Why a future tax on bank credit intermediation does not offset the stimulative effect of money finance deficits

This paper responds to a paper by Claudio Borio, Piti Disyatat and Anna Zabai " Helicopter Money : the Illusion of a Free Lunch" (http://voxeu.org/article/helicopter-money-illusion-free-lunch) which argues that:

- In the real world of fractional reserve banks, a money financed fiscal deficit implies the necessary imposition of a future tax on bank credit intermediation
- And that as a result, money financed fiscal deficits will not, in a world with rational expectations, have an effect any more stimulative than debt financed deficits.

In this paper I agree entirely with the first assertion but argue that the second does not follow logically from it.

The Undoubted Need for a Future Tax on Credit Intermediation

Many descriptions of the case for money financed deficits as a means to stimulate nominal demand growth implicitly assume an economy in which all money is held either in paper currency form or in accounts at 100% reserve banks (i.e. banks which match customer deposits 100% with reserves held central bank). In such a world, the monetary base equals the money supply, and it is straightforward to illustrate that a money financed deficit will have a stimulative effect on nominal demand which is greater than or equal to the impact of an equal sized debt financed deficit.

This greater stimulative effect emerges because:

- With the debt financed deficit, household gross nominal financial assets are increased, but households also face a future tax liability to repay the debt incurred on their behalf by the government. So household net financial wealth is not increased , even in nominal terms
- With a money financed deficit, no such offsetting liability to repay debt rises, since neither the government nor the central bank have incurred interest-bearing debt. As a result the money financed deficit increases household nominal net wealth as well as gross[1]
- And while in real terms, the increase in private nominal net wealth resulting from a money financed deficit might be wholly offset by a future "inflation tax", rational anticipation of an inflation tax cannot offset the stimulative impact of money financed deficit on nominal demand (see "*Why a money financed stimulus is not offset by an inflation tax*" http://ineteconomics.org/ideas-papers/research-papers/why-a-money-financed-stimulus-is-not-offset-by-an-inflation-tax)

But in the real world, most money (or money equivalents) takes the form of liabilities of fractional reserve banks, which hold only a small proportion of their deposits/liabilities in

[1] The relative impacts in the two cases are most easily grasped by considering the case in which the economy starts (before

reserves at the central bank. The money supply is a large multiple of the monetary base. In this world, the long-term impact of money financed deficits on the consolidated public sector balance sheet will depend on the policy of the central bank as regards the remuneration of the additional reserves (central bank liabilities) which are created. But even if it acts in a way which leaves the consolidated public balance sheet unencumbered by an interest bearing liability, some form of future "tax" on the private sector is imposed. Thus:

- The immediate impact of the money financed deficit is to create an additional non-interest-bearing liability of the central bank. These "reserves" are non-interest-bearing assets of the commercial banks.[2]
- If the operation initially occurs (as is likely) when market interest rates are close to zero, these additional commercial bank non-interest-bearing assets are likely to be initially matched by non-interest bearing deposit liabilities.
- But if and when market interest rates move to significantly positive levels, depositors will demand a positive rate of return on their deposits. One of two things must then occur:
    - Either the central bank pays interest on the additional reserves it has created to finance the money financed deficit: but if it does so, then the consolidated public sector now has an interest-bearing liability, so that (apart from some transitional effects) the situation is equivalent to if there had been a debt financed deficit
    - Or the central bank forever pays zero interest on the additional reserves created, and requires the commercial banks in aggregate to hold zero interest reserves equal to the amount of the money financed deficit[3]. But in this case the banks will face a running loss on those assets, since they will (in the long run) have to be funded by interest-bearing deposits. This loss is likely then to be offset by charging a slightly higher interest rate on lending, and thus a "tax on credit intermediation" arises[4]

This "tax on credit intermediation" will be equal to the size of the money financed deficit (Q) multiplied by the market interest rate i. It is therefore obviously the case, as Borio, Disyatat and Zabai argue, that in the long run debt-financed and money financed deficits impose an equivalent future tax burden on the private sector. Either

- A debt financed deficit of Q imposes a future tax liability of Q times the interest rate (Q*i)

[2] Of course in the unlikely event that the government/ central bank implemented the initial stimulus via the printing and distribution of actual paper currency , what is created immediately is the central bank non interest bearing liability of the note issue , but since in this case people/companies receiving the money would likely subsequently deposit it at banks , we can concentrate on the more realistic case where what increases immediately are (i) deposits at commercial banks and (ii) commercial bank reserves at the central bank

[3] This does not commit the central bank to maintaining the policy rate at zero in perpetuity , since the CB can pay zero interest on a minimum required tier of reserves but a positive policy rate on reserves held above and beyond this tier

[4] The complexities of the possible impacts of zero interest bearing reserves on the interest rates for deposits , for loans , and on the policy/market interest rate are discussed in "*Who will willingly hold non-interest bearing money?*" http://ineteconomics.org/ideas-papers/blog/monetary-finance-mechanics-complications

- Or a money financed deficit funded with (eventually) interest bearing CB reserves results in central bank losses of Q*i, which have to be funded by the government and thus by future taxes
- Or a money financed deficit funded with permanently zero interest-bearing reserves results in a tax on credit intermediation equal to Q*i

Borio , Disyatat and Zabai therefore argue that if we can assume rational expectations of future developments, and in the real world with fractional reserve banks, a money finance deficit cannot have any more stimulative effect on aggregate nominal demand than an equal sized debt financed deficit.

But while Borio, Disyatat and Zabai are quite to assert the mathematical equivalence of the future taxes imposed (apart from some transitional effects) their conclusions are still wrong.

The fact that the nominal value of the eventual taxes imposed are equal does not mean that the level of aggregate nominal demand will be equivalent in the two different cases.

The essence of the argument

Suppose the government gave someone $10,000, but told that person that he would have to repay $10,000 at a future date. And suppose it was obvious to that person that they would have to pay the $10,000 back in all states of the world, including those in which there had been no increase in aggregate nominal demand and no inflation in the intermediate period, so that the real value of the $10,000 paid back might be the same as the $10,000 received. Then it is possible that the rational reaction of the recipient to this information (combined with the actions of many other similarly placed and similarly rational people), could induce action (save rather than spend the money) which mean that no increase in nominal demand or inflation occurred.

Now suppose, alternatively, that the government gave a person $10,000, and told that person that they would have to repay the $10,000, but only if and when an increase in inflation had actually occurred, so that the $10,000 repaid would in all cases have a lower real value than the $10,000 given. Then in this case the rational reaction of the recipient to this information (combined with the actions of many other similarly placed and similarly rational people) would certainly induce action (spend at least some of the money rather than save it) which would result in an increase in nominal demand and inflation actually occurring.

But in both cases the eventual “tax” imposed would be the same – the $10,000 would be paid back.

What this illustrates is that we cannot understand the relative impact of debt-financed versus money-financed deficits by concentrating solely on the fact that in both cases there is an eventual equivalent nominal tax of Q*i. We have to consider the step-by-step actions and reactions, and resulting changes (or not) in nominal demand, which lead us to the eventual equilibrium in which the tax of Q*i is imposed.

Money finance deficits, the money multiplier, and the tax on credit intermediation.

The question is whether a money financed fiscal deficit will have a more positive (or more certain) impact on aggregate nominal demand than an equal sized debt financed deficit.

Assume that our starting point is similar to today's, with inflation below desired target, and with interest rates close to zero. There is therefore a consensus that some increase in aggregate nominal demand is desirable[5].

Suppose that the government and central bank together therefore organise a money financed stimulus of, say, 1% of GDP (i.e. in the US about $170billion) in the form of a one-off tax cut/voucher distribution to all citizens.

Immediately after this distribution, citizens would have in their bank accounts additional non-interest-bearing deposits of $170billion, and the commercial banks would hold additional non-interest-bearing reserves at the central bank of $170billion.

Two alternative actions might then follow : either

Case 1 The citizens will save their money, in which case aggregate demand will not rise, and thus neither will either real output nor the price level, and nor will there be an increase in interest rates. And as a result, as long as this equilibrium holds, no "tax on credit intermediation" is imposed. And in this environment, there is no reason why bank credit intermediation will increase: the additional reserves which the commercial banks hold at the central bank will be in some sense "idle".

Case 2 Or the citizens will spend some of their money, imparting a first-round stimulative effect to aggregate nominal demand, which will produce either (i) some mix of positive output and price effects (if the economy started below full employment/full output equilibrium) or (ii) a purely price effect (if the economy started at full employment /full potential output). This positive effect on aggregate nominal demand is then likely in turn to produce an increase in credit demand, with the banks seeking to lend out some of the additional reserve balances held at central bank. And this bank creation of credit (and of matching money or near money equivalents) will in turn provide an additional impetus to nominal demand, and thus to either output or prices.

Once inflation has returned to the target level (e.g. 2%) and interest rates to positive levels, and assuming that the central bank continues to pay zero on the additional reserves created, a "tax on credit intermediation" of Q*i will arise. But this will only occur under conditions in which:

[5]As I stressed in my IMF paper " *The Case for Monetary Finance – an essentially political issue*" (https://www.imf.org/external/np/res/seminars/2015/arc/pdf/adair.pd) , it is certainly possible to dispute whether an increase in nominal demand is required/desirable in today's circumstances , and other papers by Borio et al have challenged the idea that inflation below today's typical (2%) targets is necessarily undesirable. But that is a quite different issue from whether, **if** an increase in nominal demand is desirable , a money financed deficit will achieve it.

- Inflation has actually increased
- Increased bank credit extension is providing an additional impetus to nominal demand above and beyond the first-round stimulative effect of the initial one-off tax cut . This additional stimulative effect means indeed that a tax on credit intermediation is required to ensure that the total stimulative effect is no greater than originally intended[6]

In Case 2 there will be a tax on credit intermediation equal to Q*i , but there will also without doubt be an increase in aggregate nominal demand, and no tax will arise unless and until that rise in aggregate nominal demand occurs.

In Case 1, however, there would seem to be in equilibrium in which no increase in nominal demand occurs, and no tax is ever imposed. But this is an unstable equilibrium whether or not citizens have rational expectations, and whatever the feasible balance between real output and purely price effects. Thus

- If the economy is at full employment, so that no increase in real output is possible, and if customers rationally assume that the voucher distribution can have only an inflationary effect, they will rationally seek to spend some of their increased money balances before inflation undermines its value
- If the economy is at full employment, but consumers irrationally assume that no increased inflation will occur, they will wrongly perceive that their real net wealth has been increased by the amount of the distribution, in which case they will again spend some of it
- While if the economy is below full employment, a perfectly rational citizen can assume that some increase in private real net wealth has occurred, in which case again he will spend some of the money received[7]

[6] Depending on the power of the bank credit / money multiplier effect on nominal demand, it might actually be necessary eventually to impose zero interests bearing reserves higher in quantity than the initial money financed deficit, in order to end up with an eventual stimulus to nominal demand no greater than would have arisen from an equal sized money financed deficit in an imagined world with 100% reserve banks. In general indeed, the major challenge with money financed deficits in a world of fractional reserve banks is not (as Borio, Disyatat and Zabai argue) that they will be ineffective in stimulating aggregate nominal demand , but that their undoubted positive impact on nominal demand may be magnified by the operation of bank credit creation to an uncertain future extent and at an uncertain future date. In principle this future uncertain additional effect can be managed by the appropriate future calibration of the " tax on credit intermediation", but the uncertainty also argues (as I have argued elsewhere – see *www.bankofengland.co.uk › Home › Research One Bank Flagship Seminar)* for a cautious and iterative approach to the size of any money financed deficits.

[7] If it is possible for an increase in nominal demand to have a positive effect on output, then rationally perceived private real net wealth can in aggregate increase because of an increase in the net present value of all future real income. Note that this may imply the existence of some circumstances in which even a debt- financed deficit might rationally have a positive impact on demand , which were not adequately considered in Robert Barro's famous article "*Are Government Bonds Net Wealth?*" Journal of Political Economy, 1974 82(6): . This does not however change the relative ranking of the impact on aggregate nominal demand of money financed and debt financed deficits

Whether or not citizens are rationally forward-looking, a money financed deficit will therefore always stimulate nominal demand, even though in the long term, and once nominal demand has risen, the central bank imposition of non-interest-bearing reserve requirements amounts to a tax on credit intermediation equal to Q*i.

The proposition that money finance deficits will always stimulate aggregate nominal demand therefore holds as much in the real world of fractional reserve banks, as in the imagined world of 100% reserve banks.

As Willem Buiter has put it, inadequate nominal demand and inflation below target is therefore always a policy choice, and never an unavoidable necessity.

Debt financed deficits – an impact which can depend on whether expectations are or are not rational

Money financed deficits will always stimulate nominal demand. By comparison debt finance deficits might do so, but might not.

To simplify the analysis for debt financed deficits, let us assume that the economy starts at full employment/full potential output, so that no increase in real output is possible, and that only a price inflation effect is possible. Under these conditions, a money financed deficit will certainly (as per the logic above) produce an increase in aggregate nominal demand and the price level, but a debt finance deficit might not.

Assume the same starting conditions as in the money financed case considered above, but in this case the government makes a $170 billion one-off distribution of money to citizens financed by the issue of interest-bearing bonds, which some citizens buy in return for money.

In aggregate all citizens together now have more gross financial assets than before (they hold the same amount of money but they also hold the bonds), but the government now has a future liability to pay back the bonds, and citizens in aggregate therefore have a future liability to pay additional taxes.

Consider the position immediately after the $170 billion distribution. As in the money financed example, citizens will either save their additional gross financial wealth (Case 1) or they will spend it (Case 2). But unlike in the money financed example, Case 1 might turn out to be a stable equilibrium which results in no increase in aggregate nominal demand.

For if all citizens have rational expectations , and assume that all other citizens are rational, they may rationally conclude that

- No increase in net financial wealth has occurred, either in real or nominal terms

    - And that no increase in aggregate nominal demand and therefore in inflation is likely to occur
    - In which case there is no rational reason to spend the money
    - In which case no increase in aggregate nominal demand and inflation will actually occur

Of course, citizens might not have rational expectations, in which case

- Some of the citizens receiving the money may wrongly perceive that they have received an increase in net real wealth and will therefore spend it, thus stimulating aggregate nominal demand
- This will induce inflation, making it rational for other citizens also to seek to spend some of the additional money before it loses value
- And this might in turn induce an increase in bank credit supply and demand, giving a further impetus to nominal demand.

If rational expectations do not apply, a debt finance deficit might therefore induce an increase in aggregate nominal demand, inflation, and inflationary expectations, which, through the operation of the bank credit/money multiplier might then become self-fulfilling[8].

But this still leaves an important difference between the nominal demand impact of money financed deficits and debt financed:

- Money financed deficits will always increase nominal demand, whether or not private agents have rational forward-looking expectations
- Debt finance deficits might increase nominal demand, with the result contingent on circumstances and behaviours, and on whether expectations are rational or not

In terms of their impact on aggregate monetary demand, we can therefore conclude:

Money financed deficits are greater than or equal to debt financed deficits

[8] This idea that a debt financed deficit might achieve a self perpetuating increase in nominal demand because it unleashes future bank credit creation ,is similar to Paul Krugman's 1998 idea that a large temporary debt financed deficit might "jolt" an economy back to self perpetuating demand growth. See Paul Krugman "*It's Baaack: Japan's Slump and the Return to the Liquidity Trap*" in which he comments **: "** *The qualitative question is whether a temporary fiscal stimulus can have permanent effects. If current income has very strong impacts on spending, so that the marginal propensity to spend (consumption plus investment) is actually greater than one over some range, there can be multiple equilibria. A liquidity trap may therefore represent a low-level equilibrium, and a sufficiently large temporary fiscal expansion could jolt the economy out of that equilibrium into a region where conventional monetary policy worked again"* http://www.brookings.edu/~/media/projects/bpea/1998%202/1998b_bpea_krugman_dominquez_rogoff.pdf