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## **The Theory of the Fiscal Stimulus: How will a Debt-financed Stimulus affect the Future?<sup>1</sup>**

This paper takes a close look at the Keynesian theory underlying the policy of fiscal stimulus being undertaken or considered in many countries, led by the United States. A central question is whether a debt-financed fiscal stimulus now must adversely affect future taxpayers owing to the debt burden being created. There are many interesting issues considered, for example, the role of automatic stabilizers, and the basis for Keynes' paradox of thrift. The model used is for a single country with a floating exchange rate. It is assumed that, for various reasons, monetary policy cannot eliminate high unemployment and a resultant *output gap*. In fact, there is a market failure, which government action needs to compensate for, at least temporarily.

### **I The Main Story**

We start with an *output gap*. Actual output is below potential output. The latter can be defined as maximum output consistent with low inflation. Aggregate demand is insufficient. There are various possible reasons for this, one being that there is a credit crisis of the kind that initiated the current world output gap, and that prevents monetary policy on its own from eliminating it. The aim of the *fiscal stimulus* is to reduce or eliminate the output gap.

I am assuming – realistically for the United States and for Britain in 2009 – that the average levels of domestic prices of goods and services and of nominal wages are (more or less) constant.

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<sup>1</sup> This is a revised version of CEPR Policy Insight No 34 (2009), available at [www.cepr.org/pubs/PolicyInsights](http://www.cepr.org/pubs/PolicyInsights). I am grateful to Peter Sinclair, Christopher Smallwood and David Vines for suggestions in writing the original paper.

## The Stimulus and the Leakages

Let us assume that the fiscal stimulus consists of government expenditure on infrastructure and similar capital works. These public investments are of two kinds, namely  $I_1$  and  $I_2$ .  $I_1$  has a significant positive marginal social return. By contrast,  $I_2$  consists of building “bridges to nowhere” and other useless expenditure, thus having a zero rate of return. The latter are justified by their employment creating or vote getting potential.

The fiscal stimulus creates a budget deficit that is additional to any existing deficit or surplus. We are concerned here purely with the effects of the fiscal stimulus and not the existing situation, except that the latter yielded an output gap. The new deficit has to be financed, and this will be achieved by selling government bonds. But who will buy them? I shall come to that important issue below.

Next we come to the Keynesian multiplier. The stimulus will increase demand for domestic private sector output, and so raise incomes by  $Y_1$ . This will lead to further spending on domestic goods, and so on. This is a textbook story. At each stage there are leakages from the income stream, namely into taxation, into savings and into imports. What is left after the leakages leads to further spending on domestic goods and hence a further rise in  $Y$ , and hence a further decline in the output gap. In the final equilibrium (as any good textbook explains) the sum of the leakages – namely the sum of all the increases in tax revenue ( $dT$ ), savings ( $dS$ ) and imports ( $dM$ ) – will be equal to the original “injection” into the income stream, namely the new budget deficit caused by the fiscal stimulus ( $dF$ ).

$$dF = dT + dS + dM$$

The additional tax revenue that is raised will reduce the financing need of the original stimulus, yielding the “net” stimulus. This tax revenue can thus be subtracted from both sides of the equation, so that the net stimulus is equal to the sum of additional saving and of additional imports.

$$dF - dT = dS + dM$$

We now come to an assumption and an argument that is crucial – and not unrealistic – at this stage. I assume that the country has a market-determined floating exchange rate, that net international capital flows as a result of the stimulus are zero, and that, therefore, the exchange rate will ensure that the current account balance stays in its original position. Any increase in imports must then lead to depreciation of the exchange rate,

which will bring about a rise in exports, as well as some reversal of the rise in imports, so that there is no change in *net exports*.<sup>2</sup> It follows that any reduction in demand for domestic goods caused by a leakage into imports will be offset by an increase in demand for domestic goods caused by a rise in exports. At every stage of the multiplier process the exchange rate will depreciate because of the rise in imports, and thus exports will also increase. These two effects together – the rise in imports and the rise in exports – will then have a zero effect on the multiplier<sup>3</sup>. We thus get the simple relationship

$$dF - dT = dS$$

where  $dF$  is the initial stimulus,  $dT$  is the increase in tax revenue, so that the LHS is the net stimulus that has to be financed, while  $dS$  is the total increase in savings. The savings assumption is the standard Keynesian one that there is a positive marginal propensity to save. It does not have to be constant, but it must be positive and (at this stage of the analysis) below 100%. Various alternative savings assumptions will be considered in Part II of this paper. Here it might be noted that if the marginal propensity to save were zero the multiplier would be infinite: in that case demand would implausibly expand to an unlimited extent as a result of an initial stimulus.

## **The Financial Flows**

So far there has been an increase in public investment but no change in private investment. The increase in private demand has gone wholly into private consumption. Together the rise in public investment and the rise in private consumption have absorbed the increase in output brought about by the fiscal stimulus.

Let us now consider the financial flows. When the government sells the bonds that finance the fiscal stimulus the buyers could be on the world market – if there were international capital mobility – they could be

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<sup>2</sup> The depreciation must be not just nominal but also real. Bearing in mind that nominal wages are assumed (more or less) constant, this means that the real wage must fall. I am assuming that there is no offsetting rise in nominal wages designed to compensate for the rise in the domestic prices of imports.

<sup>3</sup> This analysis does not apply to the countries that are members of the Eurozone, or indeed any other country that chooses to maintain a fixed exchange rate. Many of the points made in this paper are relevant to Eurozone countries, but a further paper would need to explore the unusual case where fiscal policy is wholly under the control of component parts of the group (but subject to common rules) while monetary policy is unified under one central bank. A fixed rate regime clearly implies that one country's own stimulus must also stimulate other countries, so that its multiplier is less than it would be if it were in the floating rate regime as described here.

domestic savers, or they could be the central bank. As for the savers, they could buy the government's bonds, or buy foreign bonds or equities. They could also buy private domestic bonds, though these will already be held somewhere in the private sector. The main conclusions at this stage are two. (1) Because of the budget deficit resulting from the net fiscal stimulus the taxpayers will acquire a liability in the form of having eventually to redeem the bonds that were issued to finance the deficit. (2) Private savers will acquire assets in the form of bonds or equities as a result of the increases in income caused by the same fiscal stimulus<sup>4</sup>.

### **How will the Future be affected? The Conservative Allegation.**

We can think of a two-period model. The first period is the period when there was initially an output gap and when the fiscal stimulus raised output and incomes. In this period there was clearly a net gain through higher private consumption. The second period is "the future" when output and incomes would have recovered even in the absence of a fiscal stimulus, or possibly because of an earlier fiscal stimulus.

The key question is *whether the people living in the second period would be adversely affected because of the fiscal stimulus practised in the first period*. In shorthand, and admittedly applying some bias, I shall call this *the Conservative Allegation*. If one only took into account the taxpayers' liability in the second period, as is common, the "Allegation" would be correct. But two elements of the story have been completely ignored.

Firstly, there is the total value of the bonds (and equities) acquired by the savers as a result of the rise in incomes brought about by the stimulus. These are assets, and it has been shown that their value is equal to the bonds issued by the government to finance the stimulus, which are the taxpayers' liabilities. Hence here is a set of assets that exactly offsets the liabilities on which conservative critics of stimulus policies have focused.

Secondly, one must allow for the reasonable possibility that some of the extra public investment that took place in the first period as part of the fiscal stimulus turned out to be socially productive (took the form of  $I_1$ ), and thus became a positive legacy from the first period to the second period.

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<sup>4</sup> If the government's bonds are sold internationally, or the savers buy foreign bonds or equities, there will be capital inflow or outflow. This complicates our story here, and requires some modification of the assumption above that net capital flows as a result of the stimulus are zero. Essentially capital flows and the multiplier effect of a stimulus are simultaneously determined.

Of course some individuals and households will be net gainers and some net losers, since savers or their heirs will not be precisely identical with taxpayers. Furthermore, not everybody in the second period will necessarily be a beneficiary of the first-period public investment. But an overall view of the impact of the stimulus policies on the future must surely not ignore these two factors, which suggests that there is a likelihood of net gain.

Taking an overall view, one can conclude as follows. As a result of the fiscal stimulus, output and hence incomes in the first period went up. This led to increased consumption, which benefited persons living in the first period, and it also led to increased saving, which benefited persons living in the second period. At the same time the adverse effect on taxpayers of the tax liabilities passed on from the first period to the second period would be partly balanced by the favourable effect of the public investment that was induced by the same fiscal stimulus. Indeed, if the social rate of return of this investment were equal to the rate of interest that applied to the tax liabilities, these two – the tax liabilities and the benefits of first-period public investment - would be completely offsetting.

## II Complications

### **Money financing of the Deficit. Another Conservative Allegation**

The government might sell some of its new debt directly to the central bank, which would thus increase the money supply by providing credit to the government. This was done both in the United States and the United Kingdom in 2009. Since the central bank is really part of the government, and its profits go to the government, this means that one part of the government is just borrowing from another part, so that the government debt held by the public does not increase to the extent that it is held by the central bank. It means that taxpayers' liabilities in period 2 do not increase to that extent.

The same result can also come about in the following way. Sales of public debt in the market will tend to raise interest rates initially, before higher savings resulting from the growth of incomes caused by the fiscal stimulus increases the demand for debt. If the central bank is committed to a low interest rate policy (as the central banks of the US and UK have been), it will then need to buy some of the debt in the market so as to

keep the interest rate at the target level. The net result is the same as when the government borrows directly from the central bank.

If inflation is to be avoided the money supply can increase as long as the demand for money increases, and the demand for money will increase because of the rise in incomes brought about by the stimulus.

Here one should take note of another Conservative Allegation. It is that money-financing of the deficit must be inflationary. If that belief were prevalent, then inflationary expectations would be generated by the money-financing policy, and long-term market interest rates would rise. It is true that most long-running inflations, notably (but not only) in Latin America, have resulted from “fiscal dominance”. Deficits have been money-financed, and they have been politically determined. Hence monetary policy has been dominated by fiscal policy. But this is not the current “credit crunch” situation.

The channel through which money and credit reach the “real” economy is normally through private banks, and even when the central bank has charged very low, near zero, interest rates to the banks, credit to the private sector has been very tight. The private financial system has been “clogged up”. Indeed, this is the main reason why an output gap developed initially. This effect on its own reduces aggregate demand and is liable to be deflationary. When the central bank lends to the government, and the government then spends the funds, the government is simply substituting for the private sector. The government provides an alternative channel for money and credit to flow to the “real” economy. By simply avoiding a decline in aggregate demand and thus possibly deflation (or counteracting a decline that has already taken place) the effect is not necessarily inflationary. One is not causing a flood by hosing down a fire.

It might be thought that a government could completely avoid an increase in public debt that is held outside the central bank. Why not finance the whole of the fiscal stimulus with bonds that are sold to the central bank? There would then be no increase at all of taxpayer liability in Period 2. While this is an attractive thought, it overlooks the following consideration. When the economy revives in Period 2 it will, or may be found that the increase in money (or “liquidity”) brought about in Period 1 has been higher than desirable for Period 2. There will be a danger of inflation. The interest rate will then be raised, and the central bank will sell bonds to the public, in this way reducing the money supply. Thus the public will end up holding more bonds as a result of the original stimulus

and this will create a taxpayer liability when the bonds are redeemed, just as in the case where the bonds were directly sold to the public by the government.

## **High Private Savings**

There are at least two reasons why households, small business, and private corporations are likely to have high marginal propensities to save at a time of recession. I am describing here the situation in 2009.

Firstly, they are recovering from a housing market or stock market bubble, and need to pay off excessive debt. In other words, they are trying to improve their balance sheets, which have been distorted by over-priced real estate or stock market valuations. They are simply being prudent. The effect of a consequent reduction or even cessation of borrowing has been called a “balance sheet recession” by Koo (2003). Once they have paid off their debts (including mortgage debt) they will start spending again.

Secondly, they are expecting a continued, and possibly, worse recession and want to protect themselves against the consequences. In particular, households expect increased or continued unemployment. Again, they are being prudent.

In addition, in many countries, notably Japan, high savings are motivated by demographic prospects, that is, the ageing of the population. This is probably the most important rational motive for saving over longer periods. One may also save to provide against unforeseeable catastrophes, such as those that would result from global warming or other environmental factors.

A confidence-inspiring fiscal stimulus - expected to be successful in reducing or avoiding the recession - may moderate the second kind of saving, namely those savings motivated by expectation of continued recession. Another kind of saving would have exactly the opposite effect. This is “Ricardian savings”, which is savings motivated by the expectation of future tax liabilities resulting from a current increase in government debt. Presumably, a stimulus policy, such as the one I have

been discussing, could conceivably (in the view of believers) lead to increases in such savings<sup>5</sup>.

From the point of view of Keynesian stimulus policies designed to reduce an output gap, high savings present an apparent problem. Let us take the extreme case where the marginal propensity to save is one hundred percent. All extra income received in the private sector would be saved. This means that the multiplier would be 1. The increase in income would be equal to the initial stimulus, with no additional multiplier effect<sup>6</sup>. Consider the two main forms the stimulus may take.

Firstly, if the attempted fiscal stimulus consisted of direct handouts to persons or corporations, or in tax cuts, there would be no increase in output at all. The handouts would simply be saved. Hence a Keynesian fiscal stimulus policy designed to raise output in period 1 would be ineffective.

Secondly, suppose the fiscal stimulus consisted of government investment, which was the case I presented in Part I of this paper. In that case the stimulus would raise output and employment in the first round, but – with a marginal propensity to save of one hundred per cent - there would be no further rounds within period I, since the higher incomes received would not be spent. Private savings would rise to the same extent as government spending, so that the offsetting effects – increased taxpayers' liabilities being offset by increased private financial assets - which I have described earlier for period 2 would still eventuate.

In this second case - where the government supplies funds to the private sector in return for buying real output - a fiscal stimulus policy could still be effective: the output gap could be reduced to any extent desired by continued government spending. Indeed, the spending need not be on investment; it could be on anything, provided it involved production of new output. Such spending could involve production by the private sector. It could be spent on production of consumption goods, or on military goods and services. It could take the form of financing private investment through subsidisation of banks – as indeed has happened in the United States and Britain.

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<sup>5</sup> I do not discuss Ricardian savings further. I believe that there is not much empirical support for this motivation for savings. I have formed my sceptical view on the basis of two cases, namely the United States 1980-87 and Japan 1993-2002. The theory of "Ricardian equivalence" is popular in the recent theoretical literature. See Mankiw (1994, pp. 423-31).

<sup>6</sup> The multiplier is defined as the ratio of the total change in income, including the subsequent multiplier effects, to the initial (direct) increase in income resulting from the stimulus.. See Mankiw (1994, pp.244-5).

The general point is simply that in the extreme case of the marginal propensity to save being one hundred per cent the multiplier would be just 1. If marginal savings were less than hundred per cent the multiplier would be greater than 1.<sup>7</sup> And when there is a multiplier greater than 1 the stimulus policy would bring about increased output of private consumption goods as determined by private demand, as described in Part I of this paper.

### **Keynes' Paradox of Thrift**

Keynes wrote about “the paradox of thrift” He had in mind a depression situation, where there is an output gap owing to shortage of aggregate demand. It is in the private interest to be thrifty and save, but it is in the general or national interest to consume so as to keep up aggregate demand. It is this paradox that lead an Australian Prime Minister to urge Australians to spend – to consume – the hand-outs that his stimulus package had given them, even when their prudence told them they should save. He told them that a recession was coming, and when the recession was over they would all have to tighten their belts to repay the national debt. They were confused: how can a Prime Minister urge them to be imprudent?

There is actually no paradox at all. It is in the national interest and not just the private interest to be prudent and provide for the future (period 2). It is also in the national interest to spend so as to produce output at capacity level now (period 1). How can the two objectives be reconciled? The answer is for the government or the private sector to increase investment spending in period 1. Spend now to raise output now, and provide for the future with investment. It is not consumption but investment spending that needs to increase if prudence requires it. If there is saving it needs to be converted into investment either by the government with its fiscal stimulus policy or the private sector through the market<sup>8</sup>.

In constructing a stimulus package it is a challenge for governments to find investments that (1) can be implemented quickly, (2) will be reasonably temporary, so that they (or particular stages) can be completed

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<sup>7</sup> For example, with a savings propensity of 80% the multiplier would be 1.25.

<sup>8</sup> Keynes recognised, of course, that the “paradox” resulted from investment not increasing sufficiently when savings increased. He believed that investment was not responsive to the interest rate, and that it tended to be positively related to current consumption – so that increased savings would actually reduce investment. All this is discussed in Skidelsky (1992, p 499).

within a few years, and (3) will lead to useful results in future years, bearing in mind the demands of an ageing society and the requirements of moderating or dealing with the consequences of likely environmental problems, notably global warming. With such demanding requirements governments should plan in advance, as indeed Keynes recommended many years ago. For a policy of flexible public finance- what Lerner (1947, Ch 24) called “functional finance” - such planning is essential.

### **The Automatic Stabilizers. The Need for Financing**

So far I have discussed *discretionary* stimuli. But there are also the *automatic stabilizers*, which are relatively more important in continental Europe than in the United States.

A recession will reduce tax revenues, and increase spending on unemployment benefits and other social payments. This assumes (1) that the actual rates of tax and rules for benefits of all kinds are constant, and (2) that resultant fiscal deficits are actually financed. The deficits will be “automatic” because they result automatically from a recession without any changes in policy or additional spending commitments. Reliance on the automatic stabilizers at a time of recession might be regarded as minimising government activism, and that is why conservatives who are often critical of discretionary stimuli, tend to approve of automatic stabilizers.

The crucial requirement is that the resultant deficits are actually financed. If there were no financing then there would really be nothing automatic. In the absence of financing, increases in tax rates, imposing new taxes, tightening of conditions for receiving benefits, and cuts in spending elsewhere in the budget would be needed to restore budget balance. In assessing the effects of automatic stabilizers one must compare the outcome with the alternative outcome that would result from a failure to provide finance. With financing, the public debt will increase, just as in the case of a discretionary stimulus. The various measures that I have just listed could be avoided. Relative to the alternative of absence of financing, private consumption, and possibly also private investment, would increase, and there would be a positive multiplier

The effects would differ in two ways from the possible effects of discretionary stimuli outlined in Part I of this paper.

Firstly, there would be no extra public investment, with the potential benefits such investment would yield in Period 2. Principally the

stabilizers (if financed) would yield a lesser decline in private consumption than would have taken place as a result of the recession in the absence of the stabilizers. Secondly, a sufficient discretionary stimulus could conceivably avoid or offset completely the effects of a recession. By contrast, the automatic stabilizers depend on there actually being a recession; therefore the stabilizers (if financed) could only moderate the effects on incomes. They could not eliminate the effects of a recession or a boom completely. Hence the stabilizers need to be supplemented by discretionary fiscal policy. Indeed, if the discretionary policies were fully successful the automatic stabilizers would disappear. The discretionary policies would have fully stabilized the economy.

### **How the Future would be Affected – continued**

In section I of this paper –“The Main Story” I laid out the key elements of the cost-benefit analysis for Period 2 effects of a fiscal stimulus in Period 1. Now I add some further thoughts.

The principal future cost not taken into account in the preceding analysis is that of the need to increase taxation because of the bigger public debt stock. The fiscal stimulus has provided the community as a whole with the extra financial resources to pay this tax - namely through the extra savings that the stimulus made possible. The extra economic cost consists only of the administrative and possible distortion costs (such as disincentive costs if based on income tax) of extra taxation.

One might also add a political or “perception” cost. Taxpayers will forget that they owe their extra financial resources to the savings that they made only because of the rise in their incomes resulting from the stimulus. These resources, of course, are only “extra” relative to the true counterfactual, namely a period of deep recession in Period 1. But taxpayers may forget this, and may take their financial resources as given, and thus resent the taxes.

I would put heavier weight on the future (Period 2) benefits from a fiscal stimulus in Period 1 that were not mentioned in the previous section. Firstly, there are the future benefits of extra private investment stimulated in Period 1 by the restoration of confidence. Secondly, there are the benefits from avoiding a depression in Period 1. Here we need only think of the Great Depression. What harm did it do that lasted into later years? First, prolonged and severe unemployment lead to a loss of human capital, in the form of work experience and the confidence that goes with it. Secondly, the Great Depression led to popular support for anti-

capitalist (or anti-free market) policies that in some countries went well beyond the need for them - an argument that should appeal to conservatives. Thirdly, it led to social unrest, xenophobia, and finally to Hitler and the Second World War.

### **Surpluses in Boom, Deficits in Recession**

To conclude, it is necessary to educate politicians and the public that in boom times there should be fiscal surpluses so that there can be deficits when recessions threaten. It is not inconsistent, but part of a logical policy framework, to swing from surpluses to deficits within a short period – as indeed was required in many countries within 2008. No virtue attaches to balanced budgets. This is the basic Keynesian fiscal policy message.

This was not understood at the time of the Great Depression, whether in the United States or in other countries, notably Weimar Germany. Budgets did at first go into deficit owing to the initial automatic effects. But instead of financing the deficits powerful efforts were made to reduce or eliminate the deficits, which, of course, worsened the unemployment situation, even though it may have brought back some confidence in the financial and foreign exchange markets.

The basic Keynesian message, designed to fully stabilize the economy, goes beyond allowing the automatic stabilizers to work through being financed. At a time of boom, when surpluses “naturally” develop through the automatic stabilizers, a discretionary policy of fiscal contraction should increase the surpluses further, and at a time of recession (or prospective recession) a discretionary policy of fiscal expansion should increase the deficits further. This is clearly counter-intuitive to people who believe that budgets should, as far as possible, always be balanced<sup>9</sup>.

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<sup>9</sup> Just before the crisis of 2008 Australia was fortunate in having an export price boom, which, as a by-product, yielded a budget surplus. Discretionary policy pursued by a conservative government was inappropriately expansionary, but still a surplus remained. Many people said to me: “why is the government hanging on to this money; after all, it is ours, and why not give it back to us in tax cuts” Now, in 2009, when a Labor government pursues a discretionary fiscal policy that is appropriately expansionary, and hence adds to the deficit that results from automatic stabilizers (notably reduced tax revenue resulting from the decline in export prices), the air is full of warnings about the danger of excessive deficits. I have no doubt that these issues and thoughts arise in other countries also.

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