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The limits to fiscal stimulus

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Abstract The paper considers the case for an internationally coordinated further fiscal stimulus during the second half of 2009. Although this makes some of the analysis period-specific, most of the issues and principles considered are timeless. For a fiscal stimulus to be both effective there must be idle resources due to a failure of effective demand. For it to be desirable, there must be no alternative policy instruments (including monetary policy) for boosting demand. There must be no complete financial crowding out and no complete direct crowding out, through Ricardian equivalence/debt neutrality, through Minsky equivalence or through a high degree of substitutability between private and public exhaustive expenditure in private preferences or production possibilities. Finally, for international coordination to be desirable, there must be cross-border externalities from national fiscal stimuli. The paper considers each of these conditions in turn.

Key words: fiscal policy, debt neutrality, Ricardian equivalence, Minsky neutrality, crowding out, debt sustainability

JEL classification: E4, E5, E6, F4, H3, H5, H6

I. Introduction

Is there a case for a further internationally coordinated expansionary fiscal stimulus? To be warranted, a number of conditions must be satisfied.

First, there must be idle resources—involuntary unemployment of labour and unwanted excess capacity. Output and employment must be effectively demand-constrained. Second, there must be no more effective way of stimulating demand, say through expansionary monetary policy. Third, expansionary fiscal policy must not drive up interest rates, either by raising the risk-free real interest rate or by raising the sovereign default risk premium, to such an extent that the fiscal stimulus is emasculated through *financial crowding out*. Fourth, at given interest rates, the expansionary fiscal policy measures must not be neutralized by *direct crowding out* (the displacement of private spending by public spending or of public dissaving by private saving at given present and future interest rates, prices, and activity levels). Such direct crowding out can occur in the case of tax cuts (strictly speaking, cuts in lump-sum taxes

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matched by future increases in lump-sum taxes of equal present discounted value) because of Ricardian equivalence/debt neutrality. In economies with very highly indebted households, debt neutrality can occur when taxes on households are cut, because of what I shall call 'Minsky equivalence' (see Minsky, 2008). Increases in public spending on real goods and services ('exhaustive' public spending) can fail to boost aggregate demand because of a high degree of substitutability (in the utility functions or the production technology) between private consumption and investment on the one hand, and public consumption and investment on the other. Fifth, there must be cross-border externalities from expansionary fiscal policies that cause decentralized, uncoordinated national fiscal expansions to be suboptimal.

This paper considers these issues in turn. The conclusions on the scope for further conventional expansionary fiscal policy *now* are rather discouraging in nations with high and rapidly rising public debt burdens, unless there is scope for political realignments that support coalitions in favour of significant *future* fiscal tightening through tax increases or public spending cuts. I also outline some unconventional fiscal/financial policies that may be effective in their own right and may help to enhance the effectiveness of conventional expansionary fiscal policy. Collectively, they can be characterized as the *equitization of debt*—household mortgage debt, bank debt, and public debt.

II. Idle resources

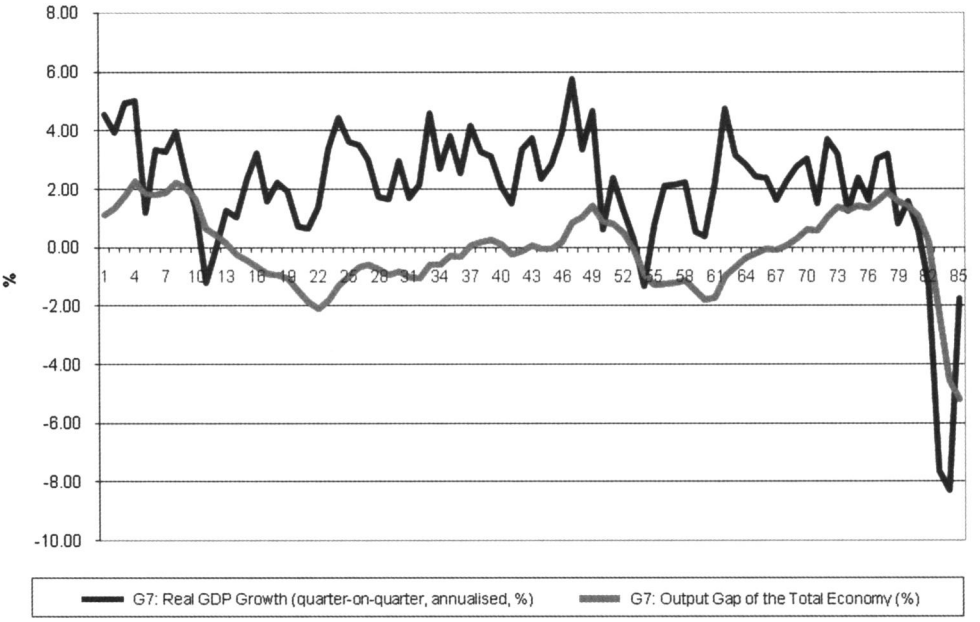
The first of these conditions, the existence of idle resources reflecting deficient effective demand, is clearly satisfied in the advanced industrial countries: at the time of writing (November 2009), unemployment throughout the industrial world is high and rising. Capital utilization rates are low and falling. Figure 1 summarizes the state of the G7 economies, indicating high and rising spare capacity; even though GDP is now growing again almost everywhere, it is growing more slowly than potential output, so unemployment will be rising in much of the industrial world for the rest of this year and much of 2010. In some countries, including the UK and USA, unemployment could still be rising in 2011.

The picture is rather better, although subject to considerable country-specific variation, among the emerging markets and developing countries, however. In the aggregate, emerging markets and developing countries now account for around 50 per cent of global GDP and trade. China's growth rate is reported to be well above 9 per cent again, at an annual rate, and India is growing fast and never even experienced much of a slowdown. Brazil is recovering briskly from a sharp decline in industrial production at the end of 2008. Other emerging markets and developing countries, such as Indonesia, also appear to have experienced only minor growth pauses. Individually none of these countries, not even China, is large enough to act as a global locomotive. Collectively, however, they are a powerful force for global recovery.

The strength of the emerging markets is, not uniform, however. Even among the BRICs,[1] Russia demonstrates, with a more than 10 per cent year-on-year decline in GDP, the vulnerability of some emerging markets to the interruption of global financial intermediation, the

[1] The BRICs are the four emerging market giants: Brazil, Russia, India, and China. The term was coined by Jim O'Neill, Chief Economist of Goldman Sachs.

Figure 1: Slack in the G7



Source: Organization for Economic Cooperation and Development.

decline in commodity prices, and the collapse of world trade.[2] Perhaps the BRICs should be re-labelled the BICs.

III. Monetary policy

As regards ways other than fiscal policy to boost demand, monetary policy in the advanced industrial countries appears to have been pushed about as far as is possible, unless governments undertake the (minor) institutional and technical reforms to permit them to set short nominal policy rates at negative values (see Buiter, 2009) as easily as at positive values. There appears to be no policy-maker interest in pursuing the possibility of extending the domain of the official policy rate to include negative numbers.

Exchange-rate changes (deliberate devaluations/revaluations in managed exchange-rate regimes or endogenous responses to policy actions or other exogenous shocks) are globally zero-sum as regards their effect on demand—they redistribute demand between currency areas. This does not necessarily mean that exchange-rate changes cannot be welcomed by all parties involved, but this will only be the case if the country with the depreciating currency has deficient aggregate demand, while the country experiencing currency appreciation has excess demand. Even more welcome would be the configuration of the country with the depreciating currency experiencing both deficient aggregate demand and an excessive trade deficit, while

[2] At the end of the second quarter of 2009, Russia's real GDP was 10.9 per cent below its level a year earlier (*source*: Federal State Statistics Service; http://www.gks.ru/eng/).

the country with the appreciating currency experiences both excess demand and an excessive trade surplus. Within the set of advanced industrial countries, such happy pairings cannot be found, but between the group of industrial countries and the group of emerging markets and developing countries, there may be some partial fits.

In what follows I look at monetary policy as working mainly through the official policy rate, through expectations of future official policy rates and through quantitative easing (QE), credit easing (CE), and enhanced credit support (ECS).

The official policy rates in much of the industrial world are very close to zero. The Federal Funds target is in a zone between 0 and 0.25 per cent; the Bank of Japan's target for the uncollateralized overnight call rate is 0.10 per cent; the Bank of England's Bank Rate is 0.50 per cent; the European Central Bank (ECB)'s main refinancing operations (fixed rate) stands at 1 per cent. From July to December 2009, the ECB made 1-year credit available on demand (against suitable collateral) at this rate. There is no good reason why all four official policy rates should not have been set at zero, from at least the end of 2008. In Japan and the USA this would not have made much of a difference, but 50 basis points in the UK and 100 basis points in the Euro Area are low-hanging fruit that should have been harvested already.

To discourage the passive re-depositing of central bank liquidity injections as reserves with the central bank, the interest rate paid on commercial bank reserves held with the central bank in excess of some normal benchmark level could be set at, say, minus 75 or minus 100 basis points. If the Swedish Riksbank can have a negative interest rate of minus 25 basis points for commercial bank deposits with the central bank, the Fed, the ECB, the Bank of Japan, and the Bank of England, too, should be able to implement negative interest rates on 'excess reserves'.[3] Commercial bank reserves held with the central bank earning a modest negative rate of interest will not be dominated as a store of value by zero nominal interest rate currency, because of the high carry costs associated with holding currency (storage, safekeeping, and insurance).

One common argument against a zero Federal Funds target rate and a negative rate on excess commercial bank deposits held with the central bank is that this would create a material risk of money-market funds 'breaking the buck', that is, of its net asset value falling below US$1 a share.[4] It is time for the regulators to educate the investing public that there is nothing anomalous about money-market funds breaking the buck occasionally. Indeed, it is to be expected that the buck will be broken from time to time, if money-market funds offer higher expected returns than deposit accounts—as they do. Unlike retail deposit accounts (federally insured up to US$250,000 through the Federal Deposit Insurance Corporation), money-market funds have not been federally insured, except during a 1-year interval following the failure of Lehman Brothers (between 18 September 2008 and 18 September 2009) when they were guaranteed by the US Treasury.

When challenged on their failure to lower the official policy rate to its lowest possible level (zero minus the carry cost of currency), the authorities tend to proffer technical, operational reasons for why a zero official policy rate would be awkward/difficult/impossible to implement. With the official policy rate at zero (assuming for concreteness that the official policy

[3] Since 8 July 2009 Sweden's Riksbank has its official policy rate, the repo rate, at 0.25 per cent and the deposit rate at –0.25 per cent.

[4] US money-market funds are mutual funds that used to invest only in short-term, generally risk-free, liquid assets. They were structured to ensure that the net asset value per share would not fall below US$1. During the period before the crisis, these funds did, however, invest in securities that turned out to be very risky, such as credit default swaps (CDS) written by Lehman Brothers.

rate is the overnight rate at which commercial banks can borrow from the central bank against suitable high-grade collateral), rates on commercial bank reserves with the central bank would have to be non-positive to preclude the possibility of pure arbitrage profits. Interest rates on some private deposits might, as a result, be negative.

Modestly negative interest rates on private deposits with commercial banks, as for commercial bank deposits with the central bank, should pose no operational, technical problems at all. To achieve significantly negative interest rates on commercial bank deposits, Treasury bills, etc. is not feasible in the presence of zero nominal interest-bearing currency, only because the authorities maintain a fixed exchange rate (set at unity) between bank deposits with the central bank and currency. As shown in Buiter (2009), by abandoning a fixed exchange rate between currency and bank reserves and instead pricing deposits with the central bank at an appropriate forward premium to currency, even (numerically) large negative interest rates on deposits do not present an operational problem for the central bank, despite the presence of zero nominal interest-yielding currency. Abolishing non-interest-bearing currency or taxing currency has the same effect of eliminating any lower bound on the risk-free short nominal interest rate.

Conventional monetary policy is not exhausted even if the official policy rate is at its lower bound. Conventional monetary policy is not exhausted until risk-free nominal interest rates at all maturities are at their lower bounds. Risk-free here means free of default risk. The monetary policy authorities can influence longer-maturity risk-free interest rates either by committing themselves to a given sequence of future (short-term) official policy rates, by lending and borrowing over longer maturities at the target risk-free rate of interest for that maturity, and/or by buying and selling longer-maturity risk-free financial instruments.[5]

All leading central banks now accept as collateral in repos, at the discount window and for any of their wide range of *ad hoc* facilities created for the crisis, private collateral. The ECB, for instance, did a very large-scale repos operation on 24 June 2009, when it lent €442 billion for a 1-year maturity at 1 per cent against its usual wide range of eligible collateral. As long as central banks steadfastly refuse to provide the information required to value the illiquid collateral they have accepted (and continue to accept), we cannot be certain that the rate of return to the central bank on these operations includes an appropriate risk premium rewarding them for the private credit risk they are taking on. Even the profits recently reported by the Fed and the ECB on some of their liquidity operations do not provide sufficient information to determine whether these central banks have been handing out *ex ante* quasi-fiscal subsidies to their commercial bank counterparties during the past 2 years.

With neither the borrowing banks nor most of the collateral offered free of default risk, the ECB's massive operation on 24 June 2009, was probably aimed at more objectives than just influencing the 1-year risk-free rate. The operation is likely to have involved a quasi-fiscal subsidy to the participating banks and may have encouraged banks to lend more at somewhat longer maturities, where private borrowing and lending rates are likely still to include a material liquidity premium. Nevertheless, the uncapped (fixed-rate) repo did also provide a strong hint, almost a commitment, that the official policy rate would not be raised from its present level during the 12 months following the operation.

Quantitative easing—expanding base money in circulation (mainly bank reserves with the central bank) by purchasing government securities—does not appear to have had a noticeable

[5] Lending by the central bank is only risk-free if it is secured by risk-free collateral, because no private counterparty is free of default risk.

and persistent effect on risk-free or on private market rates in the USA, the UK, or Japan. Credit easing—outright purchases of private securities by the central bank, which can either be monetized or sterilized—is achieving little in the USA or in the UK, although it has not been pushed very hard yet in the UK, where total Bank of England purchases of private securities amounted to just over £2 billion on 13 November 2009. The Bank of England's cumulative acquisition of gilts through the Asset Purchase Facility on that same date was just over £176 billion.[6] In August 2009, the Bank of England increased the limit on the size of its Asset Purchase Programme (APP) by £50 billion to £175 billion and in November 2009 to £200 billion. Almost all of this will take the form of Bank of England purchases of UK Treasury debt. With UK annual GDP at £1.4 trillion, the amount of gilts purchased under the APP amounts to about 12.5 per cent of annual GDP, about the same magnitude as the public-sector financial deficit expected for the current fiscal year. If the £22 billion remaining in the APP envelope is also spent on gilts, gilt purchases by the Bank of England in the current fiscal year would amount to 14.3 per cent of GDP. If the Bank of England were to wish to exit from a policy of monetizing at least the entire public-sector financial deficit before there has been a material reduction in the magnitude of this deficit, this could create material tensions between the Bank of England and HM Treasury.

Of all the leading central banks, the Bank of England has increased the size of its balance sheet by the largest proportion. From just over £80 billion at the end of July 2007, the balance sheet increased threefold to a (provisional) peak of over £240 billion in July 2009. On 11 November 2009, the size of the balance sheet was still £233.5 billion.[7] Most of the increase took the form of outright acquisitions of government debt on the asset side and of larger commercial bank and building society reserves held with the Bank of England on the liability side. The liquidity injected by the Bank of England into the economy through purchases of gilts (themselves already rather liquid, of course) was by and large immediately re-deposited with the Bank of England by commercial banks unwilling to extend their exposure to the private non-financial sector.

In the Euro Area, the announcement in July 2006 by the ECB that it would purchase up to €60 billion worth of covered bonds between 6 July 2009 and the end of June 2010 was followed up with actual purchases of €23 billion as of 16 November 2009.[8] It appears to have prompted a large increase in private issuance of and investment in covered bonds.

Enhanced credit support in the Euro Area—providing collateralized loans to banks on demand at maturities up to a year at the 1 per cent official policy rate—is not working either, or not with enough speed and impact to expedite a cyclical recovery. None of these policies appears materially to improve the ability and willingness of banks to lend to the non-financial sectors. They have had some positive impact on the corporate bond markets (which allow corporates and ultimate savers to bypass the banking system), but not enough to prevent a sharp contraction in total credit extended to non-financial corporates and households. It is not surprising that this should be so, once we reflect on the nature of these policy actions and on the conditions under which they are taking place.

In a nutshell: quantitative easing (QE), credit easing (CE), and enhanced credit support (ECS) are useful when the problem facing the economy is funding illiquidity or market

[6] The amount invested by the Bank of England in commercial paper was £0.6 billion, in corporate bonds £1.5 billion, and in gilts £176.2 billion. *Source*: Bank of England, available at http://www.bankofengland.co.uk/markets/apf/

[7] See http://www.bankofengland.co.uk/publications/bankreturn/2009/091111cs.pdf

[8] *Source*: ECB, available at http://www.ecb.int/mopo/implement/omo/html/index.en.html

illiquidity. They are of very little use when the dominant concerns of banks and their counterparties are the threat of insolvency and a lack of capital, unless these special central bank operations contain a significant amount of quasi-fiscal subsidy, in which case they can be helpful in recapitalizing the banking sector. Quasi-fiscal subsidies appear to be large, especially in the USA and in the Euro Area, although a precise estimate of the magnitude of the quasi-fiscal subsidies bestowed by the Federal reserve system on the US banking system (and on part of the non-US cross-border banking system, too) or by the Eurosystem on Eurosystem banks and on Eurosystem subsidiaries of non-Euro Area banks is not yet available.

Today, liquidity is ample, even excessive: commercial banks either re-deposit funds obtained from the central bank with the central bank or use them to purchase government debt. Little of these funds appears to be finding its way towards the non-financial private sector. Capital is scarce. It is scarce first and foremost in the banking sector. A panoply of central bank and government financial interventions and support measures have ensured, at least for the time being, the survival of most of the remaining cross-border banks. It has not done enough to get them lending again on any scale to the household and non-financial enterprise sector. In addition, although the fiscal authorities are prompting banks to raise more capital and have injected public capital into the weakest systemically important banks, and although central banks are injecting liquidity into the economy on a scale never seen before, regulators and supervisors are often forcing banks to act pro-cyclically, by prompting them to build up their liquid assets *now* and to deleverage aggressively *now*.

That banks have ample or even surplus liquidity is apparent from the divergent behaviour of the stock of bank reserves with the central bank, which is increasing fast, and the broad money stock held outside the financial sector or the credit counterpart of this broad monetary aggregate (for these purposes, the non-bank financial sector is just the off-balance-sheet segment of the banking sector and should be consolidated with it). For instance, the increase in the broad monetary aggregate, M4, outside the financial sector in the UK has since the summer of 2009 been much smaller than the growth of commercial bank reserves with the Bank of England and, indeed, turned negative in September and October 2009. Similar patterns exist in the USA and in the Euro Area.

To be sure, it is not just the supply of credit that has contracted sharply. As the economy weakened, the demand for credit engaged the supply of credit in a race to the origin, but there can be no doubt that many firms and households are credit-constrained, and cannot find external finance either from the banks or from the capital markets.[9] Only the larger enterprises, and among these only those with a good credit track record, have access to the capital markets, even in good times. Small and medium-sized firms and new firms without a credit track record cannot go to the markets. Households, of course, cannot raise funds from the markets directly at all. So with zombie banks and patchy and selective access to the corporate bond markets by non-financial enterprises, we are set for a slow and anaemic, restricted-credit recovery in much of the advanced industrial world.

It is possible that the rather dramatic recovery of stock-market valuations in the advanced industrial countries, and the apparent end to home price declines in the US and the UK since the first quarter of 2009 may have been assisted by the low interest rates and ample liquidity in the North Atlantic region. It is true that this resilience valuation of the region's

[9] For evidence on this, see, for example, the Bank of England's quarterly Credit Conditions Survey. At the time of writing the latest survey was that of Q3, 2009, which can be found at http://www.bankofengland.co.uk/publications/other/monetary/creditconditions.htm

outside assets is hard to explain in terms of the usual fundamentals, given the subdued growth prospects in the region for the foreseeable future. I consider it more likely that the low interest rates and ample liquidity of the North Atlantic region have spilled over into rapid credit growth and bubbly asset markets in those emerging markets that are attempting to prevent or restrain the appreciation of their currencies *vis-à-vis* the US dollar—China, Vietnam, Brazil, Russia, and the countries of the Gulf Cooperation Council come to mind. But there may also have been some effect on stock markets and house prices in the advanced industrial countries.

IV. Fiscal policy

With monetary policy, both conventional and unconventional, having reached the limits of its effectiveness in most of the advanced industrial countries, the only instrument left for boosting demand is fiscal policy. By this I mean, until further notice, a cut in taxes or an increase in public spending financed either by borrowing from the public (domestic or foreign) or by borrowing from the central bank, that is, by creating base money.

Like all debt, public debt is both a potentially useful and a potentially dangerous social invention. Like financial instruments in general, it permits individuals and groups of individuals, including nations, to smooth consumption over time—it permits saving to be de-coupled from investment. In what follows it will be important not to use the word 'debt' as equivalent to 'financial instrument' or 'financial claim'. Equity and other profit-, loss- and risk-sharing instruments also permit the de-coupling of saving and investment and the smoothing of consumption over time, over the life cycle, and across generations. When I refer to debt, it is narrowly defined as a financial instrument imposing fixed, non-contingent payment obligations on the borrower. Borrowing in this narrow sense creates a legal obligation to repay the debt with interest at some future date. Failure to meet the fixed debt commitments results in the triggering of default provisions that often impose significant costs on the issuer of the debt. Much of these costs is social rather than just redistributive between debtor and creditor: real resources are expended in the resolution of a debt default.

Because the net financial benefit from adhering to the terms of a debt contract sooner or later become negative for the borrower, and because the desire for future access to borrowing facilities and a concern for one's reputation are often imperfect contract enforcement mechanisms, self-enforcing debt contracts are rare in the private sphere and third-party or external contract enforcement tend to be the rule.

This is less true for sovereign borrowing. External or third-party enforcement of sovereign debt contracts is unusual, although countries can at times be forced or bullied by other nations to meet some of their external obligations. The British and Dutch authorities, for instance, forced the Icelandic government to recognize the deposit insurance obligations of 'Icesave', one of the foreign branches of the Icelandic bank Landsbanki (which became insolvent in October 2008), despite there not being any clear legal or treaty-based grounds for the Icelandic sovereign to assume these bank liabilities as its own. Self-enforcement is, however, the rule for sovereign debt contracts. Repetition and reputation can sustain debt service that would not be individually rational in a one-shot or single-stage game. Most of the time, governments honour the sovereign debt bequeathed to them by their predecessors, even if the new government disapproves of the spending programmes or tax cuts that generated that debt.

(i) Countries are open; the world is closed

This simple truism is often forgotten or ignored. The current global economic slowdown makes it desirable for every country viewed in isolation to seek to increase its external trade balance—more so for some than for others, but with not a single country (acting in its own national self-interest) likely to conclude that it ought to pursue a smaller external balance. The only exception to this rule would be a far-sighted country that feared hostile foreign-trade sanctions should it increase (or fail to reduce as expected) its external trade surplus. Since actual current-account balances across the world sum identically to zero, the *ex ante* desire by every country to boost net external demand for its products is logically impossible to fulfil and represents an open invitation for conflict.

Countries with unsustainable external deficits (e.g. the USA) should seek to boost their trade balances and de-emphasize domestic demand relative to countries with unsustainable external surpluses (e.g. China), which should seek to boost domestic demand and reduce their external trade balance surpluses.

This is but one example of a key property of a globally coordinated fiscal stimulus (as opposed to the simultaneous announcement of independently designed national fiscal policies, which is all the world has seen so far), that fiscal stimuli should be modulated according to national circumstances and capabilities.

(ii) Fiscal sustainability

Fiscal sustainability is a useful conceptual tool, but not an operational concept. Technically, a fiscal–financial–monetary programme is sustainable if the authorities have not taken a leaf from Bernie Madoff's handbook and engaged in an open-ended pyramid scheme or Ponzi finance scheme. In such schemes existing debt (both interest and principal repayments due) is serviced forever by issuing additional debt so that the debt forever grows at least as fast as the interest rate on the debt.[10]

Formally, this means that the present discounted value of the sovereign's terminal debt goes to zero as the terminal period recedes into the infinitely distant future. It can be restated as the *prima facie* operational requirement that the outstanding value of the non-monetary debt of the sovereign or the state (the consolidated general government and central bank) be no larger than the present discounted value of current and future augmented primary budget surpluses of the state. The augmented primary surplus of the state is the financial budget surplus of the state—the consolidated general government and central bank—*minus* net interest income *plus* the monetary issuance of the sovereign (the change in the stock of base money issued by the central bank). This can be written as the simple requirement that the *permanent share* of the state's augmented primary surplus in GDP, $\bar{s}$, be no less than the outstanding stock of sovereign non-interest-bearing debt as a share of GDP, d, times the difference between

[10] Let $\dot{d} \equiv (r-n)d - s$, where d is the debt-to-GDP ratio of the non-monetary net debt of the consolidated general government and central bank, r is the safe instantaneous real interest rate, n is the instantaneous growth rate of real GDP, and s is the augmented primary surplus of the consolidated general government and central bank, including seigniorage (issues of base money), as a share of GDP. It follows that $d(t) = \lim_{q\to\infty}[\int_t^q e^{-\int_t^v [r(u)-n(u)]du} s(v)\,dv + e^{-\int_t^q [r(u)-n(u)]du} d(q)]$. The no-Ponzi finance condition is that $\lim_{q\to\infty} e^{-\int_t^q [r(u)-n(u)]du} d(q) \leq 0$.

the long-term real interest rate on the sovereign debt, $\bar{r}$ and the long-run growth rate of real GDP, $\bar{n}$[11]

$$\bar{s} \geq (\bar{r} - \bar{n})\, d. \tag{1}$$

So the smallest permanent augmented primary surplus of the state, as a share of GDP, consistent with solvency of the sovereign, or the (minimum) required permanent augmented primary surplus (as a share of GDP), $\bar{s}^R$, is given by:

$$\bar{s}^R = (\bar{r} - \bar{n})\, d. \tag{2}$$

This is very similar to the expression for the current-period state primary surplus (as a share of GDP), $\tilde{s}$, that just stabilizes the state's non-monetary debt-to-GDP ratio. This is given by

$$\tilde{s} = (r - n)\, d \tag{3}$$

where r is the current real rate of interest on the public debt and n is the current rate of growth of real GDP. The difference between the sustainability condition (1) and the debt-to-GDP ratio stabilizing augmented primary surplus of the state given in (2) is that $\bar{s}$, the lowest value of the permanent augmented primary surplus as a share of GDP, $\bar{s}$, involves the *future long-run average* ratio of the primary surplus of the state and that $\bar{r}$ and $\bar{n}$ are likewise future long-run average values of the real interest rate on the public debt and the growth rate of real GDP, respectively.

Unfortunately, three of the four key parameters in (1) and (2) are unobservable. First, the long-run real interest rate on the public debt and the long-run real growth rate of GDP are uncertain and have to be estimated and predicted. The net debt-to-GDP ratio is, in principle, measurable and verifiable. Unfortunately, governments have developed the habit of hiding significant liabilities and contingent exposures in off-budget and off-balance-sheet constructs, so measuring d accurately is no trivial matter.

Given d and estimates of the long-run real interest rate and growth rate, the minimal permanent augmented primary surplus as a share of GDP required to achieve solvency can simply be calculated from (1). Whether $\bar{s}$, the actual permanent augmented primary surplus (as a share of GDP) of the state (that is, the value of the permanent augmented primary surplus as a share of GDP that is predicted, expected, or planned) is, indeed, at least as large as $\bar{s}^R$ $\bar{s}$ depends on a host of economic, social, and political factors, including the determination and credibility of present and future governments, the willingness of the citizens to pay higher taxes or accept lower public spending programmes, and the ability and willingness of the central bank to extract real resources through the issuance of base money—seigniorage.

It is, in principle, possible for a policy-maker to announce a thousand years of augmented primary deficits followed by an eternity of sufficiently large augmented primary surpluses which ensure that condition (1) is satisfied. However, no government has the credibility to commit itself and its successors to such a strategy. The markets have therefore become doubting Thomases: they want to see before they believe. The best guide to future primary surpluses is the government's capacity for generating primary surpluses in the past, when doing so was not easy. Only costly signals are credible. Governments with a history of procyclical behaviour during recent cyclical upswings will meet with market scepticism (in the form of higher credit default swap (CDS) rates and higher spreads of the interest rates on their sovereign debt over that of best-of-breed benchmarks, such as Bunds or (in the past) US Treasury bonds) when they announce counter-cyclical behaviour in the downswing while promising higher taxes and/or lower spending in the next upswing.

[11] In continuous time, $\bar{s}(t) = [\bar{r}(t) - \bar{n}(t)] \int_t^\infty e^{\int_t^v [r(u) - n(u)]\, du} s(v)\, dv$ and $\bar{r}(t) - \bar{n}(t) = (\int_t^\infty e^{\int_t^v [r(u) - n(u)] du})^{-1}$.

Conditions (2) and (3) show that the minimum required augmented primary surpluses (for long-run solvency or for stabilizing the debt-to-GDP ratio at its current level) will increase whenever the real interest rate on the public debt increases. A higher sovereign debt default risk premium will be one possible cause of such an increase. Sovereign default risk spreads have increased sharply in the current crisis, even in the Eurozone, reaching 300 basis points for 10-year sovereign debt instruments in the case of Ireland early in 2009. A vicious 'positive feedback' mechanism from a higher debt burden to a higher default risk premium to a higher deficit and a further increase in the debt burden becomes a possibility, since, letting $\dot{d}$denote the instantaneous rate of change of d:

$$\dot{d} \equiv -s + (r - g)d. \tag{4}$$

If the default risk premium cannot be addressed directly, say through guarantees from other, more solvent governments, or from international organizations with deep pockets, the only way to stabilize the potentially explosive debt–deficit spiral is through larger augmented primary surpluses, that is, higher taxes net of transfers and subsidies, τ, as a share of GDP, lower public spending on real goods and services, g, as a share of GDP, or increased seigniorage—issuance of base money by the central bank, or σ, as a share of GDP:

$$s = \tau - g + \sigma. \tag{5}$$

Real seigniorage or seigniorage as a share of GDP is likely to be subject to an upper bound. Indeed, attempts to boost real seigniorage by raising the growth rate of the nominal stock of base money will sooner or later be inflationary. Many empirically reasonable base money demand functions have the long-run seigniorage Laffer curve property: a higher long-run growth rate of the nominal base money stock will at first raise real seigniorage but will ultimately, because of the negative effect of higher anticipated inflation on real base money demand, be associated with declining real seigniorage. Both the linear and the semi-logarithmic base money demand function have this property.

It is also helpful to define the maximum permanent augmented primary surplus (as a share of GDP) that the government could extract, $\bar{s}^{\text{Max}}$. The fiscal spare capacity of the government is the difference between the maximum permanent augmented primary surplus ratio the government can extract and the minimum permanent augmented primary surplus ratio required for government solvency, that is,

$$\text{Fiscal Spare Capacity} = \bar{s}^{\text{Max}} - \bar{s}^{R}. \tag{6}$$

The highest future tax burden the government will be able to impose, and the minimum public spending levels it will be able to get away with, are determined by a host of economic, political, and social factors. Nations where the polity is highly polarized may not be able to put together coalitions that can agree on significant additional fiscal burden sharing. Nations with a strong consensus on the role of government and on what constitutes fair taxation will have higher spare capacity compared to nations where there are strong ideological differences about the role of the state and little agreement on what constitutes a just and fair distribution of income and of the tax burden. A government of a unitary state with a first-past-the post uni-cameral electoral system and limited checks and balances (the UK, say, *pace* devolution and the House of Lords) is likely to have a greater capacity to inflict fiscal pain than a federal government with a serious bi-cameral legislature and ubiquitous checks and balances (the USA, say).

This discussion suggests a fiscal policy design lesson, which I shall formulate as a proposition.

Proposition 1: *Cooperatively designed international fiscal stimuli must be modulated according to the 'fiscal spare capacity' of each country, that is, according to its ability to generate (and to commit itself credibly to generate) larger future augmented primary government surpluses.*

The fact that, from equation (4), seigniorage income from the central bank is part of the augmented primary surplus of the consolidated general government and central bank suggests the following proposition.

Proposition 2: *Even operationally independent central banks are agencies of the state.*

Even operationally independent central banks must recognize that their profits and their monetary issuance are a potentially important source of revenue/means of financing for the state, especially during periods of extraordinarily high liquidity preference, that is, during financial crises. This is true regardless of whether the official monetary policy rate is at its zero floor or above it. Quantitative easing (expansion of the monetary base through purchases of government securities) is an especially important source of revenue for the sovereign whenever the central bank's official policy rate (strictly speaking, the rates on base money; that is, the zero rate on currency and the rate paid on commercial bank deposits with the central bank) are well below the interest rate on long-term Treasury debt.

Close cooperation between the monetary and fiscal authorities is necessary to achieve the right timing and magnitude both of monetization of public debt and deficits, and of the reversal of this monetization when the economy recovers. When done competently, these cooperative and coordinated actions will not threaten the medium- and long-term price stability mandate of the central bank.

The financial crisis threatens government solvency through what amounts to an increase in the stock of net debt, *d*. This can take the form of guarantees for and insurance of bank assets or liabilities, injections of capital financed through government debt issuance, etc. Much of the exposure is contingent and technically off balance sheet for the state. From the perspective of fiscal sustainability, however, all these contingent liabilities should be priced (e.g. using real option pricing methods) and added to *d*; the fair value, that is, either the marked-to-market value or marked-to-model value of any (contingent) assets the government may have acquired as part of its banking sector or financial sector bail-out operations, should be subtracted from *d*.

Governments have wasted a fair amount of resources by guaranteeing, *ex post*, existing loans and investments that had already gone bad. This is bad economics: greater bang-per-buck in terms of new lending and, provided the guarantee is properly priced, lower moral hazard result from operating at the margin by providing guarantees for new lending rather than inframarginally, by guaranteeing existing loans.

Proposition 3: *If the state provides guarantees to banks, it should guarantee new lending, not existing debt.*

V. When does a fiscal stimulus boost aggregate demand?

A fiscal stimulus is a key weapon in the policy arsenal used to address an undesirable weakening of aggregate demand. For the policy to make sense, either an increase in public

spending on goods and services (public consumption or investment) or a tax cut (an increase in transfer payments) must raise aggregate demand at given values of the current and future expected price level, money wage, interest rates, exchange rates, and other asset prices. In the textbook IS-LM model this means that the fiscal measure shifts the IS curve to the right in output–interest rate space—there is no full *direct* crowding out, Ricardian equivalence, or Minsky equivalence.

We may still not get any effect on output and employment, even if the IS curve shifts to the right, either because there could be 'financial crowding out' through higher interest rates, lower outside asset prices, or a stronger exchange rate, or because there is 'real crowding out' through scare real resources on the supply side; real crowding out or 'factor market crowding out' occurs through rising real wages and other real factor costs, and through rising inflationary pressures.

But unless the fiscal stimulus shifts the IS curve to the right, it achieves nothing at all—we do not even have to investigate whether there is financial or real crowding out.

(i) Ricardian equivalence

Tax cuts

Even if financial markets were perfect, life-cycle theories of consumption would imply that postponing taxes by government borrowing (that is, cutting (lump-sum) taxes today and raising them by the same amount in present discounted value at some later date) boosts aggregate consumption demand because it redistributes resources from people with longer expected remaining life-spans (the young and the unborn) to people with shorter expected remaining life-spans (the old and those currently alive). Strictly speaking, this requires that the tax cuts (transfer payments) be labour-income tax cuts, or lump-sum tax cuts, or transfer payments accruing to persons (owners of human wealth—the non-tradable present discounted value of future after-tax labour income), rather than tax cuts on the returns to or on the value of non-human, financial, and real assets that are owned fully by those currently alive.

Life-cycle principles imply that, because people try to smooth consumption over the life-cycle, the old will have a higher marginal propensity to consume out of current income windfalls than the young. Prior to conception, the unborn, of course, do not consume at all.

To negate these life-cycle arguments for an expansionary demand effect from tax cuts, the Ricardian equivalence or debt neutrality school assumes (i) that the government always satisfies its intertemporal budget constraint (there is no default risk on public debt) and (ii) that aggregate consumption can be viewed as the consumption of a single, representative infinite-lived consumer. The awkward fact that people are born, live, and die is finessed by assuming that everyone is linked to all past and future generations through an unbroken chain of operative intergenerational bequest motives.

Stating the assumptions required for Ricardian equivalence to hold is to deny its relevance. Postponing taxes through borrowing, without changing their present discounted value, will boost aggregate demand because it redistributes resources from the young to the old, from the unborn to those currently alive, and from permanent-income or life-cycle households to Keynesian households—households constrained by liquidity and current disposable income. The only exception, discussed below, is when households are highly indebted and extremely risk-averse, cautious, and prudent.

A key point to note is that these aggregate-demand-boosting redistributions can also be achieved without the need for public-sector deficits if there is a sufficiently rich set of

tax-transfer instruments (see Buiter and Kletzer, 1998). If we can identify the young and the old, the life-cycle consumers, and the Keynesian consumers, and if we have a sufficiently rich arsenal of taxes and transfers, we can do balanced-budget redistributions that will boost aggregate consumption. In addition, a balanced-budget increase in public spending on real goods and services (exhaustive public spending) will boost demand unless households are ultra-Keynesian, with a marginal propensity to consume out of current disposable income of 1.

Proposition 4: *Balanced-budget redistribution between households with different marginal propensities to spend out of current income can boost demand as effectively as deficit-financed tax cuts. Examples include the following*:

1. *an increase in social security retirement pensions financed fully by higher social security contributions by workers;*
2. *an increase in student grants financed fully through a levy on financial assets (students with rising age-earnings profiles are likely to be liquidity-constrained, unlike owners of financial assets);*
3. *an increase in short-term unemployment benefit financed by a reduction in long-term unemployment benefit (short-term and temporarily unemployed workers are more likely to be liquidity-constrained).*

The consumer-oriented tax cuts and transfer payment increases recommended in the IMF Staff Position Note, 'Fiscal Policy for the Crisis' (Spilimergo *et al.*, 2008) overlap mostly with what I recommend here (increased unemployment benefits, increases in earned income tax credits, and the expansion of safety nets in countries where such nets are limited (e.g. China)). Most of these examples of balanced-budget fiscal measures with an expansionary effect, whether they work through the tax-transfer side of the budget or consist of tax-financed increases in exhaustive public spending, involve redistribution from the richer to the poorer. Distributional politics often takes precedence over macroeconomic stabilization logic.[12]

Increased public spending on goods and services

Even if there is Ricardian equivalence for tax cuts or increases in transfer payments, a *temporary* increase in public spending on currently produced goods and services (exhaustive public spending) will stimulate demand. The reason is that a 1-year (say) increase in public consumption or investment of $1 billion will, reduce permanent income by much less than $1 billion—to a reasonable approximation, private consumption would only fall by an amount given by the product of the time preference rate and $1 billion—maybe by $30m or so. In the Ricardian view, a permanent increase in exhaustive public spending would not boost aggregate demand, as it would lower permanent income and thus private consumption by the same amount as the permanent increase in public spending.

If the Keynesian consumption function with its liquidity-constrained consumers describes reality, a balanced-budget increase in public consumption or investment spending (funded with higher taxes or lower transfer payments) would boost aggregate demand.

Proposition 5: *A temporary increase in public consumption or investment will always boost public spending, even if the budget is kept balanced. If there are liquidity-constrained (Keynesian) households, even a permanent balanced-budget increase in public spending on goods and services will boost aggregate demand.*

[12] I am indebted to an anonymous referee for this point.

(ii) Minsky equivalence

When households are highly indebted, face an uncertain employment and labour-income future, and are afflicted by particularly strong risk-aversion, caution, and prudence (that is, when they are suffering from a complete collapse of consumer animal spirits), increases in current disposable income, including those associated with tax cuts or higher transfer payments, may be saved virtually in their entirety. Under such conditions household consumption is constrained from below by a socially defined 'subsistence' level of consumption, which moves only gradually through habituation and the observation of the consumption patterns of peer groups or other reference groups. Higher disposable income is devoted to reducing household financial vulnerability by paying down debt. I call this form of fiscal policy ineffectiveness *Minsky neutrality*. It can be modelled either as an extreme form of precautionary saving (see Kimball, 1990) or as a strong form of target-wealth saving or buffer stock saving (see Deaton, 1991; Carroll, 1992, 1997). It may well play a role in countries such as Iceland, the UK, and the USA, where household gross debt has grown spectacularly during the period of rising house prices and optimistic permanent income perceptions, net financial wealth has taken a major beating through the collapse of house prices, stock prices, and land prices, and unemployment has risen sharply.

(iii) More on different types of 'crowding out'

The conditions for Ricardian equivalence are unrealistic and do not hold in practice. The empirical evidence is inconclusive, however, on the (time-varying) magnitudes of the spending and tax multipliers (see, for example, Blanchard and Perotti, 2002; Mountford and Uhlig, 2002; Perotti, 2004, 2008; Spilimbergo *et al.*, 2008; Cogan *et al.*, 2009; Favero and Giavazzi, 2009; Ilzetzki *et al.*, 2009; Romer and Bernstein, 2009; Romer and Romer, 2009). One reason for the inconclusive evidence is that none of these studies distinguishes between the *ceteris paribus* effects of past, present, and anticipated future fiscal policy actions on demand holding constant interest rates, exchange rates, other asset prices, wages, and prices (the horizontal shift of the IS curve in the simplest IS-LM/aggregate demand–aggregate supply model) and the total equilibrium effect of these policy changes, allowing for the endogenous responses of interest rates, asset prices, wages, and prices.

It is clear that, even if expansionary fiscal policy can stimulate aggregate demand at given values of current and future prices, wages, interest rates, exchange rates, and other asset prices, this does not mean that it will boost demand when the responses of prices, wages, interest rates, exchange rates, and other asset prices to the fiscal stimulus are allowed for. Three types of crowding out can be distinguished: financial crowding out, real resource crowding out, and direct crowding out.

Financial crowding out

Financial crowding out occurs though the response of interest rates, the exchange rate, and other asset prices to past, current, and anticipated future fiscal actions. The textbook examples in the IS-LM framework are interest-rate crowding out in a closed economy when the path of the nominal money stock is kept constant, and exchange-rate crowding out in an semi-small open economy under a floating exchange rate and a high degree of international capital mobility.

Interest-rate crowding out will be full or 100 per cent in a closed economy when the nominal money stock is kept constant and velocity is constant—the vertical LM curve case. In the

Dornbusch model with forward-looking rational exchange-rate expectations and sluggish price or inflation adjustment, when the monetary authorities set the short nominal interest rate by following a simple Taylor rule, there will be full crowding out of an unanticipated, immediate, permanent fiscal expansion under perfect international capital mobility when the exchange rate floats and the world interest rate is given. A smaller trade surplus (larger trade deficit) undoes the effect of the permanent fiscal stimulus on output through an appreciation of the nominal and real exchange rates. An unanticipated, immediate *temporary* fiscal stimulus will be *partially* crowded out by an appreciation of the currency and a reduction in the external trade surplus.

Even when the monetary authorities peg the short nominal interest rate, there will be full crowding out of an (unanticipated, immediate, permanent) fiscal expansion under perfect international capital mobility when the exchange rate floats and the world interest rate is given. A smaller trade surplus (larger trade deficit) undoes the effect of the fiscal stimulus on output through an appreciation of the nominal and real exchange rates.

A large country or region (such as the USA or the Eurozone) with a floating exchange rate could use domestic expansionary fiscal policy to raise domestic demand to the extent that its actions raise the world real and nominal interest rate, but even for a large country or region, a significant part of a domestic fiscal stimulus may end up boosting output abroad through larger imports and reduced exports. At given world rates of interest, the entire demand stimulus leaks abroad through a larger trade deficit. When output and employment are demand-constrained, these international demand spillovers are not just pecuniary externalities, but can have first-order welfare effects. If there are domestic costs to or constraints on expansionary fiscal policy, fiscal expansion will, like any positive externality, be under-supplied.

This discussion has an obvious implication.

Proposition 6: *International coordination of cooperatively designed fiscal stimuli is likely to be necessary to allow the internalization of the effective demand externalities of a fiscal stimulus through the trade balance and the real exchange rate. This case is likely to be strongest when the degree of international capital mobility is high and the exchange rate floats.*

Real resource crowding out

Real resource crowding out occurs when, regardless of the degree of financial crowding out, real resource constraints (capital and labour bottlenecks) limit the expansion of output in response to a fiscal impulse. It will tend to be accompanied by rising prices and wages, often by rising real wages and by rising inflationary pressures. In an open economy, the domestic supply constraint on final demand can be relaxed through the trade balance. For the world as a whole this is not possible. Fiscal policy cannot relax physical supply-side constraints in the short run, unless one believes there are significant effects of changes in labour income tax rates and other non-lump-sum taxes on labour supply.

However, I argue in section VII that credit policy may reduce working capital constraints on production and employment, so credit-easing policies may relax effective (financial) supply constraints on output, thus permitting a fiscal stimulus to have a stronger expansionary effect.

Direct crowding out

The effect on aggregate demand of an increase in public spending on real goods and services depends not only on the way it is financed and on the marginal propensities to consume of current and future taxpayers. It also depends on whether the real resources consumed or

invested by the state are direct substitutes for or complements to private consumption and investment. Public spending on free (at the point of delivery) public education and healthcare may be a substitute for private spending on education and healthcare. Public spending on policing is a substitute for private spending on security guards and other means of enhancing personal security and keeping private property safe. Public infrastructure spending (roads, railroads) may boost private investment in tourism or residential construction. There is hardly any hard evidence on the presence and importance of such direct crowding out or crowding in. This is something that could usefully be taken into account when setting priorities for the detailed composition of public spending programmes.

VI. Sovereign default risk and the expansionary effect of fiscal policy

If a tax cut or an increase in public spending is deficit-financed, and if markets doubt whether the government or its successors will raise future taxes (including monetary issuance) or cut future public spending by the same amount in present discounted value terms as the up-front tax cut or public spending increase, perceived default risk will increase and the government's cost of borrowing will rise. Government borrowing rates tend to set a floor for private-sector borrowing rates. Although it is possible that the private sector could borrow on better terms than its sovereign, such situations are few and far between.

A sufficiently large increase in the government deficit (or an increase in net public debt through any other mechanism) could therefore increase the default risk premium on the public debt to such an extent that the net effect of the tax, spending, and financing decisions on aggregate demand could become negative. Note that this has nothing to do with Ricardian Equivalence, which assumes that the government never defaults but instead always meets its intertemporal budget constraint. It is a form of financial crowding out, but not through increases in the risk-free rate, but through increases in the default risk premium.

Proposition 7: *Financial crowding out is always and everywhere a (monetary) policy choice if the financial crowding out occurs through an increase in risk-free rates. Monetary accommodation may not be able to neutralize financial crowding out if rising interest rates are due to increases in sovereign default risk premia. For example, when the risk-free nominal interest rate is at the zero lower bound, monetary policy cannot neutralize an increase in default risk premia.*

So far, in most of the industrial world and in the emerging markets, the increases in sovereign default risk premia have not been of sufficient magnitude to create worries about the effectiveness of expansionary, debt-financed fiscal policy through this default-risk driven financial crowding-out mechanisms. In most countries, including the USA, the UK, and Germany, the policy-induced decline in the short-term risk-free rate was at first sufficient to neutralize the increase in the default risk premia on (longer-term) sovereign debt and any effect of higher long-term inflation expectations on longer-term risk-free nominal rates. The cost of long-term government borrowing actually declined.

This situation began to reverse itself at the end of 2008, and both government default risk premia and long-term interest rates on sovereign debt rose for a couple of quarters. In a number of European countries (Greece, Ireland, Spain, Portugal, and some of the Central and Eastern European countries) sovereign default risk premia rose to the point that a higher

degree of financial crowding out of an additional debt-financed fiscal stimulus would have been a certainty, had one been tried. Sovereign default risk premia have since the middle of 2009 returned to more modest levels, although they remain elevated compared to the pre-August 2009 period.

In other large countries, including the USA, the UK, Japan, Germany, and France, we may not yet have reached the position that a further discretionary fiscal stimulus would raise sovereign default risk premia and inflation risk premia to the point that aggregate demand actually declines. The accumulation of public debt and of other hard or contingent exposure to the banking sector, and other financial institutions (AIG, Fannie Mae, Freddie Mac, RBS, Lloyds Group, Commerzbank), and non-financial enterprises deemed too large, too interconnected, or too politically connected to fail (GM, Chrysler, Opel, Renault, Airbus), is such, however, that financial crowding out through rising sovereign default risk premia and inflation risk premia could become a real issue. In that case, only balanced-budget measures or central bank money-financed support measures would have any expansionary effect. Monetization of the deficit would only help if there were no sharp increase in inflation risk premia.

Deficit-financed fiscal stimuli should be modulated across countries according to the 'fiscal spare capacity' in that country. As discussed in section IV(ii), this is the difference between the maximum value of the permanent augmented primary surplus that is economically, administratively, and politically sustainable and the minimal permanent augmented primary surplus required for government solvency. In judging the amount of fiscal spare capacity for countries such as the USA and the UK, we must not be fooled by the contemplation of the very high public debt-to-GDP ratios found in the USA and the UK immediately after the First and Second World Wars—public debt burdens that were brought down relatively painlessly through a combination of real economic growth and unanticipated inflation.

The willingness of the public to make great sacrifices, including fiscal sacrifices, in order to pay down a debt incurred in a noble, national cause—a war against an external aggressor—is not present today. The increases in public debt we have seen in recent years and are likely to see in the next few years, were or will be incurred as a result of a war on ourselves—a civil war. The political constraints on spending cuts and tax increases are much tighter than they were immediately following the Second World War, when the US had public debt around 120 per cent of GDP and the UK around 220 per cent of GDP. The political limits to fiscal burden sharing are much tighter in the economically, politically, and socially polarized USA of today than they were in the 1950s and 1960s.

The countries with the large current and likely future increases in the public debt burden (mostly rich industrial countries) should be *able* to bear fiscal pain more easily than the victims of past deep financial crises (either developing countries and emerging markets or advanced industrial countries many decades ago, all of which were significantly poorer than today's rich industrial countries). The experiences of Sweden and Finland, which went through deep financial crises and economic contractions during the period 1991–4 without either defaulting on the public debt or using unanticipated inflation to reduce the real value of the public debt burden, are, indeed, supportive of the view that rich countries can handle the fiscal consequences of financial crises more easily than poorer countries. These episodes, and many others, are reviewed in a systematic manner in the recent global history of systemic financial crises by Reinhart and Rogoff (2009).

This argument fails, however, when it comes to the likely future fiscal fate of the US, because it does not consider the political economy of major fiscal corrections. Ability to bear fiscal pain may be higher for richer countries (because the utility cost is lower), but the willingness to bear pain may be lower if the polity is more polarized in the richer country. The war of attrition model of delayed fiscal stabilization, developed by Alesina and Drazen

(1991) (see also Drazen, 2000), demonstrates how, even though it is collectively efficient to stabilize immediately, the hope and desire by both players in the game that most of the burden of fiscal adjustment be shifted to the other player in this sequential bargaining game, can cause costly delays in stabilization. I fear that this war of attrition model may be a useful parable for understanding future US fiscal policies, in a deeply polarized society.

Real economic growth is also unlikely to come to the rescue the way it did between 1950 and 1973, the 'Golden Age' of European (and to a lesser extent American) growth. Do not therefore take the post-Second World War public debt burden figures as a guide to what the fiscal authorities will be able to get away with today without spooking the rating agencies and the markets.

VII. Will a fiscal stimulus work as effectively when the economy has been hit by a credit crunch?

The credit crunch is now hitting the non-financial enterprise sector hard. How does a fiscal boost affect demand when the enterprise sector is credit-constrained? If the constraints are tight enough, they will weaken and may even completely neutralize the effect of a fiscal stimulus on output and employment not (just) because of financial crowding out of consumer and business demand, but because of credit constraints on supply, what Alan Blinder (1987) has called effective supply failure. This is most easily seen if production is subject to a lag (inputs go in before saleable output comes out). This means that firms need working capital to get production going. Increased demand can be met from inventories, and that may provide some working capital, but once inventories have been worked off, the credit constraint on production and employment becomes binding.

The notion that a credit crunch could lead to effective supply constraints being binding in the market for goods and services, even if demand is depressed, was first developed by the South-American structuralist school of Raul Prebisch and Celso Furtado, and its neo-structuralist successors (e.g. Lance Taylor and Domingo Cavallo; see, for example, Cavallo (1977)), although its antecedents go back much further to the Austrian school of Hayek and Mises and to Marx.

The 'Austrian' or working capital supply-side model of the supply side was introduced into mainstream macroeconomic analysis by Alan Blinder (1987), but it has not become part of the standard professional tool set (for a non-technical description, see Buiter (2008)). I believe that the 'Great Credit Crunch of the Noughties' will demonstrate its usefulness, because of its key assumption that production cannot take place without credit. A severe contraction in economic activity induced by a credit crunch could, if effective supply contracts even faster than effective demand, lead to greater upward pressure on prices or inflation than would be inferred by considering the output gap defined not as the gap between effective demand and *effective* supply, but instead between effective demand and *notional* supply. Notional supply or potential output is determined by the available physical resources of capital, land, and labour and is independent, in the short run, of the cost and availability of credit.[13]

Proposition 8: *Because production takes time, working capital is essential for effective supply, even in the short run. Policies to provide credit to the non-financial enterprise sector*

[13] In the long run, the physical capital stock is endogenous and is therefore affected by the cost and availability of finance. Working capital can affect effective supply at much shorter horizons, of months or quarters.

may therefore be a precondition for expansionary fiscal policy to have any material demand on production and employment. Qualitative easing or credit easing are therefore likely to be complementary to fiscal policy in economies badly affected by a credit squeeze.

VIII. Neoclassical fiscal measures

Keynesians believe in the power of (current) income effects on spending. Neoclassical economists believe in the power of the intertemporal substitution effect. Why not use both when there is no additional price tag attached to the neoclassical effect?

A temporary VAT cut

I believe the temporary VAT cut introduced in the UK by Chancellor Darling last year (2.5 per cent down now to 15 per cent, back up to 17.5 per cent after 13 months on 1 January 2010), and which was given such as hard time by many observers, made sense. In principle, twisting the intertemporal terms of trade like that causes consumers to switch their expenditures (especially on durables) to the temporarily low tax period. It so happened that the fierce price wars that were going on at the time may have drowned out these relative minor cuts, but apart from that (and apart from the menu costs inflicted on restaurants and shopkeepers) this was not a silly idea. Perhaps a cut to 10 per cent for a shorter period would have had more impact on behaviourist consumers, but the principle of using the substitution effect where it reinforces the income effect is surely sensible.

A temporary investment tax credit/subsidy

Provided there is no binding external finance constraint on investment, a temporary investment tax credit or investment subsidy could be an effective means of shifting investment towards the present. The budgetary cost of such measures (which target just the flow of new investment) is much lower, for a given effect on investment demand, than that of measures that target the flow of new investment indirectly by giving a boost to owners of existing capital as well as those considering investing in new capital. A cut in corporation tax or in the capital gains tax would be examples of such inefficient measures, from the point of view of maximum investment-demand impact per dollar of government tax revenue lost.

IX. Further unconventional measures to increase fiscal policy effectiveness

(i) Turning unsecured bank debt into equity

Too little capital and excessive debt are limiting the ability and willingness of banks to lend to households and to the non-financial private sector. Credit constraints on supply and demand limit the effectiveness of fiscal policy. An obvious solution would be mandatory conversions of unsecured bank debt into equity (starting with the most junior debt and working up the seniority ladder until the bank is once more adequately capitalized). An appropriate special resolution regime (SRR) for banks and other systemically important highly leveraged institutions with asset–liability mismatch as regards maturity and liquidity (and possibly currency denomination) could turn unsecured bank creditors into shareholders

and could thus recapitalize banks to the point that they fulfil their designated function again of intermediating between financial deficit and financial surplus units in the economy, without dipping into the pockets of the taxpayers.

(ii) Turning household mortgage debt into equity claims of the banks

A household whose income is reduced through unemployment, short-time working, or other negative labour-market developments is at risk of losing its home through repossession by the mortgage lender—a process that involves serious real resource costs (estimated at as much as $50,000 per repossession) and considerable deleterious neighbourhood effects. If there is negative equity, the bank also makes a loss, especially if the mortgage is non-recourse. Even if the household does not lose its home, the cost of meeting the mortgage obligations can force a sharp reduction in private consumption demand.

It clearly makes sense to convert distressed conventional mortgages into equity-type instruments, where the lender, in return for partial debt forgiveness, gets a stake in any future upside for the value of the house. Indeed, mortgages could be designed right from the start along 'Islamic mortgage' lines, where the bank starts off as the sole owner of the house and the 'borrower' pays a rental to the bank and regularly purchases from the bank additional shares in the equity of the house (see, for example, El-Gamal, 2006). If the 'borrower' has trouble meeting the terms of the original mortgage, some of the equity already acquired by the 'borrower' can revert to the bank. This form of risk- and profit-sharing seems preferable to the debt contracts that characterize most conventional mortgages. Such equitization of mortgages could reduce the likelihood and severity of Minsky neutrality emasculating fiscal policy in an economy with highly indebted households.

If the shared equity-type mortgages have such obvious advantages, why do we not see more of them in the market? First, we do see them, even outside Islamic countries and outside the Islamic communities in non-Islamic countries.[14] Second, the favoured tax treatment of mortgage interest in many countries makes turning mortgage debt contracts into equity-type contracts unattractive to borrowers and lenders. It is also possible that replacing a collateralized debt contract with a shared equity contract that involves profit, loss, and risk sharing, may require a change in attitudes towards home ownership—almost a cultural change—that may be slow in coming. Finally, the notion that the market will automatically provide those financial products and services that are useful to ultimate savers and borrowers and that are socially beneficial—and only those—has probably taken a bit of a knock since 9 August 2007. Is it really so surprising that a market that generates quite a few products that have negative social utility may also fail to support products that would have positive social utility?

(iii) Turning public debt into public equity

Finally, I would propose that instead of issuing traditional government fixed- or variable-interest debt instruments (including index-linked instruments), governments instead issue *real-GDP-growth-contingent bonds.* These instruments are not new. GDP growth warrants were issued by Argentina following its most recent external debt default in 2002.

[14] As regards residential mortgages, Bristol & West (jointly with the Arab Banking Corporation), West Bromwich Building Society (jointly with the Ahli United Bank), HSBC, and United National Bank (a Pakistani bank with branches across the UK) offer Islamic mortgage products. On the commercial side Natwest RBS (ABT finance) and Bank of Ireland (Amaar) are active in Islamic mortgage products.

As a simple example, government debt could be of the fixed nominal value, variable interest rate type where the interest rate equals the growth rate of nominal GDP plus some constant. Provided the real GDP and GDP deflator data cannot be manipulated by the borrowing authorities, and provided a rule is devised for handling GDP revisions, this would reduce nominal interest rates on the public debt when real GDP growth and/or inflation were low; it would reduce real interest rates whenever the growth rate of real GDP was low. Should nominal GDP growth go negative by an amount greater than the constant in the interest-rate formula, this would be handled as a reduction in the amount of debt outstanding, so negative nominal interest rates would not be a problem. GDP growth-contingent bonds are probably the closest we can get to 'equity in a nation'. And turning public debt into public equity would be a major enhancement of the policy arsenal of governments in the current phase of the global cycle. This equitization of the public debt would reduce the real burden of debt financing when it is needed most, during a downturn and when deflation threatens.

X. Conclusion

The rapid deterioration of the public finances in many countries (as measured both by the public debt-to-GDP ratio and the public-sector structural primary deficit as a share of GDP) presents a formidable obstacle to any additional use of fiscal stimuli to boost demand, where these fiscal measures would result in even larger deficits. There are a number of ways to relax these constraints. One is to have recourse to monetary financing. This can help, provided the authorities can make it credible that they have enough fiscal spare capacity to reverse this quantitative easing in the future, when the output gap closes and the large injections of central bank liquidity would become inflationary.

A second approach is to use balanced-budget fiscal measures, both Keynesian and neo-classical, to boost demand.

The third is to shift the political equilibrium of the country to boost fiscal spare capacity. If President Obama can shift the destructive, polarized US political equilibrium, where Republicans veto all future tax increases and Democrats veto all future public spending cuts, there could be room for an additional fiscal stimulus that would not spook the financial markets.

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