# Why negative interest rates are not a solution for Japan or the eurozone

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The Bank of Japan (BoJ) has now been conducting quantitative easing (QE) for just over three years, while the European Central Bank (ECB) has been conducting QE for just over one year. In neither case can the results be said to be satisfactory. In this article I explain why these two central banks have achieved far less success than either the US Federal Reserve (Fed) or the Bank of England (BoE). I also spell out why the negative interest rate policies pursued by the BoJ and the ECB are not a solution to the problems of the Japanese and eurozone economies.

## Two types of quantitative easing (QE) implemented

Figure 1
**Two types of QE operation**

| Central bank | Targeted securities | Holders |
|---|---|---|
| Federal Reserve | Mainly long-dated US Treasuries; some T-Bills | Non-Banks |
| | Mortgage Backed securities | Non-Banks |
| Bank of England | Long dated Gilts | Non-Banks |
| | Commercial paper | Non-Banks |
| Bank of Japan | JGBs, Finance bills | Banks |
| | ETFs, J-REITs | Non-Banks |
| ECB & Euro-area National Central Banks | Sovereign debt | Banks |
| | Corporate bonds (from June 2016) | Non-Banks |

Among the major developed economies (US, UK, the eurozone and Japan) two different types of QE have been conducted in recent years.

The QE operations conducted by the Fed and the BoE have largely been successful because (1) they were targeted at the purchase of securities from non-banks, (2) they therefore increased the stock of money or purchasing power held by firms and households directly, and (3) were consistent with a reduction in private sector leverage.

By contrast, the QE operations conducted by the BoJ and the ECB have had much less success because (1) they were targeted largely at the purchase of securities from banks, and as a result, (2) they did not increase the stock of money or purchasing power held by firms and households, and (3) were not consistent with any reduction in private sector leverage.

To restore economic growth and raise inflation closer to the target area of 2% in both Japan and the Euro-area, policymakers need to achieve two sets of results. First they need to encourage and ensure the repair of private sector balance sheets since spending will not resume normal or potential growth rates unless excess leverage is eliminated. Second, the economies need to be re-liquefied, or provided with additional purchasing power but without adding to leverage.

There are two rules for central banks to follow when designing a QE programme.

First, the central bank should only buy securities from non-banks. The reason is that the primary purpose of doing QE is - or should be - to expand the money supply. If the central bank buys securities from banks, there can be no assurance that the money supply will increase. However, if it buys securities from non-banks, this guarantees that new deposits will be created, expanding the money supply. Of course, if firms or households are de-leveraging (repaying debt), the central bank may need to conduct even larger scale asset purchases to counter any reduction of deposits due to the repayment of debt.

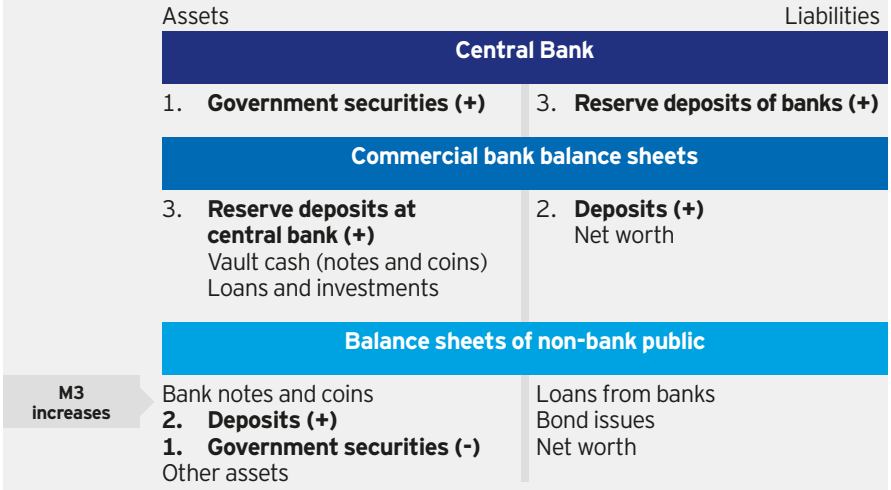
Second, the central bank should buy only long-term securities. This is only partly to bring down yields at the longer end of the curve (flattening the yield curve[1]). More importantly it means the central bank's portfolio is not eroded by selling or running down its holdings. As a result the volume of funds injected into the economy can remain stable for a long period of time.

The BoJ has repeatedly broken both these rules; the ECB has mostly violated the first rule. By contrast, when the BoE announced its QE programme in February 2009 it said explicitly that they would buy gilts with longer maturities (10-15 years) precisely so that these purchases would be from non-banks. In doing so it guaranteed the success of its programme. "The aim of the policy was to inject money into the economy in order to boost nominal spending and thus help achieve the 2% inflation target." (BoE Quarterly Bulletin Q3 2011).

[1] Many commentators, including officials at the BoJ and ECB, mistakenly believe that the primary purpose of QE is to lower long-term rates.

**A well designed asset purchase plan**

Figure 2
**Liquidity-enhancing QE**




Source: Invesco, for illustrative purposes only.

To explain the difference between the BoE (or Fed) operations on the one hand and the BoJ (or ECB) operations on the other, it is helpful to review the impact of their QE transactions on the balance sheets of the banks and the non-bank public.

The numbers above and below relate to the paired transactions set out in the T-form balance sheets above.

1. The central bank purchases government securities from non-bank entities. Non-bank entities (e.g. insurance companies, pension funds, individuals, or foreigners) sell government securities to the central bank.

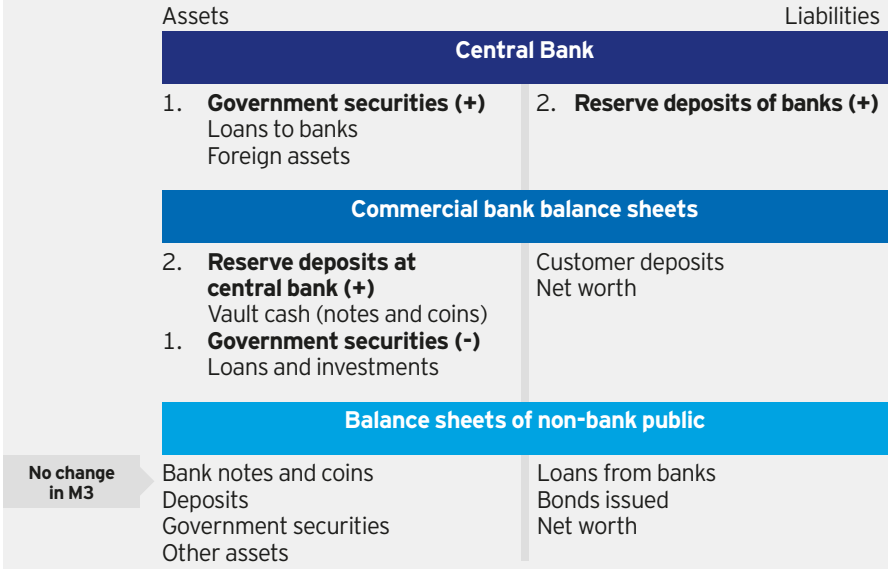
2. The sellers receive new deposits from the central bank in settlement of their sale. The sellers deposit their newly acquired funds in commercial bank deposit accounts.

3. The banks deposit the payment drafts they receive from the sellers of government securities with the central bank. Banks' holdings of deposits (reserves) at the central bank are increased by an amount which exactly matches the central bank's initial purchase.

Note that after these transactions both sides of the central and commercial banks' balance sheets have expanded, with increases in assets matched by increases in liabilities, and crucially, the money supply (e.g. M2, M3 or M4) held by the non-bank public has expanded. Although the balance sheets of the non-bank public have not increased - they have become more liquid, as government securities have been replaced with new deposits. The key point about this series of transactions is that the money in the hands of the non-bank public has now increased. Given that interest rates are at the zero bound, the holders will almost certainly wish to spend the proceeds either on new investments or on consumption, kick-starting the portfolio re-balancing process.

**An asset swap operation**

Figure 3
**Non-liquidity-enhancing QE**




Source: Invesco, for illustrative purposes only.

Next consider the effects of another type of QE such as that conducted by the BoJ or ECB, either via QE or under the long-term refinancing operation (LTRO) and targeted-LTRO programmes. Once again the numbers here relate to the paired transactions set out in the T-form balance sheets above.

1. The central bank buys government or other securities from the commercial banks. Commercial bank holdings of securities decline; central bank holdings increase.

2. Commercial banks receive a credit from the BoJ or ECB for their sale of securities; reserve deposits of banks at the central bank increase.

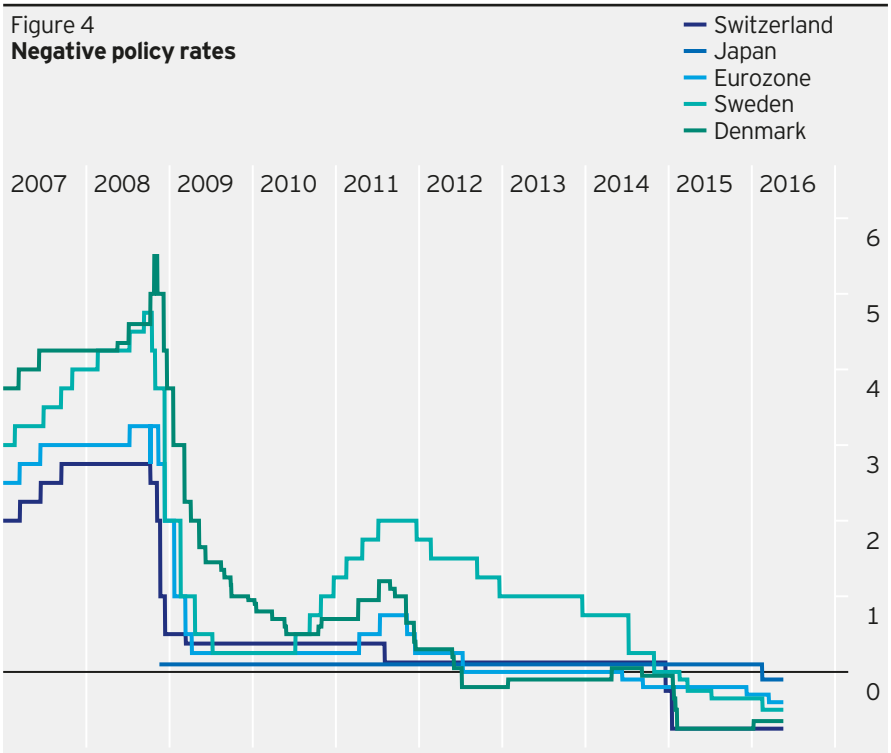
Note that after these transactions the central bank's balance sheet has expanded, with increases in central bank assets matched by increases in liabilities. Commercial banks have merely undertaken an asset swap; they now hold less government securities, but more reserve deposits at the central bank. However, on this occasion, the balance sheets of the non-banks are unaffected.

The key point is that the money supply (M2, M3 or M4) or purchasing power in the hands of the non-bank public has not increased. Moreover, given the starting point of risk aversion by the banks and by firms and households, there can be no assurance that – after these operations - the banks will expand their lending or that any new deposits will be created. Equally, new investment or consumption spending is unlikely to follow. Even if banks were to expand their lending, this would be accompanied by a parallel increase in leverage by firms or households – the opposite of the balance sheet repair process that policy-makers should be seeking to achieve.

In short, only purchases of securities from non-banks are consistent with balance sheet repair and enhanced liquidity in the hands of firms and households.

**Major central banks in Japan and Europe have moved to negative policy rates**

Figure 4
**Negative policy rates**




Source: Macrobond as at 16 May 2016.

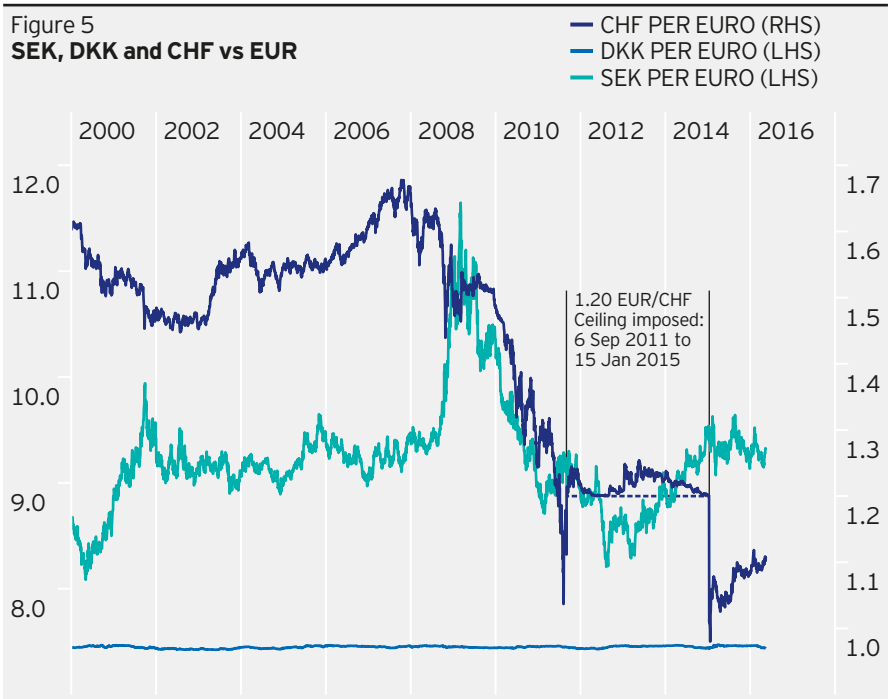
Currently there are five economies employing negative policy rates: Japan, the eurozone, and the three euro-linked economies of Denmark, Switzerland, and Sweden. The first major economy to implement negative rates was Denmark in 2012, followed by the eurozone in 2014. Next Switzerland and Sweden followed suit. Then in January 2016 the BoJ introduced negative rates.

In essence, the central banks of these economies charge the commercial banks for reserve deposits held at the central bank, although in some cases only a part of these balances are subject to negative interest rates (or penalty charges). The conventional motivations for the policy are twofold: first, to stimulate economic growth (based on the view that lower nominal rates will somehow encourage higher spending), and second to deter capital inflows and currency appreciation. Japan and the eurozone fall into the first camp, while the two Nordic countries and Switzerland fit the second. This means that almost a quarter of the world's GDP is produced in economies with negative interest rates.

Central bankers appear to believe that if banks face a charge on their deposits at the central bank they will be induced to hold lower reserve deposit balances, and somehow "lend out" some of those funds. But there are two fundamental fallacies here. First, banks do not lend out reserves. Second, the total volume of reserve deposits is set by the central bank, not by the commercial banks. If the central bank buys more assets (e.g. via foreign exchange intervention or under a QE programme), total reserve deposits will rise, and conversely if the central bank sells assets, total reserve deposits will decline. Assets and liabilities must match. Although individual banks can reduce their reserve balances, collectively they cannot reduce the aggregate reserve balance. The reduction in any one bank's balances (e.g. to pay for a security) will be matched by the increase in another's (the seller's) balance.

**In Switzerland, Sweden and Denmark negative rates result from pegging to the euro**

Figure 5
**SEK, DKK and CHF vs EUR**




Source: Macrobond as at 16 May 2016.

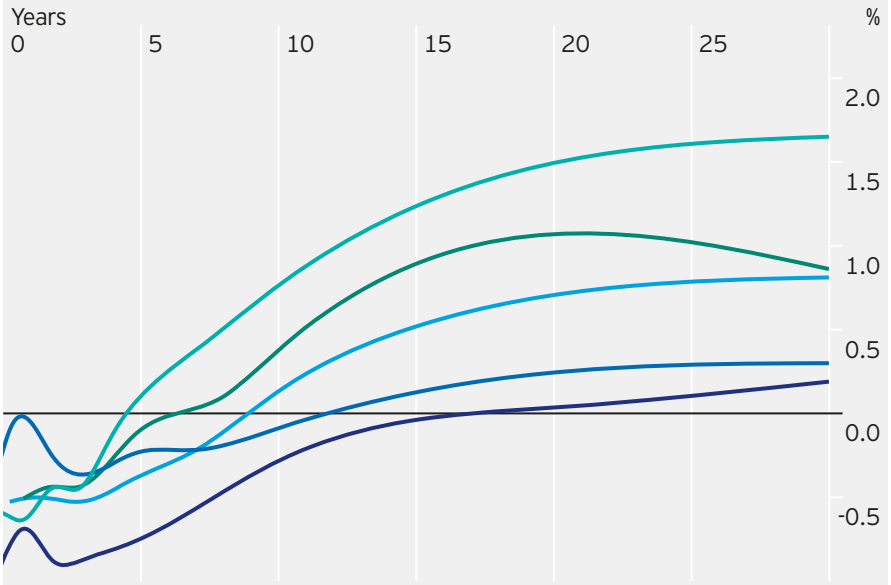
The Danish Krone (in light blue) is explicitly pegged to the euro at DKK7.46 with a trading band of 2.25% on either side, which means that Denmark imports the monetary policy of the ECB. If there is a threat of DKK appreciation - as there was in 2012 and 2015 - then Denmark must cut its interest rates below those of the ECB. This is in essence why Denmark became the first country in Europe to move to negative rates.

In Sweden there has been a floating exchange rate since 1992 when the Riksbank was forced to break its fixed peg with the deutschemark. However, monetary policy is aimed at keeping inflation at a targeted 2%, virtually the same inflation target as the ECB's, which means in effect that the two currencies have to move together in broad measure. Therefore many in the markets see the Swedish krone (shown in green) as a de facto managed exchange rate regime. From the inception of the single currency in 1999 the Swedish currency was relatively stable against the euro until 2008 when it depreciated to 11.65 in March 2009 and then recovered from mid-2009 and through 2010. Since 2011 the SEK has traded in the range 8.30-9.60, a wider range than in 2002-07, but nonetheless a trading range.

The Swiss franc has also had to be managed against the euro. While it remained fairly stable until 2007 there was little problem, but after the outbreak of the global crisis in 2007-08 the CHF was widely viewed as a safe haven, and appreciated strongly, eventually forcing the Swiss National Bank (SNB) to impose a ceiling of 1.20 euros per CHF in September 2011. However, when the ECB was contemplating the adoption of QE in late 2014 and the euro started falling steeply, the SNB abandoned the 1.20 ceiling on January 15, 2015.

**Negative policy rates and expectations of deflation have created negative bond yields**

Figure 6
**Government benchmark yield curves (Japan, Sweden, Denmark, Switzerland and Germany)**




Source: Macrobond as at 16 May 2016.

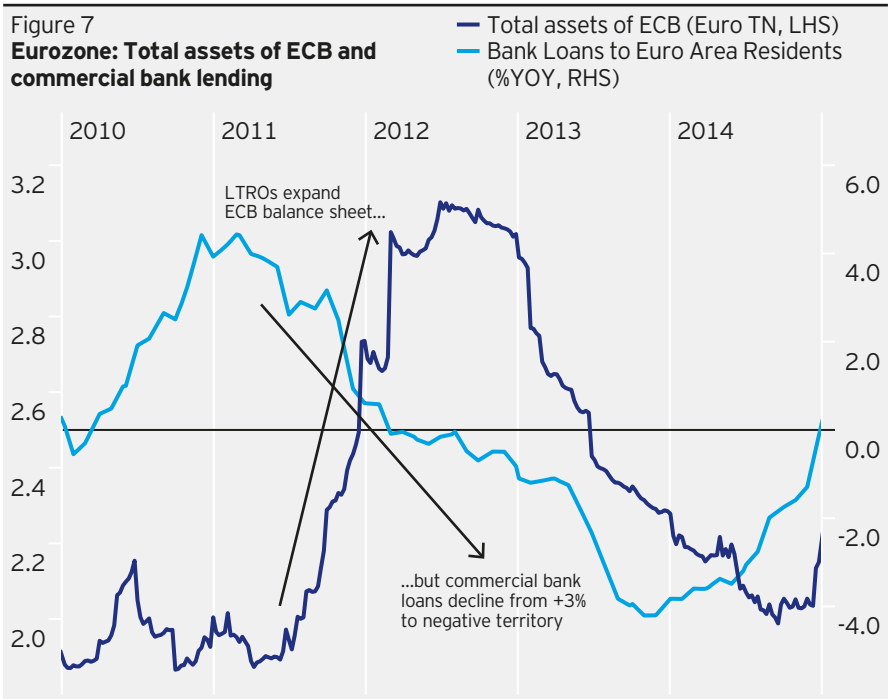
The traditional orthodoxy has been that if banks introduced negative rates on deposits, depositors would shift their money from deposits into physical cash. So far, however, this kind of large-scale shift has not occurred, at least at current levels of interest rates.

Nevertheless, the knock-on effect of negative policy rates, low inflation expectations and weak credit demand is that yield curves have become negative for the affected economies at the short end of the curve.

Also in Denmark there has been the remarkable situation of mortgage holders being credited with interest payments by their bank (albeit offset by some "fees"). In Switzerland most banks have resisted passing on negative rates to their depositors. However one bank, Alternative Bank Schweiz AG, is charging clients for holding their money on deposit. In Germany, insurance companies are feeling the pinch. According to the Bundesbank, "some [insurance] companies need to generate investment returns of more than 5% to survive" (Wall Street Journal, 25 March 2015), which implies serious doubts over the sustainability of their business models in the current environment. A shift into riskier assets is prevented by Solvency II rules that act as a major constraint on the types of asset they can acquire. In Japan the adoption of negative interest rates at the beginning of the year has caused a spike in the price of 40-year JGBs as insurance companies and pension funds have shifted their portfolios to take on greater risk, in this case added duration risk.

**The failure of the ECB's LTRO plan, 2011 – 2014**

Figure 7
**Eurozone: Total assets of ECB and commercial bank lending**




Source: Datastream as at 17 October 2014.

We now turn to the implementation of balance sheet expansion and QE operations by the ECB and BoJ.

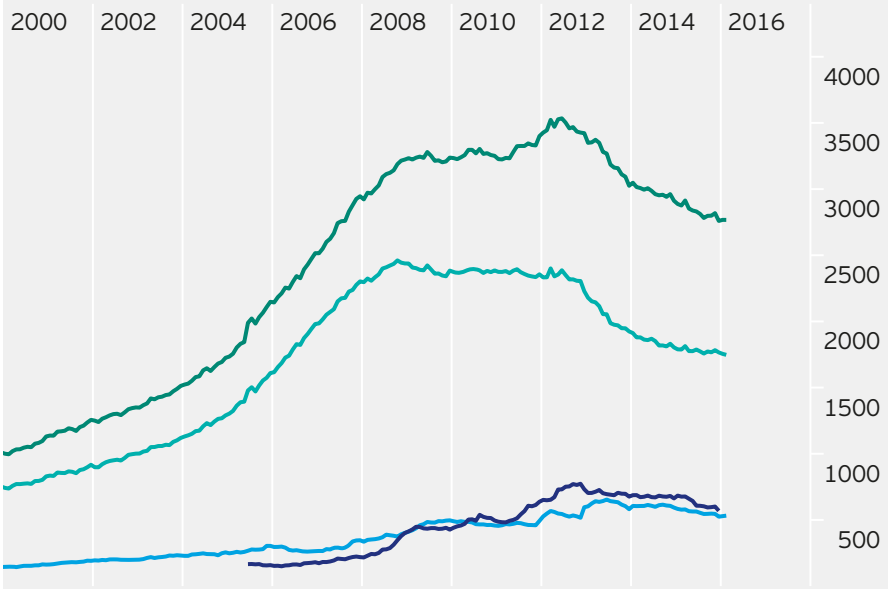
The ECB's LTRO programme initiated in 2011, soon after Mario Draghi took over as President from M. Trichet, and the more recent targeted-LTRO programme are two very good examples of the failure of central bank balance sheet expansion when (a) done in an environment of risk aversion, and (b) when it targets only the commercial banks. The LTROs in 2011-12 increased the ECB's balance sheet from two trillion to three trillion euros but lending by commercial banks decreased from a growth rate of 3.2% year-on-year in September 2011 to -4.0% by September 2013. So on this simple measure, LTROs didn't work. (Of course it could be claimed that the contraction of euro-area bank balance sheets would have been even greater without the LTROs, but equally asset purchases from non-banks would have guaranteed an increase in commercial bank deposits, helping to offset private sector de-leveraging.)

Unlike the BoE or Fed asset purchases from non-banks, LTROs were basically an "asset swap": the ECB made loans to banks against collateral from them.

In Britain, banks generally do not hold long-term gilts because the capital risk is too great. In buying long-term gilts the BoE was therefore buying assets from non-banks, and avoiding an "asset swap". Essentially it was creating new deposits, or injecting new money into the hands of households and non-bank firms, and hence into the broader financial system, thereby creating more rapid money growth in the UK - just as the Fed did in the US. Alternatively, the BoE was offsetting or preventing what might otherwise have been a monetary contraction, such as occurred in the US in 1931-33.

**The contraction of bank balance sheets in the eurozone needs to be reversed**

Figure 8
**Spain: Composition of commercial bank assets (Eur bn)**
March 2013 – Feb 2016
Bond holdings: -109bn




Source: Macrobond as at 16 May 2016.

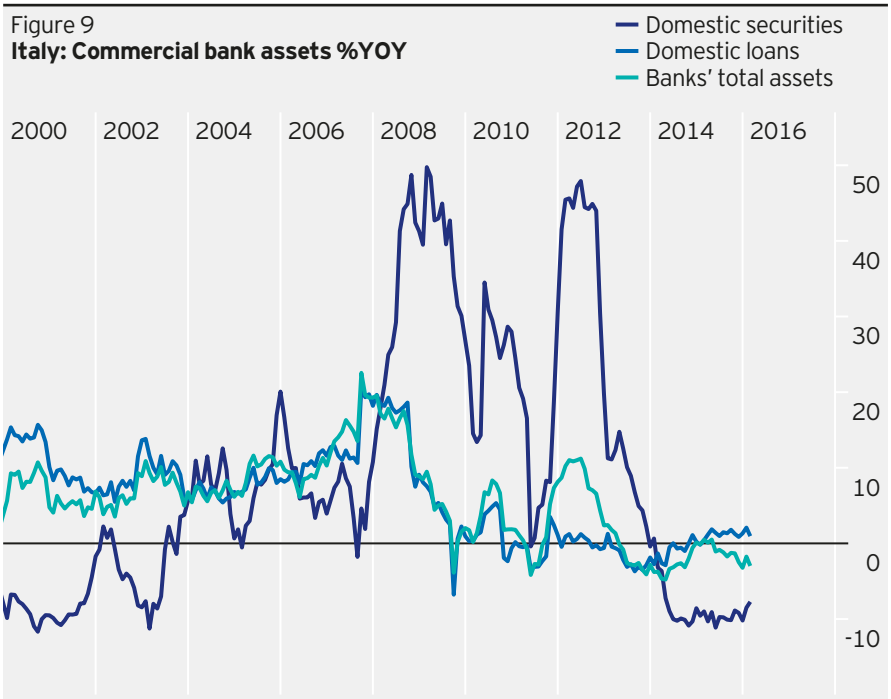
The design of the QE programmes of the BoJ and ECB imply they will be less stimulating to financial markets and to the broader Japanese and Euro-area economies than they should be if they were differently designed. It is no coincidence that the two main areas which are experiencing negative interest rates, sub-par growth and near-deflation - i.e. Japan and the eurozone (plus the three euro-linked economies of Sweden, Denmark and Switzerland) – are also the economies where the two major central banks have implemented flawed QE programmes.

The fundamental problem is that the ECB and the BoJ are trying to implement QE through the normal credit creation channels of the banking system. But these traditional transmission channels are not working – either because banks are risk averse and do not wish to lend, or because households and firms are still significantly leveraged and do not want to borrow. In these circumstances, the policy of relying on ever lower interest rates cannot be assured of success, even if rates are negative. Given that the standard transmission system for monetary policy through the banking system is broken, central banks need to circumvent the banks if they are to create new purchasing power, restore normal economic growth, and return to 2% inflation and normal levels of interest rates.

The right way to do this is not to focus policy on ever-decreasing interest rates, but instead to create money directly by purchases of securities (or indeed any other asset) from non-banks - thereby creating new deposits in the hands of firms and households. Although they did not explicitly articulate their policies in this way, this is in effect what the Fed and the BoE did in 2008-12. In other words it would be better for the BoJ and the ECB to focus on the quantitative effects of QE, not the interest rate effects. To put it differently, QE is (or should be) about expanding purchasing power in the economy or money in the hands of the non-bank public, not lowering interest rates and hoping the banks will expand lending.

**ECB buying securities mainly from banks; Italian bank holdings of securities falling**

Figure 9
**Italy: Commercial bank assets %YOY**




Source: Macrobond as at 16 May 2016.

The chart on page 08 (figure 8) showed that Spanish banks' total assets are still declining, while their loans and holdings of securities - their two major asset classes – are also still declining. Holdings of securities have declined by €109 billion (or 17%) since March 2013 and by €47bn (or 8.8%) since March 2015 when the ECB started its QE operations.

The same is broadly true of Italian banks shown in figure 9 above. The risk aversion of Italian banks is shown (a) the slump in bank lending to corporate and household customers since October 2008, and (b) the rise in holdings of securities 2008-10 and again in 2012-13. In parallel with the Spanish banks, holdings of securities at Italian banks have declined by €170 billion (or 17%) since their peak in August 2013 and by €45bn (or 5.2%) since March 2015 when the ECB started its QE operations.

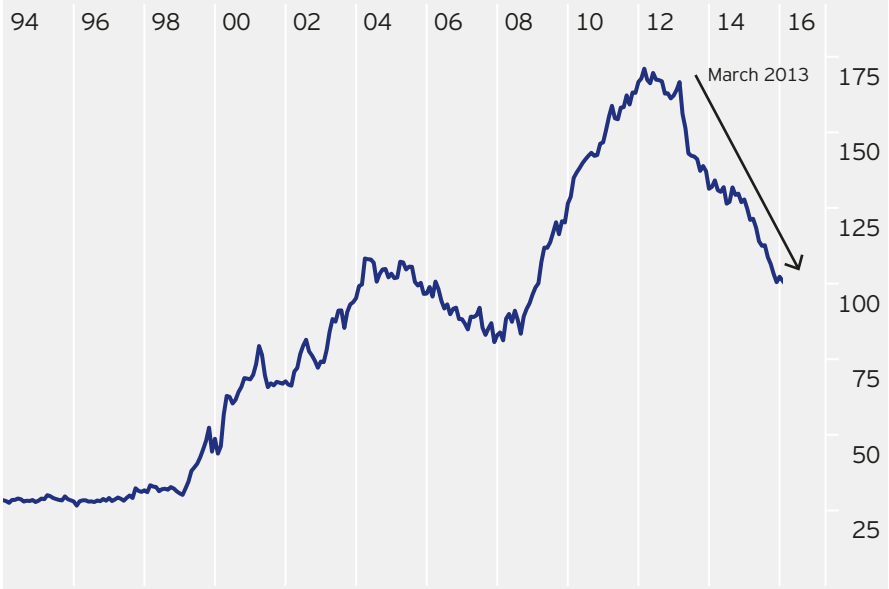
Prospects for bank lending will depend heavily on the success of the ECB's QE. To ensure an increase in lending, QE must first increase the supply of deposits (for which the counterpart asset at banks initially will be not be loans, but bank reserves at the central bank, thereby helping to reduce leverage). If successful, this increase in deposits (or M3) will in turn lead to increased business and consumer spending, later enabling Italian banks to overcome their risk aversion and start lending again.

International Monetary Fund data shows that nearly 18% of Italian banks' loans were doubtful or non-performing in 2015, implying an urgent need for a proper clean-up of the Italian banking system.

Such a clean-up is going to get harder in a much tougher regulatory environment from this year as the European Union (EU) bail-in rules are taking effect, which means the Italian government will no longer be permitted to bail out banks. Instead equity and bondholders must pay up first. There has been a deal struck with the EU allowing the government to guarantee the securitisation of bad loans. However it remains to be seen if this will be enough.

**BoJ buying securities mainly from banks; bank holdings of JGBs have declined by 66 trillion yen since March 2013**

Figure 10
**Japanese bank holdings of JGBs**
JPY, trillion




Source: Macrobond as at 16 May 2016.

Turning to the BoJ, there are two main reasons why the expansion of the BoJ balance sheet has not translated into faster growth of M2 or M3 and banks' balance sheets.

First, instead of targeting non-bank holdings of Japanese government securities for purchase, the BoJ has purchased a considerable amount of these securities directly from the banks. As shown in figure 10 above Japanese commercial banks' holdings of JGBs have fallen from 166.6 trillion yen in March 2013 to 100.2 trillion in February 2016, a decline of 66.4 trillion. In other words, in respect of a total BoJ balance sheet expansion amounting to 250 trillion yen since March 2013, between one quarter and one third is accounted for by commercial bank sales of JGBs. Banks have exchanged holdings of JGBs for increased reserve or current account deposits at the BoJ. There has simply been an asset swap. This does not increase the money supply in the hands of firms or households.

Second, a large proportion of the monthly purchases have been in the form of T-bills, again mainly purchased from the commercial banks. Since these are short-term securities they have to be continuously rolled over on maturity to maintain the expansionary effect. For example, in the fiscal year ended March 2015, while purchases of JGBs amounted to 96.6 trillion yen and largely remained on the balance sheet, T-bill purchases amounted to 101.8 trillion yen but only showed up as an outstanding balance of 49.7 trillion yen.

## Summary and conclusion

- Central bank purchases of assets or securities from commercial banks are far less effective in expanding the money supply or purchasing power in the economy than purchases from non-banks.

- Purchases from non-banks directly expand the volume of deposits, expand the money supply, and they do this without adding leverage.

- Unfortunately, for institutional or other reasons, both the BoJ and the ECB are still concentrating much of their asset purchases on banks rather than non-banks, effectively undermining or diluting the effectiveness of QE.

- Negative interest rates are a fundamentally mis-directed strategy because they aim to induce banks to increase lending and expand their balance sheets by adding to leverage in the non-bank private sector.

- The policy of reducing interest rates to negative territory will not necessarily expand money and purchasing power, and could simply lead to even lower rates by putting pressure on banks (through reduced net interest margins) to contract their balance sheets still further.

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16 May 2016

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Data as at 16 May 2016, unless otherwise stated.

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