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The Case for Monetary Finance – An Essentially Political Issue

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THE CASE FOR MONETARY FINANCE – AN ESSENTIALLY POLITICAL ISSUE

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“Consider for example a tax cut for households and businesses that is explicitly coupled with incremental Bank of Japan purchases of government debt – so that the tax cut is in effect financed by money creation”, Ben Bernanke, Some Thoughts on Monetary Policy in Japan, 2003

My aim in this paper to assess the possible and appropriate role for monetary finance of fiscal deficits. And I will argue that all the really important issues are political, since the technical issues surrounding monetary finance are already well understood (or should be) and that the technical feasibility and desirability in some circumstances of monetary finance is not in doubt. Monetary finance of increased fiscal deficit will always stimulate aggregate nominal demand: in some circumstances it will be a more certain and/or less risky way to achieve that stimulation than any alternative policy lever: and the scale of stimulus can be appropriately calibrated and controlled – there is no knife edge nonlinearity which makes dangerously high inflation inevitable.

But it is also clear that great political risks are created if we accept that monetary finance is a feasible policy option: since once we recognise that it is feasible, and remove any legal or conventional impediments to its use, political dynamics may lead to its excessive use.

The most important question relating to monetary finance is therefore whether it is possible to construct a set of rules and responsibilities which will guard against its dangerous misuse, while still enabling its use in appropriate quantities and in appropriate circumstances. But the majority of this paper is still devoted to making the technical case, since the fact of technical feasibility and desirability is still not universally accepted within the economics profession, and needs to be if we are to move on to the crucial issues of political economy.

The paper is structured in four sections:

- 1. Defining terms.** What do we mean by “monetary finance” and how is it distinguished from other policy options which might be used to stimulate nominal demand
- 2. The undoubted technical case for monetary finance.** In this section I argue that the technical case for monetary finance is clear and undeniable. I begin by defining what I mean by “technical”
- 3. The political risks of monetary finance: a manageable challenge?** I argue that in principle these risks can be managed

4. Monetary finance in today's economic circumstances. I argue that monetary finance should be an available policy tool, and that in at least one country – Japan - it not only should be but inevitably will be used within the next five years. I also consider whether money finance should be used only as an emergency measure in the face of a post-crisis debt overhang, or whether, faced with possible secular stagnation, we will have to use it on a continuous basis.

1. DEFINING TERMS: DISTINGUISHING MONETARY FINANCE FROM OTHER POLICIES

“Monetary finance” is defined as running a fiscal deficit (or a higher deficit than would otherwise be the case) which is not financed by the issue of interest-bearing debt, but by an increase in the monetary base – i.e. of the irredeemable fiat non-interest-bearing monetary liabilities of the government/central bank.

The easiest way to think about this is in terms of Friedman’s “helicopter money”, [Friedman, M. 1960] with the government printing dollar bills and then using them to make a lump-sum payment to citizens. But in modern reality

- It could involve either a tax cut or a public expenditure increase which would not otherwise occur.
- It can be one-off or repeated over time.
- And it would typically involve the creation of additional deposit rather than paper money. This would be initially in the form of deposit money in the government’s own current accounts which would then be transferred into private deposit accounts either as a tax cut or through additional public expenditure.

There are a number of ways in which the money could be “created” with different precise implications for the central bank balance sheet. They include:

- The central bank directly credits the government current account (held either at the central bank itself or at a commercial bank) and records as an asset a non-interest-bearing non-redeemable “due from government” receivable
- The government issues interest-bearing debt which the central bank purchases and which is then converted to a non-interest-bearing non-redeemable “due from government” asset
- The government issues interest-bearing debt, which the central bank purchases, holds and perpetually rolls over (buying new government debt whenever the government repays old debt), returning to the government as profit the interest income it receives from the government. In this case the central bank must also credibly commit in advance to this perpetual rollover.

But the choice between these different precise mechanisms has no substantive economic consequences, since in all cases: (Exhibit 1a and b)

- The consolidated balance sheet of the government and central bank together is the same.
- The monetary base of irredeemable non-interest-bearing money is increased
- And the government is thus able to cut taxes or increase expenditure without incurring any future liability to pay more interest, or to redeem the capital value of the money created.

Section 2 (i) explores how monetary finance, defined in these terms, is bound to stimulate aggregate nominal demand. Section 2 (ii) will then explore how such monetary finance differs from three possible alternative policy options:

- (i) Debt financed fiscal deficits (or more specifically, debt financed increases in fiscal deficit above what would otherwise be the case.) These involve tax cuts or public expenditure increases financed via the issue of interest-bearing debt. Unlike money financed deficits they do create an increased future debt servicing burden.

Such operations increase the fiscal deficit and the stock of public debt but do not involve an increase in the monetary base.

- (ii) “Pure monetary policy stimulus” working via changes in the policy interest rate, or, if interest rates are at the zero lower bound via either (i) forward guidance on the path of future interest rates (ii) quantitative easing operations in which the central bank purchases government interest-bearing debt, but without any concurrent increase in the fiscal deficit, and with the stated intention that the debt will at some time be sold back to the private sector.

QE operations involve a temporary increase in the monetary base but no increase in the fiscal deficit or the public debt stock.

- (iii) Increased fiscal deficits accompanied by QE operations. Here there is both a debt financed increase in the fiscal deficit, and a temporary increase in the monetary base. But this combination is still different from monetary finance because the stated intention that the QE operation will eventually be reversed means that the government still faces an increase in its long-term debt servicing burden, both in respect to interest payments and capital redemptions.

Such operations involve both an increase in the fiscal deficit and the public debt stock, and a temporary increase in the monetary base.

Exhibit 2 summarises the difference between the alternative options in terms of the implications for fiscal deficit, public debt stock and thus future debt servicing requirements, and the monetary base.

2. THE UNDOUBTED TECHNICAL CASE FOR MONETARY FINANCE

I argue in this section that the “technical” case for treating monetary finance as an available policy option is undoubted, and that there are no valid technical reasons for excluding it.

By “technical” considerations I mean those which would be relevant if we could assume that the policy authorities (government and central bank) could together make and stick to credible commitments which define the circumstances in which they will deploy monetary finance and the quantities of monetary finance which they will deploy. The political question of whether such commitments can be credible is considered in Section 3.

The technical case for monetary finance follows from 4 propositions:

1. That there exist some circumstances in which it is desirable by some policy or other to deliver a faster growth of aggregate nominal demand.
2. That monetary finance of increased fiscal deficits will always stimulate the growth of aggregate nominal demand.
3. That there are circumstances in which monetary finance will do so more certainly and with less risk of adverse side-effects than either a purely fiscal policy approach (debt financed fiscal deficits) or a purely monetary approach (working via interest rates, forward guidance, or QE)
4. That the scale of the impact of monetary finance on nominal demand can be appropriately controlled.

I argue that each of these propositions applies, and that in particular Propositions 2, 3, and 4 can be demonstrated with certainty on the basis of simple first principles, without the use of complex modelling. This conclusion is however supported by the formal modelling analysis which Jordi Galí presented in a recent paper, the key findings of which I therefore discuss.

(i) Proposition 1: there exist some circumstances in which it is desirable to stimulate faster nominal demand growth.

Sections 2(ii) and (iii) will prove that monetary finance will always stimulate aggregate nominal demand, and that there exist circumstances in which it is a better and less risky way to do so than the alternative policy options.

But that would only make monetary finance desirable in circumstances where aggregate nominal demand is deficient and where therefore it is desirable to stimulate nominal demand by some means or other. We must therefore agree whether Proposition 1 holds.

It could be challenged on both theoretical and empirical grounds. Indeed of my four propositions this is the one which raises the most complex issues of economic theory and empirical evidence and which cannot be proved with simple and undeniable logic. Whether it applies depends essentially on whether the real economy works in line with Classical or New Keynesian assumptions;

- If Classical assumptions hold, and wages and prices are sufficiently flexible, then maximum possible divergences from full employment equilibrium are always very small: there is limited if any capacity to improve economic performance by any category of demand management stimulus: and modern economies could operate efficiently even if they faced continuous mild deflation. A recent BIS paper argues a variant of that case (Borio et al 2015)

- But under New Keynesian assumptions with somewhat sticky wages and prices, and if there are debt contracts whose real value can increase due to unanticipated changes in inflation rates, it is possible for economies to run significantly below full employment potential, making a stimulus to nominal demand potentially appropriate. And reflecting these assumptions, modern policy practice has coalesced around a strong consensus that:
 - In general over time, it is desirable to keep inflation at a low but still positive rate (e.g. around 2% rather than zero or negative) ,implying that nominal GDP in advanced economies will tend to grow on average over time by around say 4-5% per annumⁱ
 - And that circumstances can exist when nominal demand growth is insufficient (e.g. too low to deliver the inflation target), making some macroeconomic policy change appropriate to stimulate higher nominal GDP growthⁱⁱ .

This paper agrees with that consensus, but does not evaluate the detailed theoretical and empirical issues required to prove that consensus justified. But if it is not justified then all of the policies deployed in an attempt to stimulate nominal demand since the 2008 financial crisis have been inappropriate, since all of them – from debt financed fiscal expansion, to ultra-low interest rates, forward guidance and QE – have been predicated on the belief that we face an output gap and a deficiency of aggregate nominal demand which can and should be reduced through one or other of these policies. In the rest of this paper I will therefore,

- Assume that there can exist circumstances where it is appropriate to seek to increase nominal demand
- Consider the relative merits of doing so via money finance, or via the alternative policies described in Section 1

Obviously this does not mean that it is always appropriate to stimulate nominal demand growth:

- If for instance, economies are at full employment/ full capacity, any increase in nominal demand will produce a purely inflationary effect but no output benefit, and if inflation is already on target, a further increase in inflation will be undesirable.
- And if those circumstances exist, monetary finance of increased fiscal deficits would clearly be inappropriate.
- But if these conditions pertain, it would also be equally inappropriate to consider any alternative policy to stimulate nominal demand, such as via debt financed fiscal deficits or QE programs.

A crucial question relating to the deployment of any of the policy options is therefore what mix of output and purely price effects will result from any given increase in aggregate nominal demand. In principle that balance should be independent of the choice of policy tool used to stimulate nominal demand, and determined solely by real economy factors such as the size of the output gap and the flexibility of labour markets. I will therefore

initially assume that such independence holds (Exhibit 3) In Section 2 (v) however I will relax that assumption and consider whether expectational factors could make the division less favourable for monetary finance than for the other policy optionsⁱⁱⁱ.

(ii) Proposition 2: monetary finance of increased fiscal deficits will always produce an increase in aggregate nominal demand

Monetary finance of increased fiscal deficits will always stimulate aggregate nominal demand, both because it will induce a direct impact on nominal demand and because it produces an increase in private sector perceived and actual nominal net wealth.

The direct effect is easiest to understand if we assume that the government uses money finance to increase public expenditure, buying more goods and services from the private sector or directly employing people who were previously unemployed. This will directly stimulate aggregate nominal demand in a fashion which is not dependent on any change in the current rate of interest, nor on expectations of future rates of interest, nor on any indirectly induced private sector response.

But the stimulus effect would also be certain if instead the government/central bank together arrange the printing and helicopter based distribution of actual dollar bills (as per Friedman's thought experiment) or more realistically, if the government announced a reduction in taxation which it made clear was being financed by new and permanent money creation. This would stimulate aggregate nominal demand because it would undoubtedly increase private sector nominal net wealth.

The issue of whether debt financed fiscal deficits increase household perceived net wealth is central to the debate over whether such deficits will be effective in stimulating nominal demand. As Robert Barro put it in his famous article "Are government bonds net wealth?" [Barro 1974] *"the assumption that government debt issue leads, at least in part, to an increase in the typical household's conception of its net wealth is crucial to demonstrating a positive effect on aggregate demand of "expansionary" fiscal policy"*. And Barro illustrated that if we assume rational forward-looking expectations, and if the current generation's assessment of its net wealth is connected to that of future generations by a chain of operative intergenerational transfers, then an increase in government bonds held by the household sector would not increase household perceived net wealth, since households would rationally anticipate the taxes required to meet the future debt servicing burden. Thus if the government is subject to a necessary budget constraint in which

$$\text{NPV of current and future taxes} = \text{NPV of current and future expenditures}$$

.... then any increase in a debt financed fiscal deficit today has to be matched by an increase in taxes at some future time. While therefore a debt financed fiscal deficit clearly increases the gross financial assets of the private sector (since household holdings of public debt have increased but with the monetary base unchanged) households will not perceive this as an increase in net wealth, and will not therefore increase consumption or investment expenditures and thus aggregate nominal demand.

Whether this Ricardian Equivalence effect applies in all states of the world is of course extensively debated and is an issue to which I will return when considering Proposition 3. But what is absolutely clear is that if the government funds a fiscal deficit through the permanent creation of additional monetary base, rather than using debt finance, there is a definitive and certain increase in private sector nominal net wealth. Private sector gross financial assets increase, but this time with no offsetting increase in the rationally anticipated net present value of all future taxes. The government budget constraint is in this case

$$\text{NPV of current and future taxes} = \text{NPV of current and future expenditures} - \text{NPV of all current and future increases in the monetary base}$$

...and there is therefore as Willem Buiter has set out [Buiter 2014] an asymmetry between the private sector and the government balance sheets: monetary base is an asset for the private sector, but for the government it is a purely notional liability (with NPV equal to zero) since it is irredeemable and non-interest-bearing.

This makes it undoubted that money finance of an increased fiscal deficit will always stimulate aggregate nominal demand, and will do so irrespective of

- Whether the economy is already at full employment
- Whether private agents are rationally forward looking

This follows since (Exhibit 4)

- If private agents are not forward-looking, they will assume that all of the increase in nominal net worth is equivalent to increased real net wealth, and will therefore increase their consumption level.
- If they are rationally forward looking and the economy is at full employment, they will anticipate that the impact of the money creation will be inflationary, and will therefore have an incentive to spend some of their newly increased nominal wealth before prices rise.
- While if they are rationally forward looking but the economy is not at full employment, and some real positive output effect is therefore logically possible, then some part of the newly increased nominal wealth will represent (on average across all private agents) an increase in real net wealth, making it rational to spend some of this on increased consumption.

And this finding is applicable as much when the economy is stuck in a liquidity trap at the zero lower bound as when it is far away from the ZLB. In a liquidity trap at the ZLB monetary policy is unable to produce a change in interest rates, and bonds and money are perfect substitutes, but neither fact has any impact on the straightforward transmission mechanisms by which money financed fiscal deficits will stimulate aggregate nominal demand, since:

- The transmission mechanism does not depend on any reduction in nominal or real interest rates.

- And the fact that money and bonds are perfect substitutes has no implications for the fact that monetary finance of increased fiscal deficits increases private nominal net wealth. If money and bonds are perfect substitutes, then replacing 100 bonds in private hands with 100 of money might well have no effect: but adding 100 of money to the 100 bonds will undoubtedly increase nominal wealth and therefore stimulate increased spending. ^{iv}

The logic is undeniable, and yet it is often strongly resisted because it somehow feels wrong that private net wealth can be increased simply by printing money. As one commentator on an earlier draft of this paper put it, a government can surely not provide “manna from heaven” of any real value, and cannot therefore magically overcome the real national resource constraint (applying across the government and private sectors combined) which is rooted in the real production capacity of the economy (and thus in capital stocks, total factor productivity potential and labour supply).

The crucial point, however, is that the “manna from heaven” (most easily thought of as Friedman’s helicopter money) is in nominal terms, and while the government cannot by its fiat directly and certainly increase private sector real net wealth, it can undoubtedly increase private sector nominal net wealth. ^{vvi}

That in turn would produce only price inflation effects if the economy were already at full capacity, leaving private real net wealth completely and permanently unchanged. But if we are in circumstances where an increase in aggregate nominal demand could stimulate an increase in output as well as price, then some increase in real output may also be induced.

Thus:

- If the economy is at full capacity, when no further increase in nominal demand is desirable, money finance of increased fiscal deficit will produce higher inflation.
- While if output and employment are below full capacity, money financed deficits will produce some mix of price and output effects.
- But they will always (or almost always) produce an increase in aggregate nominal demand.

While moreover absolutely strict logic requires us to add the word “almost” before “always”, the only conditions under which money finance will fail to stimulate nominal demand are ones largely irrelevant to practical policy debates.

- One would arise if the private sector, observing the government running a money financed fiscal deficit, expected the government in future to reverse the operation, running future fiscal surpluses and using them not to repay debt but to retire money from circulation. Logically this is possible, but it is highly unlikely that such expectations would exist, and analysis of the political economy of money finance deficits (discussed in Section 3 below) suggests that the expectational danger is precisely the opposite one – that the private sector will believe that moderate money finance today will be followed by excessive money finance in future. ^{vii} Such

an expectation would increase the speed with which money financed deficits stimulate nominal demand.

- The second would arise if the scale of monetary finance were so massive as to produce a hyperinflation in which almost all private agents cease to attach any value to the newly created money, choosing instead to conduct all economic transactions entirely with some other monetary device – such as foreign currency, or reverting to barter arrangements. As Section 3 argues however, there is no reason why money finance operations cannot be calibrated to avoid such an extreme: and there is almost zero probability that the private sector would anticipate such an eventual outcome the very instant the first initial money stimulus were introduced.

For all practical purposes, therefore, we can remove the word “almost” and Proposition 2 is undoubtedly valid: Monetary finance of increased fiscal deficits will always produce an increase in aggregate nominal demand.

This finding in itself, moreover, has a very important policy implications which Willem Buiter has spelt out – that in the face of a deficiency of aggregate nominal demand, governments and central banks together never “run out of ammunition”. If therefore we were to suffer from sustained deflation, low inflation, or “secular stagnation”, that would always be a policy choice and never an unavoidable necessity. [Buiter 2014]

Money finance of fiscal deficits is thus an always available and always effective option for stimulating nominal demand. Whether it is the optimal option, depends on comparison with the available alternatives.

(iii) Proposition 3: there exist circumstances in which monetary finance is a better tool for stimulating aggregate nominal demand than any of the available alternatives

Money finance of increased fiscal deficits will always stimulate nominal demand: and there are strong reasons for believing that in some circumstances it will be the optimal tool to achieve such stimulus because either

- (I) Other tools may be ineffective.
- (II) Other tools carry greater risks of potentially harmful side-effects.

This section therefore compares a money financed deficit stimulus with three alternatives

- Debt financed fiscal deficits
- Ultra-loose monetary policy implemented via very low or negative interest rates, quantitative easing, or forward guidance to generate expectations of low interest rates in future
- A combination of debt financed fiscal stimulus plus quantitative easing, but without a commitment to a permanent increase in the monetary base

(a) Debt financed fiscal stimulus

It is straightforward to illustrate that money finance will always have an impact on aggregate nominal demand which is greater than or equal to the impact of a debt financed deficit.

Before the 2008 crisis, there was a predominant belief that fiscal policy in its classical debt financed form had little useful role to play in macro demand management, and that in particular fiscal stimulus was a less effective way to manage nominal demand than monetary policy. This reflected three related developments:

- (i) The influence of classical/real business cycle assumptions which appeared to make it less likely that economies would diverge significantly from full employment/full capacity, and which thus reduced the apparent importance of any demand management policies.
- And the increasing acceptance of two arguments for doubting the capacity of debt financed fiscal deficits to stimulate nominal demand
 - (ii) The apparent victory of the Barro point of view in relation to Ricardian equivalence.
 - (iii) And the belief that if a government did attempt to increase nominal demand via debt financed deficit, then (given assumption (i)), any stimulus would be offset by the actions of an inflation targeting central bank [Sargent and Wallace 1981] which would in turn mean that any increase in debt financed public investment would be offset by “crowding out”

Since the crisis, however, a strong case has been made that debt financed fiscal deficits should have a major role to play. Among the clearest statements of this belief is Brad DeLong and Larry Summers’ paper “Fiscal Policy in a Depressed Economy” [DeLong and Summers 2012] DeLong and Summers agree that *“the conventional wisdom... rejecting discretionary fiscal policy is appropriate in normal times”* but argue that *“such a policy has a major role to play in a severe downturn in the aftermath of a financial crisis that carries interest rates down to the zero lower bound”*

DeLong and Summers argument rests essentially on two propositions:

- First that we are in circumstances where stimulus to nominal demand is appropriate because it will have a significant output as well as merely a price effect
- Second that we are in circumstances where a debt financed fiscal policy will be effective in stimulating aggregate nominal demand

The first of these propositions is identical to my own Proposition 1 and DeLong and Summers provide two compelling arguments for believing that it strongly applies in current circumstances

- First that there is a significant gap between current actual and potential output
- Second that there are powerful hysteresis effects, so that future potential output can be itself increased by policies which ensure a smaller output gap today.

Both of these arguments establish a case for the believing that the stimulus to aggregate nominal demand will produce a significant real output effect as well as some price effect: they therefore suggest that the effect of debt financed fiscal stimulus – the size of the multiplier- will be higher in current circumstances than it would in “normal” conditions.

The second of DeLong and Summers’ propositions rests on the belief that the two potential offsets to the effectiveness of debt financed fiscal policy do not apply today. Thus:

- On the issue of “crowding out”, DeLong and Summers argue while in normal times *“changes in fiscal policy would be offset as the Federal Reserve pursued the appropriate balance between inflation and investment”* when nominal interest rates are at the zero lower bound, no such crowding out effect will arise. Indeed they point out that in so far as the fiscal stimulus produces some additional inflation as well as an output effect, real interest rates will actually fall rather than rise in the early years after the debt financed stimulus is implemented.
- On the issue of Ricardian Equivalence, DeLong and Summers are less explicit about whether they take seriously Barro’s argument. But since they argue that debt financed fiscal stimulus today would have such a large multiplier effect as to potentially reduce public debt as percent of GDP, in their model rational forward-looking private agents would not feel compelled to offset the effect of an increased fiscal deficit by increasing private savings in anticipation of an increased future debt servicing burden

DeLong and Summers make a powerful case: but their arguments still leave it certain that an equal sized money financed stimulus would have a greater than or equal stimulative effect. Thus:

- Their arguments relating to the output gap and hysteresis, and thus to the strength of the fiscal policy multiplier, are neutral as between a money financed deficit and a debt financed deficit. They are arguments for believing that we should seek to stimulate aggregate nominal demand by one means or other (Proposition 1), but leave open the question of which means is most effective.
- Their arguments that there will be no crowding out *“at least until the economy exits from the zero lower bound or cyclical unemployment drops substantially”* applies equally to a money finance deficit and to a debt financed one.
- And crucially, while DeLong and Summers might be correct in their implicit assumption that Ricardian Equivalence effects will be inapplicable in today’s environment, with a money finance deficit it is absolutely certain that there will be no Ricardian Equivalence effects.

The essential comparison of money financed and debt financed deficits is therefore that

- Money finance deficits will in their first round effect have exactly the same multiplier effects as debt financed deficits.

- But whereas there might be some circumstances where debt finance is offset by Ricardian Equivalence effects, in the case of money finance there is no such possibility.

In terms of its impact on the level of aggregate nominal demand, it is therefore definitively the case that

The impact of money finance deficits \geq the impact of debt financed deficits

Or as Milton Friedman put it in 1948 *"[it is said] that in a period of unemployment it is less deflationary to issue securities [in order to fund a deficit] than to levy taxes. That is true. But it is still less deflationary to issue money"* [Friedman, M. 1948]

Strictly speaking Friedman's words are a slight overstatement. The absolutely certain proposition is that money finance has an effect "greater than or equal to" debt finance, not "greater than". This reflects the fact that in some circumstances a debt financed fiscal stimulus might be as effective. But it is also certain that there will be many circumstances where a money financed stimulus is clearly superior because debt financed stimulus largely ineffective. For while DeLong and Summers implicitly assume Ricardian equivalence does not apply, the fact that debt financed deficits create increased future public debt burdens is likely in many circumstances to depress nominal demand either now or in the future. Thus:

- While DeLong and Summers may be right that in today's specific circumstances multipliers are so large that debt financed fiscal stimulus could result in a fall in public debt to GDP, there will be many other circumstances where that is not the case but where it is still appropriate to seek to stimulate nominal demand.
- And whether or not DeLong and Summers are right, it is widely believed that the potential for debt financed stimulus is constrained by current and future debt burdens, and fiscal consolidation programs (in the Eurozone , the UK , the US and Japan) are widely justified on those grounds.
- Those beliefs, widely discussed in political debates and economic commentary, may moreover make it more likely that the stimulative effect of debt financed deficits would in today's circumstances be offset by Ricardian Equivalence effect. For while the validity of Ricardian equivalence is often discussed in binary and theoretical terms, it may well be that RE applies "to a degree", and that that degree is a function both of the level of public debt already in place, and of the extent to which the problems of future debt sustainability are discussed in the media and commented on by politicians. If a government launched a debt financed fiscal stimulus amid dire warnings from market commentators and opposition politicians about the threat to future debt sustainability, the stimulative effect might well be offset by increased savings among households and companies.
- Finally even if it were the case that private agents ignore Ricardian Equivalence effects, and that increased debt financed deficits have an immediate stimulative effect on aggregate nominal demand, in many circumstances the subsequently emerging increase in public debt to GDP would then at some future date necessitate contractionary fiscal consolidation , offsetting the stimulative impact over the long

term. Even the absence of an inevitable RE response to fiscal deficits today, would not therefore mean that public debt sustainability issues are of no substantive long-term importance.

The problems created by public debt accumulation cannot therefore be ignored. But even if these restrict (or are believed to restrict) the feasibility of debt financed fiscal deficits, there are still no circumstances in which governments /central bank together “run out of ammunition”, since money financed deficits always stimulate nominal demand without adding to future debt burdens.

(b) Monetary policy at the zero lower bound

DeLong and Summers argue that at the ZLB monetary policy is ineffective but that debt financed fiscal stimulus is an available option. The dominant assumption of recent policy-making, however, has been precisely the inverse – that the potential for fiscal stimulus is constrained by legitimate concerns about public debt burdens, but that at the ZLB monetary policy can still stimulate aggregate nominal demand via devices such as forward guidance or quantitative easing.

This section therefore considers the effectiveness of monetary policy at the ZLB, and argues that while unconventional monetary policy, if pursued sufficiently aggressively, would probably succeed in stimulating aggregate nominal demand, money financed fiscal deficits are a more certain and more direct way to achieve that stimulus, and carry less dangers of adverse side-effects.

The crucial question is whether monetary policy can be effective when an economy is in a liquidity trap and short-term interest rates have already fallen to the ZLB but without stimulating adequate nominal demand growth. We certainly appear to be in such a position: six years of ultralow interest rates have failed to produce nominal GDP growth and thus inflation rates in line with central bank objectives. (Exhibit 5) It appears therefore that the interest rate required to produce adequate nominal GDP growth might be significantly negative: and two alternative possible explanations for this situation have been put forward:

- One stressing the scale of the debt overhang effect left behind by large increases in private sector leverage in the pre-crisis decades. [Rogoff 2015]
- The other suggesting that there might be demographic or technological developments which ,even before the 2008 crisis were driving a sustained fall in the equilibrium real interest rate, thus creating the danger of “secular stagnation” [Summers 2013]

In response three policy responses have either been followed or proposed:

- Various forms of forward guidance or changes in inflation/price level targets which seek to change expectations of the future path of nominal and real interest rates.
- Quantitative Easing programs, with central banks purchasing government or other bonds.

- The implementation of significantly negative nominal interest rates, with the ZLB constraint removed through the abolition of paper money. [Rogoff 2014, Haldane 2015]

But the transmission mechanisms by which (i) and (ii) achieve their stimulative effects are indirect and uncertain: and options (ii) and (iii) are likely to have important adverse side-effects.

Expectations based monetary stimulus

The theory of the effectiveness of monetary policy at the ZLB was explored well before the 2008 financial crisis by both Paul Krugman [Krugman 1998] and by Gaudi Eggertson and Michael Woodford [Eggertson and Woodford 2003] in response to the apparent emergence of a “liquidity trap” in Japan. The conclusions they reach are both common and compelling:

- The first is that quantitative easing operations cannot be effective simply and solely because they substitute base money for bonds in private agents’ hands. This is obviously the case since the very definition of a liquidity trap is a situation where bonds and money have become perfect substitutes. Eggertson and Woodford prove it formally, illustrating an irrelevance proposition which states that open market operations at the ZLB cannot stimulate aggregate nominal demand unless they change “the expected future conduct of monetary or fiscal policy”.
- The second is that aggregate nominal demand can be stimulated even at the ZLB if the government/central bank is able to induce changed expectations as to the future path of nominal and real interest rates, either by changing expectations of the path of inflation or by changing expectations of how central banks will set interest rates in future given any future level of inflation.

Krugman then argued that Japan should in 1998 have considered setting an inflation target of 4% maintained over 15 years. Eggertson and Woodford argue that the crucial requirement is for the central bank to make a credible commitment that it will not in future be guided by an inflation targeting regime which is forward looking at all points in time (i.e. which seeks at any time to achieve, say, 2% per annum inflation over the immediate subsequent future), but instead by a price level target, which implies that a period of deflation will be offset by a period of higher than normal inflation. Within this context, QE might have a useful role to play, not because the substitution of monetary base in place of bonds has any direct significance, but because QE is a “signalling” device of central bank intent. Such signalling could also however be achieved by direct forward guidance. [See also Woodford 2012]

The theory of how monetary policy can stimulate nominal demand even at the ZLB , therefore depends crucially on the generation of appropriate expectations, and central banks have therefore paid considerable attention to whether expectations of inflation are “well anchored” around the inflation target. But there are major theoretical and practical problems in relying on expectational channels to shift an economy out of the deflationary liquidity trap. In particular:

- The theory set out by Krugman and by Eggertson and Woodford is robust if one assumes rational forward-looking expectations. But if one instead assumes that private agents are imperfectly forward-looking, the pull through from rational expectations of future inflation to current behaviours is no longer so powerful.
- And even within a rational expectations model, we face a circular problem of multiple equilibria, in which private agents have to be certain of the central banks future intent , and enough agents have to be certain that enough other agents share their expectations, as to make it rational for them to hold expectations of an increase in inflation. While both Krugman and Eggertson and Woodford are therefore able to demonstrate that there is a feasible path in which expectations of nominal demand growth and inflation drive initial nominal demand growth, both struggle with the issue of how to ensure that that path is actually achieved.
 - Eggertson and Woodford stress that the key to escaping a liquidity trap is *“the skilful management of expectations regarding the future conduct of policy”* but then warn that the central bank should not *“imagine that with sufficient guile it can lead the private sector to believe whatever it wants to, irrespective of what it actually does”*. But since the relevant *“what it actually does”* are actions which the central bank will take in the future, not what it does today, there is no certain solution to the conundrum.
 - Krugman meanwhile notes that *“how to actually create these expectations is in a sense something outside the normal boundaries of economics”* and discusses the possibility that expectations will only shift onto the higher demand/higher inflation path if a large temporary fiscal expansion is first applied, sufficient to generate enough current inflation as to make it rational to assume significant future inflation. But this effectively means that monetary policy alone cannot be effective, and takes us back to the issues of whether fiscal stimulus might in some circumstances be offset by Ricardian Equivalence effects, or, even if RE effects do not necessarily and certainly apply, by political fears that public debt burdens will become in some sense unsustainable.

There is therefore a significant danger that:

- While there exists a sound theoretical case for believing that there is a possible path by which pure monetary policy might, through its impact on expectations, generate sufficient increase in aggregate nominal demand and inflation to pull an economy out of a liquidity trap.
- There are also many other paths in which the attempt to use purely monetary stimulus in this fashion will prove ineffective.

And it is certainly the case that after six years of unconventional monetary policy which is supposed to work to a significant extent via expectational channels, measured expectations of long-term inflation are still below inflation targets and now declining (Exhibit 6)

In assessing money finance deficits versus expectations based monetary stimulus, we must therefore conclude that

- Money financed fiscal deficits will certainly and in all circumstances stimulate aggregate nominal demand.
- While monetary stimulus working through expectations channels might.

Other QE transmission channels

It is possible, however, to propose transmission channels for unconventional monetary policy which do not rest exclusively on their impact on expectations of future short term nominal interest rates or inflation. Rather than being a signalling device of future central bank intent as to short term policy rates, QE could be seen as producing its impact more directly through

- A reduction in current long term yields which might directly increase business borrowing and investment.
- Resulting increases in asset prices, which could stimulate demand either
 - Because increased wealth induces additional consumption.
 - Or because an increase in equity values relative to the replacement cost of new capital assets (an increase in Tobin's Q) induces an increase in investment.

But if these are the proposed transmission mechanisms, two considerations suggest that QE will be inferior to money finance deficits as a strategy to stimulate nominal demand in at least some circumstances

- The first is that the effectiveness of the direct “cost of lending” channel must diminish the closer long-term rates as well as short-term rates approach zero. It should be noted indeed that if we define a liquidity trap as being the point where bonds and money are perfect substitutes, that point is only reached when long-term rather than short-term interest rates reach zero and in, for instance, the US and the UK we are still some distance from that point. Conversely however in Japan, with 10 year nominal yields at 0.32%, the capacity to induce additional corporate or household borrowing by pushing interest rates still lower must be almost entirely exhausted, particularly if, as per Richard Koo's description of a “balance sheet recession” [Koo 2009] companies which already perceive themselves over leveraged become so determined to pay down debt that they are highly inelastic to movements in either short or long-term interest rates. When both short and long-term rates approach zero, the capacity of monetary policy to work via channels other than expectations must diminish.
- The second is that the transmission mechanism via induced asset prices, wealth effects and Tobin's Q effects, is indirect, uncertain and contingent on multiple factors. It may therefore prove weak, particularly if there are strong countervailing forces deriving from a large debt overhang, attempted private deleveraging and a general lack of confidence.^{viii}

It is therefore possible that while money financed deficits will always stimulate aggregate nominal demand, the capacity to stimulate nominal demand via quantitative easing may be subject to declining marginal returns and may reach a point of close to exhaustion. This would be compatible with the fact that the Bank of Japan's latest, massive QQE operations are so far having only a limited impact on the growth of nominal GDP.

Negative interest rates

There is however one pure monetary policy which would seem certain to stimulate demand in all circumstances. This would be to follow Ken Rogoff's proposal, abolish paper money, and directly overcome the zero lower bound constraint by setting short term interest rates at a significantly negative level. [Rogoff 2014, Haldane 2015]

This would clearly and directly create incentives for private agents to bring forward consumption and investment, would further increase the asset value of equities and fixed rate bonds, and would reduce the burden of any debt contracts subject to variable interest rates. It is the only pure monetary policy which would be as certain as money financed deficits to stimulate aggregate nominal demand.

But even if the strategy were in practice implementable, it would still suffer from a major disadvantage relative to money finance deficits, since one of the most important transmission channels would be through induced private credit growth, which over time means higher private leverage. As Kenneth Rogoff has himself argued, we are in a post-crisis liquidity trap in large part because rapid private credit growth before the crisis has created a huge debt overhang and attempted private deleveraging. If our only way to get out of this trap is via setting interest rates so low as to create strong incentives for private credit growth, we seem condemned to repeat the same problem in future.^{ix}

(iii) Fiscal and monetary stimulus combined?

Exhibit 7 summarises the logical ranking of money financed deficits as against alternative policy options as a means to stimulate aggregate demand. In some cases the fact that money finance dominates the alternative is unanswerable, in others highly probable. In particular:

- Compared with debt financed deficits, money financed deficits dominate since the direct impact is precisely the same as a debt financed deficit but without any possibility of Ricardian equivalence effects.
- Compared with all the pure monetary options other than negative interest rates, money financed deficits are certain to stimulate aggregate nominal demand, while pure monetary options might do so in some circumstances but not in others.
- Compared to negative interest rates, money financed deficits can stimulate aggregate nominal demand without committing the economy to a potentially harmful expansion of private credit and thus leverage.

If therefore (but only if) we are in circumstances where it is desirable to produce an increase in aggregate nominal demand, money finance should not be excluded from the toolkit of available policy options.

Before finally concluding that, however, is important to clarify how money financed deficits compare with a strategy in which government runs a debt financed fiscal deficit and the central bank simultaneously implements a quantitative easing operations and in which therefore:

- The government funds an increased fiscal deficit by issuing interest-bearing debt to the private sector;
- and the central bank then purchases the government debt from private sector agents using newly created monetary base to finance this operation.

At first sight this might appear to be the precise functional equivalent of a money financed deficit since:

- At the level of the consolidated government and central bank balance sheet, the only new liability is non-interest-bearing monetary base.
- The interest which the government pays on the interest-bearing debt held by the central bank is returned to the government as central bank profit, so that no net interest expense is incurred by the combined public sector.
- And since the QE operations will ensure that the direct demand effect of the fiscal deficit will not be offset by rising interest rates and a crowding out effect.

There remains however a vital difference, if the QE operation is intended to be temporary with the government bonds sold back to the private sector at some stage. (Exhibit 8)

- For when the interest-bearing debt is sold back to private sector it will become again a net liability of the consolidated public sector, and the future debt servicing payments will therefore enter the government budget constraint, necessitating a tighter future fiscal policy than if the monetary base expansion were permanent
- And in a rational expectations, Ricardian Equivalent world, these future government debt servicing requirements would (as per Barro 1974) count as a negative in today's private sector perceived net wealth.

If therefore it is expected that the central bank will at some stage sell the QE bonds on its balance sheet back to the private sector, we are logically in exactly the same position as when considering a debt financed deficit without accompanying QE, i.e.

- If private agents are rationally forward-looking, RE applies and a debt financed deficit will be ineffective.
- But if they are not forward-looking, and RE does not apply, it might be effective.

In contrast an increased fiscal deficit which is financed by a permanent increase in the monetary base will always stimulate nominal demand.

All central banks currently conducting QE operations strenuously deny that there is any intention of ever allowing the increase in the monetary base to be permanent and thus are able to deny that they have undertaken monetary finance. Their operations are instead supposed to work through the indirect transmission mechanisms detailed in subsection 2 (iii) (b), and they will, it is asserted, be reversed at some stage.

If these commitments are believed, and if in addition agents are rationally forward-looking in relation to government budget constraints, those commitments must logically tend to reduce the impact of the QE operations on aggregate nominal demand.

But it would clearly be possible for a central bank to relax that constraint after a QE operation had already been conducted, agreeing with the government that part of the monetary base creation should become permanent, and replacing the interest-bearing asset on the central bank balance sheet with an irredeemable non-interest bearing “due from government”. Such an action would place the government budget constraint in the position which it would have been if originally debt financed fiscal deficits had been money financed, and would therefore relax the forward-looking budget constraint facing the government.

If private agents are rationally forward-looking or can be influenced to be so by explicit government guidance about the changed nature of its future budget constraint, such an action should logically have a stimulative effect. I will argue in Section 4 that such a policy is almost certain to be implemented in Japan in the near future, and indeed that it should be.

(iv) Possible impacts on prices and real output: Galí’s formal model

If Propositions 1, 2 and 3 hold then there is a strong case for treating monetary finance of fiscal deficits as an available policy tool. And a compelling case for Propositions 2 and 3 can be made, as above, on the basis of some simple logical principles and relationships, without recourse to a formal mathematical model. But a formal model has been illustrated by Jordi Galí in his recent paper “The effects of a money financed stimulus” [Galí 2014], and provides strong support for my conclusions.

Galí concludes that *“under a realistic calibration of [wage and price] rigidities, money financed fiscal stimulus is shown to have very strong effects on economic activity with relatively mild inflationary consequences.”* Indeed *“if the steady-state is sufficiently inefficient an increase in government purchases (financed by money creation) may increase welfare even if such spending is wasteful”*. His model also illustrates that money financed deficits produce far greater stimulus impacts than debt financed.

Galí explores the possible impact of money or debt financed fiscal stimulus under both Classical and New Keynesian assumptions. In the Classical model, with fully flexible wages and prices, only small divergences from full employment/full capacity equilibrium will ever occur. And as a result under these assumptions both money financed and debt financed fiscal deficits can only have a small temporary impact on output (arising from a temporary increase in labour supply which is reversed in subsequent periods) Essentially the Classical model is one in which Proposition 1 does not apply: the economy is always very close to full employment equilibrium : and the pursuit of a simple (e.g. Taylor) rule ensures steady

inflation: money financed deficits have no useful role but neither do debt financed deficits: nor do we have any reason to consider unconventional monetary policy devices (such as quantitative easing).

Under New Keynesian assumptions however, with somewhat sticky wages and prices, it is possible for a stimulus to aggregate nominal demand to produce a significant positive output as well as price effect. The key question therefore becomes which policy is most likely to produce an increase in aggregate nominal demand.

Galí considers the impact of an increase in the fiscal deficit equal to 1% of GDP in an initial period declining over subsequent periods. This stimulus can be financed either by money creation or by debt finance. As his base model he assumes full Ricardian Equivalence. The resulting impact is shown on Exhibit 9, with the money financed deficit producing a significant impact on both inflation and on output, while the debt financed stimulus, inevitably given the RE assumption, produces only a very small effect on either.

Galí then relaxes the assumptions of full Ricardian Equivalence, allowing for the existence of a fraction of households who act in a non-Ricardian “Keynesian” fashion. Changing this fraction has no impact on the effectiveness of a money financed deficit, but as the fraction increases so too does the stimulative impact of a debt financed deficit on nominal demand, and thus on prices and output.

Galí’s precise results of course depends on the multiple parametric assumption made. The general principles are nevertheless clear from his paper:

- First, if we live in a world which is New Keynesian rather than Classical, then Proposition 1 holds and there could be circumstances in which it is appropriate to seek to stimulate aggregate nominal demand by some means or other.
- Second, under any choice of parameters, money financed deficits will always produce an increase in aggregate nominal demand (Proposition 2)
- Third, if we assume Ricardian Equivalence applies to some degree, then under any choice of the other parameters, a money finance deficit will stimulate nominal demand more than an equivalent debt financed deficit (Proposition 3)

(v) Proposition 4: the scale of the impact of monetary finance on nominal demand can be appropriately controlled

The fact that money finance will always stimulate aggregate nominal demand is undoubted: the crucial issue is therefore whether we can use money financed to produce an appropriate rather than excessive increase. The issue of calibration is as important as direction.

But in assessing calibration we face an absence of empirical data and analysis. Monetary finance has been a taboo option – excluded from consideration because if pursued to excess it will produce dangerously high inflation. And as a result we lack empirical evidence of what stimulus to aggregate nominal demand has in fact resulted from controlled and moderate use of monetary finance. DeLong and Summers draw on empirical estimates of the actual multiplier effects of debt financed deficits: and central banks have extensive empirical

experience of the impact of past movements in interest rates: for money finance recent relevant empirical experience is lacking^x.

Nor even do we have an extensive literature deploying modelling approaches which explore the implications of different parametric assumptions. As Galí comments in his recent paper, money finance has only rarely been assessed as a policy option precisely because of fears that it will inevitably lead to high inflation.

But while this makes it difficult to make specific policy propositions (e.g. of the form “implement a money financed deficit of X percent of GDP maintained over Y years”), logical analysis from first principles makes it certain that:

- There is no inherent technical reason why the scale of the impact of monetary finance cannot be managed to produce a desired pace of expansion of nominal demand : we do not face a binary choice (no impact or hyperinflation), nor is there any technical reason to believe that we face a knife edge non-linearity, in which a small increase in money financed stimulus beyond the optimal level is bound suddenly to produce a self-reinforcing increase in inflation
- And this conclusion holds not only in a simple imagined world where the only money is paper currency (or deposits held at 100% reserve banks) but in the real world of fractional reserve banks and a money multiplier. We have policy tools available to control the knock-on impacts of monetary finance.
- The crucial determinant of the ability to deploy monetary finance with beneficial than rather than harmful effects will be the expectations which use of the option generates as to future policy developments

(a) Calibration in the simple helicopter money world: the crucial role of expectations

The easiest way to think about money financed deficits is in terms of Friedman’s “helicopter money drop”, in which the government finances a tax cut through the printing and distribution of actual dollar bills, and in which it can be assumed that all of the monetary base is comprised of paper money, and that the monetary base is equal to the money supply.

In such an imaginary world it is intuitive that the impact of a money financed stimulus on aggregate nominal demand will be somewhat proportional to the amount of money created. If in today’s US economy, with a nominal GDP of \$18 trillion, the US government and Federal Reserve together decided to print and drop from helicopters \$10 million of dollar bills (credibly describing this as a one-off exercise), the impact on aggregate nominal demand would be so negligible that we could not observe it in measured inflation rates or output growth. If the drop were \$100bn there would be appreciable effects: if \$10 trillion there would be many years of very high inflation.

The precise impact on nominal demand, output and inflation would however also depend on the expectations generated by the initial money drop, and even if the government

asserted that the drop was one-off, private sector agents might have different expectations. Three potentially self-reinforcing expectational effects could be important:

- First, if agents expect the initial drop to be followed by other drops (and even more if they expect the drops to steadily increase in size), it could be rational for them to anticipate that the impact on aggregate nominal demand will eventually be great, and therefore to anticipate a significant inflationary effect, since the maximum feasible output effect is bounded by real resource constraints. Expectations of future rapid nominal demand growth could therefore become self-fulfilling even in the current period, since anticipated high inflation makes it rational to spend received money as quickly as possible: and crucially, not just the newly received money, but all pre-existing money balances as well.
- Second, if agents anticipate rapidly rising inflation, this could itself skew the division of the nominal demand increase towards prices than output, since it makes it rational to adjust wages and prices more rapidly, reducing their stickiness. This would therefore break the “independence” assumption which I made in Section 1 – that the division of the impact of a stimulus between prices and output is independent of the policy tool used to deliver the stimulus (Exhibit 10)
- And third, (though this may imply more forward-looking expectations than truly pertain), if agents anticipate that the impact will indeed be skewed towards higher inflation, rather than towards the increase in output which the government/central bank desired, they may also fear that the response of the authorities to the disappointing output response might be to try another still larger helicopter drop.

Self-reinforcing inflationary expectations, can therefore contribute to a political dynamic in which money financed stimulus does indeed produce high or even hyperinflation, and clearly played a key role in past hyperinflations such as those of Weimar Germany or of various Latin American countries during the 1970s and 80s.

There is however no inherent technical reason why such expectations will be generated, and no inherent reason why the government/central bank together could not credibly commit to deploy only a finite quantity of new money creation, or to a policy, evolving in the light of experience, which would deploy only such money creation as sufficient to bring inflation back up to target but no more. And if a government/central bank made such a credible commitment, there would be no reason why the initial stimulus to nominal demand should be magnified by expectational effects, nor why the division of the nominal demand stimulus between prices and output should be any different from that which would result from any of the other mechanisms to stimulate nominal demand considered in Section 2 (iii).

The role of expectations is, as Michael Woodford has argued, central to all monetary policy issues. [Woodford 2003] But it is even more central when we assess the potential benefits and risks of monetary finance. Precisely because the potential scale of monetary finance is unbounded by any government budget constraint, the range of potential expectations which could be generated by its use is infinite. The most important issue relating to the use of monetary finance, indeed in a sense the only important issue, is therefore whether it is possible to establish a set of rules and institutional responsibilities which can constrain the

use of monetary finance within appropriate bounds and which can make those constraints credible. That question is addressed in Section 3 below.

(b) Calibration and control with inside money

The simple model of an imaginary paper currency economy can be easily adapted to allow for deposit money in 100% reserve asset banks, which provide ease of payment and security services, but which do not create credit and inside money. Both Buiter's and Galí's models are implicitly of this form, and do not therefore need to include detailed specification of the banking system and thus of the determinants of credit and inside money creation. In their models, the monetary base is still equal to the money supply.

But in the real world, most money balances take the form of deposits held at commercial banks which hold only a small fraction of their deposits in reserves at the central bank, and the money supply is a large multiple of the monetary base. This reality introduces two complexities for calibration and for policy management which are not explored in Buiter and Galí's models. These complexities are:

- (i) The fact that the nominal demand impact of any given increase in the money base might be magnified by banking system credit creation.
- (ii) And the fact that commercial bank reserves at the central bank might not necessarily be non-interest-bearing.

Neither of these complexities however, negates the potential desirability and superiority of money finance as a policy tool in some circumstances.

Commercial banks which can create credit and inside money and can thereby increase nominal demand^{xi}. If they are subject to reserve requirements which limit their deposits (or other categories of liability) as a multiple of reserves held at the central bank, then their capacity to do so in aggregate is constrained by the quantity of reserves (monetary base) which the central bank chooses to create. But even if they are not subject to quantitative reserve requirements, the quantity of monetary base reserves available will still have some consequences for the scale and pace of credit and inside money creation, as a result of both freely chosen liquidity policies and of prudential liquidity regulations.

The possibility of credit and inside money creation via the banking multiplier thus complicates the calibration of the likely long-term effect of monetary base expansion resulting from any given quantity of money finance operation. In particular it creates the danger that a money finance operation of say \$100 billion will:

- In the short term increase the money supply by little more than \$100 billion (in an environment where demand for credit is subdued and the money multiplier ineffective.)
- But in the long term have a considerably greater impact on the quantity of credit and on nominal demand, but one whose precise size and timing is difficult to predict.

These problems would clearly be overcome if we moved to a system of 100 % reserve banks. And it is noticeable that mid-20th-century supporters of money finance as a means to

manage nominal demand [Fisher 1933, Simons 1936, Friedman 1948] argued that a move to 100% reserve banking was a logical complement to a system of money finance – removing the demand instability created by unpredictable inside money creation and destruction.

But even if we exclude that radical solution, it is still possible for the government/central bank together to counteract the emergence of a higher than initially intended stimulus to nominal demand, by imposing quantitative reserve requirements to limit the operation of the banking multiplier. If banks are required to hold a given minimum percentage of total assets or liabilities in monetary base reserves at the central bank, and if that percentage minimum can be increased by the central bank to offset unwanted credit and bank liability growth, then the eventual as well as the initial impact of monetary finance on aggregate demand can be constrained.

Return of quantitative reserve requirements to the central bank policy toolkit is therefore a logical complement to a policy of using money financed fiscal deficits to stimulate nominal demand.

(c) Central bank reserve remuneration and Ricardian equivalence effects

Central to both Buiter and Galí's models of the impact of money finance is the assumption that the monetary base represents for the government not only an irredeemable but also a non-interest-bearing liability. That non-interest-bearing character is essential to create the asymmetry under which monetary base is nominal net wealth for the private sector but not a solvency relevant liability for the government, since it is a notional liability with a net present value of zero.

The paper money component of the monetary base is by inherent nature non-interest-bearing. But central bank reserve liabilities can be interest-bearing if the central bank chooses to remunerate them. In the UK, for instance, the £375 billion of central bank reserves which have been created by the Bank of England's QE operations, are all remunerated at 0.5% per annum, and the current assumption is that when Bank Rate increases, the remuneration rate will increase in line.

But such a policy of remunerating central bank reserves, means that part of the monetary base does not represent a non-interest bearing liability for the consolidated public authorities. Paying interest on central bank reserves created in money financing operations, therefore eliminates or at least substantially reduces the superiority of money finance over debt financed fiscal deficits as a means of stimulating nominal demand. That superiority derives from the absence of a rational Ricardian equivalent anticipation by the private sector of the future interest expense burden faced by the consolidated public sector: if central bank reserves are remunerated, it is rational to anticipate such a burden. ^{xii}

Again however a technical solution for this is clearly available: which is for the central bank not to remunerate the additional reserves created by money financed fiscal deficits, while still remaining free, if it wishes, to remunerate reserves held above the required minimum quantity as one among the tools it uses to keep market rates in line with policy intent. This would effectively impose a sort of tax on bank credit intermediation: but since there are

strong arguments for believing that credit creation can impose a negative social externality, such a tax could be appropriate [see Turner 2015, Chapter 12, and Cochrane 2013]

Thus in conclusion on Section 2, while the existence of fractional reserve commercial banks, and of private credit and inside money creation, complicates the calibration and management of the impact of money financed operations, it in no way challenges the conclusions which Buiter and Galí reach. From a technical point of view, and excluding until now the impact of political dynamics, it is clear that:

- Money finance deficits can always stimulate aggregate nominal demand, and will always do so more certainly and more powerfully than either debt financed fiscal deficits or pure QE operations.
- And the scale of the resulting stimulus to nominal demand can be managed, and adjusted over time through the use of available policy tools.

If therefore there exist circumstances in which economies might face a deficiency of aggregate nominal demand, money financed fiscal deficits are, in technical terms, a feasible and at times optimal policy option.

4. THE POLITICAL RISKS OF MONETARY FINANCE: A MANAGEABLE CHALLENGE?

Expectations, whether rational or irrational, can have a major influence on the effectiveness of any macroeconomic demand management policy. But as Section 2 (v) (a) described, they are particularly important in relation to monetary finance, since the possibility of monetary finance relaxes the budget constraint otherwise facing governments, and as a result creates major political risks. For if monetary finance is accepted as legal and technically feasible, biases inherent within any political system may create incentives for its excessive use.

- In democracies, electoral cycles create incentives for governments to reduce taxes or increase public expenditures ahead of elections, or to avoid necessary fiscal consolidation. These incentives can be offset by rules, norms or belief systems (“you shouldn’t get into debt”) which constrain debt financed deficits. But if money financed deficits were an available option, they might appear a costless way out of this constraint.
- And while non-democratic political systems might in principle be free of such incentives, in many cases they depend for their stability on clientele patronage systems which are most easily lubricated by money creation.

In response to these biases, and to the macroeconomic harm which excessive monetary finance has produced in many economies, modern economic policy has gravitated to the consensus that the only way to contain the dangers of monetary finance is to prohibit it entirely. Many central bank mandates therefore make monetary finance illegal (e.g. ECB

Article 123.1), and even when not prohibited by law, monetary finance is considered a taboo policy option.

There can indeed be a logically consistent and entirely respectable point of view which:

- Recognises that monetary finance is technically feasible and in some circumstances an optimal policy instrument.
- But nevertheless prohibits the use of monetary finance in all circumstances in order to prevent its excessive use.

The central issue with money finance therefore is a political one – whether we are capable of designing a set of political economy rules, responsibilities and relationships which can allow us to obtain the technically possible benefits of money finance while constraining the dangers of excessive misuse.

Throughout modern history, the question of how to constrain excessive money creation has been an important political issue. Constraints can be achieved in multiple ways – via the design of independent institutions, the specification of rules and laws, or via belief systems and taboos e.g., strongly embedded and shared beliefs that certain policies are unacceptable or indeed “impossible”, even if that is not actually technically true.

None of these constraints can ever be perfectly and permanently effective: any rule written in one period can be overturned in another. But the challenge is to design a set of institutions, rules and belief systems which has as high as possible a probability of surviving and which strikes an optimal balance between (i) avoiding the dangers of excessive political discretion (ii) avoiding the danger that discretion is not available when needed.

The gold standard severely constrained political discretion to create new money to finance fiscal deficits. It was often operated by central banks (e.g. Bank of England) which were not merely “granted” independence by government, but which were inherently independent private institutions. It worked on the basis of implicit rules, and was also embedded in a belief system – the belief that the only ultimately “real” money was metallic, and that paper and deposit money were simply claims on this underlying real money. As long as it survived, it certainly constrained political indiscipline and ensured low (or indeed zero or negative) inflation. But since it tied the growth of nominal demand not to the inherent needs of the economy, but to the vagaries of metallic resource supply, it ultimately proved unworkable.

The collapse of the gold standard, and subsequently the Bretton Woods system, necessitated an alternative system of political discipline. The dominant system which emerged has at its core central banks which are owned by government and ultimately answerable to them, but which have been granted “independence” to pursue “price stability” (whether described in general terms or in terms of a specific inflation target). Granting “independence” effectively amounts to a self-denying ordinance enacted by politicians – giving away the discretion to implement inflationary policies such as excessive money finance.

The discipline is in some countries reinforced by a legal prohibition on money finance. But it is also (like the gold standard) made more powerful by the existence of a pervasive belief –

the belief that money finance is inherently dangerous in any quantity, and bound for some technical reason to produce hyperinflation. Money finance thus becomes a taboo policy option.

If we recognise that money finance is possible and optimal in some circumstances we break the taboo. But we can still place the use of monetary finance within the constraints of central bank independence and of inflation targeting: and we can still preserve the legally defined self-denying ordinance which prevents politicians from enjoying discretion to implement inflationary policies.

It would for instance be entirely possible to adapt the legal framework for the Bank of England so that:

- Monetary policy continues to be determined by the Bank's Monetary Policy Committee, with a mandate to pursue the inflation target (2% over the medium term) as currently defined in law.
- But with that same MPC able to recommend that in order to meet the inflation target in the most effective fashion, there should be a temporary increase in the fiscal deficit financed entirely by permanent central bank money creation.
- Such an institutional framework would for instance have made it possible for the MPC in 2009, rather than approving a reversible QE operation of £200 billion, to recommend to the government a one-off and much smaller increase of the fiscal deficit (e.g. £35 billion), or a sequence of increases over a defined number of years.

Such a system would preserve independent control over the quantity of monetary finance allowed, guided by a clearly defined price stability rule. But it would not be acceptable for the central bank alone to determine the precise allocation of the fiscal resources thereby created – i.e. whether they should be devoted to one-off tax reductions, to one-off increases in government current expenditure, or to government investment. The guiding principle should be that the specific measures implemented should be of a form which makes them credibly one-off – tax cuts and specific investment programmes might meet this criterion, but increases in ongoing entitlement programs or other forms of current expenditure which are difficult subsequently to reduce, would certainly not. But the decision on precise allocation would have to be for the elected government, not the nonelected bank, given the inherently political nature of decisions which have distributional implications.

As a result, monetary finance does imply greater coordination between monetary and fiscal authorities than applies in relation to movements in the short term interest rate. But as Ben Bernanke argued in 2003 *“under [some circumstances] greater cooperation for a time between the central bank and the fiscal authorities is in no way inconsistent with the independence of the central bank”*. The crucial element of central bank independence required is simply control over the maximum quantity of monetary finance allowed.

It is a matter of political judgement whether such a system would be sufficient to allow the appropriately moderate use of money finance in appropriate circumstances, without opening the floodgates to excessive and inflationary money finance. But there is certainly no

legal reason why the rules and responsibilities should not be written in those terms, thus ensuring that discipline is preserved as long as those rules and responsibilities remain in law.

And while laws can always be subsequently changed, so too could the laws which establish central-bank independence as currently defined. If we believe that we have political cultures robust and responsible enough to create sustainable central-bank independence in the setting of interest rates – removing from politicians a powerful tool which could be, and used to be, deployed for short-term electoral advantage – there is no inherent reason why we should not be able to place the use of monetary finance within equally sustainable legal constraints.

5. MONETARY FINANCE IN TODAY’S ECONOMIC CIRCUMSTANCES

As Section 3 recognised, there can be a powerful political case for prohibiting money finance, even while accepting that in technical terms it is entirely feasible and at times an optimal policy instrument. The dangers of excessive use may be so great that we should maintain the taboo and prohibit even its moderate and appropriate use.

But whether that is wise must depend on how serious would be the consequences of excluding the option. And there are strong reasons for believing that in today’s specific circumstances the consequences might be very severe.

Seven years after the financial crisis, nominal demand growth across the advanced economies is still below the pace required to deliver real growth in line with potential and inflation in line with central bank targets. Growth forecasts have been reduced [IMF 2015] and deflationary pressures have intensified in recent months, in part as a result of China’s slowdown. The anticipated date of “exit” from unconventional monetary policies keeps retreating – with US interest rate rises continually delayed, and with growing debate over whether Japan and the Eurozone need yet more quantitative easing. We are facing barriers to the creation of adequate global nominal demand far more fundamental and intractable than was recognised a few years ago.

Two complementary rather than competing explanations of this phenomenon have been put forward:

- The first focuses on the scale of the debt overhang left behind by rapid private sector credit growth before the 2007/8 crisis and on the resulting high levels of leverage in place by 2008. This seems to have placed us in a situation where total global debt levels cannot be reduced but simply shifted
 - between the private and public sectors as private deleveraging is offset by debt financed fiscal deficits; (Exhibit 11)
 - between countries, as, for instance, the impact on Chinese exports of privately deleveraging in advanced economies was offset in 2009 by massive Chinese credit expansion, with rapid leverage growth resulting in China and other emerging economies. (Exhibit 12)

As a result we may now face a situation where total global debt levels are so high that it is impossible to simply “grow out of them” [Reinhart and Rogoff 2013] in which debt levels can only be reduced via some mix of (i) large overt write-offs (ii) significantly negative real interest rates maintained for many years (iii) the overt monetisation of existing public debts.

- The second suggests that in addition we may face a longer term challenge of “secular stagnation” driven by a change in the balance between ex-ante desired savings and investment, which even before the financial crisis of 2007/8 had already produced a dramatic fall in long-term real interest rates. (Exhibit 13)

Together these two factors explain why the massive application of our normal policy tools – debt financed deficits and monetary policy – has still not succeeded in driving nominal demand growth to adequate levels. And together they create circumstances in which excluding the possibility of monetary finance could seriously limit our ability to achieve growth in line with potential.

We should therefore accept monetary finance as an available tool to deal with the problems of severe debt overhang. We should recognise indeed that there can be circumstances, such as those Japan now faces, where it may be the only feasible way to deal with existing debts. And if there really is a significant “secular stagnation” threat, we may have to consider the use of monetary finance not merely as a one off emergency measure but as a normal policy tool.

(i) Inevitable monetisation in Japan

Japan’s experience from 1990 to 2015 was an extreme example of the pattern illustrated on Exhibit 11 which other advanced economies have followed since 2008. Corporate debt to GDP slowly fell from 140% to 100%, but large debt financed fiscal deficits generated public debt which increased from 50% to 246% of GDP and still rising.

Faced with that huge public debt accumulation, the officially stated policy intent is that the Japanese government will at some time reduce fiscal deficit and then generate a primary fiscal surplus, enabling pay down of debt, while ultra-loose monetary policy will drive sufficient nominal demand growth to achieve the 2% inflation target plus growth in line with (admittedly slow) potential.

But there is no evidence to suggest that this policy is credible:

- On the fiscal side, the date at which successful consolidation is supposed to be achieved moves relentlessly into the future (Exhibit 14). In 2010, the IMF Fiscal Monitor described a scenario in which Japan could be put on a path to debt sustainability (defined as a target of net debt to GDP of 80% in 2030) by turning a primary deficit of 6.5% in 2010 into a surplus of 6.4% by 2020. By the time of the 2014 IMF Fiscal Monitor, almost no progress towards that adjustment had been achieved, but the scenario now assumed a six-year rather than 10 year path to almost the same 2020 fiscal surplus. The 2015 Fiscal Monitor has not repeated the scenario exercise, but given forecasts of a cyclically adjusted primary deficit of 5.5%

in 2015 and 4.3% in 2016, any scenario in which a primary surplus of 6% is achieved by 2020 would be clearly incredible. The IMF's base case assumption is for a deficit of 4.1% in that year.

- But while there is no sign that fiscal consolidation on the scale required to meet these fiscal sustainability targets is possible, attempted fiscal consolidation – via the sales tax increase in April 2014 – undoubtedly set back the objective of driving nominal demand growth and inflation back to the desired rates. And continual warnings that Japan faces a daunting future fiscal consolidation challenge, make it rational for Japanese households to be wary of exhortations to increase private consumption.
- On the monetary side meanwhile, QE operations have taken the Bank of Japan's holdings of JGB's to a level by end 2014 equal to 44% of GDP, and with the Bank of Japan now buying bonds faster than the government issues them, this percentage could well reach 95% of GDP by 2017 (Exhibit 15). In theory these bonds will at some stage be sold back to the private sector, but with Japanese headline and core inflation still well below the 2% target, and with the Japanese economy significantly exposed to China's slowdown, there is no credible scenario in which that will occur within the next 5 years, and arguably indeed, no credible path in which it will ever occur. Current policy debates focus not on exit but on the possible need for still larger scale QE.

It thus seems that the Japanese authorities are truly “out of ammunition”. But they are not since the Bank of Japan could recommend to the government of Japan that some (or all) of its holdings of Japanese government debts should be converted into a nonredeemable non-interest-bearing due from the government asset.

- This would have no implications for future BoJ solvency, since while it would cease to receive interest payments on the debt from the government, it would also cease, by an exactly matching amount, to return those payments to the government as central bank profit.
- Nor would it have any implications for the current size of the monetary base, which has already been swollen by QE operations.
- Nor would it in and of itself produce have any immediate and direct stimulus to nominal demand.
- But it would relax the budget constraint facing the Japanese government and therefore make feasible a more gradual future path of fiscal consolidation, stimulating future nominal demand relative to the currently expected path: and to the extent that Ricardian Equivalence applies, this would in turn tend to stimulate additional household expenditure today.
- The net effect therefore would almost certainly be a somewhat faster pace of nominal demand growth than would otherwise occur, with some increase in real output, and a more rapid return of inflation to its target level.

Indeed it would be place Japan now in the position in which it would have been if it had followed Ben Bernanke's advice in 2003 and had then and in subsequent years financed some of its huge fiscal deficits not with debt, but with newly created money.

It is an undoubtedly technically feasible policy: and there are strong reasons for believing it would be desirable. Some variant of it indeed is simply inevitable: there is no credible path in which Japan can generate sufficient fiscal surpluses to reduce its debt to conventionally defined "sustainable" levels.^{xiii}

And if it is inevitable, it would surely be better to recognise that fact now, and put in place the rules and responsibilities described in Section 3, rather than for the Japanese authorities to end up deploying this policy in an ad hoc and potentially undisciplined fashion.

(ii) Continuous monetary finance in response to secular stagnation?

Both the illustrative money finance operation described in Section 3 (£35 billion of additional money financed fiscal stimulus rather than £200 billion of reversible QE) and the write-off of Japanese government debt described above, would be, and could credibly be described as, one-off exercises necessary to deal with the exceptional circumstances created by a severe debt overhang. And there are a very strong reasons for preferring that money finance is only ever used in a fashion which is and is perceived to be one-off.

For if instead monetary finance were repeated year after year, and even if subject initially to the rule driven discipline described in Section 3, it might well induce a political dynamic in favour of the relaxation of those rules. Once it becomes obvious that money finance is always feasible, and that the normally defined government budget constraint exists only because we have chosen to exclude monetary finance, the political pressure to enjoy the apparent free lunch of money financed public expenditure increases or tax cuts may be too difficult to resist.

My very strong preference is therefore to argue that money finance should only be used in extreme circumstances and as a one-off exercise: I would therefore like to believe that continuous use of money finance, year after year, will never be required.

But it is at least possible that if we truly do face some variant of secular stagnation, in which the balance of ex-ante desired savings and investments produces an equilibrium real long-term interest rate which is and will remain for a long time significantly negative, then we may face an unavoidable choice between (i) keeping short-term interest rates at the ZLB continuously (ii) abolishing paper money and moving to significantly negative nominal interest rates (iii) running debt financed fiscal deficits which, as in Japan, mean that public debt levels as percent of GDP either rise continuously or only stabilise at a high level which are only sustainable if interest rates remain very low for ever (iv) using money to finance some part of a fiscal deficit not just on a one-off basis but year after year.

I hope that is not the case, but if it is we may need to consider a policy regime, such as Irving Fisher, Henry Simons, and Milton Friedman considered, in which money finance is used not only as an emergency measure but as a normal year by year policy tool. And if so, it would

be better to place its use within the constraints of a set of rules and responsibilities defined clearly in advance.

To conclude, we should recognise that there is an undoubted technical case for using monetary finance in some circumstances, and now address the political issue of how to make ensure that it will only be used in appropriate circumstances and appropriately moderate quantities.

Notes

ⁱ This reference to 4-5% annual growth in nominal GDP on average over time does not mean that I am necessarily arguing for an explicit nominal GDP growth target. Instead, I am simply accepting the dominant assumption that low but positive (e.g. 2%) inflation rates are optimal, which, if combined with medium term real growth in line with potential, necessarily implies a moderate (e.g. around 4-5%) nominal GDP growth on average over the cycle.

ⁱⁱ In principle the only circumstances in which nominal demand growth could be deemed "insufficient" is if a higher rate of growth would produce, and is required to produce, some increase in real output. In theory therefore, the fact that inflation is below target is not enough in itself to indicate insufficient nominal demand, and there is no value in increasing the inflation rate as an end in itself. But since we have set inflation targets at (typically) around 2% in the belief that achieving such inflation will enable the economy to operate, on average over time, closer to full employment than if the inflation rate were lower, I will accept in the rest of this paper that if inflation runs below target, that illustrates nominal demand growth which is lower than optimal.

ⁱⁱⁱ it is of course possible that the division of the effect between prices and output might be influenced by the specific purposes to which deficit expenditure was devoted: e.g. it might be that a deficit devoted to increased public investment, rather than to public consumption expenditure or tax cuts, might tend to produce a greater output rather than price effect since, if well designed, it could increase the supply capacity of the economy. But if this is the case, it applies equally to money financed and debt financed deficits, and therefore has no implications for their relative effectiveness.

^{iv} In his 1998 article on the return of the liquidity trap [Krugman 1998], Paul Krugman argues that "*a helicopter drop of cash is just as ineffective in a liquidity trap as an open market operation. After all in a liquidity trap money and bonds are perfect substitutes. So a helicopter drop of money is no different from a lump-sum transfer of bonds to the public which, by Ricardian equivalence has no effect*". But this logic is flawed. In the case of a "lump-sum transfer of bonds to the public" households end up with, say, 100 bonds and with an equal offsetting future liability to meet the tax payments required for government debt servicing: with a helicopter cash drop, they end up with 100 of money and no such offsetting liability. In a liquidity trap bonds and money are perfect substitutes when considered as gross financial assets in private agents' hands, and open market operations in themselves therefore have no impact. But bonds and money still differ in their implications for the existence of Ricardian equivalence effects. Open market operations are ineffective in a liquidity trap because they are intended to be reversed, and because therefore the government budget constraint is unchanged. A "lump sum transfer of bonds" plus an open market operation is therefore not equivalent to a helicopter money drop: it would become equivalent if, after the open market operation, the government bonds held by the central banks were converted into a non-interest-bearing irredeemable due from government receivable.

^v This obviously assumes that the government concerned is a money issuing power. The statement that the government can always increase private sector nominal net wealth does not therefore apply to the governments of the Eurozone countries, which, as Charles Goodhart has pointed out, should now be considered as "sub-sovereign" states. It is a government and central bank together which can always increase private sector nominal net wealth and therefore nominal demand. In the Eurozone this would require either (i) cooperation between the ECB and all of the governments together; or (ii) the creation of a fiscal capacity at Eurozone level.

^{vi} Note that the fact that the government and central bank together can always increase private nominal net wealth and thus nominal demand, is a completely different question from the one asked by Auernheimer in his famous 1974 article "*The Honest Government's Guide to the Revenue from the Creation of Money*" [Auernheimer 1974] Auernheimer was seeking to define a "revenue maximising rule" i.e. what rate of money creation and thus inflation maximise the real resources available to the government through (effectively) an inflation tax, and he illustrated important potential limits to the government's ability to command real resources in this fashion. But such limits have no implications for the separate question of whether a government and central bank together can stimulate aggregate nominal demand, private and public combined.

^{vii} In fact there have been some cases in history where a government has sought to at least partially reverse prior monetary finance. Thus for instance, the UK government paid for a significant part of its First World War expenditures with monetary finance which produced a doubling of the money supply [Ahamed 2009] but then pursued strongly deflationary policies in the 1920s in order to return to the gold standard at the pre-war parity in 1926. But this subsequent reversal was certainly not anticipated nor reflected in private agents' behaviour, and during the First World War, the monetary finance operation produced its inevitable consequence of significant nominal demand growth and inflation.

^{viii} QE may also entail the disadvantage that, if the transmission mechanism is via higher asset prices, it will tend to increase wealth inequalities, which in turn, may have had a role to play in the pre-crisis expansion of private credit which has left us facing a debt overhang effect. The Bank of England estimated in 2011 that as a result of its quantitative easing operations UK nominal GDP was about 1.5% higher than it would otherwise have been, with some positive effect on both prices and output [Joyce, Tong and Woods 2011] This effect was in part achieved because QE, on the Bank's calculations, may have increased total household wealth by just over £600 billion. [Bank of England 2012] But since the top 10% of households own over 70% of all household financial assets, and a higher proportion still of the government and bonds and equities whose value is increased by QE (as against the bank deposits whose value remains unchanged) the distributional impact of the policy was highly regressive. [See Turner 2015 p85 and note 23]

^{ix} This danger may be particularly severe because the vast majority of credit creation (potentially stimulated by very low or negative interest rates) does not fund consumption or investment activities which count as GDP transactions, but funds the purchase of existing assets and in particular real estate. As a result, low interest rates can produce a huge build-up of private leverage, creating subsequent debt overhang dangers, even if they produce only a moderate stimulus to nominal demand, current prices and output. [See Turner 2015, chapters 4, 5, 7, and 10]

^x What we do have is historical evidence of money finance either from the more distant past, or in extreme conditions. This evidence supports the conclusion that the scale of the impact of monetary finance on nominal demand depended crucially, to quote Adam Smith, on "*the moderation with which it was used*". Moderate use of monetary finance had beneficial effects and did not produce hyperinflation in for instance, the Pennsylvania Colony in the early 18th century, the Japanese economy under finance minister Takahashi's policies in the early 1930s: and it was also used effectively and without hyperinflation by US Union government in the Civil War, and the US government in the Second World War. Excessive monetary finance led to hyperinflations in the US Confederacy during the Civil War, Weimar Germany in the early 1920s, several Latin American countries in the 1970s and 80s, and in Zimbabwe recently. The impact all depends on the quantity of the monetary finance operation. [See Turner 2015, page 112- 113]

^{xi} The mechanisms by which banks create nominal demand is best understood in terms of the credit created, not the money (or other bank liability) which then results. Indeed no particular importance should be attached to whether the liabilities which emerge on bank balance sheets do or do not fall in the arbitrary definition of "money". As Benjamin Friedman has put it "*in retrospect the economic profession's focus on money – meaning various subsets of instrument on the liability side of bank balance sheets in contrast bank assets – turns out to have been a half century long diversion which did not serve our profession well*" (Friedman, B, 2012) [Turner 2015, page 268 note 14]

^{xii} The fact that remuneration of reserves creates a variant of a debt servicing burden on the consolidated public sector, is also independent of whether the asset claim which the central bank has on the government is in itself interest-bearing (e.g. the central bank owns interest-bearing bonds) or a non-interest-bearing and irredeemable asset. In the former case, government will make debt servicing payments to the central bank, which in turn makes them to private banks which hold monetary reserves: in the latter, the central bank will face a loss, for which the government will need to compensate it (via subsidy or repeated capital injections).

^{xiii} One alternative possibility is that Japan never achieves any reduction in public debt to GDP, but that this becomes treated as permanently acceptable. If both short-term and long-term interest rates fall to 0, then the debt/GDP ratio will stabilise if the Primary deficit/GDP divided by the nominal GDP growth rate, equals the Debt/GDP ratio. (E.g. with a 0% interest rate, it will stabilise at 250%, if the primary deficit is 5% and the nominal GDP growth rate is 2%). This could in principle be a permanently sustainable equilibrium: in essence indeed it would be a variant of money financing since bonds which are non-interest-bearing and irredeemable (or perpetually rolled over) are effectively money. But it would still leave Japan vulnerable to any future rise in interest rates; it would therefore make it close to impossible ever to increase interest rates significantly; and unless the reality of the situation was fully understood by all Japanese private agents, the continual assertion that Japan faces a "large public debt burden" and needs to achieve fiscal consolidation, might still have a depressive Ricardian Equivalence effect.

Public sector balance sheets after money finance

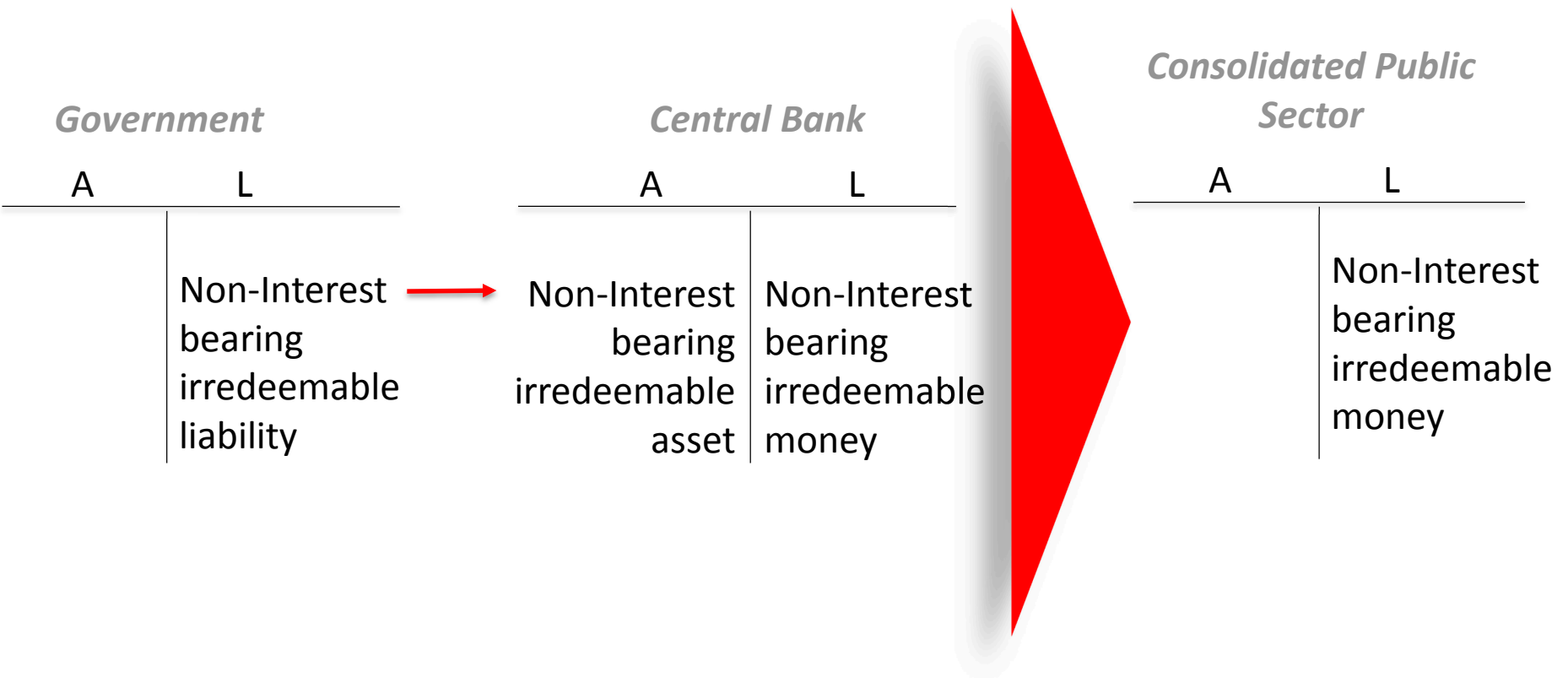
Situation after either:

Option 1

Central Bank directly credits government current account with money which government spends

Option 2

Government issues interest bearing debt which Central Bank purchases and converts to non-interest bearing irredeemable 'Due from Government'

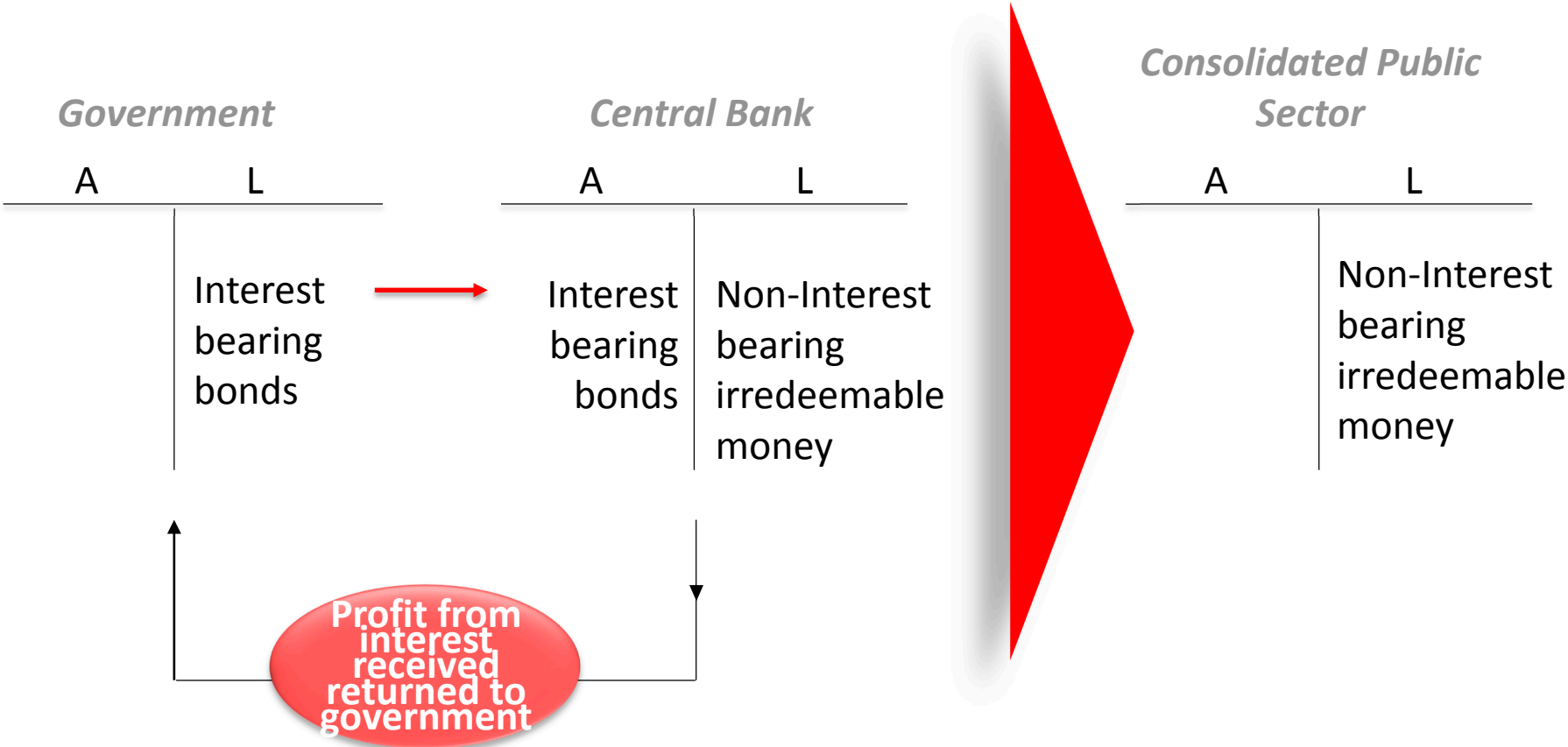


Public sector balance sheets after money finance

Situation after:

Option 3

Government issues interest bearing debt which Central Bank buys, holds and perpetually rolls over

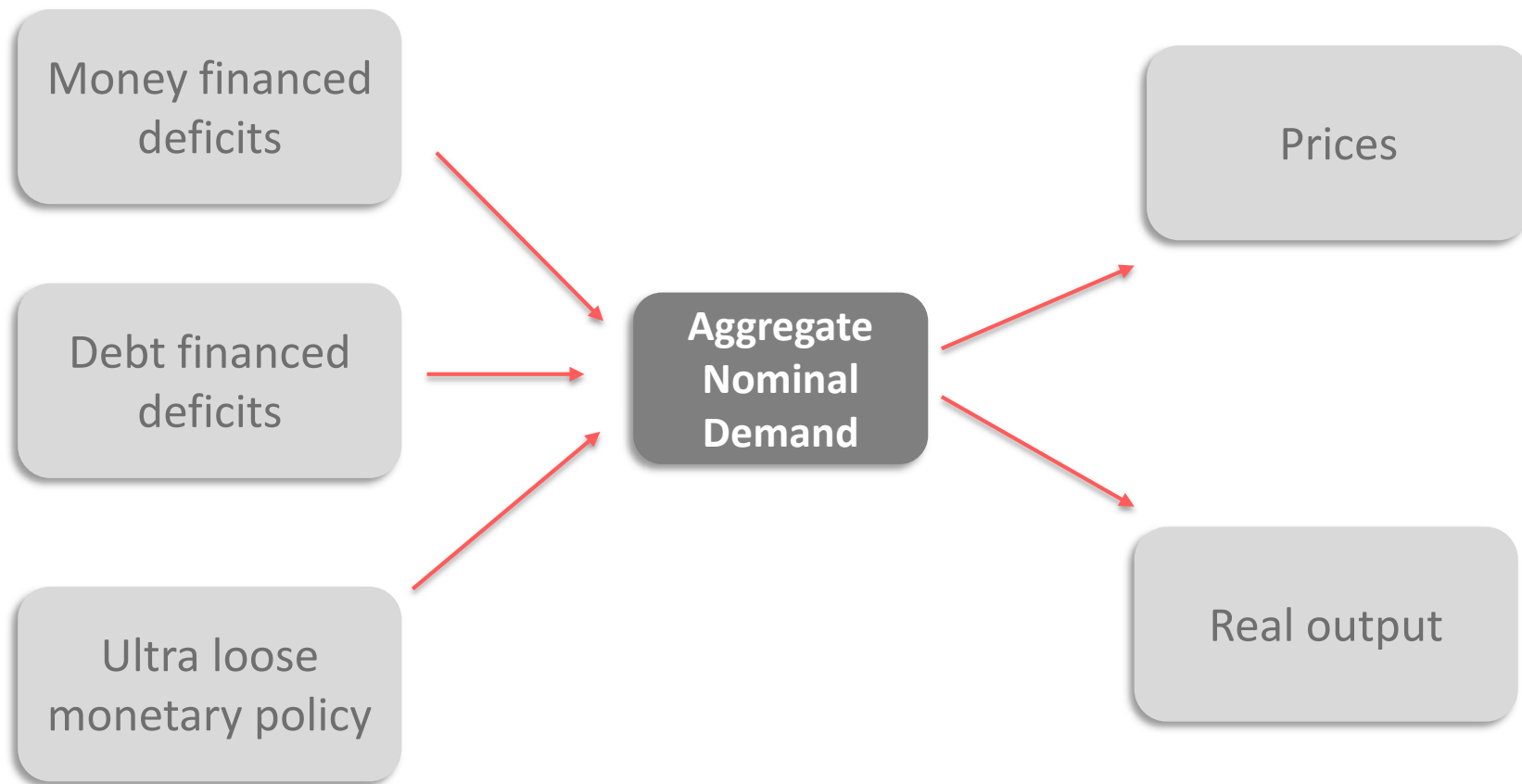


Fiscal and monetary implications of alternative stimulus policies

Impact on:

	Current year fiscal deficit	Public debt stock	Monetary base
Money financed deficit	Increase	NIL	Permanent increase
Debt financed deficits	Increase	Increase	NIL
Quantitative Easing	NIL	NIL	Temporary increase
Debt-financed deficits plus Quantitative Easing	Increase	Increase	Temporary increase

Policy tools and effects: the 'Independence' Hypothesis



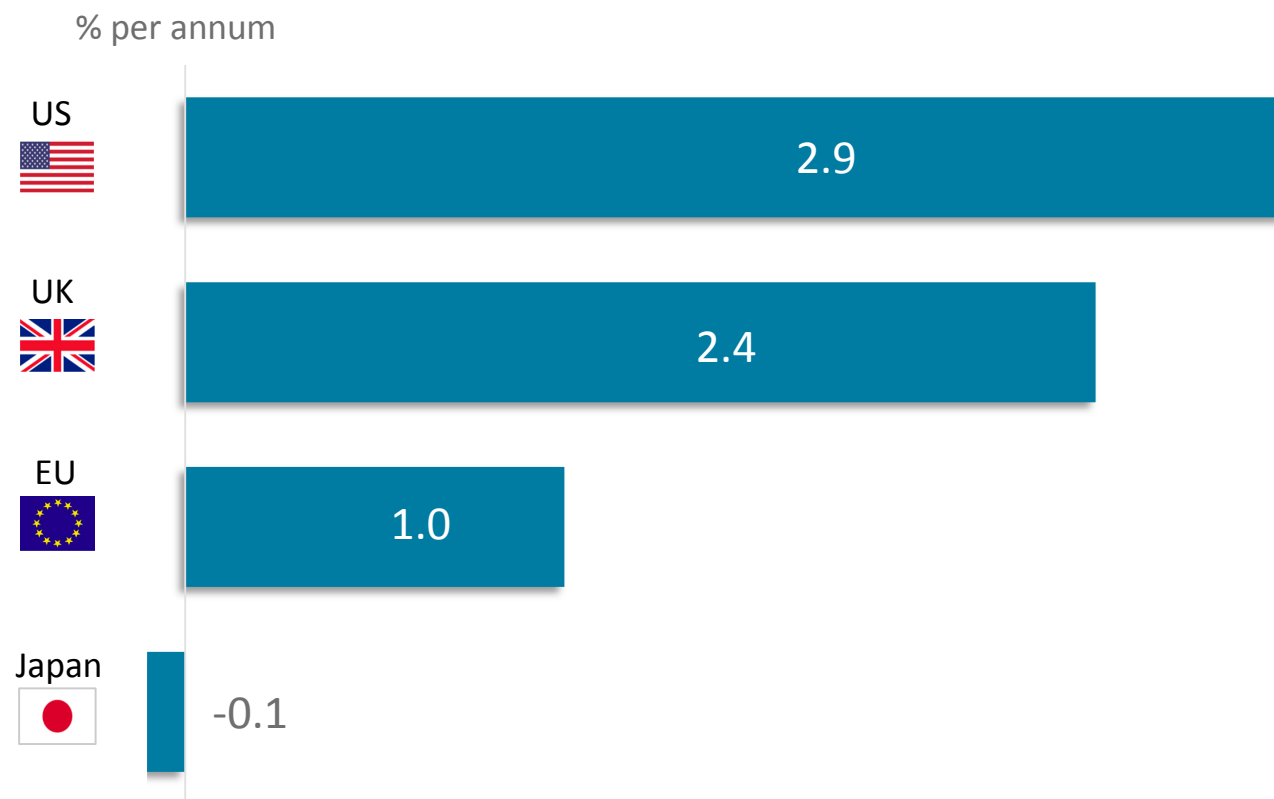
Independence Hypothesis:

The division of the increase in nominal demand between prices and real output is determined by real economy factors (the output gap and flexibility of labour models) and is independent of the choice of policy tool used to stimulate nominal demand.

Impact of increase in monetary finance on nominal demand

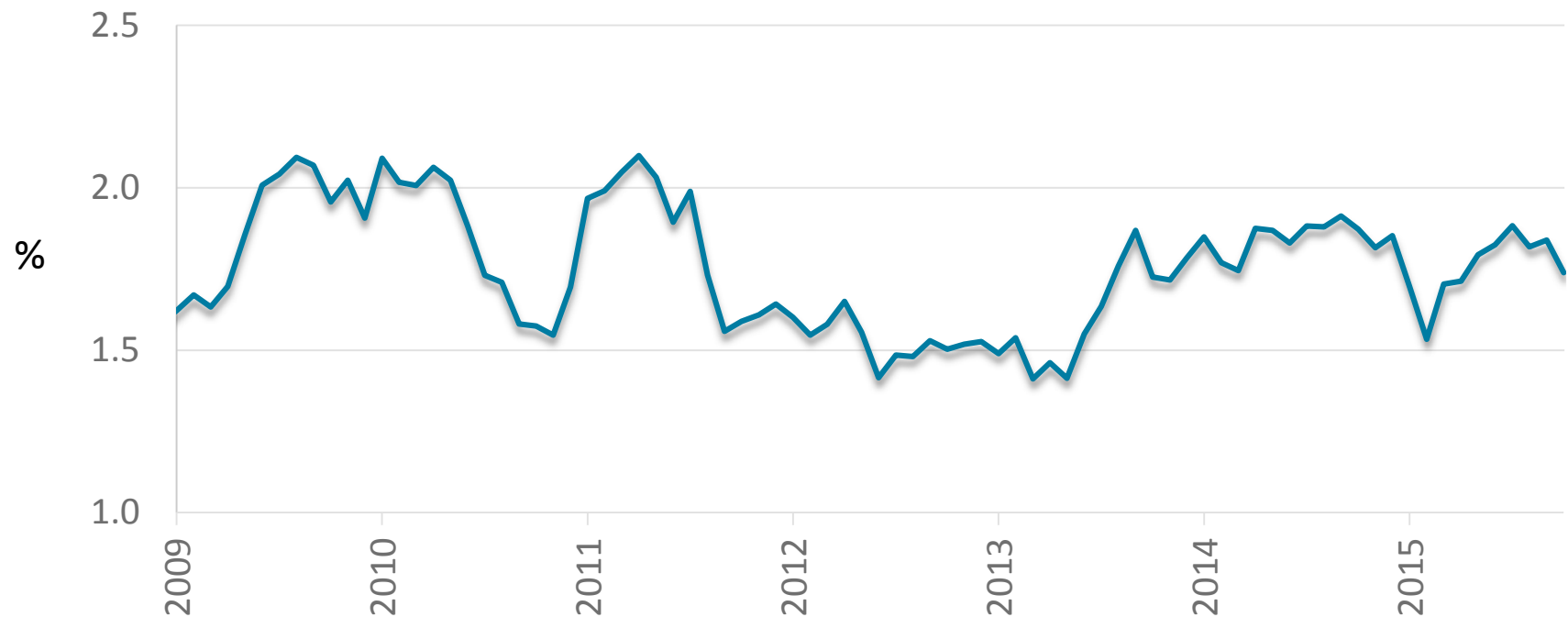
	Rationally forward looking agents	Non-rational / non- looking forward agents
Economy at full employment	Agents anticipate inflation and bring forward consumption before prices rise	Agents assume increase in nominal net wealth is also increase in real net wealth and increase consumption
Economy below full employment	Agents anticipate some rise in real output and real net wealth and increase consumption	

Nominal GDP growth 2008 – 2015



Source: IMF WFO Database 2015, ECB statistical Data Warehouse

Expected 10 year inflation



Source: Federal Reserve Bank of Cleveland

Summary comparison of monetary finance versus alternative policy options

Debt-financed fiscal deficit

Monetary finance bound to produce an impact \geq since

- First round impact exactly same
- But with no potentially offsetting Ricardian equivalence effect

Monetary stimulus via

- Expectational effect
- QE

Monetary finance always produces increase in nominal demand

VS

Ultra loose monetary policy might in some circumstances

Negative interest rates

Monetary finance produces increase in nominal demand without stimulating growth in private credit and leverage

Public sector balance sheets with debt-financed deficits plus QE

1 After QE operation but before exit

<i>Government</i>		<i>Central Bank</i>		<i>Consolidated Public Sector</i>	
A	L	A	L	A	L
Future tax claim on private sector	Interest bearing bond	Interest bearing bond	Non-Interest bearing irredeemable money	Future tax claim on private sector	Non-Interest bearing irredeemable money

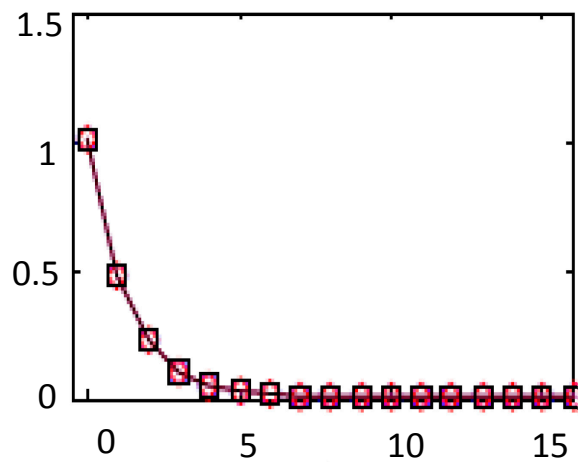
2 After exit and resale of bonds to private sector

<i>Government</i>		<i>Central Bank</i>		<i>Consolidated Public Sector</i>	
A	L	A	L	A	L
Future tax claim on private sector	Interest bearing bond	0	0	Future tax claim on private sector	Interest bearing bond

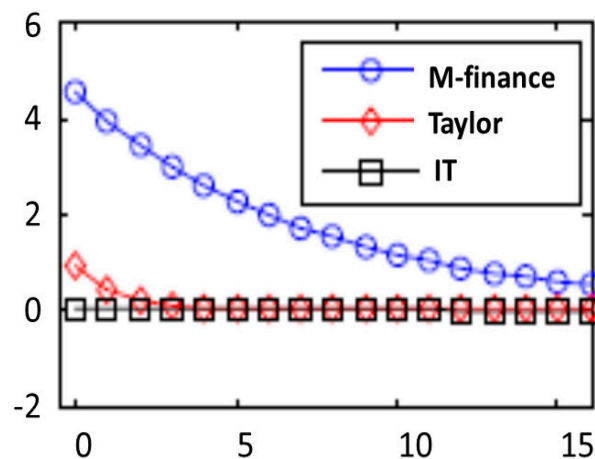
The effects of a fiscal stimulus in a new Keynesian economy

Money vs debt finance: Jordi Galí's results

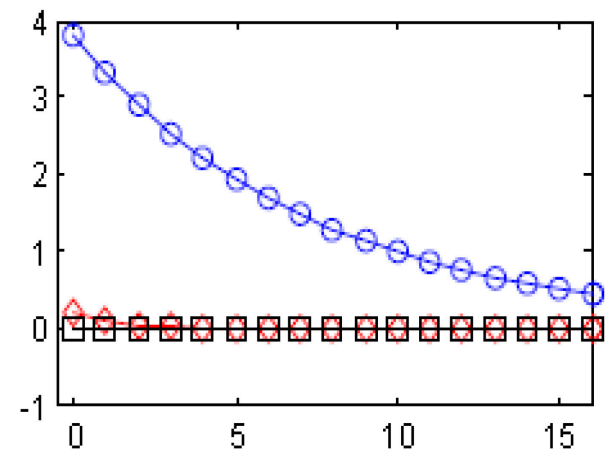
Government Spending



Output

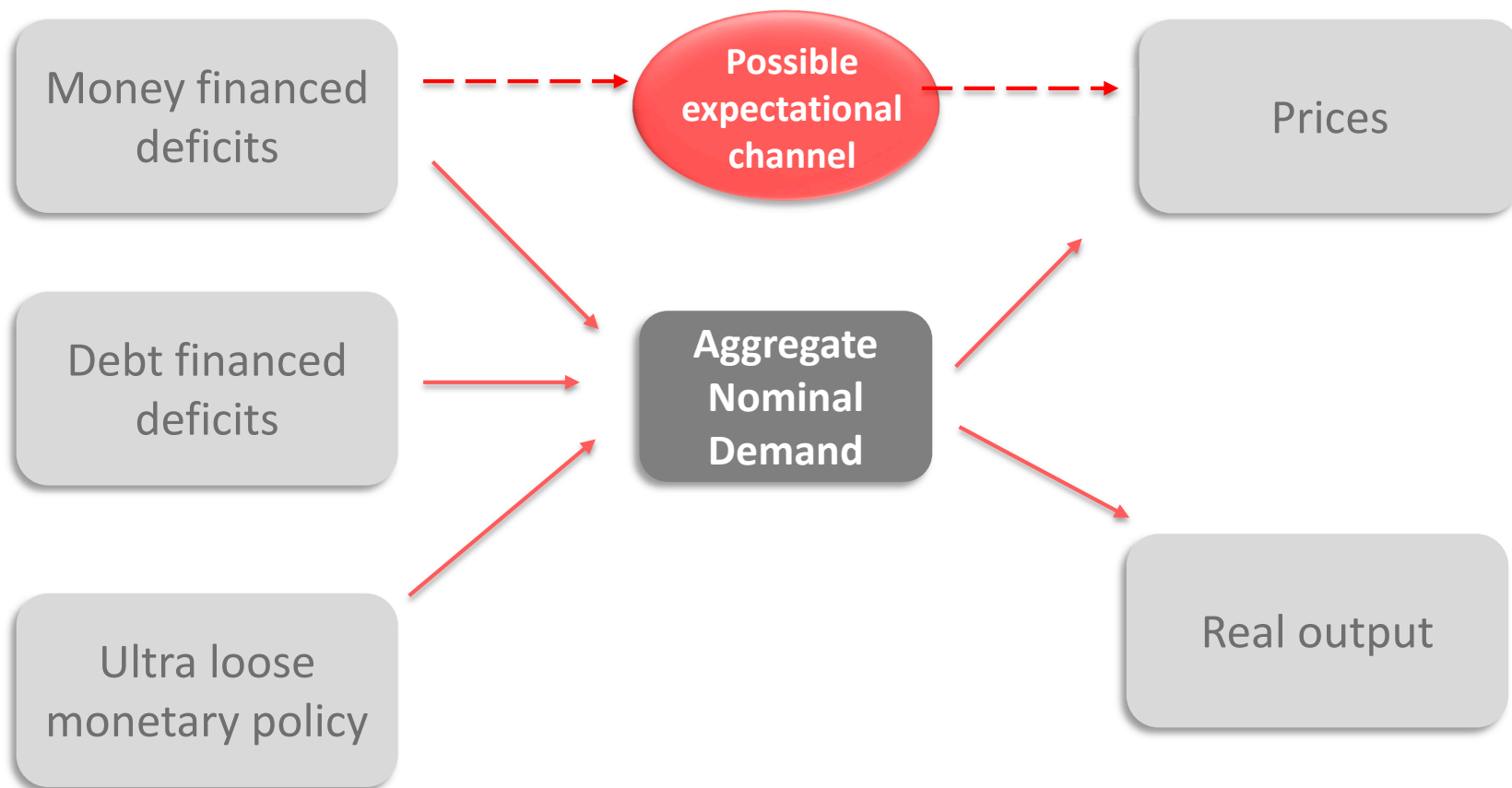


Inflation

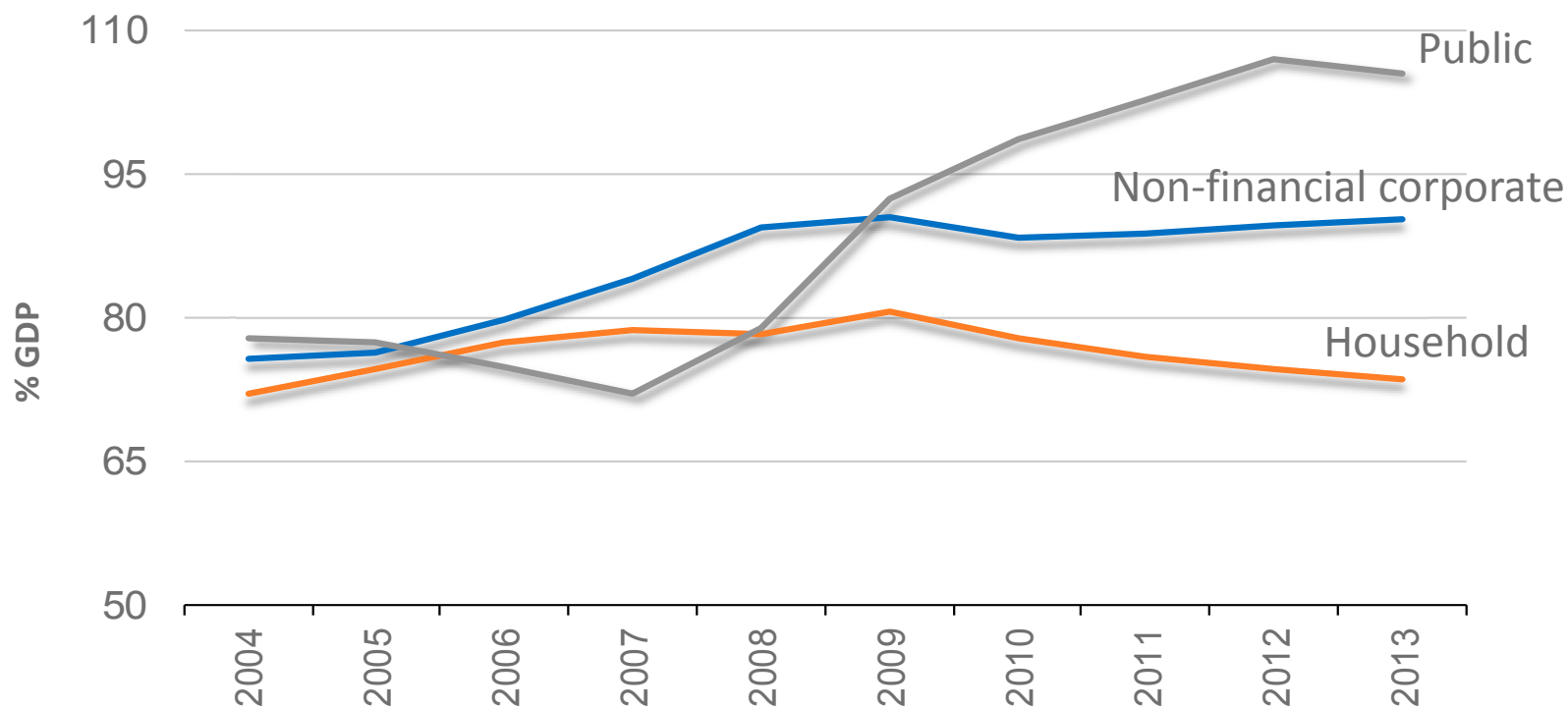


Note: for the debt-financed stimulus, Galí presents two results based on slightly different specifications of the central banks' approach to interest rate setting: a strict Taylor rule and an 'inflation targeting' response. The results are very close however for both approaches

Policy tools and effects: Do expectational effects override the 'Independence' Hypothesis?

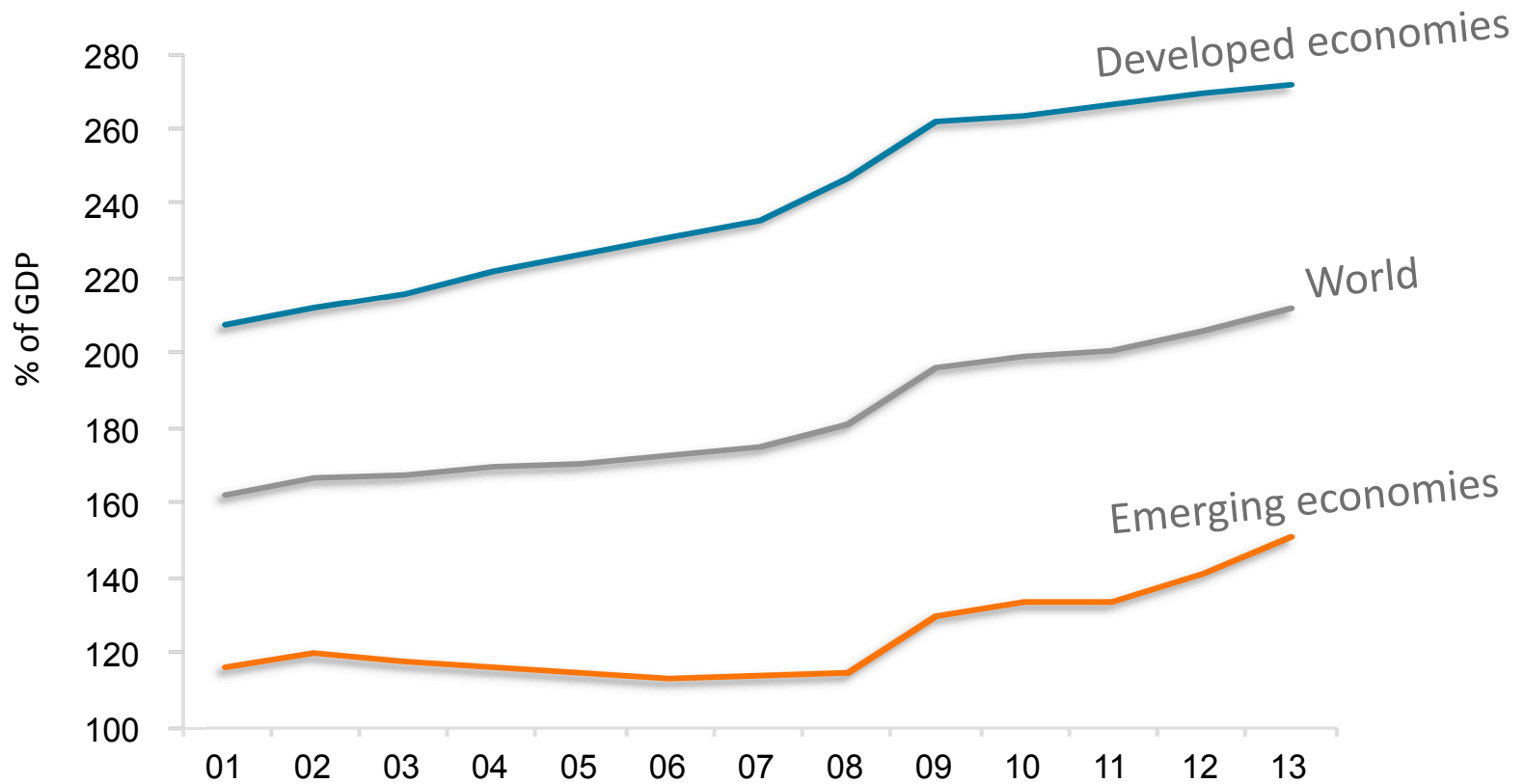


Developed economies: Debt to GDP



Source: Geneva Report No 16 *Deleveraging, What Deleveraging?* ICMB / CEPR September 2014

Global debt excluding financials



Source: Geneva Report No 16 *Deleveraging, What Deleveraging?* ICMB / CEPR September 2014

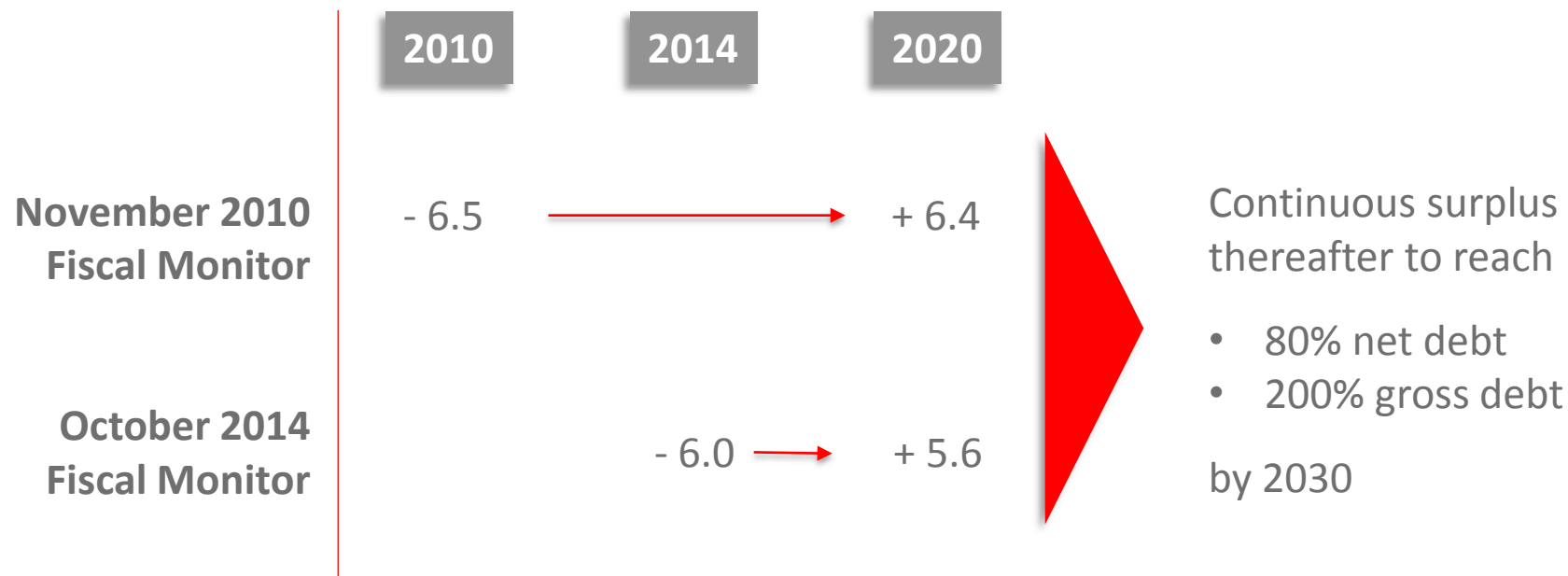
Real yields to maturity on UK indexed linked gilts



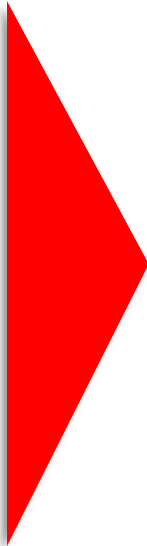
Source: Bank of England Statistics, Zero coupon real yields

Ensuring long-term Japan debt sustainability: IMF scenarios

Required cyclical changes in adjusted primary balance
% of GDP



Japanese government debt: gross, net or net-net?

	2014			2017?
	¥ trn	% GDP		% GDP
Gross debt	1130	234	 <p><i>BoJ now buying at 80trn per annum versus 50trn new issue</i></p>	~ 260
Net debt* Per IMF Fiscal Monitor	670	138		~ 160
Minus owned by BoJ	(215)	(44)		~ (95)
Net-net owed to unrelated holders	445	95		~ 65

* Net debt per IMF's definition is after social security and other government and quasi government holdings

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