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WHY NEGATIVE RATES ARE NOT A SOLUTION FOR JAPAN OR THE EUROZONE

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Johns Hopkins Institute for Applied Economics,
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Why Negative Rates are Not a Solution For Japan or the Eurozone

By John Greenwood

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The Studies in Applied Economics Series is under the general direction of Professor Steve H. Hanke, co-director of the Johns Hopkins institute for Applied Economics, Global Health, and the Study of Business Enterprise (hanke@jhu.edu). This working paper is one in a series on currency boards and monetary systems. The working papers will fill gaps in the history, statistics and scholarship of the subject. The authors are mainly students at the johns Hopkins University in Baltimore.

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John Greenwood is the Chief Economist at Invesco Ltd, a global asset management company. As editor of the Asian Monetary Monitor he is widely credited as the designer of the restored currency board system in Hong Kong at the time of the currency crisis in 1983, a model for numerous subsequent currency board systems. Holding an MA and Honorary Doctorate from the University of Edinburgh, he is the author of "Hong Kong's Link to the US Dollar – Origins and Evolution" (Hong Kong University Press, 2007).

Abstract

Since the Global Financial Crisis in 2008-09 four major central banks have implemented Quantitative Easing (QE) programs. However, the types of QE implemented by the Federal Reserve and the Bank of England on the one hand and the Bank of Japan (BoJ) and the European Central Bank on the other have been very different. In the case of the Fed and the Bank of England, the QE operations were consistent with an expansion of deposits in the banking system, a reduction of leverage in the non-bank private sector, and the gradual normalization of growth, interest rates and inflation. By contrast, the QE operations of the Bank of Japan and the ECB have not been consistent with an expansion of deposits in the banking system or a reduction of leverage in the non-bank private sector, and hence they have failed to promote the gradual normalization of growth, interest rates and inflation.

Acknowledgements

I would like to thank Professor Hanke for his support, and Stefan Gerlach for his encouragement to pursue this quantity-based, rather than interest rate-based analysis of QE.

Keywords: Central bank, Quantitative Easing

Introduction

The BoJ has now been conducting QE for just over three years, while the ECB has been conducting QE for just over one year. In neither case can the results be said to be satisfactory. Section 1 of this article explains why these two central banks have achieved far less success than either the Fed or the BoE, and Section 2 reviews the balance sheet data that offers evidence of their failed QE policies. Section 3 spells out why the QE strategies pursued by the BoJ and the ECB have led directly to negative interest rates, and why in turn negative rates are not a solution to the problems of the Japanese and Eurozone economies. Section 4 concludes.

Section 1. Two Types of QE Policy

Among the major developed economies (US, UK, the Eurozone and Japan) two different types of QE have been conducted in recent years, targeting securities held by different holders (see Figure 1).

Figure 1. Two Types of QE Implemented, Targeting Different Holders

Two Types of QE Operation		
Central Bank	**Targeted Securities**	**Main Sellers**
Federal Reserve	1. Mainly long-dated USTs; some T-Bills 2. Mortgage Backed Securities	**Non-Banks**
Bank of England	1. Long-dated Gilts 2. Commercial paper	**Non-Banks**
Bank of Japan	1. JGBs, Finance Bills	**Banks**
	2. ETFs, J-REITs	**Non-Banks**
ECB & Euro-area National Central Banks	1. Sovereign Debt	**Banks**
	2. Corporate Bonds (from June 2016)	**Non-banks**

The QE operations conducted by the Fed and the BoE have largely been successful (1) because 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 by injecting new deposits into the banking system, and (3) because these new deposits were not accompanied by the creation of new loans, they 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 (1) because 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, policy-makers 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.

In my assessment, there are two rules for central banks to follow when designing a QE programme.

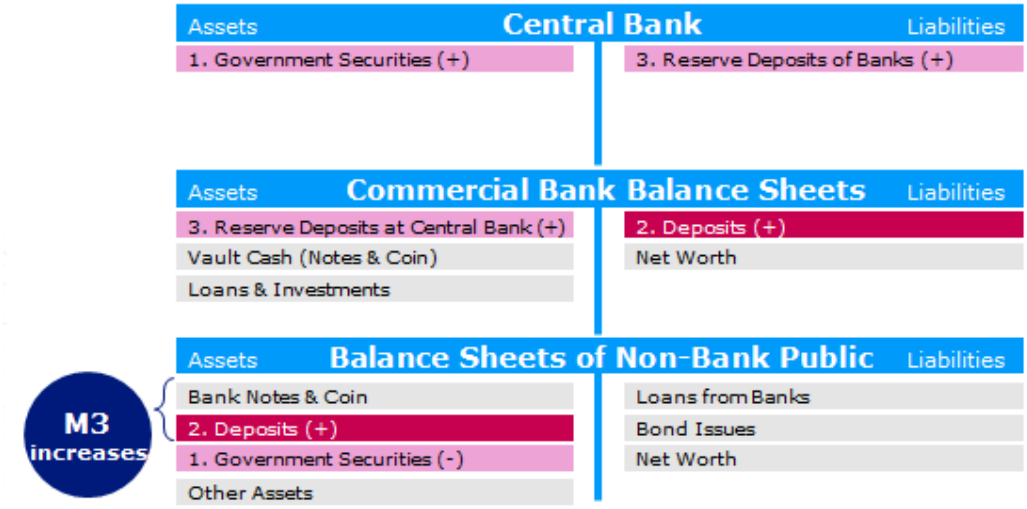
First, the central bank should only buy securities from **non-banks**. The reason is that the primary purpose of doing QE is – or should be -- to expand the money supply. If the central bank buys securities from banks, there can be no assurance that the money supply will increase. However, if it buys 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 or 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 – thereby flattening the yield curve. Nevertheless, many commentators, including officials at the BOJ and ECB, believe – mistakenly, in my view - that the primary purpose of QE is to lower long term rates. See for example p. 2 of the BoJ's Assessment, May 2015). 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 Bank of Japan has repeatedly broken both these rules; the ECB has mostly violated the first rule. By contrast, when the Bank of England announced its QE programme in February 2009 it said explicitly that the Bank would buy gilts with longer maturities (10-15 years) precisely so that these purchases would be from non-banks (as UK banks typically do not hold long-dated gilts due to the capital risk). 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, 2011 Q3). The Federal Reserve, for its part, mostly bought long-dated securities (US Treasuries and Mortgage Backed Securities), but there was a period during QE2 when the Fed acquired shorter dated Treasuries which then started to mature. To prevent the Fed's balance sheet from shrinking and to maintain the effectiveness of QE, the FOMC decided to replace its shorter term securities with longer dated securities in 2011-12 (before the start of QE3). The operation was officially named the Maturity Extension Program, but more popularly known as "Operation Twist" after the famous episode in the 1961 when the Fed had attempted to twist the yield curve by changing the maturity composition of its portfolio. Under QE3 the Fed purchased exclusively long-dated securities.

To explain the difference between the Bank of England (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 or asset purchases on the balance sheets of the banks and the non-bank public.

Figure 2. A Well-Designed Asset Purchase Plan – Liquidity Enhancing



The numbers in Figure 2 relate to the paired transactions set out in the T-form balance sheets above.

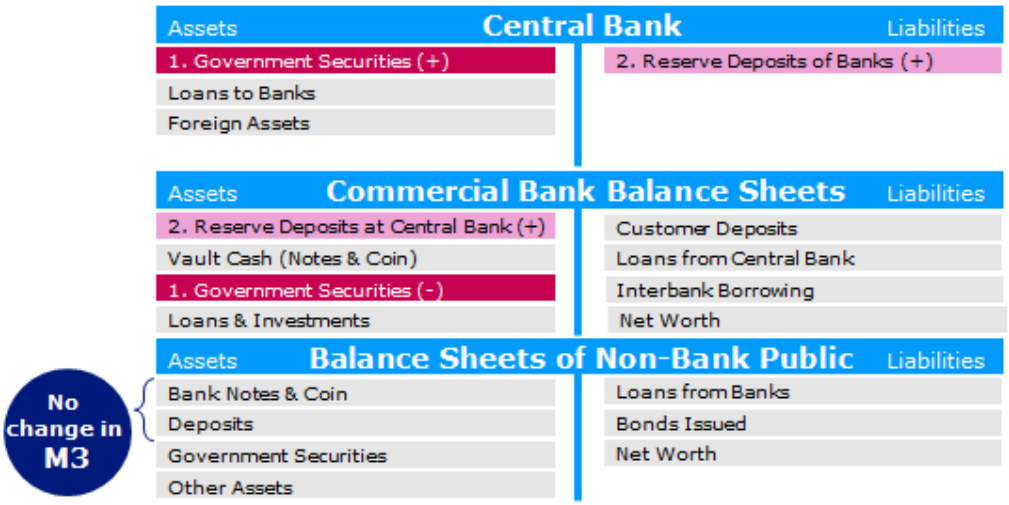
1. The central bank purchases government securities from **non-bank** entities. Non-bank entities (e.g. insurance companies, pension funds, individuals, or foreigners) sell government securities to the central bank.
2. The sellers receive new deposits from the central bank in settlement of their sale. 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 broad 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, and, given that interest rates are likely at the zero bound, the holders will almost certainly wish to spend the proceeds either on new investments such as corporate bonds, equities, real estate or commodities, bidding up their prices. Such purchases will kick-start the portfolio re-balancing process.

Note also that the money supply has increased without any addition to bank loans. The counterpart asset corresponding to the new deposits on the books of the banks is the new

reserves at the central bank. This means that the stock of money has increased relative to other assets held by non-bank entities, and that the non-bank private sector is in a better position to repay loans or other debt previously incurred. In other words, implementing this brand of QE assists the private sector to de-leverage.

Figure 3. An Asset Swap Operation – Non-Liquidity Enhancing



Next consider the effects of the type of QE conducted by the BOJ or ECB. Once again the numbers in Figure 3 relate to the paired transactions set out in the T-form balance sheets.

1. The central bank purchases 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, but the commercial banks' balance sheets have not expanded. Essentially there has been an "asset swap" conducted between the central bank and the commercial banks (exchanging government securities for reserve deposits on the books of the banks), but no impact on the non-bank public.

Now consider a variant of these transactions – the ECB's LTRO (Long Term Refinancing Operations) and Targeted-LTRO programs. In both cases the commercial banks submit collateral (e.g. securities held in their asset portfolios) to the central bank in exchange for loans (new liabilities for the banks). The central bank's intention was to encourage new lending by the commercial banks. In practice, however, Euro-area banks typically substituted the new, cheaper funding from the ECB for inter-bank or other sources of funding, increased their holdings of reserves, and reduced their total loan portfolio (see Figure 4).

In the QE case commercial banks merely undertook an asset swap; they now held less government securities, but more reserve deposits at the central bank. In the LTRO case it

was a combination of asset and liability swap; they borrowed funds from the central bank, and reduced their obligations to private sector lenders, while simultaneously taking the opportunity to shift the composition of their assets towards more reserves and less loans. In both instances, the balance sheets of the non-banks were unaffected. The key point is that under this style of QE or LTRO, the money supply (M2, M3 or M4) or purchasing power in the hands of the non-bank public has not increased.

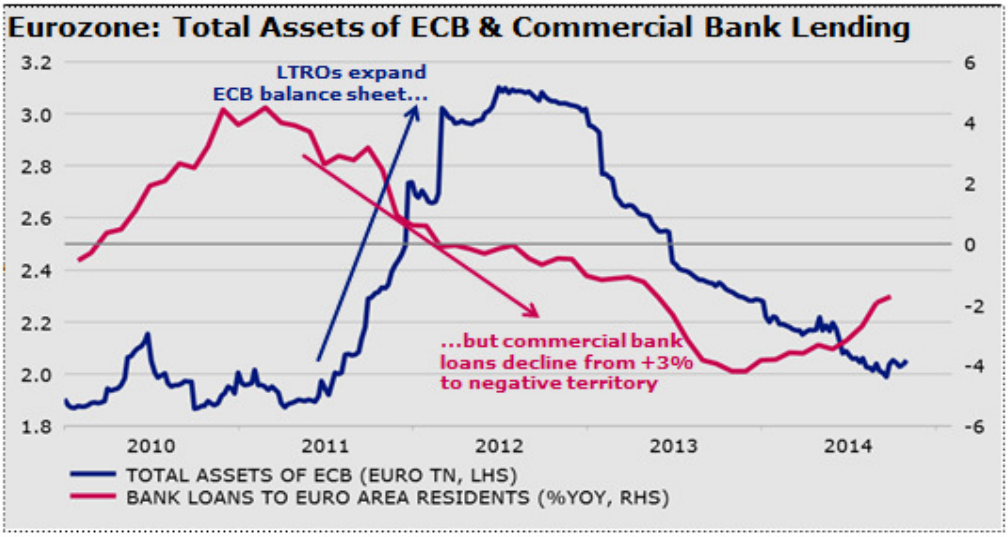
Moreover, given the starting point of risk aversion by the banks and by firms and households, there can be no assurance that – even after these operations -- the banks will expand their lending or that any new deposits will be created. Equally, new investment or consumption spending is unlikely to follow. 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, comparing the two types of asset purchase operation, only purchases of securities from non-banks are consistent with both balance sheet repair and enhanced liquidity in the hands of firms and households. As mentioned earlier, 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 Fed and the BOE were offsetting or preventing what might otherwise have been a monetary contraction, such as occurred in the US in 1931-33.

Section 2. Developments on the Balance Sheets of Eurozone and Japanese Banks

We now turn to the implementation of balance sheet expansion and QE operations by the ECB and BOJ, and their impact or lack of impact on the respective banking systems.

Figure 4. The Failure of the ECB's LTRO plan, 2011-14



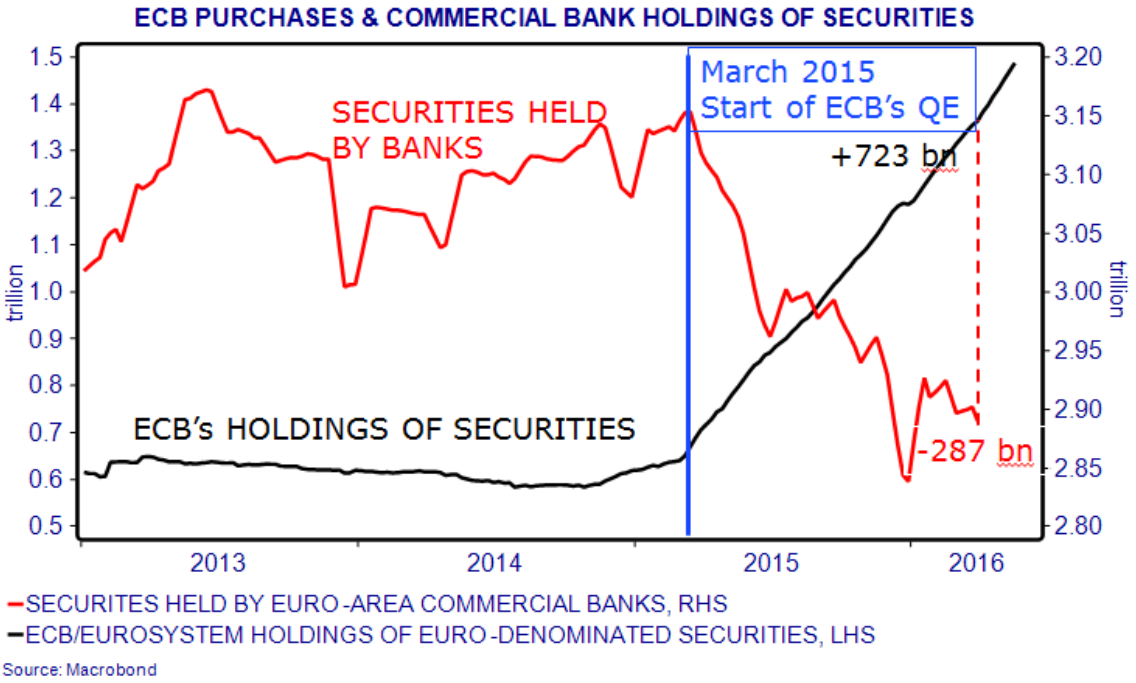
Source: Datastream as at 17 October 2014.

The ECB's LTRO program initiated in 2011, soon after Mario Draghi took over as President from Jean-Claude Trichet, and the more recent Targeted-LTRO programme are two good examples of the failure of central bank balance sheet expansion (a) when done in an environment of risk aversion, and (b) when the central bank's asset purchases or loans target only the commercial banks. As shown in Figure 4, the long-term refinancing operations (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. On this simple measure, therefore, LTROs did not 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.

As explained above, unlike the BOE or Fed asset purchases from non-banks, LTROs were basically a combination of "liability swap" and "asset swap": on the liability side the ECB made loans to banks (against collateral), but the banks reduced their borrowing from other sources, while on the asset side banks reduced their lending but increased their holdings of reserves at the central bank.

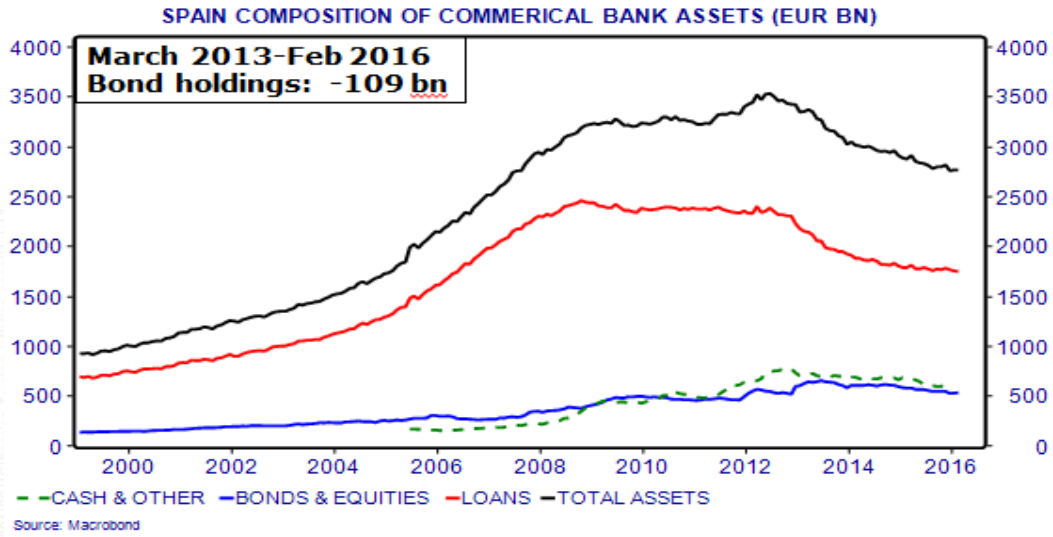
We now need to show that most of the asset purchases by the ECB or by the BOJ have in fact been from commercial banks. Figure 5 shows the decline in government securities held by euro-area banks and the simultaneous increase in ECB holdings of such securities. During the period between March 2015 (when the ECB's QE program started) and mid-May 2016 the ECB's portfolio of securities increased by Euro 723 billion, while the portfolio of securities held by commercial banks decreased by Euro 287 billion. However, while the ECB's was largely conducting a buy-and-hold strategy, the commercial banks were not only selling to the central bank, but were also replenishing their holdings regularly (e.g. at government auctions) in the market. We therefore cannot compute the aggregate sales by banks from the monthly balance sheet data of outstanding monthly holdings. All we can say is that at least 40% of ECB purchases (287/723) were from commercial banks.

Figure 5. The ECB's Asset Purchases Reduced Commercial Bank Holdings of Government Debt



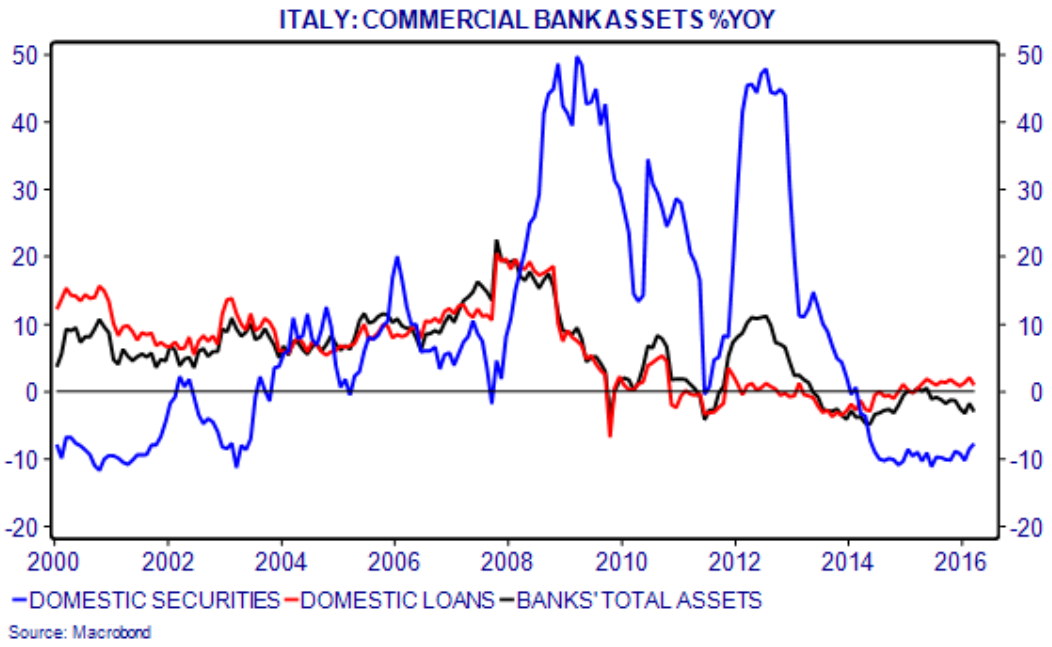
Turning from the aggregate euro-area data to country-specific data, Figure 6 shows that the balance sheets (total assets) of the Spanish banks are still shrinking. Meanwhile, their loans and holdings of securities – their two major asset classes – are also still declining. Between March 2013 and April 2016 holdings of securities have declined by EUR 109 billion (or 17%), and by EUR 47bn (or 8.8%) since March 2015 when the ECB started its QE operations. Together these facts illustrate the argument above that the ECB's QE program has not been adequately stimulative, and has not enabled or encouraged banks in some Eurozone economies to grow their balance sheets.

Figure 6. The Contraction of Bank Balance Sheets in the Eurozone Needs to be Reversed



Similarly, Figure 7 sets out the data for the Italian banks, this time in year-on-year rate of change form. Again, commercial bank holdings of securities are falling, although much more rapidly than total bank assets. Loan growth is marginally positive.

Figure 7. ECB Buying Securities Mainly from Banks: Italian Bank Holdings of Securities Falling



The risk aversion of Italian banks is shown in Figure 7 by (a) the slump in bank lending (in red) to corporate and household customers since October 2008, and (b) the rise in holdings of securities 2008-10 and again in 2012-13 (in blue). In parallel with the Spanish banks, holdings of securities at Italian banks have declined by EUR 170 billion (or 17%) since their peak in August 2013, and by EUR 45bn (or 5.2%) since March 2015 when the ECB started its QE operations.

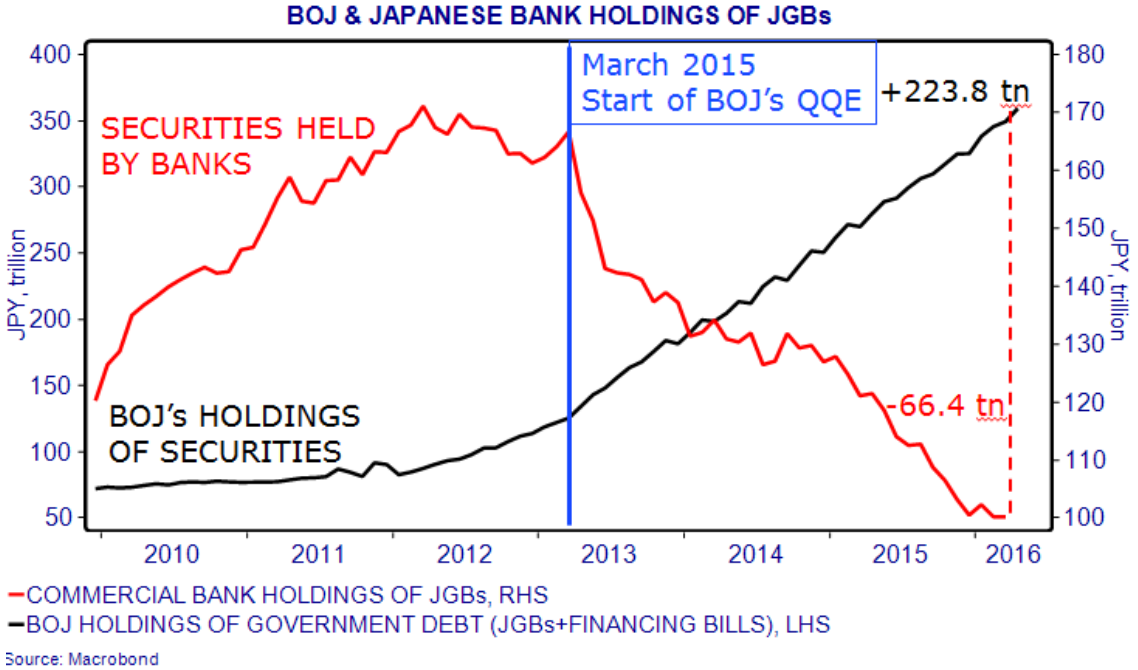
Given the way the ECB is conducting QE, prospects for any acceleration in Eurozone M3 will depend on how successful the ECB is in generating bank lending in individual economies. However, in view of regulatory pressures on the banks combined with their own risk-aversion, it seems highly doubtful that the current approach will successfully enhance M3 growth. Even if it did encourage bank lending, the end-result would be higher leverage in the Italian non-bank sector.

IMF 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 2016 as the EU bail-in rules take effect, meaning the Italian government will no longer be permitted to bail out the banks. Instead equity and bondholders must bear the first losses, converting debt to equity if required. Although a deal has been struck with the EU allowing the Italian

government to guarantee the securitisation of bad loans, it remains to be seen if this will be enough.

Turning to the Bank of Japan, 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.

Figure 8. BOJ Buying Securities Mainly from Banks; Bank Holdings of JGBs have Declined by JPY 66 trillion since March 2013



Source: Macrobond

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 8 Japanese commercial banks' holdings of JGBs fell from Yen 166.6 trillion 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 223.8 trillion 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 has been in the form of Financing or Treasury Bills (or "*tegata*"), 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 Yen 96.6 trillion and largely remained on the balance sheet, T-Bill purchases amounted to 101.8 trillion but only showed up as an outstanding balance of 49.7 trillion.

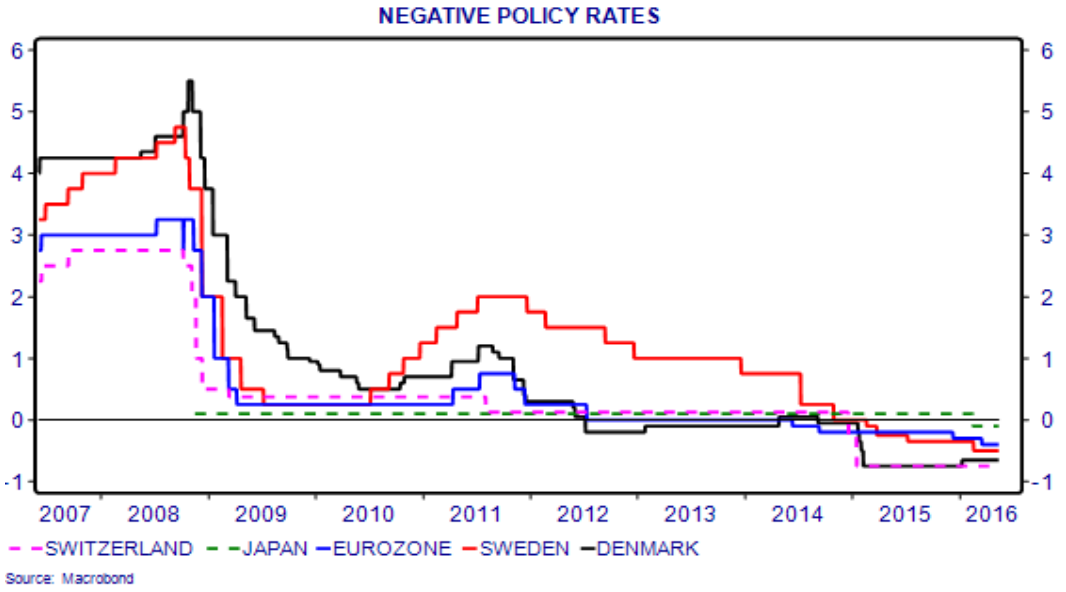
Section 3. Why Poorly Designed QE Programs Have led to Negative Rates

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 versions of QE.

The fundamental problem is that the ECB and the Bank of Japan 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 deposits and 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 Bank of England did in 2008-13. 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 rates and hoping the banks will expand lending.

Figure 9. Major Central banks in Japan and Europe have Adopted Negative Policy Rates



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 Bank of Japan 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 is subject to negative 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 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 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 program), 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.

Figure 10. In Switzerland, Sweden and Denmark Negative Rates Result from Pegging to the Euro

Source: Macrobond

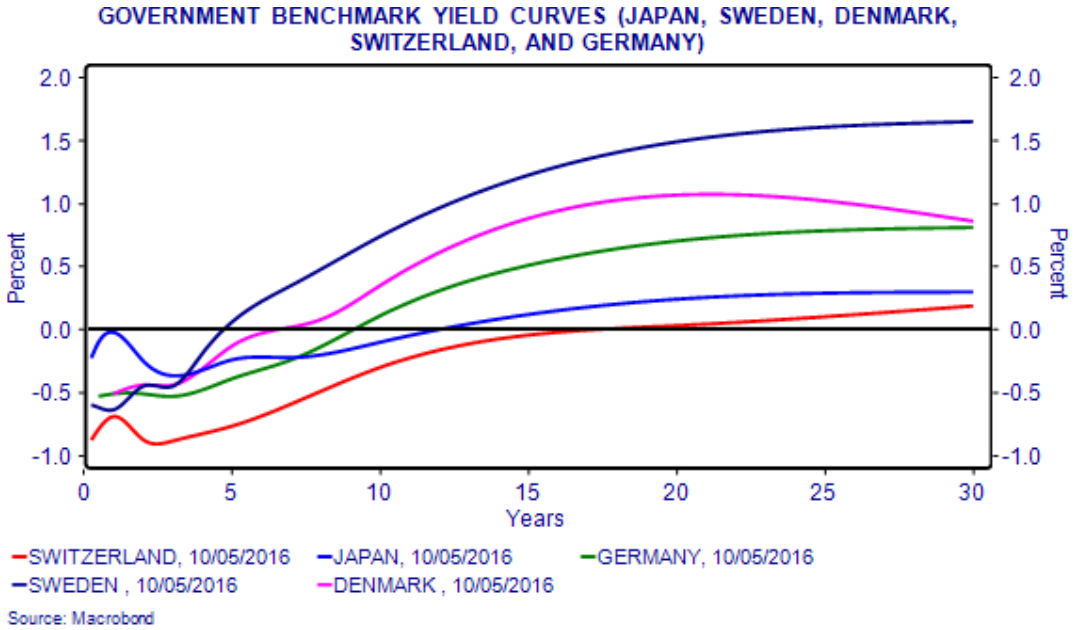
The Danish Krone (shown in Figure 10 in red) is explicitly pegged to the euro at DKK7.46 with a trading band of 2.25% on either side, which means that Denmark imports the monetary policy of the ECB. If there is a threat of DKK appreciation – as there was in 2012

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 black in Figure 10) 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 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.

Figure 11. Negative Policy Rates and Expectations of Deflation have Created Negative Bond Yields



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, March 25, 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 rates in January 2016 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.

Section 4. Summary & 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. Not only do purchases from non-banks directly expand the volume of deposits, and thereby expand the money supply, but they also do this without adding to leverage.

Unfortunately, for institutional or other reasons, both the BOJ and the ECB are still concentrating much of their asset purchases on financial instruments held by banks rather than by non-banks, effectively undermining or diluting the effectiveness of their QE programs. The failure of these programs to restore normal growth and inflation has led, inexorably, to the adoption of negative interest rates in Japan and the Eurozone, and also in those economies such as Denmark, Sweden and Switzerland whose currencies are closely pegged to or managed in relation to the euro.

Negative rates are a fundamentally misconceived 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. In an environment of risk aversion by lenders and borrowers the policy of reducing interest rates to negative levels 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.

By far the best policy would be for the ECB and the BOJ to redesign their QE programs to purchase securities from non-banks rather than banks. This would guarantee faster money growth, ensure the escape from deflation, and eliminate the need for helicopter money.

References

Bank of Japan Review, “Quantitative and Qualitative Monetary Easing: Assessment of Its Effects in the Two Years since Its Introduction. May 2015. https://www.boj.or.jp/en/research/wps_rev/rev_2015/data/rev15e03.pdf

Wall Street Journal, March 25, 2015