cuts in the *GST* in earlier budgets instead focusing on temporary cuts in the most recent budget - the government has missed an important opportunity for pursuing better fiscal policy.

Other suggestions score well on the targeted and timely criteria but less well on the temporary maxim. For example, Edlin and Phelps (2009) emphasize Phelps long-standing call for tax credits paid to companies for their employment of low-wage personnel. They like this initiative since it focuses on job creation, it allows the private sector to identify the jobs, and it puts upward pressure on the level of market wages for unskilled individuals generally. I like it too, since in Scarth (2005) I showed how this policy - *even* when financed by a distortionary tax on interest income - could help us pursue *both* our equity and efficiency goals simultaneously. In a simple endogenous growth model with unemployment, this policy is pro-efficiency since it attacks the labour-market failure at source. With lower unemployment, physical capital has more human capital with which to work, so the ongoing growth rate of living standards for both rich and poor increases. But as much as I favour Phelps' initiative as a desirable policy for addressing poverty via making employment more rewarding, I must admit that

it scores poorly on the temporary criterion. Surely, the merits of Phelps plan lead to our wanting to embrace it on a permanent basis. Thus, to move ahead with it now, we must simultaneously identify how it would be financed on an ongoing basis.

5. Fiscal Policy and Confidence Effects

According to Barro (2009a), the fundamental problem with any fiscal stimulus is that it is based on the proposition that "the government is better than the private market at marshalling idle resources to produce useful stuff." Barro thinks that this proposition is obviously false. One reason why Barro's view may be appealing is that there is no crowding out effect associated with private expenditures such as firms' investment activity. Firms finance much of such expansion by issuing equities. For one thing, there are no required interest payment obligations associated with this method of finance (as there is with government bonds). For another thing, firms dilute the ownership of the firm only when proportionately more funds can be raised than are necessary to finance that expansion (that is, when Tobin's stock market valuation ratio exceeds unity). But that is just the point; Tobin's q does not exceed unity during recessions, so the private sector is not better at marshalling *idle* resources.

In a comment on Barro's paper, Hill (2009) notes that "the problem now facing us is the lack of a truly comprehensive futures market in which firms with excess capacity and workers with excess leisure could make conditional commitments". In his rejoinder, Barro (2009b) indicates that such a vague appeal to a multiple-equilibria model, in which fiscal policy might help select a desirable equilibrium, is unappealing. But explicit models of this sort *have* been worked out (for example, Woodford (1991) and Howitt and

McAfee (1992)). These analyses involve thorough-going micro-foundations and rational expectations. In these models, the elimination of cycles is welfare-improving, and it may be possible for the government to achieve this outcome solely by committing to intervene if ever necessary. Knowledge of that commitment may be sufficient to cause agents to expect (and therefore achieve) a non-cyclical equilibrium. In short, Barro's dismissal of this work is unconvincing, and it is especially surprising given his fundamental contributions in a related literature - the role of commitment in defining a dynamically consistent monetary policy (Barro and Gordon (1983)).

6. Conclusions

This essay has summarized the debates surrounding the need for fiscal stimulus at this time. It has accepted the proposition that stabilization policy is best left as much as possible to the economy's self-correction mechanism and to monetary policy. Further, central attention has been given to the complications that accompany fiscal stimulus - such as the undesirable effects of the increase in government debt that must accompany deficit-financed initiatives. Despite these biases, we conclude that a prudent government should embrace a stimulus policy at this time. While the recent Budget is therefore supported by the analysis in this broad sense, we have identified at least one particular policy option that would have been a preferred way to implement the stimulus.

Appendix

The following equations define the models that are referred to in the text. The notation and the rationale for each relationship is explained following the list of equations.

$$(y - \bar{y}) = -\alpha(R - \bar{R} - \pi) + \beta(g - \bar{g}) \tag{1}$$

$$r = \bar{r} + \theta(p - \bar{p}) \tag{2}$$

$$\dot{p} = \phi(y - \bar{y}) + \pi \tag{3}$$

$$\dot{\pi} = \lambda(\dot{p} - \pi) \tag{4}$$

$$\dot{R} = \bar{R}(R - r) \tag{5}$$

$$(g - \bar{g}) = (\tau/\beta)(y - \bar{y}) \tag{6a}$$

$$(g - \bar{g}) = ((1 - \tau)\delta/\beta)(b - \bar{b}) \tag{6b}$$

$$\dot{b} = (\bar{R}\tau/\delta)(y - \bar{y}) \tag{7}$$

y, p, g and b denote the logarithms of real output, the price level, government program spending and the stock of government bonds, while r, R, τ and π denote the levels (not the logarithms) of the short-term nominal interest rate, the long-term nominal interest rate, the proportional income tax rate and the expected inflation rate. All slope coefficients are positive, and dots and bars above variables stand for time derivatives and full-equilibrium values (respectively).

Aggregate demand depends inversely on the long-term real interest rate and positively on government spending (equation (1)). Monetary policy is defined in equation (2): the short-term nominal interest rate is set above (below) its full-equilibrium value whenever the price level is above (below) target. Actual inflation is determined by a standard expectations-augmented Phillips curve (equation (3)) and expectations of

inflation are revised adaptively (equation (4)). These are the only four relationships involved in the initial analysis of monetary policy and the economy's self-correction mechanism. In this basic case, I follow Tobin (1975) in equating the short and long bond rates. As a result, the only difference is that the monetary authority sets the interest rate in pursuit of a price-level target here, while in Tobin's analysis the central bank sets a constant money supply. The model's stability condition is $\theta > \lambda,$ and this condition cannot be satisfied if the lower-bound-constraint limits the central bank's ability to decrease the interest rate during a recession.

I consider the long and short interest rates not being identical as a sensitivity test. The former is what affects aggregate demand, while it is the latter which has - up until now - been what is manipulated by the central bank. I follow the convention in macro modeling by assuming that the long bond is a consol. In this case, when the standard term-structure relationship (that the long rate is a weighted average of all expected future short rates) is differentiated with respect to time, we get equation (5). In this extended model, the convergence requirement is somewhat easier to satisfy. The central bank's aggressiveness parameter must still be positive (so the zero-lower-bound constraint is still sufficient to preclude stability), but that parameter, θ, does not need to be as large as the expectations-revision parameter, λ, in this case.

Finally, I adapt the specification of monetary policy so that it is consistent with what central banks are now starting to do. In this case, the bank enters the long bond market (with open market operations there in an attempt to affect the long rate directly there) instead of entering the overnight market in an attempt to affect the long rate indirectly. This re-specification involves replacing r with R in equation (3). Once again,

the stability condition is $\theta > \lambda,$ as long as the lower-bound constraint is not binding, and once again, stability is not possible if it is. Central banks have been hoping that by shifting their focus to the long bond market in this way (that is, by embracing quantitative easing) they can have additional ammunition for dealing with the zero-lower-bound problem. The present analysis does not provide support for this hope.
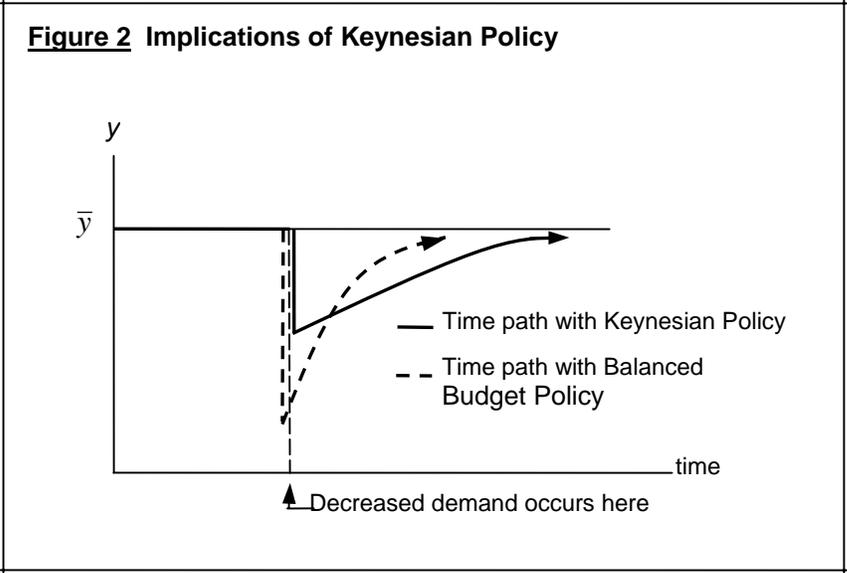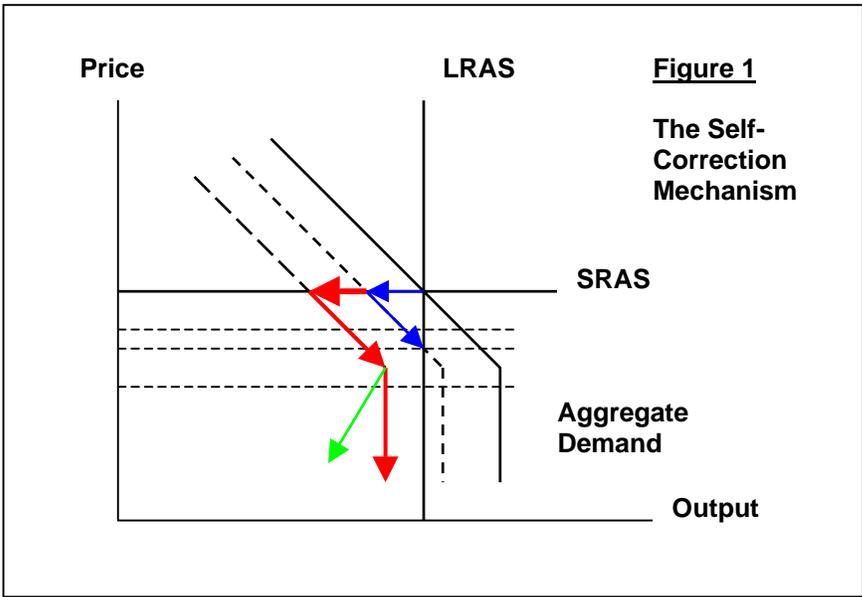
The remaining equations are added to allow the model to be used to defend the conclusions reported in the text concerning fiscal policy (in section 3). Since this application involves an additional source of dynamics - that the change in the stock of government bonds outstanding must equal that period's budget deficit - I have simplified the dynamics in the basic model slightly. In particular, π in equation (1) has been replaced by $\dot{p},$ π in equation (3) has been replaced by $\dot{\bar{p}},$ and equation (4) has therefore been dropped. For a full explanation of the equations that define fiscal policy (equations (6) and (7)) readers are referred to Scarth (2007) section 7.5, but I provide a brief summary here.

Two fiscal policy regimes are compared. In the first, the government rejects the Keynesian approach and balances its budget at every instant by cutting program spending during recessions and raising spending during booms (equation (6a)). In this case, the stock of government bonds is constant. In the second policy regime, program spending varies less over the cycle; it varies just enough to keep each period's budget deficit independent of any change in the pre-existing level of interest payment obligations. This ensures that the standard stability problem that emerges with bond-financed fiscal policy in settings involving a positive interest rate and zero growth is not relevant here. Nevertheless, in this (responsible version of a) Keynesian regime, the government runs a

deficit when output falls below the natural rate, and it works the correspondingly higher

debt level back down later on. Equation (6b) defines the adjustment in program spending

that is undertaken to limit the initial growth in debt to avoid stability problems. Equation

(7) defines the ongoing set of changes in the stock of bonds that is set in motion once a

disturbance pushes the economy away from the natural rate. Parameters β and δ are the

full-equilibrium ratios of program spending and government interest payment obligations

to *GDP*.

I consider a drop in aggregate demand (a one-time permanent cut in the target

price level) and I calculate three summary measures in each of the two fiscal regimes. I

derive the size of the immediate effect on real output, the speed with which this

temporary recession dissipates, and the cumulative undiscounted output loss (the ratio of

the first two measures). There is both a benefit and a cost of adopting the Keynesian

policy over the constantly balanced budget approach. The "good news" is that the initial

recession is smaller in the Keynesian case since the traditional "built-in stabilizer" feature

of a cyclically changing budget balance is allowed to operate. But what this dynamic

analysis clarifies is that there is "bad news" as well, since the higher government debt

must be worked down later on, and this contractionary influence slows the speed of the

economy's recovery. The expressions that emerge allow me to illustrate the magnitudes

of these competing effects, since only a few (not particularly controversial) parameters

are involved in the multiplier and adjustment-speed formulae. In line with standard

calibrations in the literature, I assume the following representative parameter values: $\phi =$

$\tau = 1/6$, $\alpha = 2$, $\overline{R} = 0.05$ and $\theta = 1$. These values make the impact multiplier 33% larger

in the balanced-budget fiscal regime, but the cumulative output effect is only 2% higher

in this case. This illustrates that the "bad news" aspect of the Keynesian regime is almost as big as the "good news" feature. Nevertheless, since the good news arrives early and the bad news arrives later on, the analysis does provide some support for the Keynesian approach to fiscal policy.

Figure 1

The Self-Correction Mechanism

Price — LRAS — SRAS — Aggregate Demand — Output

Figure 2 Implications of Keynesian Policy

y

$\bar{y}$

Time path with Keynesian Policy

Time path with Balanced Budget Policy

time

Decreased demand occurs here

25

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