

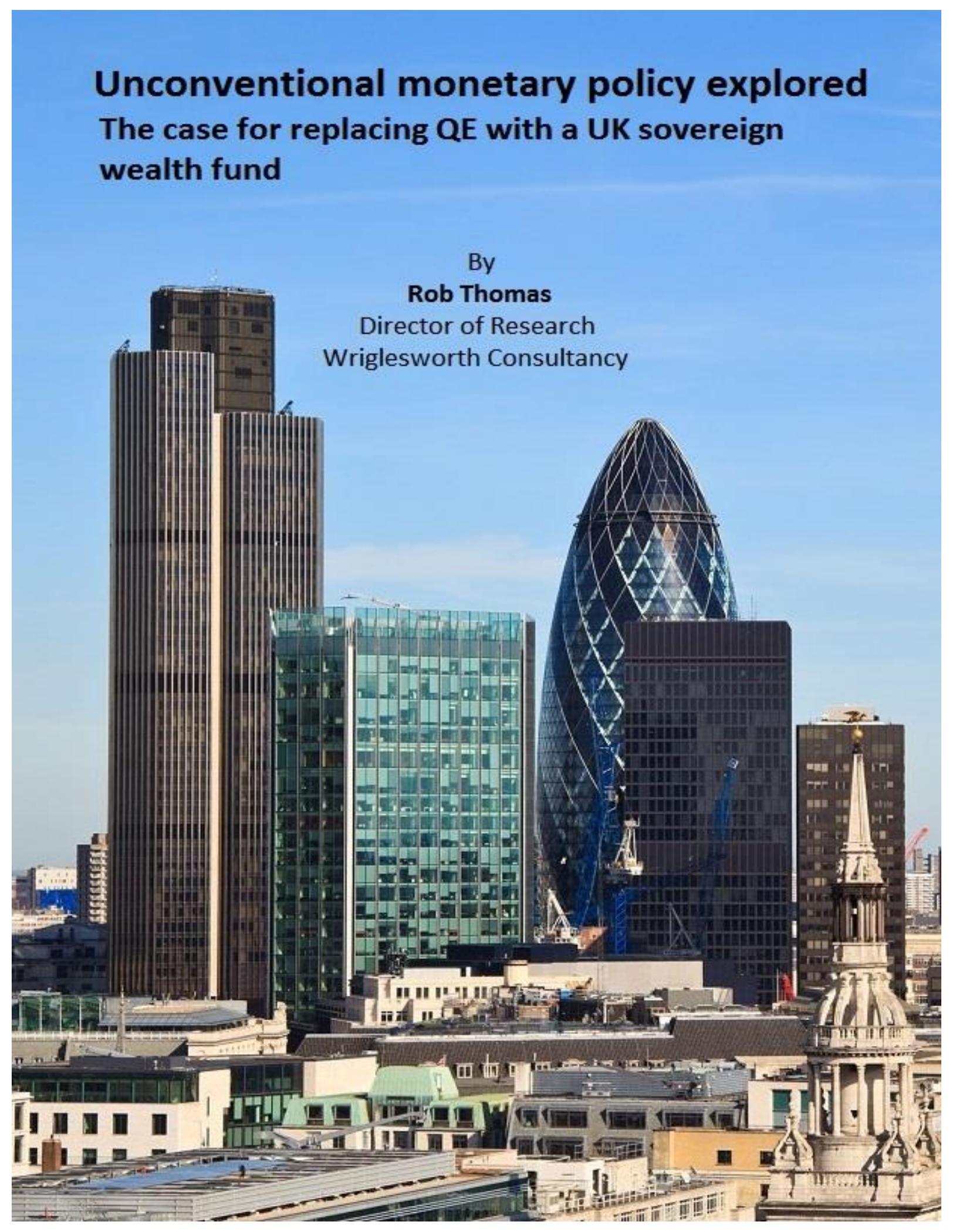
Unconventional monetary policy explored

The case for replacing QE with a UK sovereign wealth fund

By

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Executive summary

Introduction

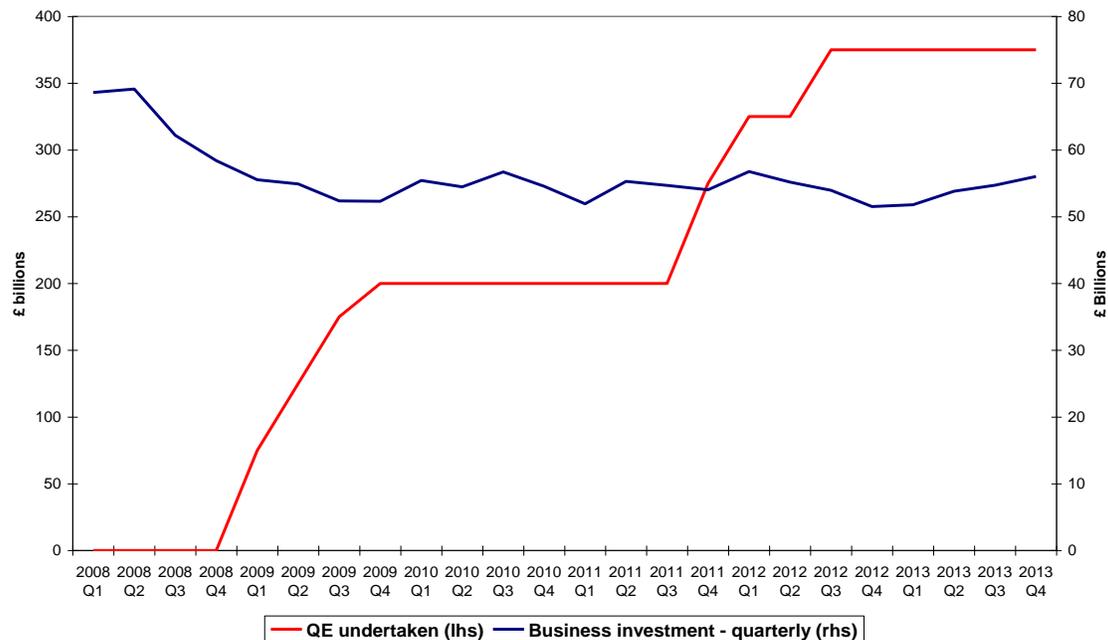
- The UK needs a fuller debate about the future course of monetary policy and in particular about how £375bn worth of quantitative easing (QE) could be unwound. £375bn is £20,000 for every household in the country or £6,000 for every man, woman and child, which has been created by the Bank of England to acquire more than a quarter of the gilt (UK government bond) market.
- This paper explains and critiques the unconventional monetary policy measures that have been tried by the main central banks since the start of the financial crisis including QE. It also explores a range of other unconventional monetary policies that have been proposed but not yet adopted by policymakers. Finally, it proposes a way forward for the UK, describing how QE could be replaced by the UK establishing for the first time a sovereign wealth fund aimed at funding infrastructure projects.
- QE was not meant to be a long term policy. But 5 years after the UK embarked on its programme of QE it is clear that it has not unleashed inflation as some initially feared and that it could remain in place, even if the Bank of England decided to start raising bank rate. If QE is to remain in place, its funds could be put to much better use by directing them to real investments in the country's infrastructure.
- QE can be unwound by the Bank of England selling its £375bn portfolio (predominantly made up of gilts) to the market. But, unless the proceeds were reinvested, this would risk a precipitous decline in the money supply. By investing the proceeds in a sovereign wealth fund focused on financing UK infrastructure investments, the UK could boost investment, establishing a stronger and more balanced economic recovery whilst improving its future long term economic performance.
- One other advantage with unwinding QE and using the funds to establish a sovereign wealth fund is that it would reinforce the Bank of England's independence from government. Under QE the Bank of England did not directly fund the government's deficit because it purchased gilts in the secondary market. But indirectly it did underpin the political decision to run large fiscal deficits because its purchases in the secondary market supported the primary

market. A sovereign wealth fund using funds from QE could be completely independent of political influence and invest for the long term.

Shortcomings with QE

- QE was designed to stimulate economic activity in large part by driving gilt prices up (and gilt yields down). It was thought that this would encourage investors to shift into riskier assets (such as corporate bonds, asset backed securities and equities) making it easier for firms to borrow or raise equity to invest.
- The evidence suggests that QE has reduced gilt yields¹ and this has helped to stimulate corporate bond and equity markets. This in turn is believed to have stimulated economic activity². However, there is little evidence that this has been successful at stimulating corporate investment. Business investment is broadly unchanged from when QE commenced in early 2009 (see Chart 1) and non-financial corporates have reduced the outstanding level of both bank borrowings and bonds. Equity issuance rose in 2009 but then fell back.

Chart 1 – QE and UK business investment



Source: Bank of England, ONS

¹ The Bank of England estimated that QE of £200bn in 2009 and 2010 reduced gilt yields in the long term by 0.95% (The impact of Quantitative Easing on long maturity gilt yields – Adrienn Sarandi July 2011).

² Assessing the economy-wide effects of quantitative easing – Bank of England Working Paper No. 443 George Kapetanios, Haroon Mumtaz, Ibrahim Stevens and Konstantinos Theodoridis.

- As QE appears to have stimulated output in general but not business investment, it seems that the rise in bond and equity prices it has brought about has stimulated consumption as investors have started to feel wealthier. As a result, QE appears to have contributed to the UK's unbalanced recovery, with too much reliance on consumption.
- By attempting to stimulate recovery by boosting asset markets QE has also worsened inequality. The direct benefits of higher bond and equity prices go predominantly to the wealthy. It is much harder to see how QE in its current form has benefitted ordinary wage earners, who have suffered falling living standards since QE was introduced in January 2009.
- One other major distortion that QE has created relates to the pensions market. By driving down gilt yields, QE has slashed annuity rates, so individuals who have a defined contribution (DC) pension and have retired over the past 5 years have been faced with lower future pension incomes. It has also increased the deficits on firms' defined benefit (DB) pension funds as gilt yields are used as the benchmark to calculate whether funds have sufficient resources to pay future liabilities.

Unwinding QE

- As the economic recovery progresses attention will start to turn to the issue of when and how the Bank of England will unwind QE. This process could involve the Bank of England selling £375bn back to the market. But there is a problem. Returning the gilt market to normality through the sale of gilts also automatically reduces the volume of deposits and reserves in the banking system as it cancels the money created by QE.
- The conditions that warrant a return to normality in the gilt market are not necessarily going to coincide with the economic conditions that warrant a reduction in the size of the money supply and of the banking sector. Indeed, a premature reduction in the money supply (bank deposits) and corresponding decline in bank reserves could derail the recovery.
- So unwinding QE will be a difficult process requiring the Bank of England to juggle a range of different economic effects. However, one important principle that the Bank of England should accept is that the unwinding of the assets it currently holds under QE does not have to coincide with the unwinding of its liabilities (reserves held with the Bank of England by the commercial banks). This link can be cut by reinvesting the proceeds of gilt sales in other assets as we propose.

Establishing a UK sovereign wealth fund

- We advocate that the authorities should consider a new approach. The gilt market can be returned to a state of normality by the Bank of England selling the holdings it acquired through QE. But rather than cancelling the corresponding deposits in the banking system, the sale proceeds can be reinvested by establishing a UK sovereign wealth fund aimed primarily at investments in the UK's infrastructure.
- A £375bn sovereign wealth fund could transform the prospects for UK infrastructural investment. Whilst conventional QE sought to stimulate investment indirectly by pumping up asset markets, the sovereign wealth fund would do so by directly funding infrastructure investments. The fund's investments would also pay a higher rate of return than gilts providing the tax payer with a better return.
- By investing in UK infrastructure projects, the sovereign wealth fund would start to rebalance the economic recovery away from its current over-reliance on consumption. It would also enhance the long term productive potential of the UK economy. Some of the most successful economies in the world, like Singapore and Sweden, have prioritised infrastructure investment.
- One major advantage of using the proceeds from gilt sales to establish a sovereign wealth fund is that it would not strain the government's finances. Infrastructure investment could be raised without increasing government indebtedness. Whilst government spending on infrastructure has tended to be pro-cyclical, being cut in downturns when public finances are under pressure, our proposal for a monetary financed sovereign wealth fund could be operated in a counter-cyclical fashion.
- A separate entity would need to be set up to administer the sovereign wealth fund, independent but ultimately under the control of the Bank of England. The fund would be required to invest alongside private sector investors to ensure that each investment proposal was scrutinised by outside parties. Gilt sales could be phased to allow for a gradual build up in the sovereign wealth fund's infrastructure investments.
- The ONS reports that the UK's population is set to reach 73.3mn by 2037, an increase of 9.6mn over current levels. Accommodating this increase in population will require unprecedented investment in our infrastructure including transport, housing, energy, water and sewage and flood defences. Whether the

bodies undertaking these investments are public or private, they will require significant external funding.

- As a tool of monetary policy, a sovereign wealth fund would have a significant advantage over many of the unconventional monetary policy measures that have been tried to date: it does not rely on the banking system as its transmission mechanism. This removes the moral hazard implicit in those schemes, including the funding for lending and special liquidity schemes, that do.
- This proposal would not interfere with the normal operation of monetary policy. As the economic recovery matures, with the risk that inflation might rise above the Bank of England's 2% CPI target rate, interest rates could be raised to slow demand in the usual fashion. Equally, if bank lending was growing too rapidly the Bank of England could withdraw liquidity from the banking system by selling bills to the market in the normal fashion.
- Once established, the UK's sovereign wealth fund could be maintained indefinitely or it could be allowed to unwind gradually as its investments matured or were sold at opportune times. Decisions about the long term future of the fund could be taken in the light of its financial performance and its contribution to improving the UK's infrastructure. But given the fund's potential to work in a counter-cyclical fashion in future downturns, it could make sense to operate it on a permanent basis.

Section 1 - Understanding unconventional monetary policy and its context

1.1 Introduction

The severity of the 2007-8 financial crisis and the recession that followed has led to an unprecedented level of macroeconomic activism by the authorities around the globe. This activism has taken the form of large scale fiscal and monetary measures to sustain the financial system, unprecedented peacetime fiscal deficits, conventional monetary policy taken to its limits, unprecedented experimentation with unconventional monetary policy measures and a re-examination of the degree to which fiscal and monetary policy should be co-ordinated, indeed at times even a blurring of the lines between fiscal and monetary policy.

As the economic recovery struggles to take hold, the limits of fiscal policy have come increasingly to the fore. The public debt burden has risen to levels at which sustainability has become a real concern, as witnessed by the credit rating agency downgrades seen for a number of western governments. This has further focused the attention of policymakers on unconventional monetary policy as the set of policy options that stand the best chance of providing the support the economy needs.

Focusing on the four leading central banks; the US Federal Reserve; the European Central Bank (ECB); the Bank of Japan and the Bank of England, this paper seeks to explain, review and evaluate the full range of policy measures that have been deployed or proposed since the start of the financial crisis, which have collectively come to be known as unconventional monetary policy. The paper then proposes what the author believes is an optimal unconventional monetary policy response for the UK today.

1.2 Defining conventional and unconventional monetary policy

In modern economies monetary policy is delegated to a nation's central bank; arms of government that typically operate independently to meet objectives set by statute. Monetary policy can be defined as any policy by which the central bank controls interest rates or the money supply. The other main policy lever, fiscal policy, encompasses government spending, taxation and borrowing policies.

To define what we mean by unconventional monetary policy it is necessary first to have a clear understanding of what constitutes conventional monetary policy. Conventional

monetary policy can be defined as those policies that central banks have deployed on a routine basis to control monetary conditions.

The dominant form that monetary policy has taken in advanced economies in recent decades is the control of a single short term interest rate or so-called 'policy rate'. This rate in turn drives the full range of other interest rates in the economy: short term market rates, interest rates on floating or variable rate loans and securities and, due to the role that expectations of future policy rates play in determining longer term interest rates, fixed interest rates on loans and securities. At any given policy rate, the economy's money demand function will then determine the level of the monetary base³ and the broader money supply.

Under this conventional policy regime, central banks move the policy rate up or down based on information on current and expected economic conditions. When economic conditions are buoyant and demand is high, putting upward pressure on inflation, the central bank will raise the policy rate to curtail demand and subdue inflation. When economic conditions weaken, putting downward pressure on inflation, the central bank will cut the policy rate to stimulate demand to prevent inflation from undershooting its target rate or turning into deflation.

Unconventional monetary policy can be defined as a policy measure designed to affect interest rates or the money supply that goes beyond the conventional policies deployed by central banks. It is to be expected that unconventional monetary policy is carried out by the central bank but, as explained later on, the lines dividing monetary and fiscal policy have become somewhat blurred with some of the unconventional monetary policy measures that have been tried since 2007.

1.3 Objectives of unconventional monetary policy

To explain, review and evaluate the unconventional monetary policy measures taken to date, it is necessary first to establish the objectives that these policies were designed to meet. Whilst the precise objectives have differed between particular measures, all unconventional monetary policy enacted since 2007 has sought to achieve one or more of the following five policy objectives:

1. Maintain the integrity of the banking system.
2. Maintain the integrity of the broader financial system.

³ The monetary base (also known as base or central bank money) comprises commercial banks' reserves (deposits) at the central bank and notes in circulation.

3. Maintain the flow of credit to solvent agents in the private sector.
4. Maintain orderly markets in government debt to prevent serious fiscal dislocation.
5. Maintain aggregate demand in the economy.

Whilst in general public discourse most emphasis has been put on the final objective of supporting demand, unconventional monetary policy was initially instigated from 2007 not for this purpose but to meet objectives 1-3.

1.4 How conventional monetary policy works

1.4.1. Policy objective

As stated above, modern central banks normally operate with a single policy instrument, a short term interest rate known as the policy rate. This instrument is used to achieve broadly the same objective in most advanced economies: stability in the general price of goods and services. The precise nature of each central bank's mandate varies with some countries, such as the UK, stipulating a specific target rate of inflation and others requiring broad price stability. Others, such as the US Federal Reserve, have a mandate that recognises the balance between controlling inflation and supporting demand, requiring the central bank to take account of variations in output as well as inflation⁴.

Figure 1 - Central bank objectives

Central bank	Controlling statute	Objective
US Federal Reserve	Federal Reserve Act	Maximum employment, stable prices, and moderate long-term interest rate
European Central Bank	Treaty on the Functioning of the European Union Article 127 (1)	Primary objective is price stability. Subsidiary objectives of full employment and balanced economic growth
Bank of Japan	Bank of Japan Act	Price stability, thereby contributing to the sound development of the national economy
Bank of England	Bank of England Act	Stable prices as defined by the government's inflation target

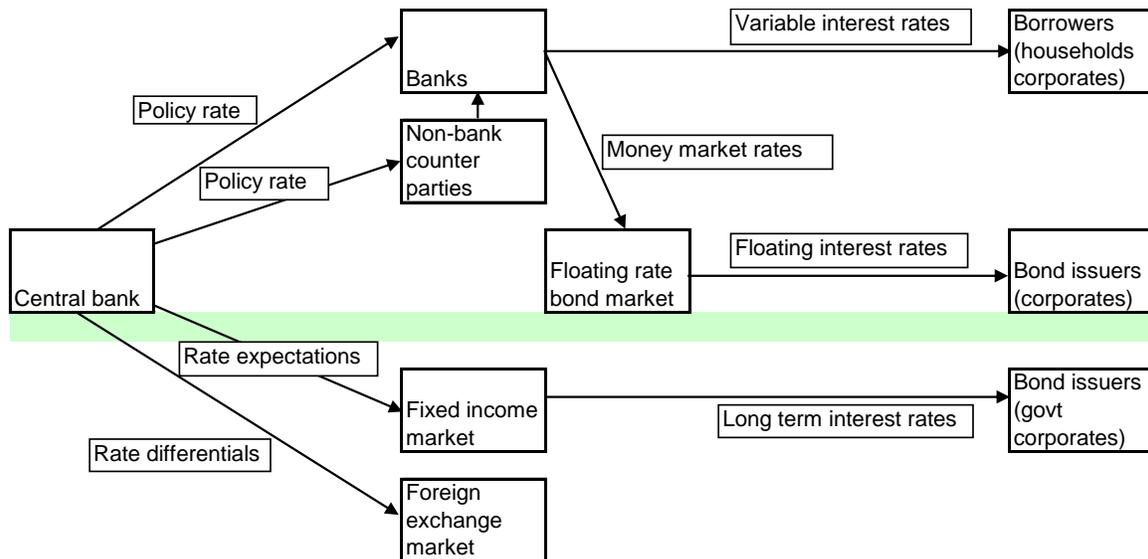
1.4.2. Policy implementation - the monetary transmission mechanism

Although the precise mechanics of monetary policy vary between countries, each central bank controls the interest rates at which it lends to and borrows from commercial banks and sometimes a small number of other eligible counterparties. The central bank can set these interest rates because it alone controls the supply of base

⁴ Some economists have argued that the recognition of output should be made more explicit in the central bank's objective function by, for example, mandating it to target a specific rate of nominal GDP growth.

money, comprising bank notes and commercial banks' reserves (deposits) at the central bank. By increasing or decreasing the supply of base money to the banking system, the central bank can ensure that its policy rate holds.

Figure 2 - The monetary transmission mechanism



The banking system thus occupies a privileged position in the economy and plays a pivotal role in the transmission of policy changes to the rest of the economy - the so-called transmission mechanism (see Figure 2). Indeed, the banking system is the only truly direct route by which policy rates affect other interest rates. For example, in the UK the commercial banks' reserves with the Bank of England are remunerated at bank rate, which sets a floor under market interest rates.

The other main channel through which policy rate changes are transmitted is the bond market. Here a distinction needs to be drawn between floating rate bonds and the fixed income or fixed rate bond market, as the transmission mechanism varies considerably between the two. But in neither case does the transmission mechanism operate directly.

The rates paid on floating rate bonds are set with reference to short term money market rates, typically Libor⁵, which are set by the banks and heavily influenced by the policy rate. This determines the rate paid by the institutions that issue in this market:

⁵ Libor is the London inter-bank offered rate. It is a measure of the rates at which leading banks lend to one another at different durations (3 months, 6 months etc). Libor is used as a benchmark for numerous floating rate contracts includes loans, securities and derivatives.

banks, non-bank lenders and other corporates. This in turn determines the rate that banks and non-bank lenders charge their floating rate borrowers (firms and households), which in the UK will typically be bank rate plus a spread or Libor plus a spread.

For example, a non-bank lender might issue floating rate asset backed securities that pay a coupon (interest rate) of Libor plus 1%. This asset backed security will be backed by a pool of loans paying Libor plus a higher spread (say 1.75%), providing the lender with a margin. Note that non-bank lenders have no access to the policy rate and no account with the Bank of England, so are dependent on market rates set by banks (i.e. Libor) for their funding⁶. So in the floating rate bond market, the impact of policy rates is felt through the prism of the banking system.

Policy rates will also affect interest rates in the fixed income market, with the government bond market acting as the benchmark. This is because the longer term 'risk free' rate, the rate at which governments borrow⁷, equals the expected path of policy rates over the same period plus a term premium, so unexpected changes in policy rates if sustained should alter longer term interest rates.

So, banks do not have the same role in transmitting policy rate changes in the fixed income market that they have in the floating rate bond market. Instead, fixed rate debt issued by private sector entities will tend to be priced off the risk free yield curve i.e. at a given maturity the yield on a bond issued by a corporate will be priced at the risk free rate at this maturity plus a premium to reflect other factors (such as additional credit risk and lower expected liquidity).

Thus agents seeking to borrow at longer term fixed rates of interest will also be affected by changes in monetary policy. But significant changes in the longer term risk free rate would require a significant revision to market expectations of future policy rates. A change in the policy rate that was expected to be reversed in the near future would have little effect.

⁶ This explains why non-bank lenders do not typically offer their borrowers loans linked to bank rate, as this would give rise to so-called 'basis risk' as they fund themselves at a rate linked to Libor rather than bank rate.

⁷ The rate at which governments borrow is often referred to as the risk free rate because any government that controls its own currency can ultimately repay any debt by requiring the central bank to create more money. Such a government thus cannot be forced into default. However it could choose to default, so strictly speaking these bonds are not risk free but this paper sticks with the standard terminology.

1.4.3. The economic impacts of monetary policy

Changes in market interest rates affect the real economy in two main ways. Firstly, there is an inter-temporal substitution effect by which lower interest rates encourage consumption and investment decisions to be brought forward. This could apply either to borrowers or savers.

When interest rates fall, borrowers may decide to borrow and spend sooner as the ultimate cost of the additional expenditure will appear lower. But those borrowing for more than very short periods of time at floating rates will need to form a view about the future path of short term rates rather than focusing solely on the rate when the loan is taken out. The same effect applies to those with savings, who will have seen the interest they receive reduced. It is thus cheaper for them to spend some of their cash today because they forgo less interest when rates are lower.

Secondly, changes in interest rates have distributional effects - they shift income between savers and borrowers. A fall in interest rates will reduce savers' income whilst reducing borrowers' interest costs. If in aggregate borrowers and savers have different marginal propensities to consume, changes in interest rates will affect aggregate demand. Usually it would be expected that borrowers' expenditure will be more sensitive to interest rate changes than savers' (i.e. higher interest rates would reduce borrowers' expenditure more than it would increase savers' and vice versa). So, distributional effects should reinforce the negative correlation between interest rates and output.

Second round effects should also reinforce the negative correlation between interest rates and output. When lower interest rates stimulate high expenditure, suppliers will have seen their income rise. In particular higher consumption expenditure tends to boost investment expenditure by an even greater proportion through the investment multiplier.

A similar 'virtuous circle' can be found in bank lending - when lower interest rates encourage higher borrowing, each extra pound or dollar lent becomes a deposit in another bank account, which itself can then be lent out. This process is known as the money multiplier, and it can be at least as powerful as the investment multiplier.

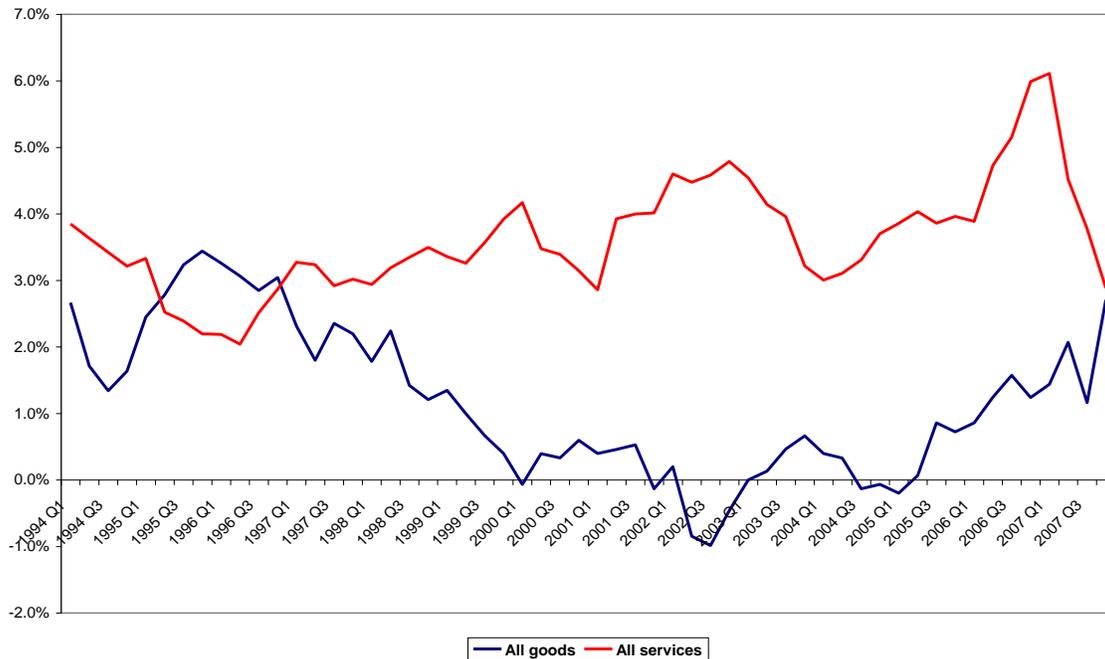
And finally the exchange rate can also act as a component of the transmission mechanism. When one central bank cuts interest rates unilaterally, returns on domestic financial assets will have fallen relative to those of other countries. Seeing domestic returns reduced relative to those in other countries will encourage investors to move funds abroad, reducing the exchange rate.

So central banks are tasked with regulating the economy by raising and cutting short term interest rates in response to information on whether demand is too high (leading to the risk of rising inflation) or too low (giving rise to the risk of lower inflation or even deflation). But although the trade-off between output and inflation is one of the most robust empirical relationships in macroeconomics, the relationship is subject to variations in sensitivity and time lags as the economy evolves and is hit by new external 'shocks'. This makes the successful operation of monetary policy far from a simple task.

1.5 The operation of monetary policy in the mid-1990s to mid-2000s

It is now widely accepted that advanced economies were subjected to such a 'shock' (external change) from the mid 1990s to the mid 2000s, as a result firstly of a period of relatively depressed commodity prices and then the emergence of new low cost manufacturing centres such as China, as well as productivity enhancing new technologies such as the internet. These shocks reduced the rate of inflation (particularly for goods – see Chart 2) compatible with any given level of output and improved the terms of trade for advanced economies, raising real incomes in these economies.

Chart 2 – UK goods and services CPI inflation 1994-2013



Source: ONS

This was the period that Mervyn King, then Governor of the Bank of England, termed the NICE ("non-inflationary consistently expansionary") decade. Low inflation in goods and to a lesser extent services was coupled with high growth rates. To achieve a given

target rate of inflation, central banks needed to keep policy rates considerably lower than would otherwise have been the case. Lower policy rates reinforced the positive effects of this real economic shock, encouraging agents to take on higher levels of debt, increasing the money supply through the money multiplier.

Voices of concern were raised at this time about the excessive expansion of the money supply and excessive price gains in some asset markets, most notably in residential property. Some economists, particularly those who emphasised the importance of monetary variables, were concerned that the objective of price stability in the market for goods and services was failing to reflect the true state of monetary conditions, leaving monetary policy too loose for the long term health of the economy. They worried that overly loose monetary conditions would inevitably lead to higher inflation later on.

But there seemed little central banks, with their single policy instrument and single primary policy objective, could do other than to run broadly accommodative monetary policy in the face of such positive shocks. As long as the monetary authorities were confident that high rates of growth in the money supply or in asset prices such as housing did not endanger a spill-over into the general price of goods and services, they had little choice but to disregard these factors when setting policy rates.

1.6 The challenge for monetary policy since 2007

When the NICE era finally came to an end it came about not, as many had warned it might, through excessive money supply growth finally spilling over into inflation in the goods market but from a largely unanticipated source: the near collapse of an over-leveraged financial system.

Too much leverage amongst final borrowers in some specific markets, most notably the US sub-prime mortgage market, gave rise to large credit losses for some banks and other financial institutions. Many of these institutions had increased their leverage significantly during the preceding upswing, leaving them more vulnerable to credit losses.

Because of the widespread use of securitisation and the purchase of US sub-prime mortgage backed securities by many banks around the globe, it soon became clear that credit losses were not confined to self-contained segments of the financial system, as they generally had been in the past (e.g. in the US savings and loan crisis). Instead, much of the losses were buried in bank balance sheets across a range of countries leading to a systemic loss of confidence between financial institutions globally. The over-leverage and inter-connectedness of the financial system as whole had made it unstable, unable to absorb adverse shocks such as the US sub-prime crisis.

The tumultuous events of 2007-8 were completely new territory for most policymakers. In particular, the monetary authorities were faced with an entirely new landscape with two enormous implications:

- First and most immediately, monetary policy would have to be commandeered to meet new, emergency, policy objectives of keeping the banking system afloat and maintaining functioning financial markets.
- Second, the monetary policy transmission mechanism would no longer operate in a normal fashion. However, it took some time for central banks and the broader economics community to fully appreciate how broken the transmission mechanism had become.

Conventional monetary policy could be deployed by reducing policy rates to zero or close to zero. This is known as the 'lower bound' for rates because there is no mechanism for applying negative interest rates to money held in note form and as any firm or individual can switch their cash holding to notes, it is assumed that cash cannot pay an interest rate much below zero.

But it was clear from the early stages of the crisis that reducing policy rates to their effective floors would not, by itself, be capable of meeting the new objectives of maintaining functioning banks and financial markets. Thus the era of unconventional monetary policy had begun.

The combination of monetary and fiscal policies that were deployed in the face of a faltering financial system proved highly successful. The patient was saved from the heart attack that the 2008 financial crisis represented. But policymakers would soon start to discover that recuperation would not be swift. The patient would need to remain on a form of life support for a number of years to come.

1.7 The broken monetary transmission mechanism

Section 1.4 above explains how the monetary transmission mechanism works under normal economic conditions. Section 1.7 explores how, in the post financial crisis era, the old certainties can no longer be taken for granted.

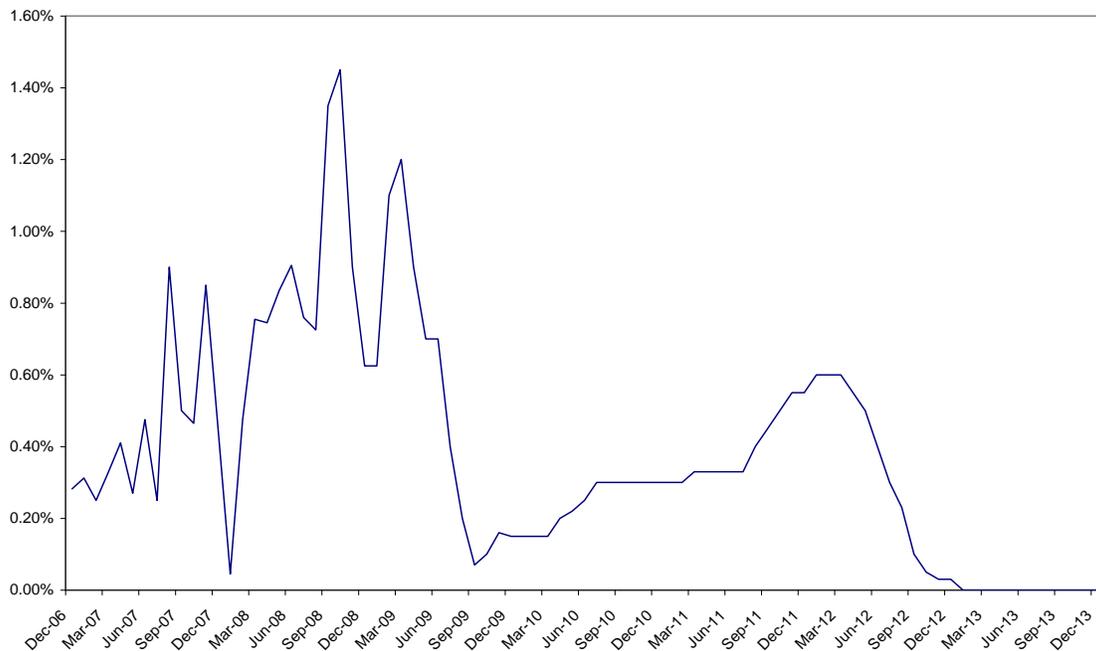
1.7.1. The banking transmission mechanism

As stated above, a common feature of advanced market economies is that the banking system plays a pivotal role in the transmission of central bank interest rate decisions into the real economy. It is thus an implicit assumption that for monetary policy to work as it is expected to, the banking system must be able to operate in a 'normal' fashion.

In the pre-2007 period, the banking system, the wider financial system and financial markets were all operating in what could be termed a normal manner i.e. they were not impeding the implementation of monetary policy, the monetary transmission mechanism or the successful operation of the real economy⁸. Thus, at that time, a central bank could pursue a policy objective of price stability safe in the knowledge that its policy instrument (the policy rate) could be altered to achieve the desired tightening or loosening of monetary conditions in large part through its impact on bank behaviour.

But from 2007, the traditional relationship between monetary policy and banks began to break down. The first clear sign was evident from the very start of the financial crisis in July 2007 when Libor started to spike relative to policy rates. This reflected banks' growing distrust of each other's credit worthiness, which drove them to reduce lending and hoard cash. The disconnection of Libor from policy rates worsened into 2008 despite the efforts of central banks to provide additional liquidity to the banking system (see Chart 3).

Chart 3 – The spread between bank rate and 3 month Libor



Source: Various

Libor is used as the pricing benchmark for trillions of dollars worth of loans and derivatives. Many thousands of ordinary final borrowers, both firms and households, pay floating rate interest of Libor plus a specified spread. So whilst policy rates were

⁸ With the exception of Japan as explained in Section 1.8.

falling the actual rates payable by many existing floating rate borrowers were actually rising due to the spike in Libor.

Moreover, for new floating rate loans, banks' desire to hoard cash and avoid risk led to a sharp rise in the typical spread over Libor that was on offer for those final borrowers who could still get credit. Central banks could lower policy rates aggressively but this could not stimulate lending or even stem the decline as borrowers were faced with rising borrowing costs or even no access to credit at all. Thus banks' pivotal role in the monetary transmission mechanism had broken down.

1.7.2. The fixed income market transmission mechanism

A sharp adjustment of expectations of future policy rates and a flight to safety helped to ensure that interest rates fell sharply across the risk free yield curve. However, again heightened perceptions of risk meant that lower risk free interest rates did not translate into a fall in the rates available in the fixed income market for either banks or final borrowers. So the other main transmission mechanism was also broken.

Central banks had taken policy rates close to the lower bound of zero but it was clear that this alone would not be a sufficient response. A response from the fiscal authorities and unconventional monetary measures would be needed just to stabilise the financial system, let alone support the real economy.

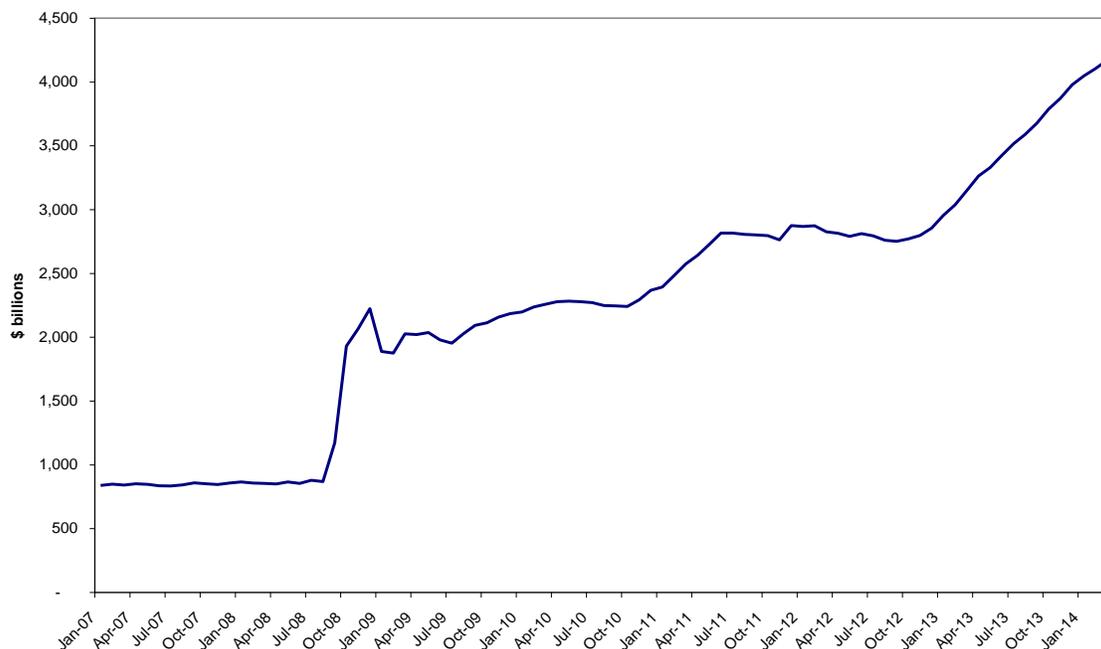
1.8 Policy responses by the big four central banks

The financial crisis provoked different responses from the main central banks as each grappled with varying impacts and each had to tailor policies to suit the local structure of the financial system and economy. Here we briefly describe the key differences in the response in the US, euro zone, Japan and UK.

1.8.1. The US Federal Reserve

Since the financial crisis the Federal Reserve has pursued aggressively expansionary policies drawing on a number of unconventional policies including forward guidance, 'operation twist' and money creation to support the purchase of both government and non-government debt. No other central bank has been more prepared to innovate in the application of unconventional monetary policy, and as Chart 4 shows, the Fed has not been afraid to greatly expand its balance sheet.

Chart 4 - Federal Reserve's balance sheet



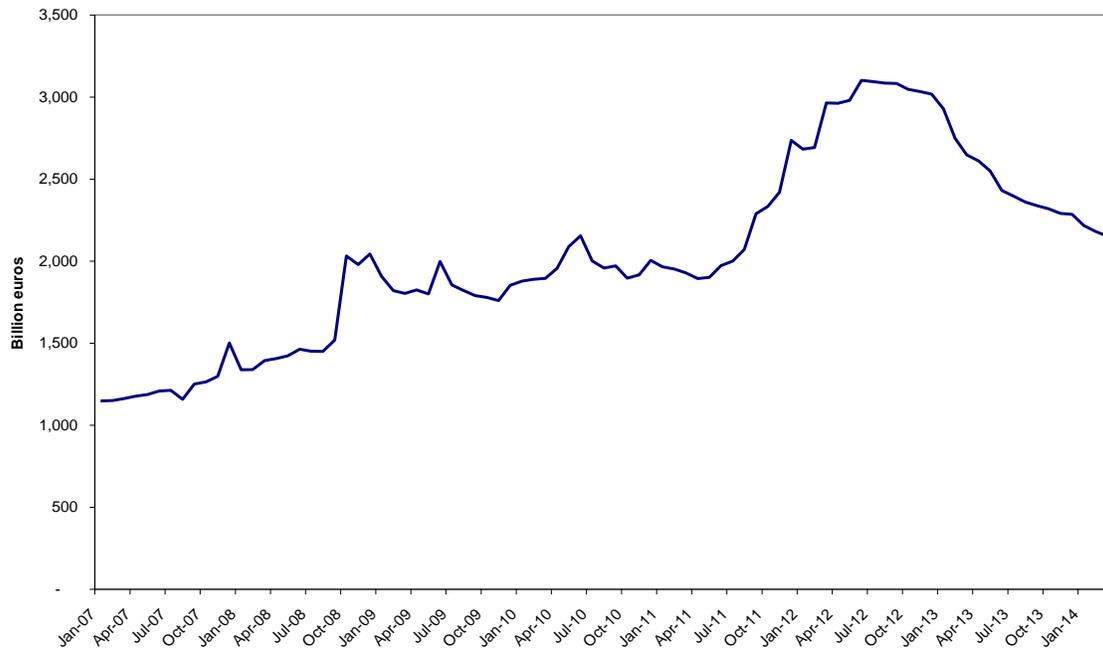
Source: Federal Reserve Board

The feature that particularly differentiates the Fed is its willingness to support private debt markets. Whilst the Bank of England and now Bank of Japan have focused on expanding their balance sheets through the purchase mainly of government debt and the ECB has focused on providing direct support to banks, the Fed has sought to use its clout to improve the functioning of the debt markets, particularly the mortgage backed securities market to underpin a housing recovery.

1.8.2. The European Central Bank (ECB)

The ECB's approach since the financial crisis has been significantly different from the Fed's. It has appeared to be the most reluctant to undertake unconventional policies. Yet, arguably facing the most potentially catastrophic outlook, it has been prepared to take what in some respects are the most controversial measures. Its long term repo operation (LTRO) involved the creation of money to directly support the banking system, with the support offered without risk pricing. It has also felt the need to underpin specific euro zone government bond markets, stretching its remit to the limit.

Chart 5 – ECB’s balance sheet



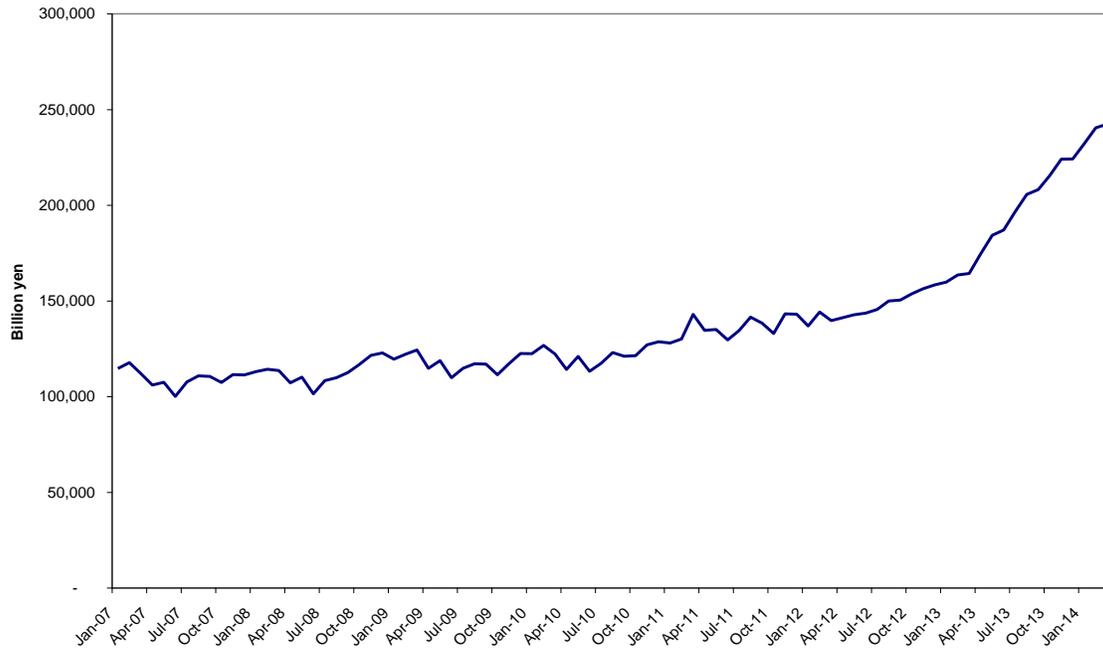
Source: ECB

1.8.3. The Bank of Japan

The Bank of Japan stands out amongst central banks in that it alone was facing a bursting of an asset bubble and a critically weakened banking system not from 2007-8 but much earlier: after 1990. Indeed, the events in Japan before and after 1990 in many respects provide a template from the global financial crisis of 2007-8: a buoyant economy had spurred bank lending, leading to asset bubbles in property and the equity market. Final borrowers had taken on unprecedented levels of debt and the banks had simultaneously increased their own leverage significantly.

2007-8 was thus not a turning point for the Bank of Japan in the way that it was for the other three central banks considered in this paper. Economic conditions were so slow to recover from the 1990s crash that Japan implemented a policy of QE from March 2001 after zero interest rates failed to provide a sufficient boost. Although QE was terminated in March 2006 the economy was still in a fragile state by 2007-8 and the downturn in other advanced economies provided a further negative jolt to the Japanese economy.

Chart 6 - Bank of Japan's balance sheet



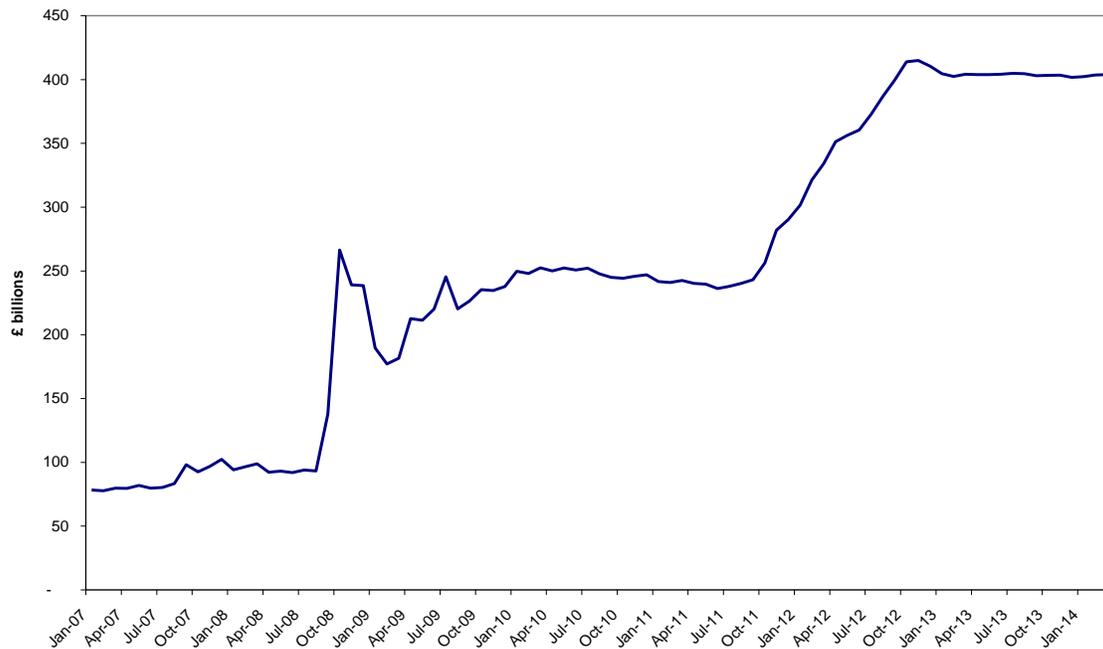
Source: Bank of Japan

Perhaps in part spurred on by the more proactive approach to monetary policy taken in the US, eventually in 2013 the Bank of Japan announced a second, much larger attempt to reflate its economy using QE. Relative to the size of its economy, this amounts to the largest programme of QE seen to date. So Japan may prove to be the ultimate laboratory for QE, revealing whether it is simply a matter of sufficient scale or, alternatively, whether the policy faces diminishing marginal returns.

1.8.4. The Bank of England

Since the Bank of England started its QE programme in March 2009 it has bought £375bn worth of bonds - equivalent to around 25% of UK GDP. But the Bank of England's policy has not been especially radical, with the vast majority of money creation used to purchase government bonds. Indeed, the Bank of England has tried to avoid over-stimulating private debt markets or providing banks with overly generous support. As a result it has minimised the risk of moral hazard relative to its central bank peers. But by relying on QE, the Bank of England may have diluted the impact of its considerable £375bn money creation programme because, in contrast to the US, few private sector agents in the UK borrow at longer term fixed rates.

Chart 7 - Bank of England's balance sheet



Source: Bank of England

1.9 The dividing line between fiscal and monetary policy

To accurately define unconventional monetary policy it is also necessary to understand the dividing line between fiscal and monetary policy. As central banks started to unleash unconventional monetary measures and governments also helped to shore up the banks and the broader financial system, it quickly became clear that the lines dividing fiscal and monetary policy had become quite blurred. Emergency measures to support banks, the financial system and financial markets included measures that could be defined clearly as fiscal in nature, some that were clearly monetary in nature and others that could have been carried out by either the central bank or government.

For example, the supply of emergency liquidity was firmly within the remit of the monetary authorities. Measures such as recapitalising banks and providing credit guarantees were much more in the realm of fiscal policy as they required decisions to put taxpayer funds in serious jeopardy and, where they were carried out, they were

indeed policies enacted by governments not central banks. However, between these more clear-cut cases there was a grey area of potential overlap in policies.

The troubled asset relief program (TARP) in the US saw the government authorised to purchase up to \$700 billion worth of illiquid bonds from banks and other sellers to underpin bond prices, which in turn was designed to shore up the balance sheets of banks and other financial institutions. But central banks have also run programmes in which they have purchased non-government bonds, for example the Federal Reserve's credit easing, the ECB purchases in the covered bond market and the Bank of England's modest purchases of corporate bonds alongside QE.

Central banks have typically been indemnified against losses on their outright asset purchases by their respective governments, further blurring the distinction between government and central bank action. And with such an indemnity central banks could conceivably go further than they have to date and carry out policies that have been undertaken by government, for example with central banks purchasing bank equity as governments have done.

This illustrates the extent to which the objectives of maintaining the integrity of the banking system and stabilising the wider financial system created a situation where monetary and fiscal policy naturally started to overlap and converged. It would have made no sense to maintain barriers between governments and central banks to demonstrate central bank independence when both arms of the state needed to pursue policies to meet the same objective of preventing a collapse of the financial system.

Of course 2007-8 was an exceptional period requiring an exceptional response from the authorities. But this new found co-operation now appears to be going beyond policies to support the financial system and has crept into the more controversial arena of macroeconomic management. With fiscal policy increasingly constrained in its ability to support aggregate demand by high public debt to GDP ratios, and advanced economies facing the weakest recovery of recent decades, the political leadership has looked increasingly to central banks to aid recovery, seeking enhanced co-operation on this front too.

The starkest example of this trend can be found in Japan. Shinzo Abe, who assumed the role of prime minister in December 2012, vowed to pursue expansionary policies. He installed a new governor of the Bank of Japan, Haruhiko Kuroda, in March 2013 who almost immediately announced a decisive shift towards a policy of aggressive QE. The depreciation of the yen was an explicit objective of the government and ultra-loose monetary policy has been the main instrument used to achieve it.

But the Federal Reserve, Bank of England and ECB have all pursued policies that involve an unusual degree of co-ordination with government or are seen as overtly supportive of fiscal policies. For example, the funding for lending scheme (FLS) in the UK, which

provides cheap funding to banks to encourage greater lending to the real economy, is openly being presented as a joint Treasury/Bank of England policy measure.

The appointment of Mark Carney as governor of the Bank of England by chancellor Osborne can also be seen as an attempt to promote a more activist approach to monetary policy. George Osborne then used the March 2013 budget to ask the Bank of England to examine what other ways it could use unconventional monetary policy to produce 'monetary activism with fiscal responsibility'.

Commentators who emphasise the importance of central bank independence have been alarmed at this new found spirit of co-operation. To them policy co-operation must entail some loss of independence and in a fiat money economy in their view central bank independence is ultimately what ensures price stability.

Section 2 - The A to Z of unconventional monetary policy

This section examines in detail the different unconventional monetary policy measures that have been implemented to date in the US, euro zone, Japan and UK. It provides a clear definition for each policy measure, outlines the objectives that policymakers have set out, explains the mechanisms by which each policy works and, where relevant, explains how the policy can be unwound. A critique for unconventional monetary policies is contained in the later Section 5.3.

2.1 Quantitative easing (QE)

2.1.1 Description of QE

Quantitative easing can be defined as the purchase of government bonds in the secondary market by a central bank using newly created money. It has been the most widely used form of unconventional monetary policy since the financial crisis, being the main unconventional policy measure in the UK and Japan whilst also being heavily used in the US. In the UK, QE has totalled some £375bn to date, equal to £6,000 for every man, woman and child in the country.

To date QE has been explicitly designed to be a temporary policy measure but one of undefined duration. The increase in the monetary base that it entails is set to be reversed by central banks selling bonds back to the market when economic conditions improve rather than on any specified timetable.

QE works as follows: the central bank purchases on the open market or by means of a reverse auction outstanding government bonds from the private sector. A typical seller might be a pension fund, and the newly created cash used to purchase the bonds will be deposited in its bank account. Unless its bank lends this money out it will add to the bank's reserves (deposits) with the central bank.

Thus the cash that the central bank has created becomes its liability to the commercial bank into which the new money was deposited. So both sides of the central bank's balance sheet will have expanded by the amount of the bond purchase, with the asset being the bonds purchased and the liability being the increase in bank reserves.

Both sides of the balance sheet of the bank into which the funds are placed will also have expanded by the amount of the QE, the liability being the pension fund's new deposit and the asset being the bank's deposit with the central bank. The pension fund's balance sheet will remain unchanged in size but with a change in composition - its assets

now comprising a smaller quantity of government bonds with a corresponding rise in the amount of cash.

2.1.2 Objective

The stated objective of QE in the UK is to raise aggregate demand by stimulating private sector activity to avoid an undershooting of the 2% inflation target. Other central banks have set forth similar objectives of supporting demand and raising the inflation rate.

QE is also likely to play a role in meeting other post-financial crisis objectives of monetary policy, such as supporting the banking system and improving the functioning of financial markets. However, central banks have made less reference to these other potential goals and they have generally not formed part of the stated policy objectives for QE.

2.1.3 Immediate impact of QE

QE has three key immediate effects:

Firstly, the central bank bidding for government bonds will drive their market price up, reducing the yield. So QE allows the central bank to directly influence government bond yields (or the risk free rate) across the yield curve. This can be contrasted with conventional monetary policy, which operates by directly setting interest rates only at the short end of the yield curve (typically 1 month duration or less). Although expectations of future policy rates will always influence interest rates along the yield curve, this is only an indirect effect.

QE allows the central bank to directly target longer term risk free interest rates, although interestingly the Bank of England has always expressed its decisions to undertake QE in terms of the quantity of bonds purchased/money created rather than explicitly using QE to target a particular long term interest rate. This contrasts with conventional policy where the central bank targets a short term interest rate and is required to supply whatever quantity of funds is required to maintain that target rate.

The second immediate effect is that the seller of government bonds (say a pension fund) will have seen the composition of its assets altered, with a smaller proportion invested in government bonds and a larger amount in cash.

The third immediate effect of QE is to increase the level of deposits in the banking system and, correspondingly, the level of banks' reserves with the central bank. This immediately increases the liquidity of the banking system (or at least those banks that receive the proceeds of the bond sales).

2.1.4 Impact of QE on the real economy

Each of these immediate effects should have an impact on the real economy:

The pension fund has been induced to sell government bonds by a rise in their price. This, of course, will have left the fund with a higher level of cash than it had previously elected to hold. There is no reason to believe that QE will have induced it to want to hold more cash. So, it would be expected that the fund would then seek to reinvest the proceeds in other financial assets, such as higher risk bonds or equities. Indeed, the pension fund may conclude that QE is likely to stimulate other financial asset prices and want not only to reinvest the additional cash but go further and reduce its other cash holdings.

Pension fund purchases of other, higher risk assets such as corporate bonds, asset backed securities or equities should raise their price and lower their yield. This increased demand for these higher risk assets should have two effects: it should increase the net wealth of those holding these assets and it should make it easier for firms to raise money by issuing in these markets.

This in turn should encourage more investment and consumption, raising aggregate demand (the inter-temporal substitution effect). Lower long term rates may also have some positive distributive effects as borrowers increase their expenditure by more than the corresponding reduction by savers.

Lower interest rates on government bonds and other assets would also be expected to reduce the attractiveness of domestic financial assets to overseas investors, reducing net capital inflows and thereby reducing the value of the currency. To the extent that foreign investors believe that QE will succeed in raising inflation, they are also likely to reduce the price that they are willing to pay for the currency of a country embarking on QE to reflect a faster expected decline in its nominal value.

Higher demand will then give rise to positive second round effects as agents who have seen their income rise start to increase their expenditure. If consumption rises, it is likely to spur an even larger increase in investment due to the investment multiplier effect, so these second round effects could be quite large.

Lastly, higher levels of liquidity in the banking system should improve credit availability. This is the result both of changes in banks' assets and liabilities. Higher deposit levels will reduce the funding constraint facing banks, while higher levels of cash reserves will

increase banks' buffer against unexpected liquidity shocks and act as a drag on bank profits if they are not lent out, given the low rate of interest paid on such reserves⁹.

Typically QE requires a central bank to alter the way it carries out money market operations. Previously, the central bank would set a policy rate and the banks would determine what reserves they wanted to hold at that rate. With the introduction of QE total reserves are no longer a function of banks' demand, so the central bank has to move to a different operational system, for example by remunerating all reserves at the policy rate. This creates a floor under market rates as no bank would deposit funds with another commercial bank for less than it could receive from the central bank.

The sense that the new reserves created by QE are additional to banks' requirements has led some economists to argue that QE has little effect via the liability side of the central bank's balance sheet. However, this view can be questioned on two grounds. Firstly, while the level of reserves is fixed across the banking system as a whole, individual institutions can reduce their reserves by increasing their lending, potentially increasing the velocity of circulation. Secondly, by increasing the level of banks' deposits, QE should help plug the funding gap left by reduced wholesale funds. This should make it less likely that banks will reduce their lending out of fear that redeeming wholesale funding will not be replaced.

2.1.5 The size of the impact on the real economy

The size of QE's impact on the real economy has been the subject of much debate, with two opposing camps in the UK in turn seeing QE as having substantial effects (Bank of England) and being largely ineffective or at best having only weak effects (Susil Wadwani, Willem Buiter).

A similar discussion has occurred with respect to other central banks' QE programmes. The Japanese embarked on QE before the global financial crisis, having shifted from a policy of just maintaining the policy rate at zero after this had failed to bring the deflation then gripping Japan to an end. QE was introduced in March 2001 and withdrawn in March 2006 when deflation temporarily ended. Generally it is felt that QE was not very effective but some commentators believe this was due to an insufficiently bold scale of QE. A far larger scale QE programme was implemented in Japan in 2013 but it is perhaps too early to draw conclusions about its success.

⁹ Note that the quantum of the increase in commercial banks' reserves with the central bank (the size of increase in base money) is fixed by the volume of QE. Whilst one bank can reduce its reserves by lending them out, the banking system as a whole cannot reduce its level of reserves. The failure to understand this fact has led some commentators to brand QE a failure from the observation that banks' reserves with the central bank have remained stubbornly high.

In a paper published in January 2012¹⁰, the Bank of England estimated that £200bn of QE could be expected to reduce government bond yields by some 150pb and increase asset prices by around 20%. This in turn was estimated to raise output by as much as 2% at the peak of its effect, raising inflation by about 1 percentage point after about a year. What is, however, clear from Chart 1 on Page 5 is that QE does not seem to have raised business investment but appears instead to have increased the consumption of those benefitting from higher asset values.

2.1.6 Impact of QE on other policy objectives

QE can also play a role in meeting the other objectives of monetary policy outlined above, that came to prominence during the financial crisis, namely, maintaining the integrity of the banking and broader financial systems, maintaining the flow of credit to solvent agents in the economy and potentially preventing fiscal dislocation.

QE supported the banking system by increasing the total level of deposit funding at a time when wholesale funding was scarce. This helped to slow the deleveraging of bank balance sheets that the financial crisis had triggered. And by increasing bank reserves at the central bank it provided a large cash buffer for banks to meet future payments.

So QE directly helps to maintain the integrity of the banking system and by so doing, indirectly supports the rest of the financial system, given the pivotal role that banks play in financing non-bank lenders and other financial institutions. And by increasing the cash available amongst institutional investors, it should support the continued functioning of other financial markets that, like banks, faced a collapse of investor confidence.

2.1.7 Unwinding QE

Once the central bank has determined that QE needs to be unwound, it can sell the government bonds it has purchased back to the market. This reduces cash deposits in the banking system which in turn reduces banks' reserves with the central bank. The central bank's balance sheet thus shrinks down in a mirror image of the process that accompanied the original bond purchases.

If a government bond bought by the central bank under its QE programme matures before the central bank wishes to resell it, the central bank will receive the cash proceeds from government. Whether the government makes this payment out of tax receipts or raises the funds through new debt issuance, by repaying the central bank it has automatically unwound the QE and thereby reversed the money creation to the

¹⁰ The impact of QE on the UK economy – some supportive monetary arithmetic – Bank of England working paper no. 442.

value of the redeeming bond. The central bank would then need to reinvest the proceeds by purchasing other government bonds in the market to maintain the overall level of QE.

Risks to central bank

Since under QE the central bank is purchasing an asset (government bonds) it is also acquiring the corresponding credit risk and the revaluation risk that corresponds to this asset. One of the advantages of QE over policies that involve the purchase of private sector financial assets (see credit easing below) is that in a country with monetary sovereignty (i.e. one that controls its currency unlike euro zone countries), government bonds effectively carry no default risk, as the government can always instruct the central bank to meet bond redemptions with payments of newly created cash.

So the Bank of England carries no default risk on its QE bond portfolio but it still carries a revaluation risk. This arises because the bonds are purchased in the open market and when QE is unwound they will be sold back into the open market. There is no guarantee that the Bank of England will receive the same price on sale that it had to pay to buy the bonds. Under the UK QE programme, however, the Treasury explicitly indemnifies the Bank against any possible losses on sales.

QE and fiscal policy

On the face of it, QE meets the criteria for being a pure monetary measure, respecting the traditional separation of monetary policy, carried out by an 'independent' central bank, from fiscal policy under the control of government. The central bank is buying government bonds in the secondary market from the private sector to inject liquidity into the economy in a policy that will be reversed when the central bank believes that conditions justify it.

However, the reality is not so clear cut. QE is designed to drive down the secondary market price for government debt and the price in the primary market is clearly determined to a significant extent by the secondary market price. So it is certain that QE, by creating a large new buyer of government bonds in the secondary market, will make it cheaper and easier for government to fund any given level of deficit in the primary issuance market.

QE will also appear to improve the sustainability of government debt as lower government bond yields on primary issuance directly reduces the interest burden. This will reduce the fiscal deficit relative to where it would otherwise have been, and put off the date when debt levels appeared to become unsustainable.

Consider a central bank that is forbidden by law to buy government debt in the primary market but nonetheless wishes to aid the government's attempts to maintain spending

and borrowing levels. It could institute a programme of purchasing bonds from the secondary market seconds after they were issued in the primary market. The private sector buyer is now no longer concerned about default risk or the appropriate yield but merely about the price they will receive for selling the bond on to the central bank. Under these circumstances the distinction between primary and secondary market purchases would have become a charade.

2.2 Credit easing (CE)

Description

Credit easing (CE) can be defined as the purchase of non-government bonds or securities by a central bank using newly created money. One example is the Federal Reserve's purchase of mortgage backed securities.

Objective

As with QE, CE is designed to stimulate aggregate demand. However, CE directly targets specific non-government debt markets. For example in the US, Federal Reserve purchases of mortgage backed securities have driven down the yield on these securities reducing mortgage costs for consumers¹¹. This is a more direct stimulation of private sector activity than QE, which relies on the changes in government bond yields having knock-on effects on other interest rates.

Transmission mechanism

CE works in a similar fashion to QE as outlined above. The purchase of securities by the central bank using newly created money raises the price (depresses the yield) in the security market that is subject to the purchases, shifts institutional investors' asset mix towards cash which can be reinvested and increases the amount of cash deposits and reserves in the banking system.

The transmission mechanism by which CE impacts the economy is thus very similar to QE. However, whereas QE relies on indirectly stimulating private sector financing markets through its effect on the government bond market, CE acts directly on these markets, potentially giving rise to a more powerful effect. This certainly allows CE to be applied in a more targeted fashion, with the authorities able to support specific credit

¹¹ We classify mortgage backed securities or debt issued by Fannie Mae or Freddie Mac as non-government although these institutions are now under government control.

markets, such as corporate bonds to stimulate investment, or mortgage backed securities to stimulate housing activity.

However, as CE does not directly affect the risk free rate, it may not have the same ability as QE to reduce long term funding costs across a range of financial markets. For example, if CE is focused on the mortgage backed securities markets it may have a more limited effect on interest rates in corporate bond markets.

The effects of CE on the banking system are likely to be very similar to those of QE, as these relate mainly to the impact on bank behaviour of a large additional injection of deposits with a corresponding rise in bank reserves with the central bank. Equally, you would expect CE to have a similar kind of impact to QE in respect of wealth effects and the exchange rate.

Like QE, CE can also help to achieve the other policy objectives outlined in Section 1.3, namely supporting the banking and broader financial system and supporting the functioning of specific financial markets. By making banks' balance sheets more liquid, like QE, it reduces the risk of bank insolvency and should reduce the banking system's need to delever.

But it is in supporting specific financial markets that CE can have the most direct benefits. Where credit availability is restricted because the market in the supply of that credit is malfunctioning, rather than the financial institutions themselves being the problem, CE should be a powerful tool to replace demand and maintain market liquidity.

CE would be expected to have the most powerful positive effects in an economy in which bond markets play an important role in supplying credit, as opposed to banks or other institutions. It is thus no surprise that the US has championed CE in the mortgage backed securities market as the availability of residential mortgages is quite dependent on the functioning of the securitisation markets in the US. This contrasts with Europe, where financial institutions and more specifically banks dominate in the supply of mortgage credit.

Unwinding CE

CE can be unwound in exactly the same manner as QE. The central bank can sell the bonds back to the market, simply reversing the money creation process. And indeed like QE, CE has been conducted to date as a temporary policy of undefined duration. The policy is designed to stay in place until market conditions no longer require such support.

2.3 Enhanced credit support (ECS)

Description

Enhanced credit support (ECS) can be defined as the provision of loans or repo agreements of long maturity to banks funded by creating new money. The term enhanced credit support was coined by the ECB when it announced in December 2011 that it was extending its repo operations for euro zone banks. It announced that it was establishing a long-term repo operation (LTRO) with a three year maturity at a fixed rate of 1%. These funds were not drawn on evenly amongst euro zone banks but rather were highly concentrated amongst banks in the peripheral countries that were facing severe liquidity shortages because of investors' fear of default and redenomination risk.

ECS works in a very different way than QE and CE. Newly created money is loaned to banks using a repo agreement so the central bank does not make an outright asset purchase. As a result the central bank is not exposed to revaluation risk on a specific asset. Rather it is exposed to the risk of a combined default by the bank and a loss of value in the collateral posted by each bank entering into a repo agreement.

Objective

In contrast to QE and CE in the UK and the US, ECS in the euro zone was not designed to boost demand. It was openly targeted at maintaining the integrity of the banking system and indirectly supporting weak euro zone sovereign bond markets, because banks could use any euro zone government bonds as collateral on these repos and banks were expected to invest some of the borrowed funds in purchases of government bonds. The ECB could have chosen to sterilise its programme of ECS, withdrawing the same amount of liquidity from the banking system, but it did not. This indicates that it felt that the euro zone banking system as a whole needed the extra funding and liquidity that an unsterilized injection entailed.

Transmission mechanism

ECS was a response to the serious deterioration in the euro zone banking system that developed in the wake of the euro zone crisis. Peripheral euro zone countries such as Spain, Ireland and Cyprus had seen their banking sectors expand rapidly during the pre-crisis period. After the financial crisis it started to become clear that many of these new loans were duds, so many banks in these countries found they could no longer borrow in the wholesale markets. To make matters worse, the economic weakness in these countries led to speculation that one or more would have to leave the euro. So money was pulled out of these countries by investors and depositors who were worried that a euro exit would devalue their funds.

The ECB found itself having to plug the gap that was opening up as wholesale creditors and depositors raced to get their funds out of peripheral country banking systems. A failure to act would not only have led to much sharper deleveraging by peripheral country banks but to insolvency, as some banks were losing their funding far more quickly than they could practically have reduced their assets.

So the transmission mechanism for ECS was through the banking system. ECS enabled banks to survive and slowed the process of deleveraging that the economic environment dictated. By allowing banks to use new funds to purchase longer term government bonds it also sought to support government bond markets as a second round effect.

Unwinding enhanced credit support

In contrast to QE, which has been undertaken in the US, UK and Japan as an open-ended policy, to be unwound when economic conditions dictate, the ECB's LTRO has a set three year lifespan. But just as QE cannot be unwound without risking a further downturn as long as the economy stays weak, so the LTRO cannot terminate whilst the euro zone banking system remains fragile without risking another banking crisis.

For this reason it seems likely that the LTRO's three year lifespan will be extended in some form. So in reality, ECS is, like QE, a policy that needs to be in place until market conditions dictate that it is safe to unwind.

2.4 Negative interest rates on central bank reserves

Description

In academic literature, interest rates are often referred to as being bounded at zero because agents can always withdraw their money from the banking system and hold it in note form without cost. However, it is recognised that this general rule of thumb does not always hold true. Market interest rates can fall below zero because in practice there are some costs to holding money in note form, such as the cost of ensuring that notes are held securely. However, such costs are clearly not going to be a substantial proportion of face value so a practical lower bound for market interest rates is likely to be a small negative.

However, the same logic does not have to apply to banks' reserves at the central bank. Banks are typically required to hold certain levels of reserves (deposits) with the central bank and under QE the commercial banking system as a whole has a largely fixed level of reserves. The central bank can dictate the rate of interest paid on these deposits and Denmark's central bank has already adopted a policy of imposing negative interest rates

when they cut the rate to minus 0.2% in July 2012. More recently the Bank of England and ECB have both publicly discussed this as a policy option.

One advantage with this policy is that, unlike other unconventional monetary policies that rely on the banking system to act as the transmitter, it does not subsidise the banks. Indeed, it could be thought of as a special tax on the banking system but one which incentivises banks to continue to lend by penalising them if they hold excessive reserves. In contrast to the policies above it also does not require the central bank to purchase assets or expand its balance sheet, so there is less risk of distortions to other markets.

Objective

The objective of negative interest rates is to encourage commercial banks to increase their lending by penalising them for holding excessive reserves at the central bank. It is hoped that this increased lending will then stimulate demand. But by cutting the income of the banking system, some fear it may encourage banks to just increase their margin on lending to the real economy without necessarily increasing credit availability.

Transmission mechanism

Clearly the transmission mechanism for this policy is through the banking system, and its effectiveness will be determined mainly by how the banks respond to the policy. However, the policy can also reduce interest rates further out along the yield curve, so there is a secondary transmission channel through the fixed income market and potentially a channel through the exchange rate as well.

2.5 Operation twist

Description

Operation twist is the name given to the policy where the US Federal Reserve altered the profile of the risk free yield curve by selling government bonds with maturities of less than 3 years and using the proceeds to buy longer term government bonds (with 6-30 year maturities). This 'twisted' the yield curve by simultaneously driving up shorter term rates and driving down longer term rates. The policy had no impact on the size of the monetary base or on the size of the Federal Reserve's balance sheet, as the quantity of bonds bought and sold were equal.

Objective

The objective of operation twist was to stimulate demand by depressing long term interest rates. For operation twist to succeed, the stimulating effect of the reduction in

long term fixed rates must surpass any adverse effect of the central bank selling short term paper. This in turn depends on the relative price elasticities of short and long term interest rates and the relative sensitivity of the economy to changes in short and long term rates. The Federal Reserve did provide indications on the length of time over which operation twist would be in place, but it could equally be operated without explicit time limits as QE has been.

Transmission mechanism

Operation twist depends on long term fixed interest rates as its transmission mechanism to the real economy. It is therefore unsurprising that the policy has been implemented in the US, where long term interest rates play a much larger role than in other advanced economies. In countries where little private sector borrowing is undertaken at longer term interest rates this policy has much less appeal.

Unwinding operation twist

Operation twist can be unwound by the central bank selling longer term bonds and buying shorter term bonds in a mirror image of the original policy.

2.6 Forward guidance

Description

By directly purchasing long term bonds central banks can affect the level of interest rates along the yield curve beyond their traditional domain of short term money market rates. However, the longer term risk free rate is heavily influenced by market expectations of future short term interest rates. This gives the central bank the opportunity to affect longer term risk free rates by signalling the future direction of short term policy rates.

Central banks have routinely communicated their intentions to the markets as part of the normal operation of monetary policy and in this sense forward guidance is nothing new. But the term forward guidance has taken on a particular meaning since the financial crisis, as another tool of unconventional monetary policy, used to try to cut interest rates along the yield curve but without the central bank having to carry out any actual market operations.

In its most basic form, forward guidance involves the central bank committing itself publicly to keeping the policy rate at a certain level for a specified period of time. This reduces interest rates along the yield curve as the market factors in the impact of a prolonged period of low short term rates.

However, this creates potential for so called 'dynamic inconsistency'. For example, suppose a central bank publicly states that it will hold the policy rate at zero for another two years. If this surprises the bond market it will respond by pushing down yields along the yield curve. Now suppose after one year the economy is recovering far more strongly than anticipated. By sticking to its original promise the central bank is endangering a loss of control over inflation. Given the central bank's core objectives it seems likely it would then feel obliged to renege on its earlier commitment and raise rates.

If private agents anticipated this outcome it could undermine the policy from the start, diluting its effect on longer term rates. If, however, in the example above the economy remained in the doldrums, there would have been no need to increase policy rates anyway. So this policy can only move longer term interest rates if private agents accept that the central bank will maintain lower policy rates in the future than future market conditions would otherwise justify. This approach, sometimes referred to as odyssean forward guidance, amounts to the central bank hamstringing itself.

So it is unsurprising that most central banks have avoided this approach. Rather than signalling that the policy rate would remain low until a particular future date they have typically adopted a policy of signalling that rates would not rise before a particular trigger event was reached. The Fed and Bank of England both used this approach using the unemployment rate as the trigger. They signalled that policy rates would not rise while unemployment was above the trigger rate (7% in the case of the Bank of England) but would also not necessarily rise once it had fallen below this rate. However, given the need to demonstrate that they remained vigilant about inflation, this approach came with caveats stating that the commitment to keep policy rates low would no longer hold if inflation spiked or if inflation expectations took off.

Central banks have presented this policy, sometimes called delphic forward guidance, as in essence just revealing part of their reaction function (the model they use to determine policy rates given changes in economic variables). But the policy can only therefore alter market interest rates if either a) the market had previously misunderstood the reaction function in some way or b) if the central bank has altered its reaction function alongside revealing part of it to the public.

Objective

Forward guidance is designed to flatten the yield curve, pushing rates down across the maturity spectrum without the need for market operations. The market's appreciation that rates will stay lower for longer is designed to increase the potency of rate cuts at the short end, stimulating activity more effectively than policy rate cuts could do alone.

Transmission mechanism

Forward guidance relies on the bond market (long term interest rates) as its transmission mechanism but without the need for direct central bank intervention in these markets.

Unwinding the policy

Odyssean forward guidance can be dropped once the period of the initial guidance has expired. Delphic guidance can be dropped once the trigger event has been reached or when one of the caveats comes into play. Thus a policy of forward guidance may seem appealing to central banks because unwinding it does not involve the risk of disruption that, say the unwinding if QE or CE might entail, when bonds need to be sold back into the market. However, as governor of the Bank of England Mark Carney discovered in 2013, an unexpected movement in the variable used as a trigger point (the unemployment rate in this case) can force a central bank to abandon the policy in a rather messy fashion.

2.7 Securities market programme (SMP) and outright monetary transactions (OMT)

Description

The ECB's securities market programme was introduced in May 2010. The Outright monetary transactions (OMT) policy was announced in August 2012. Under these programmes the ECB has purchased government bonds of euro zone countries that were facing high borrowing costs as a result of investor concerns about default and redenomination risk. The ECB fully sterilised these purchases (i.e. there was no increase in the monetary base) by issuing very short term paper (1 week) to the value of the bond purchases, although these bills were so short term that they might be described as sterilisation in name only.

Objectives

The main objective of the SMP and OMT was to restore confidence in government bond markets of euro member states that were facing a loss of investor confidence because of concerns about default and redenomination risk. The ECB sought to drive down the yield on government bonds in these countries to convince the markets that the high rates of interest they demanded was not concomitant with the risk.

Although these policies may look much like QE without the money creation as they involve the purchase of government debt by the central bank, their objective marked

them out as different. In contrast to QE, these policies were not instigated to support aggregate demand.

Although these policies may have remained within the letter of the Maastricht treaty as they did not involve direct purchases of bonds from governments, they breach the spirit of the rules by allowing governments to continue to fund their deficits at a price that the market, left on its own, would deem insufficient. The ECB thus underpinned the fiscal position of countries that the market judged to be at risk of default.

However, there was an important secondary consideration. Euro zone banks hold large government bond portfolios and the weakest banks have tended to be in the countries with the weakest fiscal positions, such as Greece, Spain and Ireland. So rising government bond yields (falling prices) in these countries implied large mark-to-market losses for banks on their government bond portfolios, potentially endangering their solvency. The ECB wanted to ensure that this toxic link between fiscal weakness and bank solvency did not create a potentially disastrous spiral.

Transmission mechanism

The transmission mechanism for SMP and OMT was through the fixed income market. Yields were reduced in the government bond markets that were subject to the purchases. This has a number of positive effects, raising the wealth of private sector holders of these bonds and improving the solvency of banks with large government bond portfolios. This may in turn have helped to support demand and bank lending. However, this was not the primary purpose of the policy – which was to prevent serious fiscal disruption for the governments involved.

Unwinding

As with QE, no timetable has been set for unwinding SMP and OMT. These are outright asset purchases that the ECB can hold on to for as long as it feels appropriate. But the maturing of any of the bonds purchased by the ECB triggers an automatic partial unwinding unless the funds are reinvested back into the market.

2.8 Special liquidity scheme (SLS)

Description

The special liquidity scheme (SLS) was introduced by the Bank of England in April 2008 to improve the liquidity position of the banking system and thereby support bank lending to the real economy. Under this scheme UK banks and building societies could swap high quality mortgage-backed and other securities for UK treasury bills for up to three years. The SLS finally closed in January 2012.

The Scheme was designed to finance part of the overhang of illiquid assets on banks' balance sheets by exchanging them temporarily for more easily tradable assets. The SLS meets the criteria for monetary policy: it was operated by the central bank and was designed to affect monetary conditions.

Objectives

The specific objective of the SLS was to support the banking system by giving banks access to more liquid instruments, providing them with greater confidence in their ability to operate and providing counterparties with greater confidence in them. Given the linkages between banks and the rest of the financial system this support was also likely to be beneficial to the broader financial system.

By allowing banks to use mortgage backed securities and other instruments that had become difficult to trade to access more liquid government debt, the SLS was also potentially able to improve the functioning of the market in these illiquid assets to some extent. It was also hoped that the SLS would allow banks to maintain lending to the real economy and thereby support aggregate demand.

Transmission mechanism

The SLS worked through the banking system. By allowing banks to finance their assets when private sector funding was scarce, it is likely to have reduced the pace at which banks wanted to shed risk assets.

Unwinding the SLS

The SLS officially closed on 30 January 2012. All drawings under the scheme were repaid before the scheme closed.

2.9 Funding for lending scheme (FLS)

Description

The Bank of England and HM Treasury launched the funding for lending scheme (FLS) on 13 July 2012. The FLS allows participating banks and building societies to borrow UK treasury bills in exchange for eligible collateral during the drawdown window which is still open. Eligible collateral consists of all collateral eligible in the Bank's discount window facility. The fee and the amount participants are able to borrow depend on participants' lending growth.

Participating banks and building societies are able to borrow up to 5% of their stock of existing lending to the real economy, plus any net expansion of lending during a reference period. In other words, for every pound of additional lending to the real economy an institution advances, an additional pound of access to the scheme is permitted for that institution. There is no upper limit on the size of either individual or aggregate borrowing under the scheme. By way of illustration, 5% of the stock of existing loans is equivalent to roughly £80bn across all potentially eligible banks and building societies.

Objective

The FLS is designed to incentivise banks and building societies to boost their lending to UK households and companies, to support aggregate demand. The FLS could thus be described as the SLS with lending targets attached.

Transmission mechanism

The transmission mechanism is through the banking system.

Unwinding the FLS

FLS support is provided over a predefined period. At the end of this period the recipient banks must hand back the treasury bills. The scheme will thus automatically unwind on its established timetable unless it is extended.

2.10 Term asset backed securities loan facility (TALF)

Description

The term asset backed securities loan facility (TALF) was introduced by the US Federal Reserve in November 2008 to ensure the continued functioning of certain asset backed credit markets. Under the TALF the Federal Reserve made cheap loans of 3-5 year duration available, not just to its normal bank counterparties, but to other buyers of AAA rated securities in certain securitisation markets (auto loans, credit card debts, student debts and business loans). The lending, which was made available to buyers in the primary and secondary asset backed securities markets, was on a non-recourse basis.

The TALF meets the definition of monetary policy in that it was run by the Fed with the aim of altering interest rates in the markets against which loans were made available. However, the Fed was indemnified against credit losses by the Treasury although these indemnities have not been drawn.

Objective

In 2008, certain key US securitisation markets had ceased to function normally because they were dominated by bank buyers and the banks no longer had the appetite to purchase in volume. By providing low cost loans to purchasers of asset backed securities the TALF enabled these markets to continue to function, ensuring the continued flow of new credit through these markets to consumers at lower interest rates than would otherwise have been available.

Transmission mechanism

The transmission mechanism by which the TALF worked was unusual because although banks could use the facility alongside other investors in asset backed securities it did not work through the banking system, but rather worked through the securitisation markets.

Unwinding the TALF

The TALF stopped providing new loans in June 2010. The outstanding book of loans held by the Fed has subsequently fallen away quite rapidly as private sector sources of credit have improved.

Section 3 - Related government policy responses

As explained in Section 1, as an array of innovative policy initiatives have been introduced, some have blurred the lines between monetary and fiscal policy. National treasuries have used government funds to carry out some of the same sorts of policies that central banks have been pursuing.

In the pre-2007 period, central bank independence was seen as a crucial foundation stone for credible monetary policy. But the nature of the banking crisis inevitably required unprecedented co-ordination and co-operation between governments and their central banks. Under these circumstances central bank independence has had to play second fiddle to the job of averting the collapse of the financial system. This section considers the fiscal policies that have been enacted since 2007 which overlap with the policies pursued by central banks.

3.1 Troubled asset relief program (TARP)

Description

The troubled asset relief program (TARP) was the first major policy response of the US Treasury for stabilising financial markets after the collapse of Lehman Brothers. Under this proposal, the US government planned to use up to \$700bn buying illiquid assets on banks' balance sheets. The TARP could have been implemented as a monetary policy action, either through the creation of money or through the Federal Reserve issuing additional non-monetary liabilities, but perhaps because of its scale and controversial nature it was the Treasury that put forward the plan.

Objective

The rationale for TARP was that dysfunction in financial markets had created systemic illiquidity which was depressing the price of even high quality securities. The concern was that this systemic illiquidity would create insolvency in even the most robust financial intermediaries unless a buyer of last resort could step forward to break the negative spiral that financial markets had got stuck in.

Transmission mechanism

TARP worked through the financial markets in which purchases were made, and through the banks and other financial institutions by shoring up their balance sheets.

Unwinding TARP

Initially little focus was placed on how TARP might be unwound. It was an emergency measure deemed necessary to maintain the integrity of a faltering financial system. But clearly it was hoped that the provision of such a facility would restore the confidence needed to underpin a recovery in financial markets and, as a result, also restore confidence in banks and other financial institutions. It was hoped that this would make exit from TARP possible through the sale or redemption of the securities bought in the programme once normality had been restored to the markets.

Concerns with TARP

The TARP seemed to take moral hazard to new heights. By being prepared to buy securities from banks at prices above their observed levels in the market, it represented a direct and explicit subsidy to banks that seemed in proportion to the volume of bad investment decisions they had made. Focusing taxpayer funds on debt instruments rather than offering to shore up the equity positions of financial intermediaries also offered the prospect that bank shareholders would be bailed out by the taxpayer without having to share the burden.

In the event, after the UK announced its bailout package including bank recapitalisations, TARP was adjusted to include such capital injections. This greatly lessened the moral hazard as the banks' owners were required to share the pain through the dilution of their equity as the government's equity injections were made at prices that reflected the extreme market stress of the time.

3.2 Bank recapitalisation

Description

A key policy that emerged in the wake of the Lehman Brothers collapse was bank recapitalisation. Under this policy governments made direct equity injections into banks and other financial institutions. This immediately improved these firms' ability to absorb losses and thus helped to restore confidence in the broader financial system, as it was clear that government would stand behind banks rather than allowing losses to fall on bondholders or depositors.

The list of institutions that received such assistance was long and in the UK included some that were fully nationalised (e.g. Northern Rock and Bradford & Bingley) and others that have been allowed to retain private shareholders now sitting alongside state shareholdings (RBS and Lloyds Banking Group).

Bank recapitalisation could in theory have been carried out by a central bank, either through money creation or the issuance of other paper. However, it seems that central banks were deemed to be inappropriate vehicles for such actions, perhaps because of the level of risk involved in purchasing bank equity and because the controversial nature of the decision was ultimately deemed to be one for politicians. Moreover, where the central bank acts as regulator it would create an apparent conflict of interest for it also to be a major shareholder.

Objective

Bank recapitalisations were designed to prevent bank collapses which, if they had been allowed to take place, could have triggered a systemic financial collapse. They were therefore very much an emergency measure.

Transmission mechanism

By definition any bank recapitalisation works through the banking system. But the effect is quite different from that of the cheap funding that has been provided to banks via schemes like the LTRO in the euro zone or the FLS in the UK. Because equity injections are loss absorbing they are a much more potent form of support, with a much greater ability to restore confidence in the banking system.

Recapitalisations are thus much more about maintaining confidence in the financial system than about maintaining lending. However, they do have the potential to support lending if banks are otherwise constrained in their ability to lend by inadequate capital, as many have been since 2007.

Unwinding bank recapitalisations

Unlike the funding support schemes operated by central banks, capital injections in banks are not time limited, reflecting the nature of equity investments. In the US banks have been in a position to cancel this equity and repay government relatively rapidly. In the UK talk is not of cancelling bank equity but rather of selling it to investors once its price is deemed to be sufficient to give the taxpayer an adequate return.

3.3 Credit guarantee scheme (CGS)

Description

The CGS was introduced by the UK Treasury in October 2008. Under the CGS, banks were able to borrow in the credit markets with the benefit of a full government guarantee. This reassured the markets that banks would be able to keep funding themselves and reduced the risk that banks would shrink their balance sheets. It was

natural that the government rather than the Bank of England provided such a guarantee, both because it is the sovereign issuer of debt and because of the inherent risk of loss if the issuing institution became insolvent.

Objective

The objective of the CGS was to improve the stability of the banking system by allowing banks to raise or roll-over funds in the wholesale debt markets and thereby reassure the markets that the banks would be safe from insolvency. It was thus very similar in its effects to central bank funding schemes like the SLS in that it helped to plug banks' funding gaps.

Transmission mechanism

The CGS worked through the banking system.

Unwinding the CGS

The CGS was time limited. It closed to new issuance on 28 February 2010. The scheme terminated when the final guarantee expired on 26 October 2012.

3.4 Asset protection scheme (APS)

Description

The APS was introduced by the UK Treasury in January 2009. In return for a fee, banks could insure a defined portfolio of their riskier loans against credit losses beyond a defined threshold. The APS was used by RBS and Lloyds Banking Group. Although neither bank has needed to claim under the APS as losses have not exceeded the thresholds, the scheme still included an element of subsidy as the nature and price of insurance provided under the APS could not realistically have been provided by a private sector entity at the time it was entered into.

Objective

The objective of the APS was to improve the stability of the banking system by reassuring the markets that the participating banks would be safe from insolvency in the event that credit losses proved higher than expected.

Transmission mechanism

The APS was available only to banks and thus worked through the banking system.

Unwinding the APS

The APS was closed in 2012 when Lloyds Banking Group and RBS left the scheme.

3.5 Altered targets for central banks

This paper does not include changes to a central bank's policy objectives under the unconventional monetary policy banner, as such objectives are set by government and therefore do not form an aspect of monetary policy in themselves. But clearly, changes to a central bank's targets could be part of the solution to overcoming adverse monetary conditions. For example, inflation targets can be raised or objectives changed so that other variables are targeted such as nominal GDP.

In a recent example, the new Japanese government announced that the Bank of Japan will switch from having a (loose) inflation "goal" (of 1%) to a (precise) inflation "target" (of 2%). Although this is an objective rather than a policy measure, through its effect on expectations, it can have the same effect as a measure.

Section 4 - Alternative unconventional monetary policy proposals

All of the policies described in Sections 2 and 3 have been put into effect over the past few years in at least one developed economy. The paper now turns to unconventional monetary policies that have been proposed but not yet implemented.

It is perhaps inevitable that these policies, which the authorities have so far failed to embrace, are at the more controversial end of the spectrum. But as some economies still struggle to recover despite the array of unconventional monetary policies undertaken to date, and as the shortcomings of these enacted policies become clearer, the pressure for more radical solutions may well grow. And as we have seen since the financial crisis broke, the unthinkable can rapidly become accepted policy.

4.1 Monetary financing of fiscal deficit

Description

Monetary financing of fiscal deficits can be defined as central banks directly financing government deficits by buying newly issued government bonds with newly created money.

For example, consider a country where the government is running a \$100bn a year fiscal deficit. Normally, this gap would be financed by the government selling bonds to the private sector. The fiscal deficit would have a neutral impact on the money supply if it was financed by the sale of bonds to the non-bank private sector as the excess of government expenditure over tax receipts would equal the amount of money taken out of the economy through bond sales. But in the case of a monetary financing of the deficit, the central bank would buy these bonds directly from government, paying with newly created cash and thereby increasing the monetary base.

Objective

The objective of the policy would be to raise nominal demand and thereby avoid the risk of deflation or an undershooting of the inflation target. It would be most relevant in an economy in which the banking system and final borrowers in the private sector are already over-leveraged, creating a 'liquidity trap' where attempts to pursue monetary policy through the traditional transmission mechanisms of banks and fixed income markets are ineffective.

In a sense this approach represents the ultimate unification of monetary and fiscal policy - the two arms of government macroeconomic policy would be working in unison. And such a policy is likely to prove effective in the short term as it allows government to inject demand directly into the economy, rather than relying on a stimulation of private sector demand as the unconventional monetary policies described in Section 2 generally do.

Transmission mechanism

A monetary financing of the fiscal deficit differs from most of the unconventional monetary policies pursued to date in that it relies on neither the banking system nor the fixed income market, but rather is transmitted directly into the economy through government expenditure and/or tax cuts. If the traditional transmission mechanisms are damaged there is an obvious attraction to substituting in a more direct transmission mechanism of this kind.

The Bank of England estimates that the first £200bn of QE - equal to around 14% of national output - added 1.5% to output at its peak. If these estimates are broadly correct it suggests that QE has an 'efficiency ratio' (ratio of value to impact on demand) of some 10.7%. This suggests that, assuming there was no crowding out of private demand, a policy of higher government expenditure financed from new money would provide some nine times the boost to demand as QE did for each pound created.

Thus monetary financing of the deficit would not need to be undertaken on the same scale as QE. It would also avoid some of the negative side effects - larger pension fund deficits and lower annuity rates – that arise when government bond yields are driven down by central bank purchases.

Toxic reputation of monetary financing of the deficit

However, in practice this policy has gained an extremely dangerous reputation, being seen by many as the road to hyper-inflation. This reflects four main concerns:

- When government asks the central bank to finance its deficit through money creation it implies to some that the monetary authorities have fallen completely under the control of government and are simply following an instruction to print money at the behest of their political masters.
- The seemingly permanent nature of the money creation, as the central bank may not appear to have a clear exit route to unwind the policy. This contrasts with say QE, which is explicitly temporary and can be unwound by the central bank selling government bonds back to the market.

- The apparently on-going nature of the policy - governments running on-going deficits may seek central bank finance on the same basis. While a one-off exercise in money creation may not be seen as inflationary, a continuous one certainly will.
- The history of monetary financing of deficits, which has been associated with previous infamous cases where hyperinflation was indeed the final result, including the Weimar Republic and more recently Zimbabwe.

For these reasons the financial markets are likely to take a very unforgiving stance with any country that embarked upon this policy and politicians will want to avoid the controversy associated with it. But it is worth questioning the assumption that monetary financing of the deficit is always bad policy. The concerns above, which underpin the view that the policy is dangerous, can be questioned as follows:

- It must be possible for an independent central bank to make an informed judgement that an exercise in money creation distributed into the real economy through government spending is an optimal policy. In practice it is of course highly unlikely that any western central bank would do so, but this reflects the extreme stigma attached to the policy more than a logical appraisal of its efficacy as a policy option.
- There is no reason why the rise in the monetary base need be permanent. The loans that the central bank extends to the government under this policy could have redemption dates set by the central bank based on its appraisal of when the money creation might best be reversed. On redemption, government would repay the loan: whether this was funded by higher taxation or new government borrowing from the private sector, at this point the money creation would be automatically reversed.
- An independent central bank could choose to undertake a one-off exercise in money creation - there is no more reason for this policy to be carried out in an on-going fashion than with QE or CE. Just as with QE, it would be for the central bank to determine whether the policy should be continued. And it is worth bearing in mind that the Fed has already pursued a policy of on-going asset purchases over an extended period.
- The historical examples that haunt policymakers are of limited relevance when considering the options available to a western central bank operating independently with a statutory mission to maintain price stability.

Indeed, at first sight monetary financing of the fiscal deficit seems to have considerable similarities with QE. In both cases the central bank is creating money to purchase

government debt. With QE, the direct link with government is avoided as all purchases are made in the secondary market and the policy is explicitly stated to be temporary. But government bond yields are reduced, making it cheaper for governments to borrow, increasing the sustainability of fiscal deficits. This could certainly allow a government to maintain spending at higher levels than it would otherwise be able to, particularly given that QE has become an on-going policy where purchases have been made on a repeated basis.

It seems that the fundamental political difference between QE and a monetary financing of the deficit is that central bank purchases of debt direct from government carry with them a sense that the central bank is somehow endorsing the government's fiscal policy.

Unwinding a monetary financing of a fiscal deficit

Many economists would characterise a monetary financing of the fiscal deficit as a temporary fiscal deficit financed by a permanent increase in the monetary base. However, as argued above, this need not be the case. The bonds or loan issued by the government to the central bank in exchange for new money can be of any maturity and upon maturity the money creation will be automatically reversed unless rolled over into another bond or loan from the central bank. Only in the case of a perpetual bond would it be correct to say the increase in the money supply was permanent.

Deficit monetisation

One permutation of monetary financing of the deficit put forward by the Australian economist Richard Wood, which he coins 'deficit monetisation', involves the central bank assigning the right to create money to the government to some predetermined extent. This would eliminate the need for the government to incur a debt to the central bank and would therefore allow the government to run deficits without a corresponding rise in its total indebtedness. There are clear similarities here with the policy of debt cancellation discussed in Section 4.3 below.

Wood argues that as fiscal sustainability is a function of government debt levels rather than the size of cumulative deficits, such a policy could simultaneously maintain demand whilst improving the fiscal position. According to Wood 'Maynard Keynes, Abba Lerner, Milton Friedman, Ben Bernanke and, most recently, Max Corden, Richard Wood, Willem Buiter and Anatole Kaletsky have all advocated consideration of this general approach for use in appropriate circumstances'.

While such a policy could involve a permanent increase in the monetary base it could equally be reversible if, for example, the central bank required that government unwind the money creation after a certain period or in the event of certain economic objectives being met (e.g. unemployment falling below a certain level).

To those who view any monetary financing of fiscal deficits as a dangerous threshold not to be crossed, handing control over the creation of money to government would surely be seen as an even more unsupportable step, even if the terms by which government was allowed to create money were set by the central bank.

Moreover, the central bank would witness the same rise in commercial banks' reserves whether the money creation had been undertaken by the central bank or the government. This would create the problem for the central bank discussed in Section 4.3 below, namely that it would have potentially interest bearing liabilities (the new reserves) and no corresponding asset.

4.2 Helicopter drop

Description

Macroeconomic literature famously contains the concept of the helicopter drop, first put forward by Milton Friedman in 1969. This is the notion that a central bank could, if it chose, print large quantities of bank notes and distribute them to the population literally by dropping them from a helicopter. The imagery is designed to remind us of the potential potency of monetary policy in a fiat money system. The central bank can create money without limit.

The helicopter drop is not as far-fetched as it may sound. It is perfectly possible to create money and distribute it directly to the population - which is the economic essence of the helicopter drop. Once a decision has been taken to do so, the main issue becomes how to distribute the funds in a way that is equitable. A literal helicopter drop would be grossly unfair - anyone standing in the right street would benefit at the expense of those who were elsewhere. But the tax code or census could be used to identify every taxpayer or household to provide a lump sum to each.

Indeed one-off payments to the population have been made in a number of jurisdictions in the past. These payments have generally been confined to countries where the fiscal authorities have accumulated cash surpluses but this need not always be the case.

So an injection of cash directly targeted at ordinary citizens is practical and could be coupled with central bank money creation (although in contrast to the helicopter drop in a modern economy it would undoubtedly take the form of an electronic payment rather than printing notes). For the central bank this would involve advancing funds directly to government in the same manner as seen in a monetary financing of the deficit.

A number of leading economists have come out in support of a helicopter drop in principle including Adair Turner, Susil Wadhvani and Willem Buiter. That such esteemed economists support the concept of a monetary financed direct cash distribution to the population highlights the fact that, although this unconventional monetary policy option has not been adopted since 2007, it has not been completely dismissed either.

Objective

The objective of a helicopter drop would be to stimulate nominal demand, perhaps after other less controversial measures such as zero policy rates and QE had been tried and failed to provide the required boost. A helicopter drop would be most appropriate for an economy stuck in deflation as such an increase in the money supply would be expected to result in an upward shift in inflation expectations. But even when deflation was not present, a helicopter drop might be seen as an appropriate way to counter deficient aggregate demand.

Transmission mechanism

In common with a monetary financing of the fiscal deficit, the helicopter drop bypasses the monetary transmission channels used in most unconventional monetary measures implemented to date (the banking system and the fixed income market). Instead the helicopter drop relies on recipient households spending the proceeds to boost demand.

However, the policy does inject an element of uncertainty into the final impact on demand which is not present when newly created funds are spent by government. In uncertain economic conditions, when the conventional transmission mechanisms are not working as normal, households may also be inclined to save an abnormally large proportion of any windfall they receive or use it repay debt. Indeed Ricardian equivalence could be used to suggest that households in aggregate will understand that on a net basis they are no better off¹², and thus not increase their spending.

Unwinding a helicopter drop

Following Milton Friedman's original approach, it is usual for economists to characterise a helicopter drop as a temporary fiscal give-away financed by a permanent increase in

¹² Ricardian equivalence would apply either if you believed that households viewed money as a liability of the government or if households believed that any increase in the monetary base would need to be reversed at some future date. However, Ricardian equivalence would not apply if the increase was believed to be permanent and households did not categorise base money as government debt. Moreover, distributional effects are likely to support demand – the poorest households receiving such a windfall could spend it safe in the knowledge that they are unlikely to share an equal burden should the authorities decide to reverse the money creation at some future date.

the monetary base. However, as with a monetary financing of the deficit, this need not be the case. When the central bank provides the government with newly created money the government is incurring a debt to the central bank. This debt can be of any maturity and upon maturity the government will repay the central bank, automatically reversing the money creation regardless of whether the repayment is made out of taxation or the issuance of new government debt to the public. Only in the case of a perpetual bond would it be correct to say the increase in the money supply was potentially permanent.

Similarity of the helicopter drop to monetary financing of the deficit

There is a difference of emphasis between a monetary financing of the deficit, which tends to be thought of as supporting government expenditure on an on-going basis, and a helicopter drop which is likened to a one-off tax cut. But the distinction is superficial. Both policies use newly created money to fund part of the fiscal deficit and either could be implemented as a one-off or on an on-going basis. While the emphasis with monetary financing of the deficit is usually placed on increasing expenditure, this need not be the case - it could be carried out to fund tax cuts rather than higher expenditure.

Could a helicopter drop be conducted as pure monetary policy?

In the economic literature a helicopter drop is seen as a money creation exercise coupled with a decision on its distribution that amounts to determining how a tax credit should be implemented. It is thus seen as a combined monetary and fiscal measure. This creates the same impediment to the policy gaining acceptability as a monetary financing of a fiscal deficit - the monetary authorities risk being perceived as being at the behest of the fiscal authorities.

However, the helicopter drop could be thought of as purely a monetary policy measure - a decision by the central bank to distribute new cash requiring no intervention by the fiscal authorities. However, there is a complication with such a central bank determined helicopter drop.

If a central bank prints notes and gives them away, it creates a liability that will be reflected in higher commercial bank reserves, since the central bank cannot prevent some of the new notes being deposited in the banking system. In contrast with the conventional interpretation of a helicopter drop, where the government borrows from the central bank, the central bank will hold no corresponding asset. On the face of it, the central bank's balance sheet will no longer balance.

This is more than just an accounting issue. It can affect the central bank's ability to pay its way over time. In its future operation of monetary policy, the central bank may at times be required to pay interest on the extra reserves it has created. If there is no corresponding asset there will be no corresponding income to meet this future stream of payments.

There are ways that a central bank could, in theory, conduct a helicopter drop alone and overcome this issue. It could recognise the current discounted value of future seigniorage as an asset on its balance sheet to plug the hole created by the helicopter drop. And it would be able to fund the on-going interest cost of higher reserves as long as its income from seigniorage on the rest of its balance sheet was sufficiently large. But despite the possible economic benefits of a helicopter drop carried out independently by the central bank, it is unlikely that any central bank would want to place itself in the position where it had eroded its future profitability in this way. This issue is discussed in more detail in Section 4.3 below.

4.3 Cancelling government debt

Description

Some commentators have argued that the government should consider cancelling some of the debt bought by the Bank of England under the QE programme. At first sight this might be thought of as fiscal policy, as it would be a decision for government as to whether to cancel its debt. However, it is possible that the decision to cancel debt held by the central bank could be delegated to the central bank and could under these circumstances be considered a form of unconventional monetary policy.

Supporters of this measure point out that the government and central bank can be thought of ultimately as one consolidated entity as government is typically the sole shareholder of the central bank. So cancelling a debt already held by the central bank would be a straightforward netting off of an asset and equal liability from one part of the public sector to another which would not adversely impact any parties in the private sector.

Objective

Supporters argue that this policy would have two main advantages: it would reduce the government debt to GDP ratio, improving fiscal sustainability; and it would transform the temporary increase in the monetary base seen with QE into a permanent gain. It is argued that signalling that money creation will be permanent (i.e. will not be reversed), will increase its potency in affecting the real economy.

Transmission mechanism and unwinding debt cancellation

Cancelling government debt that has already been bought by the central bank has no effect on the private sector's current financial position. It would work either by allowing the government to run a more expansionary fiscal policy in the future or by altering expectations of when the money creation would be reversed.

These effects could be quite significant however. The impact of QE could be weakened by concerns about its reversal. For example suppose that QE has increased a bank's deposits and reserves by £10bn. This might be expected to encourage the bank to increase lending to the real economy. However, if the bank believes the policy could be reversed in the near future, it will not want to commit to lending the funds for long durations.

However, as QE is supposed to be unwound when improvements in the economy justify it rather than on any fixed time frame, you would expect that agents would largely disregard the risk that the central bank prematurely exits from QE. Indeed, QE can be kept in place for as long as the central bank believes it to be beneficial, which in theory could be permanently.

As long as the central bank retained the debt however, the government debt to GDP ratio would remain unaffected. Only outright debt cancellation would reduce the government's stated indebtedness. However, if at some future date it was deemed necessary to reverse the money creation, some debt instrument would need to be issued in exchange for the cash that was being withdrawn from the economy. Thus, the government's debt to GDP ratio can only be permanently reduced through debt cancellation if the corresponding rise in the monetary base is also permanent. If agents believe that the monetary base would have to be shrunk back at some point in the future, they might conclude that even debt cancellation was only temporary and thus discount it.

Impact of debt cancellation on central bank

With debt cancellation the central bank is depriving itself of an asset without removing the corresponding liability on its balance sheet - the commercial bank reserves that were created when the bonds were purchased. So the central bank would have a hole in its balance sheet and the on-going liability to pay a return on reserves with no corresponding income.

This hole in the central bank's balance sheet and profit and loss account has led some economists to argue that a debt cancellation of this kind is not possible. However, this is not necessarily the case. Accounting techniques could be deployed to plug the hole in the balance sheet. The central bank could recognise the current discounted value of future seigniorage as an asset to replace any cancelled debt. And the central bank would remain profitable as long as seigniorage on the rest of its balance sheet was sufficient to outweigh the negative seigniorage on the newly created money that was the counterpart to the cancelled government debt.

But ultimately, it would always be possible for the government to inject additional capital into the central bank's balance sheet to fill any holes. This could be achieved by

the central bank delegating the authority to create money to the government to the value of the cancelled debt. The government could create the funds and inject them into the central bank as equity capital which would then be written off.

So the cancellation of government debt by the central bank is feasible, but its impact on the economy will depend on the extent to which it shifts agents' views as to the permanence of the money creation and corresponding debt reduction. If it convinces people that a temporary monetary boost has become permanent it could have quite a large positive impact on activity.

4.4 Monetary credit extension

Description

Another possible policy innovation that has been suggested would see newly created money lent directly to final borrowers. This could be achieved through the establishment of a state owned commercial bank. The central bank could advance newly created funds to this commercial bank under a loan agreement, with the state owned bank required to lend the funds to ordinary borrowers.

The idea of using state owned banks to lend has been raised in the UK since the financial crisis. It has been suggested that Northern Rock Asset Management, which has been fully owned by the state since early 2008, could be used to lend directly to mortgage borrowers. Vince Cable has also raised the concept of a state bank to encourage lending to SMEs. Although the funds for such lending could come from other sources e.g. redeeming mortgages in the case of Northern Rock, the use of new central bank money would help to maximise the effectiveness of the policy.

To use newly created money to lend to ordinary borrowers would be highly controversial however. A wholly state-owned bank would be required to make lending decisions, choosing between thousands of individual borrowers. Although it could make such decisions on an entirely arms length basis, free from any political involvement, it would nonetheless be seen as unfair competition for other commercial banks and therefore market distorting.

Objective

A monetary credit extension would ensure that money creation was converted directly into funds for borrowers, which should boost demand more effectively than relying on a weakened banking system to do so. It would also avoid the need to subsidise banks in the private sector.

Transmission mechanism

This policy would differ from the FLS in that rather than using newly created funds to improve credit availability indirectly by using them to fund banks, and relying on the banking transmission channel to work effectively, this policy would see this transmission mechanism bypassed with funds lent directly to final borrowers. This would have the advantage of ensuring that the level of funds available to final borrowers would be increased with certainty, against the uncertainty of attempting to induce banks in the private sector to increase credit availability.

Unwinding a monetary credit extension

Directly unwinding the assets that the central bank would have accumulated under this policy would be more protracted than selling government bonds back to the private sector. These assets will be loans to the state bank which could presumably be sold off but they are likely to be quite illiquid.

However, if the central bank was faced with a need to slow money growth at some point in the future it would not have to wait until it found a buyer for these loans. It could reverse the previous money creation by issuing other debt instruments, delinking the timing of its reversal of money creation from the disposal of the assets acquired through money creation.

4.5 Monetary induced currency depreciation

Description

The unconventional monetary policy measures that involve creating new money balances that have been taken to date (QE, CE, ECS) have been focused on the two primary transmission mechanisms (longer term interest rates and the banking system). But it is recognised that they will have impacted another important though less direct transmission mechanism - the exchange rate.

A policy such as QE or CE, which increases the outstanding stock of money and drives down long term interest rates would be expected to reduce the currency's value relative to other currencies where similar policies were not being pursued. This would be the case even where the policy was accepted as being only temporary. However, it would clearly be an option for central banks to operate an unconventional policy that specifically and deliberately targeted the exchange rate. The central bank could use newly created money to intervene directly in the foreign exchange markets, increasing its foreign currency reserves by selling its own currency.

Objective

A monetary induced currency depreciation would stimulate activity by providing a competitiveness boost to domestic producers who are exporting their products or competing with imports. Such a policy is likely to be highly controversial as it amounts to an explicit competitive currency devaluation, disadvantaging other countries.

But where the two primary traditional transmission mechanisms (longer term interest rates and the banking system) are impaired, policy makers may well be tempted to resort to manipulation of the exchange rate as a more effective channel to boost demand, although this is more likely to take the form of signalling a desire to see the exchange fall rather than explicit use of new money to buy foreign currency.

A country that might be forgiven for considering such a policy would be one that had experienced a consistently lower rate of inflation (or higher rate of deflation) than its competitors, leading to an upward trend in its exchange rate, which in turn would reinforce the deflationary forces in the economy. If breaking out of this negative spiral required a policy to depress the exchange rate, it might be considered justified by many.

Although Japan is not using newly created money directly in the foreign exchange markets to depress the value of the yen, it is the country that has come closest to such a policy solution. Under prime minister Shinzo Abe, Japan is pursuing a large scale programme of QE coupled with a commitment to drive down the yen to get inflation up to 2%. Although it is too early to judge the overall effectiveness of the policy, it has certainly succeeded in reducing the value of the yen.

Unwinding a monetary induced currency depreciation

Reversing a policy where the central bank bought foreign currency with newly created money would be relatively straightforward. The foreign currency could be sold back into the market to purchase domestic currency which could then be cancelled. This would, of course, tend to push the exchange rate back up but a similar concern exists with policies such as QE and CE, where a reversal will push prices down (and yields up) in the markets they work through.

4.6 Government borrowing from the banking system

Description

The final alternative unconventional policy considered in this paper can only be described as monetary insofar as it affects the level of the money supply. It is carried out by government rather than the central bank and does not affect the size of the

monetary base. Under this proposal, rather than issuing bonds the government finances at least part of the deficit by borrowing from the banks.

When the government runs a deficit financed by borrowing from the non-bank private sector the quantity of money in circulation remains unchanged. However, if the government borrows from the banks, the money supply will rise. Under these circumstances a fiscal deficit would stimulate monetary expansion, reinforcing its positive effects on aggregate demand. One advocate of this approach is the monetary economist Tim Congdon.

This policy can be contrasted with QE in its affect on the banking system. Whilst QE increases the supply of deposits, this policy raises the demand for loans. It may therefore raise interest rates on bank loans and risk an element of crowding out of private sector borrowers in a way that QE does not.

Objective

The objective of this policy is to stimulate an increase in the money supply to boost aggregate demand. When a bank makes an additional loan it is also creating an additional deposit within the banking system, so government borrowing from banks will create an increase in aggregate deposit balances. Monetarist economists like Tim Congdon argue that the nominal level of deposits plays a crucial role in determining nominal demand, so the rise in deposits that this policy induces should boost aggregate demand.

Transmission mechanism

When government borrows from the banking system, the transmission mechanism is through the banking system as well as via any increase in government expenditure. But this policy differs from QE or CE because here, the government is stimulating bank lending which automatically increases bank deposits whilst QE and CE produce new bank deposits which do not automatically stimulate bank lending.

Although this policy does not involve the government or central bank creating a new source of funding for banks in the way that QE, CE and LTRO do, at a banking system level it creates its own funding because each new loan is also a new deposit. However, individual banks cannot be certain that *their* deposits will rise, which may still make some banks cautious about extending new loans to government when funding is scarce.

Unwinding the borrowing

How quickly the policy could be unwound would depend on the maturity of the loans extended by the banks. If the government borrows under long term loan agreements,

the increase in the money supply will not be reversed quickly unless the government exercises an option to repay early. But if the loans were of shorter duration, say a few years, then like the LTRO or FLS, the policy could be allowed to automatically terminate on that shorter timeframe unless the decision was made to roll the loans over.

Section 5 - Categorising and evaluating unconventional monetary policies

5.1 Categorising unconventional monetary policy measures

Table 1 - Categorising unconventional policies

	Money creation	Direct assistance to banks	Directly reduce longer term interest rates
Implemented policies:			
Quantitative easing (QE)	Yes	No	Yes
Credit easing (CE)	Yes	No	Yes
Enhanced credit support (ECS)	Yes	Yes	No
Negative central bank rates	No	No	No
Operation twist	No	No	Yes
Forward guidance	No	No	Yes
SMP and OMT	No	No	Yes
Special liquidity scheme (SLS)	No	Yes	No
Funding for lending scheme (FLS)	No	Yes	No
TALF	No	Yes	Yes
Related fiscal policies			
TARP	No	No	Yes
Bank recapitalisation	No	Yes	No
Credit guarantee scheme (CGS)	No	Yes	Yes
Asset protection scheme (APS)	No	Yes	No
Proposed policies:			
Monetary financing of deficit	Yes	No	No
Helicopter drop	Yes	No	No
Cancelling government debt	No	No	No
Monetary credit extension	Yes	No	Could be
Monetary currency depreciation	Yes	No	No
Government borrowing from banks	Yes	Yes	No
Monetary investment fund	Yes	No	No

It is possible to place unconventional monetary policies into certain broad categories based on key common features. One obvious way to categorise these policies is by whether they involve money creation (see 5.1.3. below). This is shown in the first column of Table 1.

It is worth noting that the policies where money creation has been deployed could have been conducted by the central bank issuing a debt instrument instead and thereby

sterilising the impact of increasing the asset side of its balance sheet (i.e. not altering the size of the money supply), as the ECB did with its SMP and OMT programmes. There is considerable debate amongst economists about whether QE and CE affect the economy mainly through the asset purchases or through the impact that money creation has on bank behaviour. Some economists believe that it makes little practical difference whether asset purchases are financed by creating money or issuing debt.

Another way to classify measures is by the transmission mechanism that they rely on. Although a wide range of unconventional monetary policies have been implemented since 2007, almost all of them have relied on the 'conventional' transmission mechanisms of either using the banking system or the fixed income market or both. Use of the banking system and fixed income market is shown in the final two columns of Table 1.

5.2 Evaluating tested policies

Having attempted to group unconventional monetary policy into broad categories in Section 5.1 above, Section 5.2 seeks to evaluate these broad categories.

5.2.1 Lack of effectiveness of conventional transmission mechanisms

The policies outlined in Section 2 may be unconventional, but as stated above, almost all of them rely on the two primary conventional transmission mechanisms by which monetary policy affects the real economy: by way of the banking system and via the fixed income or long term bond market.

Dependence on these conventional transmission mechanisms has a clear drawback: the kind of economic environment in which conventional monetary policy becomes ineffective is also likely to be an environment in which these traditional transmission routes are least effective. If holding the policy rate at the lower bound fails to stimulate demand sufficiently it is likely to be because private sector agents are reluctant to increase their borrowings. Under such circumstances, lowering longer risk free rates or incentivising banks to lend is also likely to have only a limited stimulative effect. This situation could be described as a form of liquidity trap¹³.

¹³ As Tim Congdon has pointed out, there are a number of different economic situations that have been referred to as 'liquidity traps'. We refer to the situation where monetary policy is ineffective because the private sector perceives itself to be over-indebted and does not want to accumulate further debt regardless of the cost.

In particular, long term fixed rate bonds are subject to the lower bound just as short term rates are. Once long term interest rates have fallen to zero, QE will become an ineffective policy tool. This is a position that Japan is very close to, raising a serious question mark over whether its decision to increase the scale of QE is really the best policy remedy under the circumstances.

5.2.2 The perversity of encouraging more indebtedness

Since the financial crisis was the result of a combination of excessive debt levels amongst final borrowers and excess leverage amongst financial intermediaries, policies designed to induce additional indebtedness amongst private sector final borrowers, some using the banking system as facilitator, might seem like a perverse remedy.

Ideally policymakers should be looking for policies that reduce the debt burden by stimulating sustainable growth (i.e. improving the supply side of the economy rather than trying to pump up demand by making debt more available). This objective has been widely acknowledged in the UK, couched in terms of the need to rebalance the economy away from an over-reliance on domestic consumption and debt towards exports and investment.

5.2.3 Moral hazard of encouraging further indebtedness

The arguments above can be taken a stage further. It is not only perverse to encourage agents in an economy to take on more debt as a policy remedy to a crisis caused by excessive debt. It also creates a moral hazard. If agents come to see that excessive borrowing, if carried out sufficiently widely across an economy, is always met with a policy of bailing out debtors, the risk must be that agents will collectively engage in more excessive borrowing.

Policies that rely on the banking system as the transmission mechanism also suffer from moral hazard. The banking system can only be induced to extend more credit to the real economy by means of a financial incentive. These policies thus involve an implicit subsidy to banks which might seem undesirable at any time. But to subsidise banks to lend in the wake of a financial crisis which was in part caused by some banks' previous excessive lending underpinned by a backstop of government support would seem to be compounding the fault lines exposed by the financial crisis.

5.3 Critique of individual unconventional monetary policies

This paper now examines in turn each individual unconventional monetary policy that has been put into effect, asking how effective each has been at meeting its objectives and what side effects or unforeseen consequences have resulted.

5.3.1. Quantitative easing (QE)

Effectiveness in meeting objectives

QE does seem to have met the objective of supporting aggregate demand and also has helped to stabilise the banking system.

Key advantages

- Asset purchases made in the government bond markets are made in large, liquid and transparent markets that form a benchmark for pricing in other fixed income markets. It thus directly reduces interest rates out along the yield curve for the full range of borrowers.
- For countries that control their currency, government bonds carry in effect no default risk making this an attractive asset for central banks to hold.
- Avoids directly distorting specific private sector financial markets and instruments, avoiding need to pick winners in the private sector.
- Improves the safety of the banking system by increasing its deposit funding and liquidity.
- Should be straightforward to reverse by selling bonds back to private sector although care needs to be taken over speed of reversal to avoid instability in yields and banking system.

Key disadvantages

- Relies to a large extent on the impact of long term risk free rates to stimulate the broader economy, which can be a weak effect in economies such as the UK where the private sector borrows mainly at short term interest rates.
- Relies heavily on stimulating further private sector borrowing, both through its impact on bond markets and on the banking system.
- Provides artificial support to government bond market reducing incentives for responsible fiscal policy and flattering the true state of the public finances. This risks undermining confidence in central bank independence.
- By artificially depressing yields on government bonds it disadvantages those institutions and individuals that depend on this safe asset e.g. pension funds and annuity purchasers.

- It has not had the expected positive effect on investment but rather, by boosting asset prices across the economy, it advantages the rich and has relied to a large extent on their increased spending to boost economic activity.

Overall assessment

It should come as no surprise that QE has been the most popular form of unconventional monetary policy. QE works through both of the two main traditional transmission mechanisms because of its ability to drive down long term interest rates whilst improving the stability of the banking system by increasing deposits. Government bonds are obvious assets for central bank purchase – large, liquid and transparent markets which offer a degree of neutrality and no effective credit risk. But by working through banks and debt markets QE encourages further debt accumulation and has increased inequality.

5.3.2. Credit easing (CE)

Effectiveness in meeting objectives

CE has helped to support key non-government debt markets like the US mortgage backed securities market, which has underpinned aggregate demand. Like QE it has also helped to stabilise the banking system.

Key advantages

- Targeted at specific non-government debt markets that may not be operating effectively, providing a more direct stimulus to the economy than QE.
- Improves the safety of the banking system by increasing its deposit funding and liquidity.

Key disadvantages

- Directly distorts specific non-government debt markets and is unlikely to have the same economy-wide impact as QE due to its focus on specific non-government debt markets.
- Encourages private sector borrowers to take on more debt than would otherwise be the case.
- May be difficult to unwind when broader economy recovers without a destabilising rise in interest rate in target markets.

Overall assessment

CE offers one significant advantage over QE in that it works through specific non-government credit markets, so can be targeted more carefully at those markets that needs the most assistance. But this targeting gives rise to greater credit risk for the central bank and fewer economy-wide effects.

5.3.3. Enhanced credit support (ECS)

Effectiveness in meeting objectives

The ECB's LTRO programme was highly successful at meeting its objective of supporting the euro zone banking system at a time when it was facing unprecedented stresses.

Key advantages

- Stabilised the banking system when some institutions were facing severe funding shortage.
- Provided indirect support for government bond markets that were facing severe pressure.

Key disadvantages

- Is a subsidy to banks that is proportionate to their difficulties (i.e. provides the greatest subsidy to the weakest banks and therefore contains a severe moral hazard).
- Indirectly provides artificial support to government bond markets reducing incentives for responsible fiscal policy and flattering the true state of the public finances.
- Risks increasing the toxic interplay between bank solvency and national fiscal instability.
- May be difficult to unwind as support is focused on banks that private sector investors may consider too risky.

Overall assessment

Although effective at supporting the euro zone banking system when sections of it were under extreme pressure, ECS has left the ECB with a large exposure to many banks that

may only survive due to further state subsidies. ECS has also created a serious moral hazard by failing to include a mechanism to price for the relative riskiness of each bank using the facility.

5.3.4. Negative interest rates on central bank reserves

Effectiveness in meeting objectives

Negative interest rates on commercial banks' reserves at the central bank seem to have been successful in Denmark, where the central bank wanted to curtail an inflow of capital to cap upward pressure on the exchange rate which is pegged to the euro. It should also encourage more bank lending.

Key advantages

- Encourages banks to increase lending without providing them with a subsidy.
- Does not distort specific debt markets.

Key disadvantages

- Will reduce the profitability of banks which may require them to increase the cost of credit to final borrowers.

Overall assessment

There is still limited evidence on the impact of negative interest rates on reserves with the central bank. But this looks like a relatively uncontroversial policy that, refreshingly, does not include an implicit subsidy to the banking system and should have been tried more widely.

5.3.5. Operation twist

Effectiveness in meeting objectives

Operation twist seems to have had only a modest impact on interest rates and aggregate demand in the US. But it was a policy that came at a low cost so could still be considered a modest success.

Key advantages

- Reduces longer term risk free rate without the need to resort to money creation.

Key disadvantages

- Provides artificial support to long term bond markets, which could distort these markets encouraging excessive borrowing in them.
- Less effective at stimulating private sector demand in economies where agents do not borrow heavily at long term rates of interest.

Overall assessment

Operation twist was a relatively uncontroversial policy but one which is unlikely to be attractive to policymakers outside the US, given the lesser role that long term debt markets play for private sector borrowers outside the US.

5.3.6. Forward guidance

Effectiveness in meeting objectives

Forward guidance is only effective at reducing the longer term risk free rate if it can convince the market that the central bank will pursue a more accommodative policy stance in the future than the market had previously believed it would. This can only be the case if the central bank either changes its underlying reaction function or if the market had previously held a misconception about the central bank's reaction function which the central bank has now clarified.

In explaining forward guidance, the Bank of England took the line that it had not changed its reaction function, implying that it believed the market misunderstood how it took account of the unemployment rate when setting rates. However subsequent events, with unemployment falling rapidly towards the trigger rate of 7% at the end of 2013, prompted the Bank to distance itself from 7% unemployment as a trigger point. This in turn gave the impression that the Bank of England never saw 7% unemployment as the key element in its reaction function that its policy of forward guidance had implied. The policy has sown confusion and thus not been a success in the UK.

Key advantages

- If effective, reduces longer term risk free rate without the central bank having to undertake any market operations.

Key disadvantages

- Has proved difficult to communicate effectively to the markets and the public.

- Has proven of limited value in the UK when unemployment fell rapidly towards the trigger rate, leading to the Bank of England shifting quickly away from target.

Overall assessment

Perhaps the most obvious advantage of this policy, if it is effective, is that it can reduce long term interest rates without the central bank having to undertake market operations. This should minimise the risk of market distortions.

However, the policy can only be effective at reducing longer term risk free rates if it persuades the market that a central bank will operate looser policy into the future. If the market is rational and can forecast the future as accurately as the central bank this suggests that, unless the central bank has changed its reaction function, the market must have been systemically misjudging the central bank's reaction function. As this seems unlikely, there must be a question mark over the effectiveness of the policy.

5.3.7. SMP and OMT

Effectiveness in meeting objectives

The objectives of the ECB's SMP and OMT were to support specific national government debt markets that were under pressure due to market fears of default or redenomination. In this respect they were indeed successful, calming these markets by showing there was a backstop buyer.

Key advantages

- Provided direct support for government bond markets that were facing severe pressure and thereby helped to avert a serious potential fiscal crisis.
- Helped to improve the balance sheets of banks in the affected countries as these banks held substantial portfolios of government debt.

Key disadvantages

- Provides artificial support to government bond markets creating a moral hazard and reducing incentives for responsible fiscal policy.
- Provided an implicit subsidy to banks in affected countries by artificially increasing the market value of their government debt portfolios.

Overall assessment

These policies can be criticised on the grounds that they create a significant moral hazard. If euro zone countries can see that the profligate are bailed out by the ECB they lose the incentive to run responsible fiscal policies. However, at a time of crisis such arguments have to take a back seat to the need to prevent a negative fiscal spiral that could become much more damaging, and the SMP and OMT did help to avert such a spiral.

5.3.8. Special liquidity scheme (SLS)

Effectiveness in meeting objectives

The SLS helped to stabilise the banking system when wholesale funding markets were dysfunctional and in doing so helped to maintain the flow of credit to the real economy, so the scheme met its aims, although government was disappointed with the weakness of the recovery in bank lending.

Key advantages

- Stabilised the banking system when some institutions were facing a severe funding shortage, helping to restore confidence in the banking system.
- Helped to partially restore the effectiveness of the banking transmission mechanism as it allowed banks to continue to fulfil their function of providing credit to the real economy.

Key disadvantages

- Was a subsidy to banks, exacerbating the moral hazard of public support for banks.
- Did not include a mechanism that ensured that banks maintained lending to the real economy.

Overall assessment

The SLS was a sensible response to an environment in which many banks found it difficult to obtain wholesale funding and were responding by shrinking their lending. The scheme was concerned with maintaining financial stability rather than boosting demand, and considering this objective must be deemed a success.

5.3.9. Funding for lending scheme (FLS)

Effectiveness in meeting objectives

The FLS followed on from the SLS but with a much greater emphasis on increasing banks' lending to the real economy to maintain aggregate demand. By the time the FLS was launched the banking system was in a more secure position but was still reluctant to expand lending. By the third quarter of 2013 outstanding drawings totalled £23.1bn but net lending by the lenders participating in the scheme only turned positive in that quarter, reaching a cumulative £3.6bn. Lending was thus disappointing during the first year of the scheme which caused some commentators to judge it relatively unsuccessful.

Key advantages

- Provides a mechanism to directly incentivise banks to increase lending to the real economy, potentially boosting aggregate demand.

Key disadvantages

- Is a subsidy to banks, exacerbating the moral hazard of public support for banks.
- Distorts lending and savings markets by, for example, artificially depressing rates paid to savers and artificially depressing borrowing rates.

Overall assessment

Of all the new policies tried since 2007, the FLS stands out as the most overt attempt to get the banking system to increase its lending to the real economy. It provides a direct subsidy to banks to lend in the form of cheap funding which is available if banks manage to increase their lending. This may help to restore the banking transmission mechanism but increases moral hazard.

5.3.10. Term asset backed securities loan facility (TALF)

Effectiveness in meeting objectives

The TALF was designed to support key US credit markets which had ceased functioning effectively in the financial crisis by incentivising a wider range of institutions to participate as purchasers. The scheme successfully supported these debt markets without exposing the Federal Reserve to the same risks that it would have run if it had made direct asset purchases.

Key advantages

- Maintained the supply of credit through key funding markets when these became dysfunctional, supporting economic activity.
- Limited the risk to the central bank by placing it in a second loss position behind the investor and ensured that the investor rather than the central bank made and priced the investment decision.
- Broadened the availability of central bank funds away from just banks, limiting the moral hazard compared to schemes using the banking system as the transmission mechanism.

Key disadvantages

- The investors who took TALF funding had all the potential upside from buying in distressed debt markets, but the Federal Reserve had some material risk as the loans were non-recourse.

Overall assessment

The TALF was an effective answer to the dislocation in key US securitised debt markets such as auto loans and credit cards in the wake of the financial crisis. It was designed to maintain the flow of credit through these markets to ordinary borrowers, whilst leaving it to private sector market participants to make the investment decisions and allow the market to set the price. This lessened the degree of distortion that central bank support entailed and lessened the moral hazard as Fed funding was available to a wide range of institutions. The policy must be judged a clear success.

5.4 Critique of proposed unconventional monetary policies

Having considered the merits of the policies tried to date we now turn to the policy proposals that have not so far been taken up. How viable are the proposed unconventional monetary policies outlined in Section 4? Have central banks failed to adopt them because they are unworkable in practice or entail damaging side effects? Or is it simply a lack of imagination or fear of market misinterpretation that is holding central banks back from policies that are more out of the norm? Below, we consider each policy in turn.

5.4.1. Monetary credit extension

Of the measures discussed in Section 4, a monetary credit extension is arguably the closest to the unconventional monetary policies that have been adopted to date. It involves using newly created funds to lend to the private sector (either firms or households) but rather than relying on an impaired transmission mechanism as the SLS or FLS do, it does so directly through a state controlled bank. But this policy is still seeking the same result: to stimulate demand by increasing private sector borrowing. This policy would be more effective in all likelihood as a state controlled bank could ensure that lending increased. But it would come at the cost of a degree of state involvement in the lending market that would no doubt be seen as distorting and anti-competitive.

Conclusion: This policy is likely to be unattractive to central banks given the state involvement in commercial lending it entails.

5.4.2. Helicopter drop

In contrast the helicopter drop puts newly created funds directly into the pockets of the general public. This has the advantage of being a more certain way to boost aggregate demand than stimulating borrowing. It also avoids the need to increase private sector indebtedness still further and potentially provides a more uniform distribution of the rewards of money creation, as it can be implemented as a uniform payment to each household or taxpayer.

Given the concerns about over-indebtedness you might have expected such a policy option to receive more serious consideration. A helicopter drop-style policy may have been deemed too radical because distributing newly created cash directly to the population would involve too close a co-operation between government and central bank and therefore would be seen as too political.

Central banks may also have feared that a cash transfer to citizens would unleash a short term consumer boom. In contrast, it had been hoped that QE would work by boosting investment, but in practice this appears not to have been the case. Rather QE seems itself to have stimulated demand mainly via higher consumption by those who enjoyed rising wealth as bond and share prices moved higher. Had the redistributive effect of QE towards these asset owners been more visible, the policy would surely have been viewed in a more negative light and the helicopter drop seen as a viable alternative.

Conclusion: The helicopter drop should have been seen as a serious policy option as it offers significant advantages over policies such as QE.

5.4.3. Monetary financing of the deficit

Ironically, given how unfavourably a monetary financing of the deficit is viewed in official circles, such a policy looks much less radical than a distribution to the population. It simply involves part of the fiscal deficit being financed from new central bank money. Once again the concerns centre on the fear that the central bank would appear too close to government – that by financing part of the deficit it is endorsing a particular government's budget and thereby becoming too politicised. But perhaps it is time for a rethink. If an independent central bank can decide to buy government debt in the secondary market using newly created money, in the hope that this will feed through to higher demand, should it not also be able to directly support demand by funding part of a fiscal deficit?

Conclusion: In the context of an independent central bank with clear legal objectives this policy option need not be seen as dangerous and is likely to be effective at boosting aggregate demand, but will be seen by many as overly politicised.

5.4.4. Government borrowing from banks

The government borrowing directly from the commercial banks would increase the money supply without the need for central bank intervention. However, by increasing demand for bank lending it is likely to push up the price of bank credit, in contrast to QE, which by increasing deposits relative to the stock of lending should push lending rates down. If the cost of bank credit rose it would crowd out some private sector borrowing, exacerbating the lack of credit availability in the economy. The policy also depends on there being sufficient capital in the banking system to support additional lending, something that may not be the case at a time of stress in the banking system.

Conclusion: The case has not been made for the benefits of this policy option relative to QE.

5.4.5. Monetary currency depreciation

Using newly created money to drive down the exchange rate by purchasing foreign currency focuses on the exchange rate as the transmission mechanism, which has the advantage of avoiding the traditional transmission mechanisms which may be ineffective. It also focuses on stimulating demand without relying on domestic consumption. But it does so at the cost of being seen as a beggar-thy-neighbour policy that would hurt international competitors. It thus might be seen as a policy applicable only in special circumstances such as when an overvalued currency is driving domestic deflation.

Conclusion: This is a policy option that is likely to be worth pursuing only in very rare circumstances.

5.4.6. Cancelling government debt

A policy of cancelling government debt bought by the central bank would work by signalling the potential for accommodative monetary policy to be in place much longer, and for fiscal policy to be more expansionary in the future. In a sense it could be thought of as the government ripping off the self-imposed shackles of current monetary and fiscal orthodoxy.

If the economy was being held back either by fears that QE could be reversed too quickly or by the drag imposed by an excessive government debt to GDP ratio, the cancellation of government debt would appear to be a sensible policy option. Once again it could be criticised for signalling too close a relationship between central bank and government, but these concerns may be mitigated to some extent by the fact that only previously issued debt, reflecting past spending decisions, would be cancelled.

Conclusion: In the context of the framework of an independent central bank pursuing statutory policy objectives, this policy should have received more serious attention. It could have been used alongside QE, improving its effectiveness.

Section 6 - An alternative unconventional monetary policy for the United Kingdom

6.1 The shortcomings of current unconventional monetary policies

As well as sketching out the advantages, Section 5 outlines the shortcomings of the unconventional monetary policies that have been put into effect since the start of the financial crisis including:

- The relative ineffectiveness in the current economic climate of the transmission mechanisms (longer term interest rates and the banking system) that they depend on.
- Their reliance on increasing still further the level of debt in the economy despite the fact that the financial crisis was in large part the result of excessive borrowing.
- The moral hazard implicit in schemes that operate by providing the banking system with subsidies in the hope that it then extends more credit to the real economy.
- The side-effects or unforeseen consequences of the policies pursued so far. For example by driving down government bond yields, QE has increased the size of pension fund deficits, reduced prospective annuity incomes and increased inequality in society by boosting asset prices.
- The extent to which they undermine central bank independence, either through the central bank and treasury operating schemes together or via their support for more expansionary fiscal policies.

6.2 Criteria for an optimal UK unconventional monetary policy

Based on an appreciation of these shortcomings and on the UK's broad macroeconomic policy objectives, it is possible to construct a set of criteria for evaluating unconventional monetary policy for the UK. The criteria for an optimal unconventional monetary policy could be summarised as follows:

- Optimal policy should be exclusively a monetary measure. This reduces the risk that the markets become concerned by the loss of central bank independence

implied when monetary and fiscal policies are co-ordinated or where the dividing lines between the two become blurred.

- Optimal policy would avoid encouraging further debt accumulation. Policies that stimulate borrowing represent a subsidy, which will lead to borrowers accumulating higher levels of debt than would occur under market conditions.
- Optimal policy would avoid using the banking system as the transmission mechanism as the SLS and the FLS do, as this inevitably involves an element of subsidy to the banks and heightens moral hazard, as banks are rewarded following previous excessive expansion.
- Optimal policy would help to address the UK's cyclical and structural economic weaknesses. As well as facing a deficit in aggregate demand, there is something of a consensus that the UK faces the need for supply side renewal to rebalance the economy away from an over-dependence on financial services and domestic consumption.

6.3 The solution: UK sovereign wealth or monetary investment fund

Applying the criteria for an optimal unconventional monetary policy for the UK outlined in Section 6.2 above, we believe that the authorities should consider establishing a sovereign wealth fund with the proceeds from the sale of the gilt portfolio built up through QE, to invest in UK infrastructure projects.

This policy solution offers a direct mechanism for boosting demand without the suspicion that the central bank is underpinning political decisions to run fiscal deficits, while it avoids the need to stimulate further debt accumulation in the private sector. Because it would use the funds created by QE, this new body could be described technically as a “monetary investment fund”.

A new body would need to be established as a subsidiary of the Bank of England but with operational independence to make the investment decisions and oversee the operation of the fund. QE could be unwound through a gradual sale of gilts back into the market to be co-ordinated with the new fund’s investments in UK infrastructure projects.

The key advantages with the sovereign wealth fund proposal are as follows:

- It would stimulate demand more directly than QE and rebalance demand away from an excessive reliance on consumption. By channelling funds directly into

physical infrastructure investments, the proposal would increase demand via an increase in investment.

- Such infrastructure investment would also increase the productive potential of the UK economy. With a rapidly rising population, the UK needs substantial investment in infrastructure including transport, housing, energy, communications, water and sewage and flood defences.
- It would also avoid inflating prices in secondary debt markets. By channelling funds directly into infrastructure investments it would avoid stoking demand for debt in secondary markets. QE and CE by comparison operate through secondary debt markets, raising prices in these markets in the hope that this then stimulates higher investment. Our proposal would avoid creating such a subsidy in debt markets which encourages borrowers (either public or private) to take on more debt. It would also limit the wealth effect that stems from pushing up asset prices, which increases inequality and risks over-stimulating consumption.
- It would provide the taxpayer with a better yield than is received on the gilt portfolio acquired under QE.
- A monetary financed sovereign wealth fund could, if it remained in place, become a source of counter-cyclical demand. In contrast, government investment is often pro-cyclical, being slashed in economic downturns as the government seeks to save money without cutting core services.
- The fund would avoid using the banks in its transmission mechanism, removing the moral hazard implicit in any scheme that sought to incentivise banks to lend.
- Our proposal is more consistent with an independent central bank than QE, where the central bank is indirectly subsidising the fiscal deficit and thereby is seen to assist a political decision to run an accommodative fiscal policy.
- This policy would return the gilt market to normality, improving pension fund finances and annuity rates without the risk of shrinking the money supply that would otherwise accompany a reversal of QE.
- As a monetary rather than fiscal body, its infrastructure investment would not increase net government borrowing. But higher investment expenditure would generate additional tax revenues for the government's coffers.

The fund would hold illiquid long term investments which would take a good deal of time to unwind, in contrast to QE, where sales of gilts back to the market could be undertaken at relatively short notice. However, once the sovereign wealth fund is in

place, conventional monetary policy could be deployed to control the economy as the recovery matures. There would be nothing to prevent the Bank of England from raising bank rate or withdrawing excess liquidity from the banking system by the issuance of bills.

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