Central banks and credit creation: the transmission channel via the banks matters

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A starting point for a discussion of central banks' mandates is the effectiveness of their policies. Such effectiveness has been called into question since policy rates hit the ZLB, given the inability of central banks to boost bank lending and drive a sustainable recovery in economic growth. In this paper, we analyse why, and discuss the process of credit creation. Increasingly, central bank watchers question whether monetary policy measures can significantly boost credit creation. The discussion of monetary policy has mostly, and excessively, concentrated on the direct links between the riskless official policy rate, and expectations thereof, ignoring all consideration of banks, of other financial intermediaries, of credit creation or of broad money growth. We question whether this is correct. Repeated easing initiatives seem to have had a diminishing effect on financial markets, portfolio reallocation, and economic sentiment. Central banks' ability to boost bank lending also crucially depends on financial regulation, fiscal policy and structural reforms. In our view, the main reason for the ineffectiveness of monetary policy has been the weakness of the banking sector.

1 Introduction

A key element in debating central bank mandates is the perception that monetary policy has lost a considerable part of its effectiveness in boosting domestic demand and in guiding inflation dynamics back to target in recent years. Despite subsequent aggressive rounds of monetary policy easing since financial market confidence was largely restored in early 2009, the ability of central banks to boost bank lending and generate a sustainable recovery in economic growth has been limited. Here we analyse why this has been so, and discuss the process of credit creation in more detail. In our view, a clear understanding of these processes is key to any discussion of amending the central bank's mandate in the light of recent experience.

Market perception of the effectiveness of monetary policy measures seems to be oscillating between believing that central banks are omnipotent to them becoming impotent. In itself, this rising scepticism in financial markets could undermine the effectiveness of monetary policy. Increasingly, central bank watchers have seemed to question whether monetary policy measures can effectively boost credit creation. What is remarkable is that much mainstream monetary economics seems to focus solely on the direct relationship

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between the official (riskless) short-term interest rate, and expectations thereof, and the "real" economy, abstracting entirely from the transmission mechanism via the banking sector, and other financial intermediaries. A prime example is Reifschneider's (2016) recent influential paper, on "Gauging the ability of the FOMC to respond to future recessions", in which the words "banks", "credit" and "money supply" are conspicuously absent. Cukierman (2016) has explained how the failure to consider the monetary transmission mechanism via the banking sector can strongly bias downwards estimated values for the natural, or neutral, real long-term interest rate.

2 High-powered money has lost power?

"Don't fight the Fed" is a widely-repeated aphorism. Central Banks have been seen as having great power; indeed, in a world where fiscal policy is constrained by a debt overhang and political issues, monetary policy is often regarded as the "only game in town", the last best hope of a battered and fragile world economy.

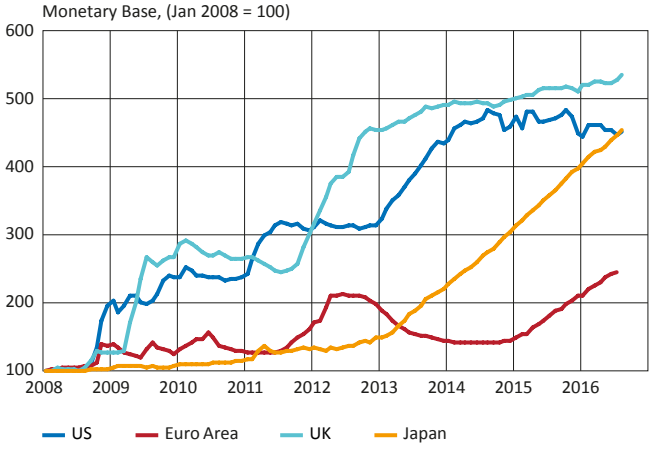
And yet, what is remarkable about the years since the Great Financial Crisis (GFC) has not been the success of expansionary monetary policies, but their failure to drag the world economy out of its low inflationary torpor. Consider the following syllogism: Inflation is a monetary phenomenon. Central Banks can create money. Therefore Central Banks can create (2 per cent or higher) inflation.

Moreover, Central Bank attempts to restrain inflation when it was *above* target were constrained by political and public antagonism to higher interest rates and lower asset prices, as much as that the Federal Reserve Chairman Paul Volcker had to resort to the subterfuge of a purported monetary regime change to defeat the engrained inflation of the 1970s. In contrast, bringing about lower interest rates and higher asset prices should have been a walk in the park for today's Central Banks.

So what went wrong? Central Banks created base money (so-called high-powered money or monetary base) with great enthusiasm. Their monetary liabilities, currency outstanding plus commercial bank deposits with themselves, exhibited a manifold increase since the onset of the GFC, see Figure 1. Yet, after the success of QE1 in helping to bring about a recovery to a collapsing financial system in 2009 together with a pick-up in economic growth, nothing much thereafter seemed to happen. The transmission mechanisms from changes in base money (H) (or M0) to broad money (M) collapsed. High-powered money became low, or zero, powered, see Table 1.

Figure 1. G4 Monetary base expanded rapidly

Monetary Base, (Jan 2008 = 100)



Sources: Morgan Stanley Research, Bank of England, Bank of Japan, European Central Bank and US Federal Reserve Board

Table 1. Tiny changes in broad money despite surging base money

		% change in*		
		Base Money (H)	Broad Money (M)	Ratio M/H
USA	2009	41.8	5.4	−25.7
	2010	−0.2	3.4	3.5
	2011	32.7	9.7	−17.3
	2012	1.1	7.6	6.4
	2013	38.6	6.1	−23.5
	2014	6.8	5.8	−1
Japan	2009	4.7	2.3	−2.2
	2010	3.9	2	−1.8
	2011	14.9	2.5	−10.8
	2012	11.5	2	−8.6
	2013	46.8	3.4	−29.6
	2014	37.4	2.8	−25.2
UK	2009	106	5.7	−48.7
	2010	−0.8	5.5	6.3
	2011	5	−3.1	−7.8
	2012	61.7	0.2	−38
	2013	7.3	0.7	−6.2
	2014	1.3	−0.1	−1.4
Eurozone	2009	−8.3	−0.5	8.5
	2010	2.3	−0.7	−2.9
	2011	24.3	2.2	−17.8
	2012	22.1	3	−15.6
	2013	−27	0.5	37.7
	2014	−0.2	4.9	5.1

*Annual changes are 4Q/4Q.
Sources: US Federal Reserve Board, Bank of England, European Central Bank, Bank of Japan and Morgan Stanley Research.

Why did this happen? Effectively, the commercial banks have found themselves in a liquidity trap, wherein they became happier to hold ever larger deposits with their own Central Bank rather than wanting to use such reserves to expand their assets. See Figure 2. Central Banks can, and indeed do, enforce an aggregate increase in the total of reserve deposits available to commercial banks, but it is up to the individual commercial bank to decide whether to use its own, now much larger, reserve deposits to purchase other (normally higher-yielding) assets. As discussed in Box 1, because the return, risk advantage of doing so has been eroded, they have not been taking this second step.

As Bernanke (2015, p. 325) noted,

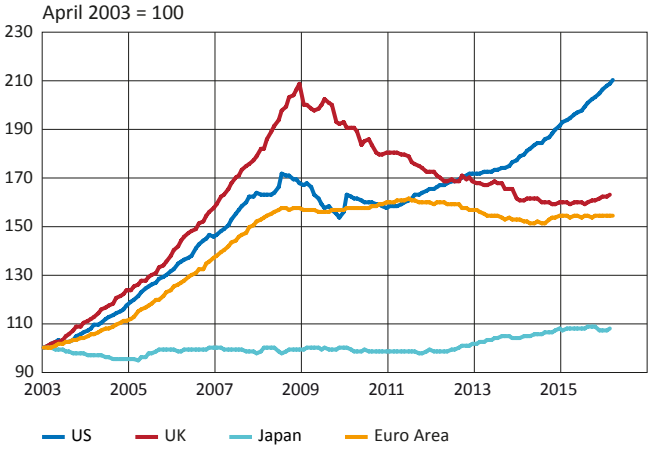
> *"We had initially asked to pay interest on reserves for technical reasons. But in 2008, we needed the authority to solve an increasingly serious problem: the risk that our emergency lending, which had the side effect of increasing bank reserves, would lead short-term interest rates to fall below our federal funds target and thereby cause us to lose control of monetary policy. When banks have lots of reserves, they have less need to borrow from each other, which pushes down the interest rate on that borrowing – the federal funds rate."*

The interest rate paid by central banks on (marginal) reserves held with themselves becomes *the* crucial, central peg for official rates. But this changes the underlying structure dramatically. Reserves no longer necessarily have a lower return than other money market assets. Moreover, they have better risk and regulatory characteristics. They have become an asset whose place in banks' portfolios is determined by their relative return and risk. With expansionary monetary policies not only driving down yields, relative to the interest on reserves, but flattening the yield curve, the demand for such reserve holdings has surged, alongside the massive increase in the supply of base money.

With the demand for liquidity amongst banks largely satiated after 2009, the availability of cash reserves has subsequently become no longer *any* constraint on banks' capacity to expand lending. The constraint, instead, comes from the availability of capital. But capital will always be made available to any clearly profitable enterprise. Like any other service industry, the expansion, or decline, of banking will depend on its prospective profitability.

Figure 2. G4 Bank lending remained sluggish

April 2003 = 100



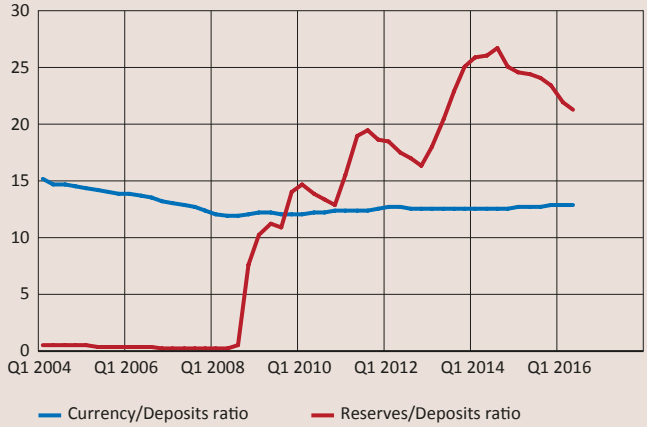
Sources: FRB, ECB, BoJ, BoE and Morgan Stanley Research

Box 1 – The collapse of the money multiplier

As shown in Table 1, there has been no relationship between the rate of increase in the monetary base and in broad money since 2008. QE has led to a massive expansion in the monetary base; this consists of currency outstanding and the reserve deposits of the commercial banks held at the Central Bank. The cash usage of the general public is demand-determined; the Central Bank and the commercial banks provide cash on demand, for example from ATMs, whatever the public wants. Apart from a panicky blip in 2008 Q4, see Ashworth and Goodhart (2014), such cash usage has generally risen quite slowly and steadily, unlike in the USA in 1929-1933 when there was a massive shift out of bank deposits into cash, to protect against the risk of bank failure.

The bulk of the massive increase in monetary base has ended up in commercial bank reserve holdings at the Central Bank. Since such reserves had been kept low prior to 2008, this represented an even larger percentage increase in reserves than in the monetary base.

Figure 3. US – Currency to deposit and reserve-to-deposit ratios



Sources: Federal Reserve Board and Morgan Stanley Research

The prior money multiplier analysis (see Equation (1)) was based on the assumption that both the ratio of commercial bank reserves (R) to total bank deposits (D), that is R/D, and the ratio of the public's currency holding (C) to their deposits, that is C/D, would remain quite stable. As can be seen from Figure 3 above, the C/D ratio did remain stable, but the R/D ratio rose dramatically with a very strong correlation with changes in H.

$$(1) \qquad M = H \times \frac{(1+C/D)}{(R/D + C/D)}$$

This behaviour was quite unlike the past. What had changed? Prior to 2007, reserves held by commercial banks were unremunerated (zero yield), whereas returns on longer-dated riskless assets were positive, and returns on risky assets higher still. Thus, holding reserves at the Central Bank represented a penalty, and the commercial banks maintained a wafer-thin buffer above the required minimum, to avert the non-pecuniary costs of falling below the requirement (for example, the need to explain their short-fall to the Central Bank).

From 2008 onwards all that changed. Reserve deposits at the Central Bank now became remunerated. Moreover, Central Banks often consciously used QE and forward guidance to flatten the yield curve. The running interest-rate advantage from maturity transformation largely disappeared in the main core countries, though not in the periphery of the EU, while

the potential interest rate risk, should rates renormalize, remained elevated. What was then the point for a commercial bank in Germany, Japan, the USA or UK in moving out of reserve deposits at their Central Bank into longer-dated, bonds, JGBs, T-bonds or gilts?

Risky bank assets, such as loans to SMEs, continued to have higher yields, but they were riskier, especially given the weakness of the macroeconomic recovery. Moreover, regulatory policy has been set to require much higher capital against such risks. Clearly, there is an obvious inconsistency between regulation aiming to make banks safer and QE seeking to encourage investors to shift into riskier assets. As a result, banks have refrained from strong expansion of private sector lending, and in the aftermath of the GFC there was not much demand for loans in any case.

To put it simply, commercial banks have been, and still are, in a liquidity trap. Holding reserves at the Central Bank is safe, requires no extra capital, adds to liquidity, and has only a minimally lower yield than other longer-dated public sector debt with far less interest rate risk. With bank loans being considerably riskier, and requiring the application of scarce capital, banks will impose tougher conditions, for example in the guise of additional collateral, on aspiring borrowers. Thus, under present (post GFC conditions), the hurdles facing such borrowers have become higher. The path of least resistance is to allow any extra cash reserves generated by QE, LTROs, etc., to pile up in commercial bank balances at the Central Bank. This is what has been happening.

Whereas Central Banks have made access to additional reserves much easier (via widening the range of assets that they will accept as collateral), the massive accumulation of cash reserves at the central bank by commercial banks has meant that such extra access has hardly been used. For the time being, the trade-off between the costs of Lender of Last Resort (LoLR) action by central banks CBs, in the form of potential loss and greater moral hazard, and its benefits in preventing contagious crises, has not been much tested; this trade-off was, however, discussed by one of the authors of this note (Goodhart) at the Riksbank conference recorded in this volume. This latter paper was first presented at a festschrift in honour of Prof. Gerhard Illing, March 2016, and will be published in the Proceedings of that conference, forthcoming.

At the outset of the GFC, in 2008 and 2009, banks, suddenly fearful of risk, retreated into their shells and hoarded liquidity. In order to keep the financial system afloat, central banks not only had to provide extra liquidity but also themselves to act as intermediaries in place of banks in various markets for allocating credit.

But once that crisis of confidence had been successfully managed, the effects of further unconventional monetary expansion policies, notably QE, upon financial stability became ambiguous. On the one hand, force-feeding banks with a larger diet of cash must protect them from runs and liquidity problems, as Stein has emphasized, in his papers Kashyap and Stein (2012), and Greenwood, Hanson and Stein (2016). On the other hand, forcing down rates on alternative safe assets, relative to the interest payable on reserves, encourages banks to reach for yield on riskier assets, reduces the incentive to clean up balance sheets and harms bank profitability (because of the effective ZLB on deposits), and hence bank expansion. To some extent unconventional monetary policy and QE is turning banks away from enterprise into becoming rentiers of the State.

2.1 Policy discussions often neglect money, focus on interest rates

In the macroeconomic models currently in vogue, the monetary aggregates do not appear to play any role. Instead, the variable that enters, prominently, in such models is the interest rate. Central Banks seem to have put on a brave face, given their inability to restore the expansion of broad money and bank loans, and some indeed claimed, ex post facto, that they had never expected this particular transmission channel to work anyhow. Instead, the important requirement was to lower both nominal and real interest rates, in the latter case by preventing deflationary expectations from taking hold. If the monetary aggregate channel was gummed up, the portfolio balance channel could still work, as well as the effect of a lowering of interest rates on the intertemporal balance of expenditures; in other words, the lower the interest rate, the greater the incentive to shift expenditures (both consumption and investment), from tomorrow to today. A problem is that under conditions of considerable uncertainty, as for example during the Euro area crisis or after the Brexit referendum, a reduction of a few basis points is unlikely to sway many expenditure decisions.

Following the outburst of the GFC in 2008, interest rates were rapidly reduced, initially from a normal level to zero and there they have stuck – Figure 4. There is no doubt that that helped greatly in preventing the GFC from becoming a deep depression, as did QE1 and the LTROs and the promise of OMT, notably by reducing risk premia (Figure 5), which had kept the interest rates on risky assets way above the zero rate on riskless assets (Table 2). But it was not enough to restore strong growth, except initially in China and EM (where massive fiscal stimulus also played a major role).

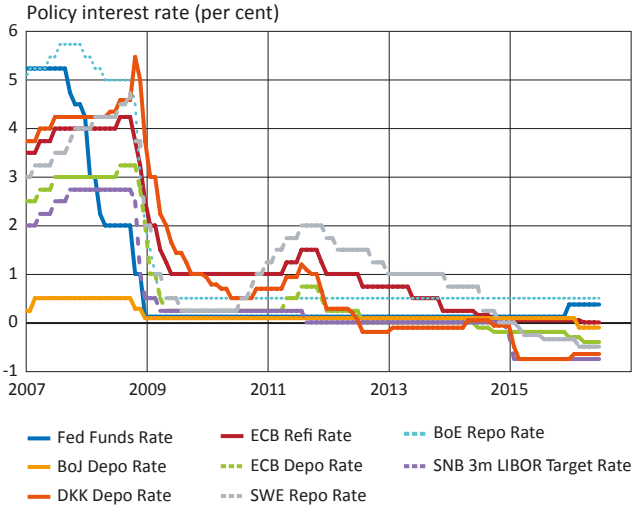
Table 2. G4 central bank policy measures in comparison

		Fed	ECB	BoJ	BoE
Lending operations		+	+	+	+
QE	– Public debt	+	+	+	+
	– Private debt	Mortgage	Corporate/ Covered bonds, ABS	+	+
Negative Interest Rates		– /?	+	+	–

Source: Morgan Stanley Research

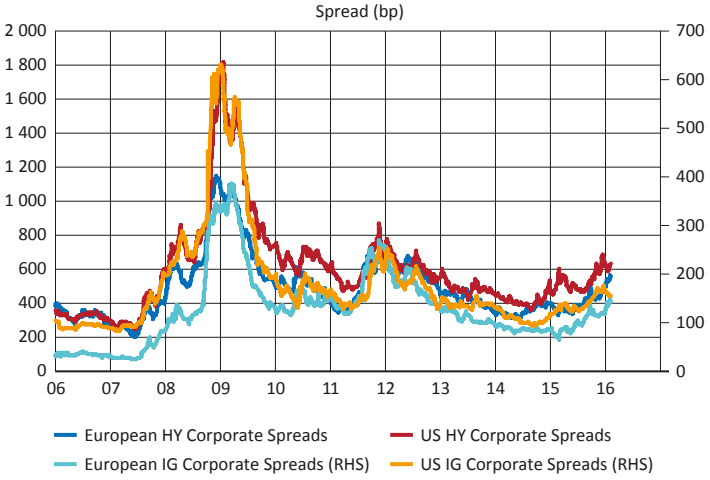
If lowering interest rates to zero was not enough, why not make them negative? The barrier to negative interest rates, giving a subsidy to spending today rather than tomorrow, was the zero lower bound (ZLB), caused by the availability of currency, which has a zero yield and anyone can hold. How can you force interest rates on any asset, say a government T Bill, negative when potential holders of that asset can hold zero-yielding currency instead? Well, actually you can, up to a point, because holding lots of currency notes involves some expense and bother, for example safe-keeping and insurance costs.

Figure 4. Key policy rates headed below zero
Policy interest rate (per cent)



Sources: National central banks and Morgan Stanley Research

Figure 5. Initially monetary policy helped to reduce risk premia
Spread (bp)



Sources: Markit and Morgan Stanley Research

Nevertheless, the tolerance of the financial system for ever-greater negative interest rates is limited, as long as zero-yielding currency remains as an alternative. Thus, there has been considerable attention given to potential alternative schemes for abolishing zero-yielding currency, or some segments of it. A selection of these is reviewed in Box 2.

Box 2 – Getting rid of the ZLB by changing currency usage

There are at least four, or perhaps three and a half, methods that have been suggested for adjusting currency usage so as to weaken, or completely remove, the ZLB.

(1) Abolish national currencies altogether, replacing cash with electronic purses and other (plastic and telephonic) means of payment.

Pros	Cons
Technically feasible and, indeed, Swish.	An enormous break with historical tradition, and upsetting for the old.
Hinders the Black/Grey economy.	All transactions can, in principle, be monitored, so illiberal.
Would increase the efficiency of payments systems considerably.	Black/Grey economy (and others) will switch to other currencies (dollar or euro), that benefits other countries' seignorage.
Conclusion: A step too far at the moment.	

(2) Abolish large denomination notes, leaving small value notes.

Pros	Cons
Easily do-able.	Relaxes, but does not remove, the lower limit to negative interest rates.
Less of a sudden break with tradition.	Black/Grey economy will simply switch to other countries' high denomination notes. Will such a change be useful unless it is internationally coordinated? Could that happen?
Hinders Black/Grey economy.	
Not nearly so illiberal.	
Conclusion: Worth doing, since it is the right thing to do, but do not expect too much from the reform.	

(3) Impose a tax on cash withdrawals by banks from Central Banks[1]

Pros	Cons
Much the same as (2), but can be made more flexible by varying tax rate according to conditions.	Puts pressure on banks to recoup tax. Would need to be introduced in concert with banks.
Raises extra revenue.	Effect on willingness to shift into currency depends on expectations of the future duration and extent of negative interest rates. If expectations were very gloomy, higher tax rates would be needed to prevent switching into currency.
	Unless the tax was expected to be temporary, people would start using other currencies instead.
Conclusion: If there was a sudden collapse in confidence and in the economy, this could provide, in conjunction with sharply negative interest rates, a real expansionary jolt. But it should be publicly explained, after full negotiation with the banks, and be a once-off measure. Probably not suited to being a continuous mechanism.	

(4) Floating exchange rate between currency and deposit money. Any negative rate could be achieved by the Central Bank committing to depreciate currency relative to deposits.

Pros	Cons
Doable, at least in theory.	Much more complex, with the exchange rate between currency and deposits continually shifting.
Completely removes any barrier to any desired level of negative interest rates.	Can be avoided by certified checks, pre-payment, all sorts of innovation. The banks would get around it.
Allows currency to continue, so not illiberal.	Likely to cause a shift into the use of more stable currencies that are not expected to depreciate.
Conclusion: Too clever by half. It would be, in practice, highly unpopular. If we must go to deeply negative interest rates, the Method 1 is probably better than this.	

Source: Morgan Stanley Research

1 Note that the abolition of high denomination notes is equivalent to imposing an infinite tax rate on them. If the tax rate on high denomination notes was infinite, and on low denomination notes was zero, Then method 3 is exactly equivalent to method 2. Probably best to make such a tax highly progressive in denomination.

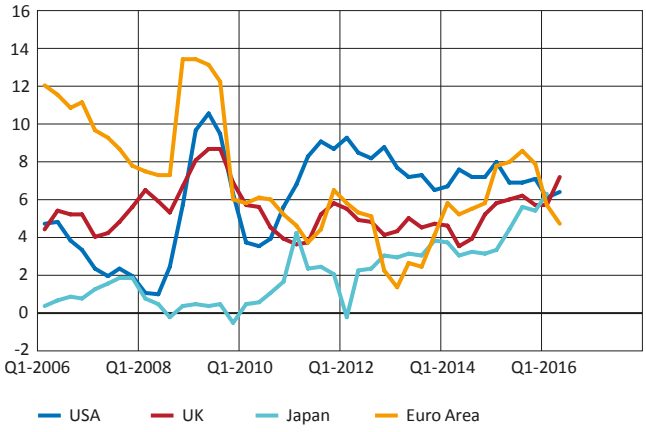
But such schemes are still mostly "pie in the sky", for future enactment, if at all. Moreover, the announcement effect of what could be perceived as a desperate last throw of the dice could be strongly negative. In the meantime, Central Banks, eager to show that they have not run out of ammunition in an uncertain world, have been moving, albeit a bit gingerly, into negative interest rate territory, as can be seen from Figure 4. The results have been quite mixed. There has not been much sign yet of any *massive* shift into currency (Figure 6) (although low interest rates do appear to be a factor behind rising currency holdings in some countries) and, with the exception of the aftermath of the recent introduction of negative deposit rates by the Bank of Japan, the effect on the exchange rates of the countries involved has been largely as expected and intended.

2.2 Boost to growth from negative interest rates negligible due to incomplete transmission via banking system

On the other hand, there is no sign that this move towards negative official rates has done anything to stimulate their domestic economies, apart from the exchange rate effect. Nor do we think that schemes to change currency usage to allow even more negative official rates would be, in present circumstances, much more successful.

Figure 6. G4 currency in circulation

Per cent



Sources: Morgan Stanley Research, Bank of England, Bank of Japan, European Central Bank, US Federal Reserve Board and Haver Analytics

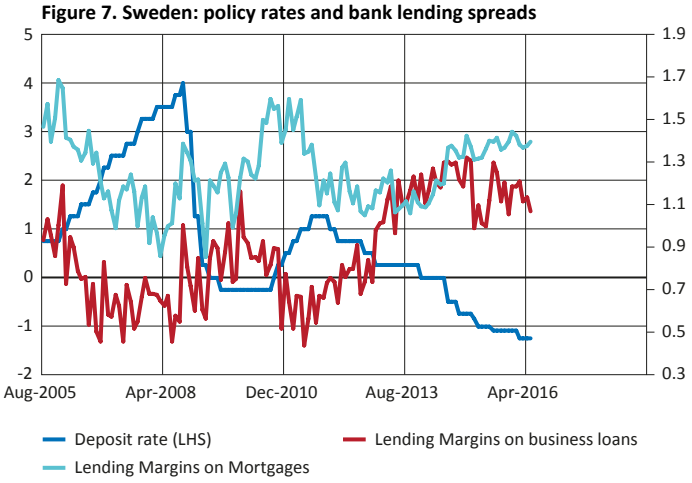
The reason for this scepticism is that the transmission mechanism for interest rate effects runs again largely through the commercial banks. The vast majority of us cannot borrow, or lend, at anything close to the official risk-less interest rate. Instead, we borrow from banks, and hold our liquid financial assets primarily in bank deposits, or in some cases in money market mutual funds. So much, perhaps most, of the force of changes in official rates occurs when, and if, interest rates on deposits and on bank lending change in line with official rates, or in other words when bank spreads vis a vis official rates remain constant.

But as official rates fall towards, and beyond, zero this is not happening, and should not have been expected to happen. The reputation of commercial banks (and MMFs) has depended on them being "safe", which is widely interpreted as meaning an individual's asset holdings not declining in nominal value, not "breaking the buck". There is some margin for increasing fees on handling deposits, strongly limited by commercial pressures, but, as a generality, commercial banks (and MMFs) face an even stronger ZLB than do Central Banks.

It is not just the direct effect of the negative rate on their (marginal) reserves that matters; it is the wider effect of the reduction of interest rates on their assets, relative to the rate that they will feel forced to continue offering on their (retail) deposits. As was set

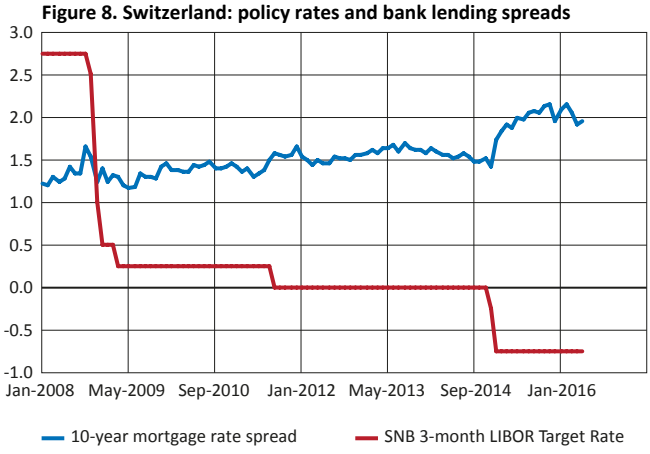
out in Van Steenis and Bartsch (2016), the effect of negative interest rates on banks' net interest margins and incomes is increasingly adverse. The impact on commercial banks of negative rates on their deposits at the Central Bank and their holdings of public sector debt is to reduce their interest income and profitability yet further. If this happens, their reaction could be to widen spreads between deposit and lending rates. This is indeed what has been happening, see Figures 7 and 8. This rise in spreads is clearly counter-productive.

Figure 7. Sweden: policy rates and bank lending spreads



Sources: Morgan Stanley Research, European Central Bank, Sveriges Riksbank and Haver Analytics

Figure 8. Switzerland: policy rates and bank lending spreads



Sources: Swiss National Bank, Morgan Stanley Research and Haver Analysis

Commercial banks, and MMFs, have a reputation to defend. They will not, perhaps cannot, pass on increasingly negative official interest rates to their retail customers on a one-for-one basis, unless the government takes full responsibility for the exercise. And until that happens, the application of such negative official rates may well continue to be counter-productive. If a government should state publicly that the purpose of its policy is to enforce a continued decrease in the nominal value of all your liquid assets, it may have a sharp and beneficial effect on expenditures; spend now because you will not have that much to spend next year. But would that be a political vote winner?

Have proponents of negative interest rates thought through its political implications? Unless the government takes the heat off the banks by taking responsibility for negative deposit rates, it will not work economically. But if they should take the heat off the banks by taking direct responsibility for declining nominal values, it will probably not work politically.

The basic problem, both with monetary expansion and negative interest rates, is that the primary transmission channel is via the commercial banks, and that channel has, for a variety of reasons, become constricted.

3 Mission to reboot bank lending

So what could be done? The first lesson, of course, is the need for Central Banks to be sensitive to the impact of their policies on commercial banks, because it is through the transmission channel of such banks that much, perhaps most, of the effect of such policies will come through to the real economy. The focus should be to rekindle bank lending. Four good examples of such sensitivity, and one example that stymied it, are set out below.

The first good example is the recent decision of the Bank of Japan to apply its negative interest rate to the marginal deposits of commercial banks with itself, rather than to their total reserve deposits. The application to marginal deposits fully maintains the desired relative interest rate effect, while greatly reducing the adverse effect on bank profits, which is counterproductive. Even so, the response to this unexpected change of policy has been negative, in some part because there still has been an adverse effect on Japanese commercial banks' profitability. The next three, good, examples are the earlier Funding for Lending Scheme (FLS) and now the Term Funding Scheme (TFS) of the Bank of England, the Dynamic Pre-Provisioning program of the Banco d'Espana and the TLTRO of the ECB.[2]

All of these worked in concert with the needs and objectives of commercial banks to achieve public policy outcomes. In contrast, the levying of considerable legal fines on financial institutions, rather than on individuals within a financial institution, reduced credit creation. Moral and ethical judgments aside, from a macroeconomic viewpoint they have created a headwind. Some improvement now could be obtained by the common application of best practice; thus, if any Central Bank wants to move deeper into negative interest rates, then do so on a marginal, rather than an average, basis.

But the world economy remains in a fragile condition, and it is possible that this could get worse. What more could be done that, unlike negative interest rates, works with the grain of a strengthening commercial banking system?

One answer to this could be for Central Banks to extend QE to purchases of unsecured senior bank debt. Such purchases would be somewhat risky, the more so now that such debt has become bail-inable. But if such purchases of the debt of bank X would seem too risky for a Central Bank to contemplate, does not that by the same token imply that bank X has too small an equity buffer, so that its Recovery program should be initiated?

If Central Banks were to purchase senior unsecured bank debt, it would give them some "skin in the game", and perhaps encourage them to move faster to prevent a downwards spiral (and even, possibly, to shift the governance of banks away from shareholders alone towards a wider set of creditors). Pessimists might argue that Central Bank holding of bank debt might reinforce forbearance, but would it, if such forbearance then later made Central Bank losses likely to be even greater? For agents to have skin in the game is generally thought desirable, for example to reduce agency problems; might this be just as true for regulators as for any other agent?

The ECB used to apply a two-pillar approach, with the second pillar based on the growth of the monetary aggregates, not just on M0. Whatever became of this second pillar? Can any Central Bank really expect to achieve significant real expansion if its commercial banking system, broad monetary growth and bank lending remain mired in a difficult slough? Moreover, the problem is getting worse because the prior expansionary success of Central

2 Though recent research, (Forbes, Reinhardt and Wieladek, 2016), suggests that some large part of the extra bank lending in the UK was mirrored by a cut-back in cross-border bank lending.

Banks rested partly on a generalised belief that they did have the power to lift us out of despondency. But confidence in that power is ebbing, and that just makes it that much harder for them.

A somewhat deeper problem is that banks have, by and large, almost ceased to be a conduit for channelling household savings towards business. The bulk of their business now involves channelling household savings into real estate projects; they have become akin to "real-estate hedge funds". The nexus between bank credit expansion, housing booms and busts and the financial cycle has become a major source of dynamic instability in our economies. Yet, partly because of an erroneous diagnosis of the causes of the GFC, blaming it largely on the dangers of exotic derivatives and investment bankers, little has yet been done to break this nexus and to mitigate the underlying dynamic instability.

4 Summary and conclusion

When a crisis of confidence hits the financial system and banks withdraw from risk-taking and hoard liquidity, there is no real policy alternative to central bank expansion, for the purpose of creating liquidity, reducing risk spreads and even in some cases replacing banks in certain markets for credit allocation. This is what central banks did successfully in 2008/9 and in the Eurozone in 2012.

But when confidence has been restored, simply repeating the same medicine runs into rapidly diminishing returns. When the demand by banks, and others, for liquidity has been satiated, as it has been, the constraint on banks' credit expansion becomes capital and, above all else, profitability. The move towards the ZLB, and beyond to NIRP, and the flattening of the yield curve, has depressed bank profitability, as have other factors, for example the imposition of fines on banks, rather than on individual bankers. Facing such diminished profitability, banks have responded to regulatory requirements for higher capital ratios by deleveraging rather than by raising new equity.

Consequently the massive expansion in the monetary base, the liabilities of the central banks, have not been matched by an equivalent rise in bank credit expansion or of broader monetary growth. Meanwhile from 2009 onwards, apart from the problems of the periphery of the Eurozone, the extent of potential cuts in interest rates has been pitifully small, relative to the uncertainties of the sluggish recovery.

The monetary authorities have now become cognisant of this problem, but it is not clear how they can best respond. As long as the bank transmission channel is thus clogged up, and the abolition of currency remains a futuristic dream, it would seem that monetary policy really is running out of ammunition. If so, the authorities have to look elsewhere, notably to fiscal policy, to provide further impetus, should this be desired, to our economies.

References

Ashworth, Jonathan and Charles Goodhart (2014), "Measuring Public Panic in the Great Financial Crisis", VOX EU.

Bernanke, Ben S (2015), *The Courage to Act*, W.W. Norton & Company: New York, NY.

Cukierman, Alex (2016), "Reflections on the Natural Rate of Interest, its Measurement, Monetary Policy and the Zero Lower Bound", *Discussion Paper No. 11467*, Centre for Economic Policy Research.

Forbes, Kristin, Dennis Reinhardt, and Tomasz Wieladek (2016), "The Spillovers, Interactions, and (un) intended Consequences of Monetary and Regulatory Policies", External MPC Unit, *Discussion Paper No. 44*, Bank of England.

Greenwood, Robin, Samuel G. Hanson and Jeremy C. Stein (2016), "The Federal Reserve's Balance Sheet as a Financial-Stability Tool", presented at the Federal Reserve Bank of Kansas City's 2016 Economy Policy Symposium: Jackson Hole, WY.

Kashyap, Anil K. and Jeremy C. Stein (2012), "The Optimal Conduct of Monetary Policy with Interest on Reserves", *American Economic Journal: Macroeconomics*, Vol. 4, No. 1, pp. 266‑282.

Reifschneider, David (2016), "Gauging the Ability of the FOMC to Respond to Future Recessions", Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board: Washington, D.C.

Van Steenis, Huw and Elga Bartsch (2016), "Negative Rates a 'Dangerous Experiment' with Diminishing Positive Impact?", Morgan Stanley Research.