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Global Economics View

What More Can Central Banks Do To Stimulate the Economy?

- We think central banks in the US, euro area, Japan and UK could and should do much more, including
  - (i) reducing rates, first by lowering them all the way to zero (UK and euro area), then by eliminating the effective lower bound on nominal interest rates (all four currency areas)
  - (ii) carrying out more imaginative forms of quantitative easing (QE) & credit easing (CE), in all four currency areas, by focusing on outright purchases of and/or loans secured against less liquid and higher credit risk securities, subject to a sovereign guarantee (joint and several in the euro area) for all such risky central bank exposures
  - (iii) engaging in helicopter money drops (all four currency areas): a combined fiscal-monetary stimulus
- Credit rationing and excessive funding costs for certain segments of the household and non-financial business sectors, and a weakness of effective demand in all four currency areas, imply that the case for (ii) and (iii) is strong
- By contrast, lowering interest rates further and the less imaginative forms of QE and CE, which focus only on government securities, likely have little more to add: risk-free interest rates are already very low and market inefficiencies in high-rated sovereign debt markets are very small, or are associated with excessively low interest rates.

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See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

What More Can Central Banks Do To Stimulate the Economy?

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(i) reducing rates, first by lowering them all the way to zero (UK and euro area), then by eliminating the effective lower bound on nominal interest rates (all four countries)

(ii) carrying out more imaginative forms of quantitative easing (QE) & credit easing (CE), in all four countries

(iii) engaging in helicopter money drops (all four currency areas): a combined fiscal-monetary stimulus

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By contrast, lowering interest rates further and the less imaginative forms of QE and CE which focus only on government securities likely have little more to add:

- **risk-free interest rates are already very low, and**
- **market inefficiencies in high-rated Treasuries markets very small**

What can the leading central banks in the advanced economies – the Fed, the ECB, the Bank of Japan and the Bank of England – do to boost the level of economic activity? The answer is: even though nominal interest rates are near-zero in all of them and, despite having taken a number of unconventional measures that included giving guidance on future interest rates, increasing the size of the central banks' balance sheets and changing the composition of central bank assets towards less liquid assets and assets subject to higher credit risk (see Sheets (2012a)), they could do much more. Among the measures that they could take are: (1) further lowering official policy rates; first, all the way to the effective lower bound rather than keeping them suspended some distance above the floor (as is the case currently in the UK and the euro area) and, second, by removing the effective lower bound on nominal interest altogether, (2) more aggressive combinations of quantitative easing and credit easing, and (3) helicopter money drops (a combined monetary-fiscal stimulus).

In our view, central banks *should* also do more, i.e. the case to take some or all of these measures is strong in the countries under consideration. In particular, the case to address the weakness of effective demand suggests that helicopter money drops would be appropriate in all four currency areas – although time will tell whether the US and the UK have already engaged in helicopter money drops that dare not speak their name. Access to credit is also highly restricted for certain segments of the economy (including for households and small-and medium-sized enterprises), although not necessarily for every would-be borrower category. In certain euro area countries, access to credit is severely restricted, notably in Greece, Portugal, Ireland and Spain. In addition, many medium- or low-rated asset markets remain dysfunctional. Central banks therefore have a role to play in easing access to credit and in acting as market-makers of last resort, notably in the US and the UK.

The case for lowering interest rates further may be slightly less strong than for helicopter money drops or credit easing, but remains substantial. This is partly because risk-free rates are already very low once we recognise that current government bond yields (even for the US, Japanese, German and British sovereigns) already incorporate substantial default risk premia and even the 'headline' yields have recently reached record lows, including in Germany, Japan and the UK.

We attribute the failures to fully use the potentially available policy arsenal to institutional conservatism and to a lack of coordination and cooperation between monetary and fiscal authorities due to a range of political dysfunctionalities.

Interest rate policy

Lowering the official policy rate to the effective lower bound (ELB)

The Bank of England and the ECB still have room to cut rates

Because of the unfortunate but, for the moment, irremediable existence of currency (banknotes) bearing a zero nominal interest rate, the official policy rate of the monetary authorities cannot be set much below zero. With the official policy rate at zero, the rate on the central bank's Standing Deposit Facility could be around minus 0.75% - the effective lower bound (ELB) for nominal interest rates – just about as low as it can be before banks likely start hoarding banknotes (despite the cost, inconvenience and insecurity of holding large amounts of banknotes) instead of holding their excess reserves with the central bank. The Fed and the Bank of Japan have their policy rates as close to zero as makes no difference.

However, 0.50% has been defined as the British zero by the Bank of England. Bank Rate, the Bank of England's official policy rate, stands at this level and has not been below this level since records began in 1694. The Bank of England's interest rate on the Standing Deposit Facility is 0%. There's no reason why Bank Rate cannot be lowered to 0% (or even to -0.25%), with the Standing Deposit Facility Rate at -0.50% (or -0.75%), in our view. It would likely result in current account deposits at commercial banks and building societies offering negative nominal interest rates to households and firms, and in some tracker mortgages, whose rates are tied to Bank Rate, carrying a negative nominal interest rate, but that ought not to be an issue. We have, after all, had negative *real* interest rates on many occasions in the past. We see no efficiency or fairness argument that the price of borrowing money should always be positive. Indeed, it might be rather nice once in a while to have banks paying interest to mortgage borrowers. The same argument applies to the ECB, where the official policy rate (the refi rate) stands at 1.00% and the Standing Deposit Facility rate at 0.25 %. We see no reason why the refi rate cannot be brought down to 0% or slightly below zero with a -0.50% or -0.75% Standing Deposit Rate. We are, however, not holding our breath and fear that the ECB too will treat 50 basis points as the ELB for the refi rate.

Abolishing the effective lower bound on interest rates

Central banks could also choose to abolish the effective lower bound (ELB) on interest rates by:

- **abolishing currency completely**
- **taxing holdings of bank notes**
- **ending the fixed exchange rate between currency and central bank reserves**

Removing the effective lower bound (ELB) on nominal interest rates would eliminate the fundamental asymmetry in interest rate policy: when the economy is overheating, inflation is above-target or credit is excessively loose, the central bank's official policy rate can be raised to any level. When there is excess capacity, inflation is below target and credit growth is inadequate, the official policy rate can only be lowered to a level not too far below zero. What we call the effective lower bound (sometimes also referred to as the zero lower bound) on central bank official policy rates is an artefact of history, clumsy financial design and central bank conservatism, in our opinion. The existence of bank notes or currency, which is an irredeemable 'liability' of the central bank – bearer bonds with a zero nominal interest rate – sets a lower bound (probably at something just below 0%) on central banks' official policy rates.

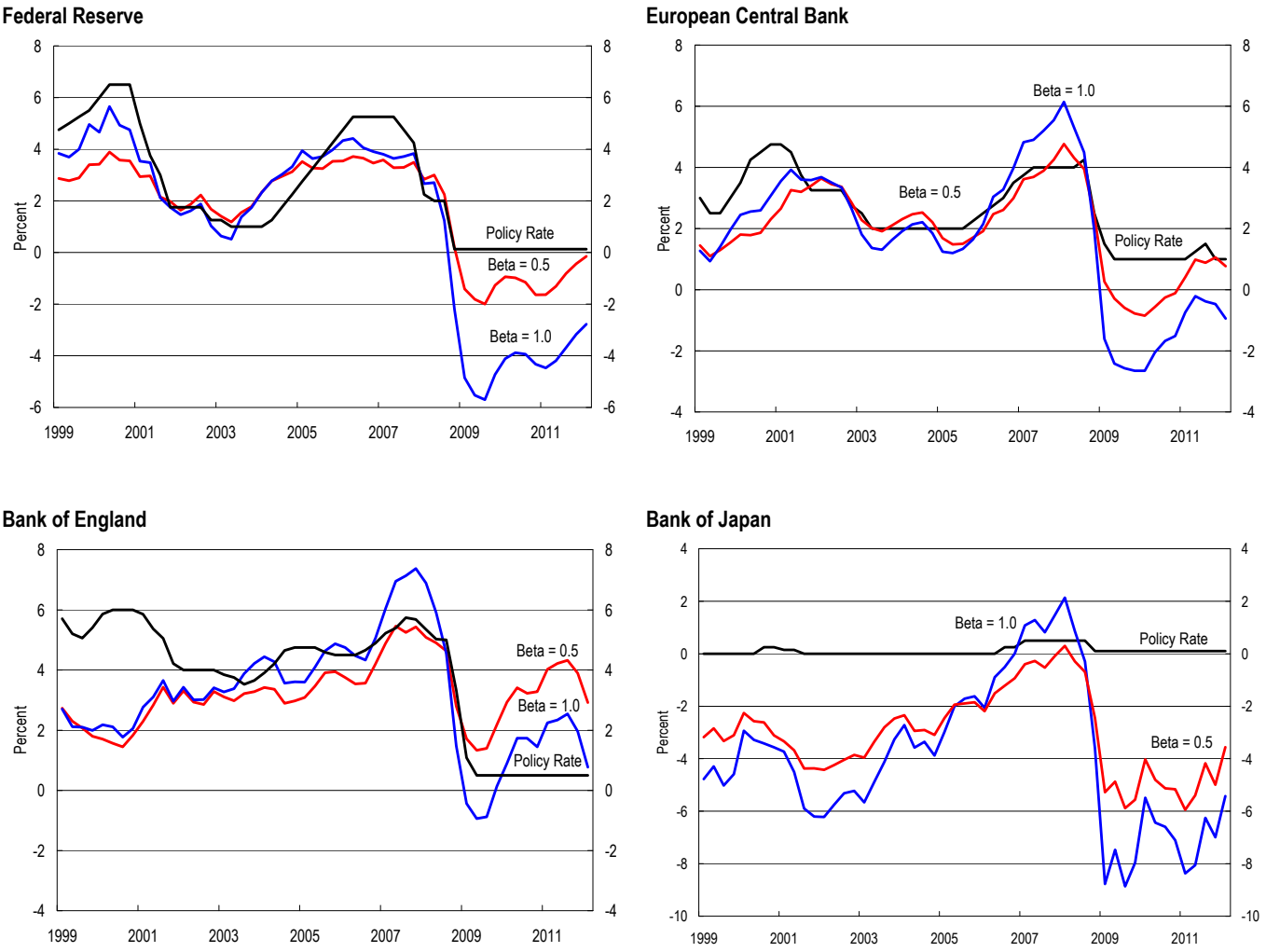
The obvious solutions are: (1) abolishing currency completely and moving to E-money on which negative interest rates can be paid as easily as zero or positive rates; (2) taxing holdings of bank notes (a solution first proposed by Gesell (1916) and also advocated by Irving Fisher (1933)) or (3) ending the fixed exchange rate between currency and central bank reserves (which, like all deposits, can carry negative nominal interest rates as easily as positive nominal interest rates, a solution due to Eisler (1932)). These, by revealed preference, do not seem acceptable to the central banking and political establishments, despite the long history of proposals to implement these solutions (see e.g. Hall (1997), Goodfriend (2000), Buiter and Panigirtzoglou (2001, 2003), Fukao (2004), Buiter (2009, 2010) and Mankiw (2009).

Abolishing or taxing currency would take time and involve non-trivial costs, but introducing a variable exchange rate between currency and central bank reserves would be easy

Clearly, the abolition of currency and the taxation of currency would take time and involve non-trivial administrative and implementation costs. But introducing a floating or managed exchange rate between commercial bank reserves with the central banks (dollars, say) and a new currency (rallod, say) could be implemented overnight. A minus 5 % interest rate (annualised) on commercial bank dollar reserves with the central bank, for instance, would require the forward exchange rate of dollar reserves in terms of rallod bank notes (which carry a zero interest rate), to be five percent (at an annual rate) stronger than the spot exchange rate. If the authorities fix the next period's spot exchange rate at the same level as this period's one-period-ahead forward rate, then the *certain* appreciation of the dollar in

terms of the rallod would make up for the interest differential in favour of the rallod. So there would be no pure arbitrage opportunities.[1] We think the monetary policy establishment would benefit from moving and implementing any of these proposals for eliminating the ELB, but fear it won't.

Figure 1. Taylor Rules*



Note: Red and blue lines are policy rates implied by a Taylor rule with a coefficient of 1.5 on the inflation gap (the deviation of realised inflation from the inflation target) and a coefficient Beta on the output gap (the actual level of GDP relative to its estimated potential).

Sources: Sheets (2012a) based on data from National Central Banks and Statistical Agencies, Haver Analytics, and Citi Investment Research and Analysis.

The case for further lowering rates is not as strong as it once was according to some specifications of 'Taylor rules'

The case for lowering official policy rates may also not be quite as strong today, especially in the US and in the UK, as it was in the '08-'09 period and, as we will argue, is not quite as strong as the case for other measures central banks could take. Figure 1 compares actual policy rates with those implied by different formulations of a 'Taylor rule' for monetary policy – which is a simple rule linking the

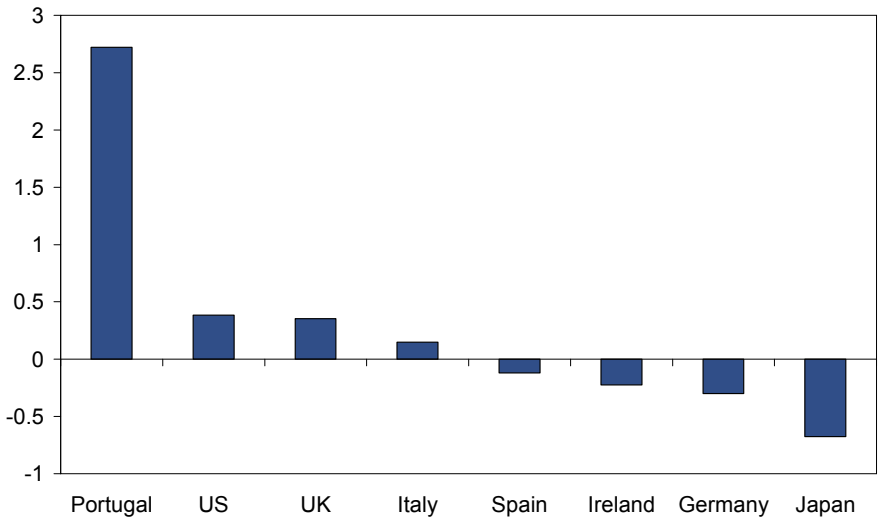
[1] The same concept of decoupling the numéraire (dollar) from the medium of exchange/means of payment was a key element of our discussion (Buiter and Rahbari (2011, pp. 34-36)) of how it might be technically and legally possible to introduce a New Drachma as a complementary or parallel currency/unit of account for Greece, while Greece remained a euro area member with the euro as the sole legal tender. We have our doubts, however, about the political acceptability of this proposal.

policy rate to deviations of inflation from its target level and of actual output from its potential level. As the figure shows, the difference between the policy rate implied by some formulation of this rule and actual rates has shrunk considerably relative to the discrepancy in 2009. For rules that stipulate a rather low sensitivity of desired policy rates to output gaps, the deviation between current policy rates and the rule-implied target is in fact virtually zero in the US and the euro area. In the UK, the policy rates implied by the Taylor rules actually imply that policy rates should be *higher* than they currently are – owing to the persistent inflation overshoots relative to the BoE's target – while, in the case of Japan, the formulations of the Taylor rule used here would suggest policy rates which are substantially negative would continue to be appropriate.

Risk-free rates are also already very low, even at longer maturities

In any case, the *level* of risk-free rates is already very low, as Figure 2 illustrates. This figure deducts 5-year CDS rates from yields for government bonds of the same maturity for a number of countries, to arrive at a simple measure of what government bond yields would be once we abstract from credit risk. While this measure is far from perfect for a number of reasons, including dislocations in either or both of government bond and CDS markets, low liquidity and high volatility, it does indicate that, in a number of industrial countries, risk-free rates are in – or at least close to – negative territory. This is for medium-to-long-term funding (a 5-year horizon), and yields remain low for longer maturities too.

Figure 2. Selection countries – Risk – free five-year interest rates (%), 4 May 2012



Note: 5-year government bond yield minus 5-year CDS rate as of May 4, 2012.

Source: Citi Investment Research and Analysis

Low interest rates also bear some risks, including for those subject to nominal return targets

Low interest rates also carry a number of risks. Among them is that they encourage 'search for yield' and taking on excessive risk. This tendency is aggravated by the large number of nominal return or payout targets, as implied e.g. by defined contribution pension schemes, targets that appear to respond extremely slowly to changes in risk-adjusted expected returns actually available in the markets. They also make life hard for pension funds and insurance companies that have minimum (nominal) return guarantees or that are forced by economically illiterate regulations to discount their liabilities using a government bond yield of equivalent duration. Very low rates also increase the chance of destabilising sudden withdrawals of funds from certain systemic asset markets, including the risk of panic in money markets that comes from 'breaking the buck' for money market funds that guarantee (unwisely) a net asset value of $1. Low rates may also encourage depositors to take

their money out of the banking system, which would aggravate liquidity pressures for the already-troubled banks in certain countries. Many of these risks are the making of regulatory shortcomings and do not suggest that low or negative nominal or real interest rates would be inefficient or undesirable but, since we have to take these shortcomings as given for the time being, they imply that the balance between risks and opportunities created by further lowering rates may be close to being balanced outside the euro area. This appears to be the view of the IMF also, which in its most recent Global Financial Stability Report IMF (2012) warns about the scarcity of safe financial assets and the very low risk-free rates this has brought about.

From a longer-run perspective, it would seem desirable to eliminate the ELB on nominal interest rates through one of the three methods sketched earlier, if central banks want to continue to target price stability, operationally defined as a low rate of headline inflation over the medium term. With a low inflation target, there is always the risk that, as during the crisis of 2007-2009 in the US, the UK, the euro area and Japan (and for Japan for a much longer period extending to today), the ELB becomes a binding constraint on the official policy rate.

In a modern, financially developed economy, like the four currency areas under consideration here, the costs of abolishing the ELB, if achieved by moving to a cashless society with E-money only, consists mainly in the loss of seigniorage income to the central bank and the loss of anonymity provided by banknotes to those holding their wealth in currency and conduction transactions with it. There undoubtedly are legitimate reasons for households and businesses to wish to preserve anonymity in their financial dealings. There also can be little doubt, however, that some of the main beneficiaries of the existence of state-issued bearer bonds of the highest liquidity – instruments that are generally accepted as medium of exchange and means of payment, often with the imprimatur of legal tender status - are the grey, underground and black economies. The state provision of currency can therefore inadvertently subsidise those engaged in such illegal activities as money laundering, tax evasion and funding terrorism and other criminal activities at home and abroad. It would, in our view, be worth getting rid of currency, regardless of the ELB issue.

Guidance about the future course of interest rates

Unconditional interest rate forecasts are useful

Explicitly conditional interest rate forecasts would be *really* useful.

The effectiveness of interest rate policy depends very little on the level of the *current* official policy rate and much more on the expected path of future official policy rates. The Fed (like the Swedish Riksbank and the Reserve Bank of New Zealand before it) now gives guidance about the likely future behaviour of the official policy rate. The Fed does so in the form of unconditional forecasts by the individual members of the FOMC as to the likely future date on which the Federal Funds target rate will be raised for the first time from its zero level. This is useful, but less useful than a clearer sense of the Fed's 'reaction function', the interest rate policy *rule*, if you like. An unconditional forecast would be very effective if the Fed had perfect foresight. But, as we noted before, it is not, today in the advanced economies, the current level of interest rates, even of current long-term interest rates, but rather the uncertainty about their trajectory that is an impediment to investment. Clarifying the way the Fed Funds target rate responds to changes in observable economic conditions would take out one of the reducible dimensions of uncertainty for private sector agents. With unconditional forecasts there is a risk that the more naïve investor base could at times *mistake* them for perfect foresight. Explicitly conditional forecasts would conversely provide a desirable reminder that the world is an uncertain and risky place.

From statements by Chairman Bernanke and others, we know that further Quantitative Easing (QE) won't happen unless the US unemployment rate starts rising again and appears likely to head higher for some sustained period of time, and unless the inflation rate is deemed likely to fall below the official target (two percent for the PCE deflator) in the medium term. A conditional rule along these lines for the Fed Funds target rate would be helpful. If the private sector were to be given more inside information about the central bank's official policy rate reaction function (something the central bank presumably knows more about than the private sector) it would permit the private sector to make its own forecasts of future policy interest rates, conditional on the private sector's own forecasts of the arguments in the central bank's reaction function (the output gap, the medium-term inflation rate, monetary and financial conditions or the stock market, say). Central banks don't have particularly distinguished records for forecasting output or, especially in the case of the Bank of England, inflation during recent years. Unconditional central bank rate forecasts, that convolute the central bank's official policy rate forecast conditional on the arguments of its Federal Funds target rate reaction function or policy rule, with the Fed's forecasts of these arguments, are likely to be less useful to the private sector than clearer statements of the Fed's reaction function itself.

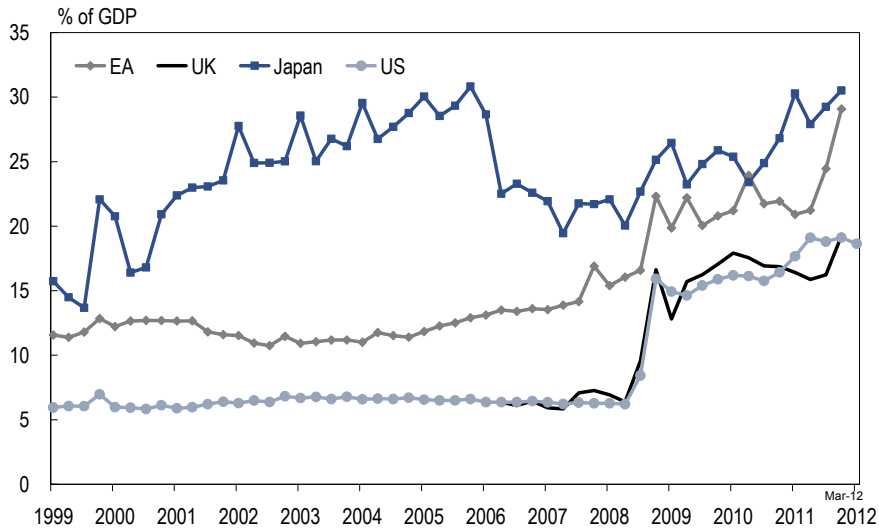
Quantitative Easing, Credit Easing, Enhanced Credit Support, Large Scale Asset Purchases

QE and CE have been tried…

Central bank balance sheets have increased substantially over the past four years

Quantitative easing (QE) is the expansion in the size of the balance sheet of the central bank, holding constant the risk and liquidity composition of the assets. It is clear from Figure 3 that the increases in the size of the balance sheets of the Fed, the Bank of England and the ECB/Eurosystem have been impressive since the beginning of the crisis.

Figure 3. Selected Countries - Balance Sheet Size of Central Banks (% of GDP), 1999 – 2012 Q1



Note: data ending in Q1 2012 for the US, in Q4 2011 for the rest.

Source: National Central Banks, National Statistics Offices, and Citi Investment Research and Analysis

As a share of GDP, the Federal Reserve System's balance sheet and that of the Bank of England have more than trebled since 2007, from around 6 % of GDP to around 20 % The ECB is catching up fast as regards the growth rate of its balance sheet. The size of its balance sheet (as a share of GDP) was always larger than that of the Bank of England and the Fed. It stood at around 13 % of GDP at the beginning of 2007 and, following the two 3-year LTROs in December 2011 and February 2012, it has increased to well over 30 % of GDP. The Bank of Japan's balance sheet has, however, not grown as a share of GDP since 2005-2006, although it declined during 2006-2007. It now stands at just over 30 % of GDP, slightly smaller than the Eurosystem's balance sheet.

At the ELB, QE works mostly through the asset side – whether it is financed by the issuance of monetary or of non-monetary central bank liabilities is of no material relevance.

Commonly the term QE is reserved for *monetised* balance sheet expansions but, at the ELB, the liability side of the central bank's balance sheet is effectively irrelevant. At the ELB, it makes no material difference whether central bank asset purchases or lending operations are sterilised (financed by issuing non-monetary liabilities) or monetised (funded by issuing currency or creating overnight deposits for commercial banks and other eligible institutions – reserves with the central bank). If the monetisation route is chosen, the increase in the monetary base will typically be in the form of excess reserves held with the central bank by commercial banks and other eligible institutions. This is true excess liquidity that sits idly on the balance sheets of the central banks and the commercial banks. An increase in the monetary base when the economy is effectively in a liquidity trap at short maturities doesn't achieve anything, in our view.

If the increase in the size of the balance sheet of the central bank is sterilised, as it is, for instance, when the ECB/Eurosystem engages in outright purchases of sovereign debt through the Securities Markets Programme, an increase in the monetary base is prevented by an auction of one-week term deposits with the central bank, which are not part of the monetary base. These instruments are very close substitutes for overnight bank deposits with the central bank, which *would* be part of the monetary base. In addition, the one-week term deposits can be offered as collateral (with very low haircuts) for overnight liquidity from the central bank, making them indeed effectively equivalent to base money. Because of this feature, in the case of the ECB, the distinction between sterilised and monetised balance sheet expansion is effectively without substance, even with the official policy rate still well above the ELB/ZLB. There exist modes of financing central bank balance sheet expansions, through issuance of illiquid instruments or instruments that cannot be offered as collateral in exchange for overnight liquidity at the central bank, that would cause the composition of the increase in the liabilities of the central bank to matter. But at the ELB, base money and other short-term instruments become effectively perfect substitutes in private portfolios. With the Fed still predicting it will not raise the Federal Funds Target Rate before the end of 2014, there is, if this prediction is interpreted as credible – almost as a commitment – very little difference between funding a Fed balance sheet expansion through an expansion of excess reserves or through other instruments maturing before the end of 2014. In a liquidity trap, central bank money does not matter, but assets purchased by the central bank still can matter. The Fed predicts a partial liquidity trap until the end of 2014. It appears only by issuing liabilities with a maturity beyond 2014 (or by reducing the quantum of their issuance) can the Fed credibly influence the economy through the actions it undertakes on the liability side of its balance sheet.

Therefore, as long as central bank money or base money retains unique liquidity properties that cannot be replicated by privately issued financial instruments, the composition of the central banks' liabilities between monetary and non-monetary instruments will matter when the official policy rate (and/or the rate on central bank non-monetary liabilities of longer maturities) is above the ELB.

With fully efficient markets, even the composition of central bank purchases would have little effect – but markets are manifestly inefficient

The more inefficient the market, the more effective are QE and CE

We have argued that central bank balance sheet expansion at the ELB works mostly through the asset side of the balance sheet. It is true that, with fully efficient financial markets, purchases or sales of non-monetary financial instruments by the central bank would not have any effect on interest rates, asset prices or economic activity, even if the economy were not at the ELB for nominal interest rates. Financial markets are, however, manifestly inefficient in every sense of the word, so changes in the size and/or composition of the assets held by the central bank will affect their yields and through them the prices and yields of all assets, including interest rates at varying maturities, stock prices, house prices, commodity prices and the exchange rate. Credit easing (CE), aka qualitative easing, holds constant the size of the balance sheet (and the composition of the liabilities) and refers to an increase in the share of assets consisting of illiquid or higher credit risk instruments. Enhanced credit support (ECS) is what the ECB calls its QE and CE operations. QE and CE can of course be combined, when the balance sheet increases through purchases of less liquid and riskier assets or through loans to banks collateralised with less liquid and riskier assets. Large-scale asset purchases is an alternative characterisation of balance sheet expansion by the central bank, which does not specify whether the counterpart on the liability side of the balance sheet is an expansion of monetary liabilities or of non-monetary liabilities (term deposits with the central bank and, in the euro area, central bank bills and (possible but not yet used) central bank bonds.

Combined QE and CE is what the ECB/Eurosystem has been doing through its Securities Markets Programme (SMP) of outright purchases of euro area periphery sovereign debt and through its two covered bond purchases activities, through the recent 3-year Longer Term Refinancing Operations (LTROs) and through earlier shorter maturity LTROs. We have already questioned the assertion by the ECB that it sterilises its SMP purchases. In the ECB's sterilisation through one-week term deposit auctions, we have an example of semantic rather than substantive sterilisation, even away from the ELB.

QE at the ELB through purchases of long-dated government securities by the central bank under orderly market conditions for sovereign debt, which is virtually all that QE in the US and the UK has amounted to in recent years, is a poor man's monetary policy, in our view. CE operations 'lite', like 'Operation Twist' in the US (where purchases of long-term Treasuries are funded by the sale of short-term Treasuries) are even less effective – a pauper's monetary policy, in our view. The whole point of these interventions is to bring down long-term interest rates. This would be necessary, partly because the traditional tools to bring down long-term rates, i.e. cutting short-term rates and making credible commitments to keep future short-term rates low, have almost reached their technical limits or 'commitment technology limits' unless we consider measures to remove the ELB as previously discussed, and partly because the transmission mechanism from short-term interest rates to long rates is perceived to be impaired – although how much of this is due to the official policy rate being at or near the ELB is not yet clear.

… but QE and half-hearted CE are unlikely to yield much more

QE and 'CE lite' have little to add at this stage, as:

- **Treasuries markets are not illiquid**
- **Even long-term 'risk-free' interest rates are low**
- **'safe rates' are only a small part of the funding cost of credit-constrained households and firms**

At this stage, QE (through purchases of high-grade sovereign debt) and 'CE lite' through Operation Twist (involving the swap of high-grade sovereign debt instruments of different maturities) are likely to have very limited incremental stimulative effects on private sector spending decisions. This is, for QE, mostly because base money is now plentiful almost everywhere and even risk-free long-term interest rates are very low. Concretely, QE in the US and the UK now overwhelmingly takes the form of central bank purchases of the safest long-maturity assets – Treasury securities. Say the effect of these purchases thus far (till end-March 2012) on long-term Treasuries are of the magnitude estimated by our colleague Nathan Sheets (estimates not based on event studies but on correlations over time between interest rates and balance sheet variables): 100 basis points off long-term US Treasury rates and 75 basis points off long-term UK Gilt rates – estimates that are half the magnitude of those based on event studies. Even if these estimates are robust, we doubt whether effective demand by households and firms in the US and the UK today is being boosted materially by 10-year Treasuries being at 195 bps (on April 30, 2012) rather than 295bps in the US or at 211bps rather than 286bps in the UK. For those for whom the cost of funding is a major concern, lending *spreads*, not the risk-free rate – even at long duration – accounts for the bulk of the funding costs.[2] The cost and availability of private funding (especially for SMEs and households) therefore is little affected by reductions in long-term sovereign rates.

QE may have some additional stimulative effects through depreciating the nominal exchange rate

It is possible that some of the excess liquidity created by the QE operations in the UK and the US leaks into other risky assets, like stocks, residential housing, commercial real estate, commodities and exchange rates. Indeed, we would expect that if QE lowers long-term rates, the exchange rate would weaken in a floating exchange rate environment, stock prices would strengthen even holding constant the expected path of future dividends and house prices would strengthen for any given expected future path of rental income or imputed rentals. The evidence to that effect is, however, unconvincing in our view except possibly for the exchange rate channel. Even though there is only limited evidence for exchange rate effects of QE/central bank balance sheet expansion in the US, the UK or the euro area, it is possible that this is because the central banks in the Emerging Markets that would be experiencing the currency appreciations mirroring the Advanced Economies' currency depreciations, have relaxed their monetary policy stances in such a way as to neutralise much of the Advanced Economies' currency depreciations that would otherwise have taken place. Studies of exchange rate effects should of course look at the relative stance of monetary policy, conventional and unconventional, at home and abroad. Empirical tests typically have not controlled for the stance of monetary policy in the rest of the world.

[2] Of course, since spreads are not generally negatively correlated to the risk-free rates, reducing risk-free rates still reduces borrowing costs for risky borrowers, and would therefore be useful. It is just that that usefulness is limited.

Existing studies likely overestimate the effects of QE and CE, as:

- **they include the acute periods of the financial crisis, when market inefficiencies were large**
- **'event studies' by construction only capture very short-term effects**

In apparent contrast, many recent studies seem to suggest relatively sizable effects of QE and CE. Because, outside Japan, we have very few observations on economic policy at the ELB, the evidence cited in support of the effectiveness of QE through long-dated Treasuries relies either on 'event studies' (see e.g. Gagnon, Raskin, Remache, and Sack (2010), Joyce, Tong, and Woods (2011) and Meaning and Zhu (2012)) or on correlations between balance sheet variables and asset yields or prices estimated over samples that include periods when the policy rate was not at the ELB (see Sheets (2012b)) as well as periods during which, unlike today, financial markets in the UK and the US, even at times the sovereign debt markets, were disorderly.

We believe these studies might overestimate the effects of QE and CE 'lite'. The main reason we note is that they include or, in fact, concentrate on the acute periods of the financial crisis. During this period, the market inefficiencies that are at the heart of the effects of CE in particular were substantial. Today, these inefficiencies are much reduced outside specific areas where market liquidity is still much impaired.

In addition, we suggest there are statistical shortcomings, familiar and unavoidable but nevertheless serious, of these studies.

Event studies, by their very nature and design, can only look at effects on, say, long rates or the exchange rate in a short window (sometimes hours or days, seldom more than a few weeks) around the instant that (news about future) QE hits the market. The problems with this methodology are well-known, but are not always reflected in the policy conclusions derived from these studies. There are the obvious problems of establishing (1) exactly *when* news, say, about QE or Operation Twist first becomes (widely) available to the markets and (2) that no other relevant event occurred at the same time (or earlier) that could have influenced the markets during the window as well as or instead of the QE or Operation Twist announcement.

Even more damaging from the point of view of the policy implications of these event studies is that, even if the QE news event is correctly identified as the only driver of asset movements in the window under consideration, these event studies only reveal the effect of QE or Operation Twist on asset yields or prices during the event window – a very short period of time. For QE to be interesting from a policy perspective, the effects on long-rates, the stock market or the exchange rate have to be long-lasting. We argue the event studies cannot establish this.

As regards the more conventional statistical studies, they suffer from the problem of all statistical analysis not based on data derived from controlled experiments, of interpreting correlations between endogenous (or predetermined) variables as causal, and of using observations drawn in part from periods when the policy rate was not at the ELB to make inferences about likely correlations when the policy rate is at the ELB. This holds both for systematic statistical analysis and for 'eyeball econometrics' that looks at interesting patterns, including co-movements in the data, and imposes a causal interpretation on them that cannot be justified on the basis of these data themselves. An interesting example of this is the innovative theoretical and empirical work by Roger Farmer (2009, 2011 and 2012) who notices (1) that the stock market leads or helps predict unemployment over a period of time going back to 1929, and (2) that some key CE and QE actions by the Fed led significant stock market gains since the financial crisis started. On the basis of the theoretical approach he develops in Farmer (2009), he then concludes first, that "The Stock Market Crash of 2008 Caused the Great Recession" and, second, that the Fed should use more QE or CE to stimulate the stock market and lower unemployment.

An equally plausible alternative or complementary approach would have come up with the following alternative to his first proposition: "The Stock Market Crash of 2008 *Anticipated* the Great Recession (which could, however, have been caused by something quite different)". In our view, there is room for both channels of causation and for common third factors driving both the stock market and unemployment. As regards the policy implication that the Fed should do more, that is based on correlations between QE, CE and the stock market drawn from the days of chaos surrounding Bear Stearns, Lehman, AIG and WAMU and of the Tarp recapitalisations of the US banking sector, when both funding liquidity and market liquidity had dried up across the board. More than two years later, the case for the effectiveness of QE and CE under the currently prevailing funding liquidity and market liquidity conditions has to be made *de novo*, in our view.

As marginal effects of QE and CE likely diminish, even doubling or tripling the size would not multiply the effects

A common rejoinder to arguments that the effects of QE and CE are smaller than those inferred from the event studies and smaller even than those based on recent econometric estimates is that, even if the impact of a given quantum of QE or CE on, say, long rates is small, one can still achieve the desired impact on long rates by increasing the quantum of QE or CE.

The argument that if QE has had limited impact thus far, as long as the impact is nonzero, one can always achieve any desired effect by increasing the dosage is not valid under the orderly sovereign debt market conditions observed for the US and the UK through most of the financial crisis, and certainly since early 2010, in our view. With orderly financial debt markets, the financial market inefficiencies that are necessary for QE or CE to have any effect on anything, including long-term yields, can be argued to have become negligibly small for purchases of long-term sovereign debt or for Operation Twist. If the marginal impact from additional asset purchases by the monetary authority on long-term yields goes to zero quickly enough, then additional QE or CE could, regardless of the magnitude of these asset purchases or swaps, not drive down the secondary market yields of long-term sovereign debt. Of course, the potential scale of QE that is restricted to longer-dated Treasuries is also capped by the size of that particular market. The Fed and the Bank of England already own substantial shares of the total outstanding stocks for the longer-dated maturities in particular.

QE and CE could still have an effect if it implies a subsidy relative to equilibrium market rates

It remains true that the central bank can, even with fully efficient financial markets, provide a fiscal transfer to the sovereign by purchasing *new* sovereign debt issues in the primary issue market at prices above the secondary market prices (or, equivalently, at yields below the secondary market yields), without such purchases having any effect on the secondary market price/yield itself. It would be interesting from an academic point of view as well as highly relevant from the perspective of practical QE and CE effectiveness (at the ELB or away from it), to determine whether, or to what degree, future QE and CE interventions in orderly markets drive a wedge between the secondary and primary market prices of the debt, raising the primary market prices without any enduring effect on the secondary market prices, rather than raising the primary and secondary market prices in tandem.

Even if we take the best of these event studies and time series analyses at face value, the ability of QE or CE to influence the real economy when the economy is at the ELB depends on the impact on the real economy of the asset price changes caused by QE and CE *and* on any further transmission of QE or CE to the real economy through channels other than asset prices or yields, including possible expectational transmission channels that don't work through asset prices, like changes in expectations of future demand for firms' products, or changes in expectations concerning future household income, permanent income, or unemployment.

And even the cost and availability of private funding is, other than for households and SMEs, unlikely to be a binding constraint on private effective demand in the US and the UK today. It is the lack of current and future expected effective demand that is holding back corporate investment spending today. It is fear about future job and income security and high household indebtedness that are holding back household demand today and are likely to continue to do so for the foreseeable future. In the euro area and the UK, high banking sector leverage and market and regulatory pressures to recapitalise and shrink bank balance sheets are likely to act as future constraints on bank lending to the real economy, despite the prevalence of low safe rates.

More imaginative QE & CE

More imaginative CE – purchases of specific illiquid and high risk securities and lending to credit-constrained borrowers – could still have substantial effects

We believe that changes in the size and composition of the balance sheet of the central bank only have material effects on the real economy of the advanced economies under current conditions – at or close to the ELB, with excessively indebted/leveraged sovereigns and banks almost everywhere, and with excessively indebted households in many countries (including the US, the UK, Ireland, Spain, Portugal, the Netherlands and the Nordic countries), but excluding Germany, Japan and Italy – if they are focused on less illiquid assets and/or assets with higher credit risk. This holds both for outright purchases of less liquid and high credit risk securities by central banks and for loans to possibly illiquid and/or high-credit risk banks secured against illiquid and/or high credit risk securities. So why do the Fed and the Bank of England overwhelmingly restrict their QE to purchases of long-dated Treasuries? There are no illiquidity problems, technical market failures or disorderly markets where UK and US Treasuries are concerned. If anything, financial repression and poor regulation have lowered long-term sovereign rates in the UK and US too much, threatening the survival of Defined Benefit Pension funds and insurance companies.

Central banks should focus on those – but obtain a full guarantee for these actions from their respective sovereigns

In our view, the Fed and the Bank of England should take a leaf from the ECB and focus their balance sheet expansions on less liquid and higher credit risk securities. In the US and the UK, this would mean that no more central government securities should be added to the balance sheet, either through outright purchases or as collateral offered in secured lending to banks. In the euro area, more sovereign debt from the periphery, either purchased outright through the Securities Markets Programme or offered as collateral by euro area banks would be useful additions to the Eurosystem's balance sheet. The SMP also already allows the purchase of any public *and private* debt securities but, apart from the limited purchases of covered bonds under the two Covered Bonds Purchase Programmes, the ECB has not ventured into the world of outright purchases of private securities so far.

However, for all outright purchases of securities and for all securities offered as collateral in repos or against loans from the central bank that don't have the highest creditworthiness that is or could be achieved by any financial instrument issued in that jurisdiction, we think a full sovereign guarantee/indemnity should be given. In the US, Japan and the UK this would mean that all domestic private securities purchased or accepted as collateral by the central bank should carry a full sovereign guarantee.[3] Instead of a sovereign guarantee on each individual security of less than top-grade creditworthiness, held by the central bank, the sovereign could provide just a general guarantee against net credit losses.

[3] This could perhaps be softened to the requirement that all domestic private financial instruments rated less than triple-A by all recognised rating agencies carry a sovereign guarantee if purchased or accepted as collateral by the central bank.

In the case of the euro area, this would mean that all private and public securities that have a creditworthiness less than the highest level available in the jurisdiction, which is that achieved by a debt instrument jointly and severally guaranteed by all 17 euro area member states, should carry a joint and several sovereign guarantee from all the euro area member states if bought outright or accepted as collateral by the Eurosystem.[4] Again, a general joint and several guarantee or indemnity by all euro area member states for the net credit losses of the Eurosystem would suffice.

To make sure that this guarantee is worth something and to make sure that this arrangement does not increase the incentives for lax fiscal discipline in countries with less fiscal space, incentives for fiscal discipline would need to be strengthened. The new preventative arm(s) of the euro area fiscal sustainability toolkit are untested and we question whether it will be materially more effective than the late and unlamented Stability and Growth Pact. We doubt whether the new institutions, rules, pacts and procedures will be able to impose additional fiscal austerity on governments that are engaged in policies likely to produce unsustainable outcomes, but continue to be able for the time being to fund themselves in the markets. With the euro area fiscal and banking crisis still in full swing, it seems the policy authorities are more focused on mitigating and avoiding immediate disasters than perhaps preventing future ones. However, we think it unlikely that an enhanced monetary-fiscal policy stimulus arsenal will be put together in time to help the escape from the present recession in the Euro area and the UK, unless there is faith that these new instruments and policies will not be abused.

To make sure that the Eurosystem would not succumb to inappropriate pressures for monetisation and/or balance sheet expansion, the ECB's substantive accountability would have to be strengthened, in our view (see Buiter and Rahbari (2012) for further discussion.

These fiscal guarantees would prevent the central bank from being used and abused as a quasi-fiscal operator, making transfers, paying subsidies and redistributing wealth and income without a legitimate political mandate, and without substantive accountability. The Bank of England has, when it still engaged in low-liquidity and/or high credit risk asset purchases or collateralised lending (under the Special Liquidity Scheme and under the Asset Purchase Facility) obtained such a full sovereign guarantee. The Fed only had a very limited sovereign guarantee for its high-risk asset purchases or loans during the crisis. The ECB/Eurosystem had and has none, except very briefly and for a limited amount, when the Greek sovereign was in selective default during the debt exchange period that was part of its debt restructuring program in May and April 2013. The EFSF guaranteed the old Greek sovereign debt (now in default) that had been offered to the Eurosystem as collateral, mainly by Greek banks. The total exposure of the Eurosystem to the 5 periphery countries (SMP purchases of government bonds of Greece, Ireland, Portugal, Spain and Italy and lending to banks from these countries, excluding ELA) was about €920bn in March 2011.

It is therefore surprising that the UK has done less, in outright purchases of or in lending against collateral consisting of illiquid and high credit risk securities, than the ECB/Eurosystem or the Fed, although the Bank of England, unlike the other two central banks, is fully covered against credit risk by the UK sovereign.

[4] Again, this could perhaps be softened to the requirement that all euro area private and government-issued financial instruments rated less than triple-A by all recognised rating agencies carry a joint and several guarantee from all 17 euro area member states if purchased or accepted as collateral by the central bank.

We urge all four key central banks to pursue adding outright purchases of (or loans secured against) covered bonds, gold-standard asset-backed securities (including residential mortgage-backed securities) to their asset menus. We likewise urge central banks to encourage financial engineering and financial innovation aimed at objectives other than regulatory and tax arbitrage, to enable the securitisation of SME loans and other illiquid loans to households and non-financial corporates. The resulting new securities should be fit for outright purchase by central banks or as collateral for repos and other collateralised lending by central banks. A lot more can be done than has been done so far. And provided the riskier financial instruments end up on the central banks' balance sheets with a full (joint and several) sovereign guarantee/indemnity, there is no corrupting intermingling of liquidity support provision (the province of the central bank) and solvency support (the responsibility of the fiscal authorities).

Helicopter Money

Central banks should also engage in 'helicopter money drops' to stimulate effective demand

Helicopter money drops are *temporary* tax cuts, increases in transfer payments or boosts to exhaustive public spending, financed through *permanent* increases in the monetary base.

Finally, in cooperation with the fiscal authorities, the central bank can engage in helicopter money drops, as described by Milton Friedman (1969, p. 4). This is a *temporary* tax cut, increase in transfer payments or boost to exhaustive public spending (including infrastructure investment), financed through a *permanent* increase in the monetary base. This will always be effective if it is implemented on a sufficient scale. Consider the thought experiment where the Chancellor of the Exchequer sends a £1000 cheque to every man, woman and child in the UK and funds this by borrowing from the Bank of England, which monetises the debt and commits not to reverse this ever. Now consider the following negative economic environment: the British public has become Teutonic in its attitudes towards thrift or caution and decides to save the entire windfall. The solution is simple. Repeat the exercise with a £10,000 cheque for one and all and keep going adding zeros until the consumer cries uncle and starts spending. Ben Bernanke (2002), citing Milton Friedman's original helicopter money drop parable, listed helicopter money drops (aka money-financed tax cuts) as one of the options open to the monetary authorities at the zero lower bound – as any well-informed monetary economist would have done. He was riled with the epithet "Helicopter Ben" as a result, and has not discussed the merits of the proposal since then, unfortunately.

Financing a temporary boost to exhaustive public spending through a permanent increase in base money would be a call to arms for all those appointed or self-appointed guardians of Art 123 of the Lisbon Treaty, but would be legal as far as we are aware. It may well be the most effective form of stimulus currently, in particular if directed towards public investment which has taken the brunt of public spending cuts in those countries that have begun fiscal consolidation in earnest (i.e. not the federal government of US or Japan). If the helicopter money were at the pure discretion of the central bank (it could simply say 'no'), it need not imply weaker incentives for governments to manage their own finances prudently.

Helicopter money is not hard. It would most likely be politically popular.

A helicopter money drop is not difficult to implement. It would most likely be politically popular. It just requires cooperation between the central bank and the Treasury. In the US and the UK, helicopter money may in fact turn out to be the true face of the QE we are supposed to have seen these past years. If the asset purchases and monetisation are not reversed at some point in the future, QE will turn out to have been helicopter money after all, if either it brought down government borrowing rates in the primary and secondary markets or if it just provided a subsidy to government funding in the primary markets. Unless the central bank makes a credible non-reversal commitment *today*, however, the asset purchases and monetisation may be interpreted as temporary – as QE - and their effectiveness therefore less than would have been the case had it been recognised for what it is (or may be) – helicopter money.

Helicopter money, even in huge amounts, need not become inflationary *ever*. The increase in the government deficit associated with the fiscal stimulus is temporary because the fiscal stimulus is temporary. The associated increase in the size of the central bank's balance sheet may be large, but it is finite. As long as the current quasi-liquidity trap, high leverage for sovereigns, banks and households endure, much of the money transferred to households (should they be the primary beneficiaries of the helicopter money drop) could well be saved by households, to be deposited in banks who add it to their excess reserves. Should consumers get their confidence back and decide to spend the part of the helicopter money drops they initially saved, fiscal tightening is the solution. Should banks get their confidence back and decide to push their excess liquidity towards the private sector by offering loans on irresistible terms, any inflationary increase impact of the enlarged stock of base money on the stock of bank credit or broad money can be neutralised either by raising bank reserve requirements, or by raising the remuneration rate on excess reserves held by banks with the central bank to levels that would induce banks to keep their money at the central bank rather than lend it out to the private sector.

Because, by assumption, helicopter money requires the irreversibility of the monetary base expansion produced by the temporary fiscal stimulus, the options of reducing the size of the monetary base, either by reversing the expansion in the size of the central bank's balance sheet or by sterilising the increase in the monetary base (which would be effective if interest rates are above the ELB), are not available. For expansions in the monetary base created by QE or by some combination of QE and CE, a later reversal of the monetary base expansion through sterilisation or balance sheet shrinkage is an option. A modern central bank can deliver price stability with any size balance sheet.

In Japan and in the euro area, central bank independence tends to be interpreted by the central banks as not answering the telephone when the fiscal authorities call. Such a rejection of cooperation between monetary and fiscal authorities and of coordination between monetary and fiscal policies reflects an elementary but damaging misunderstanding of the meaning of independence, in our opinion. If an escape from this self-imposed state of impotence is deemed to require an amendment of the Bank of Japan Law and of the European Treaties, then we would encourage it. We actually believe that the European Treaties, including Article 123, permit the funding of sovereigns by the ECB and the national central banks in the secondary sovereign debt markets. That's good enough to make helicopter money drops feasible even in Euroland. In any case, good monetary and fiscal policy should not be blocked or inhibited by a blanket or even a partial prohibition of the monetisation of public debt and deficits. If done properly, and subject to the consent of the monetary authority, a monetary authority which we can presume to take its price stability mandate seriously, it would not cause inflation. Instead, we think it would help prevent inflation falling below the level deemed consistent with price stability in the medium term, or even deflation, and the risk of recession or even depression.

Finally, helicopter money is not a solution to fiscal unsustainability. It is just a means of providing a *temporary* fiscal stimulus without adding to the stock of interest-bearing, redeemable public debt. Any attempt to permanently finance even rather small (permanent) general government deficits (as a share of GDP) by creating additional base money would soon – once inflation expectations adjust to this extreme fiscal dominance regime - give rise to unacceptably high rates of inflation and even hyperinflation. Our estimates of the maximum general government deficit for the euro area and the US that can be financed without a surging rate of inflation are around 2 %of GDP at most – hardly the stuff of which permanent monetisation

dreams are made. Although unanticipated inflation can reduce and, at the extreme, wipe out the real NPV of servicing a given stock of domestic currency debt, once inflation becomes embedded in expectations, the ability to extract additional real resources through the anticipated inflation tax is very limited.

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Notes

Notes

Appendix A-1

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