

# Quantitative Easing

Evolution of economic thinking as it  
happened on Vox

Edited by Wouter J. Den Haan



CEPR Press

A VoxEU.org Book



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# Foreword

Quantitative easing is one of an array of new tools policymakers have used to try and revive economic performance in the aftermath of the Global Crisis. A relatively untested monetary policy tool, the intricacies of the repercussions of QE have been hotly debated by policymakers and academics alike. While the ECB is committed to extend its QE programme, other central banks have dismissed it altogether. It is clear quantitative easing remains a contentious issue. Over the last eight years, VoxEU has kept a record of this progress of this debate, brought together in this Vox Collection.

This eBook is part of the *Vox As It Happened* series, created to record the progress of thought as key economic events have unfolded. It collects some of the best Vox columns on the economic foundations of quantitative easing, measuring its impact and discussions of how QE affects (among other things) economic growth and inflation. One section of this eBook directly considers QE in the Eurozone. The columns chosen for this eBook are an accurate reflection of the complexity of the topic, and indeed, of how much more there is to know.

CEPR is grateful to Wouter den Haan for his editorship of the eBook. We also thank Anil Shamdasani and Shreya Hewett for their efforts in publishing and launching this eBook, and the European Commission for its support of CEPR research. The Commission's support for the production of this publication does not constitute an endorsement of the contents, which only reflects the views of the authors, and the Commission cannot be held responsible for any use made of the information contained within this eBook. CEPR, which takes no institutional positions on economic policy matters, is glad to provide a platform for an exchange of views on this topic.

Tessa Ogden

Deputy Director, CEPR

January 2016



# Introduction

**Wouter J. Den Haan**

LSE and CEPR

The severity of the recent financial crisis and the inability to generate a turnaround with ordinary policy tools forced policymakers to come up with new methods to revitalise economic performance. One of those tools is quantitative easing (QE). Expansionary monetary policy typically consists of buying short-term government debt to affect short-term interest rates. This policy instrument quickly reached its limit as policy rates reached near zero levels.<sup>1</sup> Quantitative easing consists of buying other types of financial assets, e.g. long-term government bonds or mortgage-backed securities, with the objective of increasing the amount of liquid assets in the economy (starting with an increase in the monetary base) and pushing down interest rates more generally, which should be helpful for the ultimate goal of reigniting economic growth. The Bank of Japan pursued quantitative easing during the 2001-2006 period, when the term originated. During the recent recession, the Bank of England took the lead and announced on 5 March 2009 that it would purchase £75bn of long-term government bonds in the next three-month period.<sup>2</sup> The latest addition is the expansion of the asset-buying programme of the European Central Bank from €10bn to €60bn, which was announced 22 January 2015.

The description of quantitative easing given above might give the impression that it is not much more than a typical central bank operation – namely, buying financial assets – but applied to a different type of financial asset. But quantitative easing is called unconventional monetary policy for good reasons. The first reason is that the scale was humongous. Total assets of the Federal Reserve, for example, more than quadrupled since the onset of the financial crisis. Also, as discussed in detail in the next section of this introduction, the channels through which quantitative easing programmes were believed to affect economic growth are quite different from ordinary monetary policy.

<sup>1</sup> See Armstrong et al. (2015a) for a discussion on the feasibility and desirability of negative policy rates.

<sup>2</sup> Later in the year, the programme was increased to £200bn. A detailed overview of unconventional monetary policy programmes can be found in IMF (2013).

Moreover, the assets that central banks bought as part of their QE programmes are riskier than short-term government bonds, and massive QE programmes could have severe consequences for the health of central banks' balance sheets. Finally, by buying an alternative set of financial assets, the central bank's actions positively affect some persons and institutions and very possibly negatively affect others. For example, if a QE programme is successful in pushing down long-term rates, then this may be beneficial to a government that would like to increase its debt level and to other borrowers, but it would hurt savers. One could question whether institutions with unelected officials should be making these types of decisions.

During the financial crisis, central banks set out using mostly unexplored policy operations during turbulent and very unusual times. One could draw an analogy with a physician who faces a patient whose health is rapidly deteriorating and not responding to the usual medical treatment. Not willing to give up, the doctor tries to cure her patient with untested, possibly intrusive medication, even though she does not even know all the patient's ailments. In the process of better understanding the failing of the economy and the search for a cure, central banks have not stood alone. There has been a healthy and at times critical exchange between policymakers, academics, and the public. An important forum for this exchange has been CEPR's policy portal VoxEU.org. This eBook contains several of the Vox columns related to quantitative easing. Some columns are by policymakers explaining their policies, some are by academics who discuss related new research, some critique existing policies or point at risks, and some plead for quite different policies.

This eBook consists of four parts. The first part examines the possible reasons why QE could affect economic growth. The second part discusses the risks associated with QE and important criticisms. The third part focuses on differences between the different QE programmes, and in particular on the late introduction of QE by the ECB. The last part deals with exit strategies. The remainder of this introductory chapter reviews and summarises the four parts of this eBook.

## **Part One: The economics behind quantitative easing**

The financial crisis fully erupted after Lehman Brothers filed for Chapter 11 bankruptcy protection on Monday 15 September 2008. Trading in several financial markets came to a standstill. In the following year, central banks lowered their policy rates

sharply and put several emergency measures in place to calm down financial markets.<sup>3</sup> Although a total collapse had been avoided, it soon became clear that the situation in financial markets remained precarious and that the real economy was not recovering. By lowering their policy rates, central banks mainly affect short-term interest rates. Reductions of policy rates are supported by central banks through buying short-term government bonds.<sup>4</sup> One cannot keep on reducing the policy rate, since it is difficult – although not impossible – to have negative policy rates. Faced by this zero lower bound constraint, a central bank could start buying long-term government bonds. One would think that buying long-term government bonds would lower long-term interest rates just as buying short-term government bonds lowers short-term interest rates. Moreover, should it not be the case that reductions in long-term interest rates stimulate the economy just as reductions in short-term interest rates stimulate the economy? In fact, one could even argue that reductions in long-term rates are even more important, since important economic decisions such as firm investments and purchases of durables often require long-term financing.

Unfortunately, it is not that simple.<sup>5</sup> In fact, dominant asset pricing theories, such as the capital asset pricing model (CAPM), and most macroeconomic models would predict that quantitative easing would not work. To justify QE policies, policymakers have relied on other theories, and in particular on portfolio balance models from the 1960s. It will be interesting to see whether the revival of these theories will have long-lasting consequences for the types of models used by economists in research and teaching students, or whether they will be discarded again when central banks stop pursuing QE policies.

To understand the claims made above, consider the reasoning behind the view that expansionary conventional monetary policy stimulates economic activity. Expansionary monetary policies increase the amount of liquidity in the economy and lower nominal interest rates. If prices are fully flexible, then inflation would adjust and nothing would

3 One example is the Federal Reserve Commercial Paper Funding Facility (CPFF), which was created to restore lending in the short-term commercial paper market. Such programmes are referred to as ‘credit easing’. Credit easing and quantitative easing involve asset purchases by central banks. With credit easing, this is done to rejuvenate specific financial markets (so it matters a lot what asset is bought), whereas quantitative easing concentrates on increasing liquidity in the private sector (and it matters less what asset is bought).

4 This increases the market price, which implies that the expected return on this asset falls.

5 An excellent overview of the main theoretical issues related to QE is given in Woodford (2012).

change in real terms. If prices are sticky, however, then the real amount of liquidity in the economy increases and real interest rates would drop. Both are believed to stimulate spending, although economists disagree on what matters most. One could argue that QE simply leads to a further increase in liquidity and should therefore also be expansionary. The counter-argument is that this will not happen in a situation we observed during the financial crisis when the asset positions of the private sector and the banking sector are already very liquid, the private sector is hesitant to spend and the banking sector is hesitant to lend. The extra liquidity would then be simply absorbed and not induce a shift into other assets that could possibly stimulate the economy.

An argument for why QE might lower long-term interest rates is the following. Investors like particular portfolio compositions better than others. For example, pension funds prefer holding long-term bonds to match their long-term obligations. If QE programmes reduce the amount of long-term government bonds available in the market and investors think other assets are not perfect substitutes, then this will lead to a reduction in the yield on long-term government bonds. Moreover, if investors shift into corporate bonds or equity, then this could increase real activity. This summarises the portfolio balance view of QE.<sup>6</sup> Bond-financed fiscal stimulus *increases* the supply of long-term government bonds, which would put upward pressure on long-term rates. As pointed out in Levy Yeyati, Ghezzi and Broda (2009), one can think of QE as offsetting the positive effect of fiscal stimulus on interest rates by taking this additional supply of new long-term government bonds out of the market.

In contrast to portfolio balance models, prevalent asset pricing theories such as the CAPM have different predictions about the effect of QE on rates of return. The CAPM predicts that the expected rate of a return on an asset depends on its risk, and the relevant risk measure is the risk that investors cannot get rid of themselves by holding diversified portfolios. That risk is the correlation of the asset's return with the market portfolio. According to the CAPM, there are two reasons why QE purchases of long-term government bonds could affect yields. First, QE affects correlation coefficients by changing the market portfolio, but these effects are quantitatively small.<sup>7</sup> Second, QE could affect the correlation coefficient for government bonds, and thus its expected

6 The foundation of this theory was put forward in Tobin (1969).

7 As pointed out in Woodford (2012), in a Ricardian world the market portfolio would not be affected, since investors take into account that they are responsible for all government debt repayment through taxes.



return, by affecting the law of motion of the (random) holding period return on government bonds. It is not clear, however, why that would be the case. The CAPM has some flaws. In particular, it is well known that factors other than the correlation with the market portfolio return matter for asset prices. However, the other factors that have been put forward – such as the correlation of asset returns with aggregate activity – also do not provide a direct reason why QE should affect expected returns.

The reader may wonder whether the CAPM also predicts that conventional monetary policy, i.e. buying and selling of short-term government bonds, should have no or little effect on asset prices? Such transactions change the supply of liquid assets (bank reserves and/or deposits) relative to the supply of short-term government bonds. However, most economists would agree that these liquid assets, especially bank reserves, are special in that they provide a key transaction role in the economy.<sup>8</sup> That is, bank reserves and short-term government bonds are *not* perfect substitutes. Note that at the zero lower bound, bank reserves are no longer scarce and become perfect substitutes for short-term government bonds. As pointed out by Woodford (2012), one can think of QE as the sum of two operations: conventional monetary policy of buying short-term government bonds in exchange for bank reserves; and buying long-term government bonds in exchange for short-term government bonds. At the zero lower bound, the first operation is no longer effective, since bank reserves and short-term government bonds have become very close substitutes. The portfolio balance argument behind QE implies that the second operation has a non-trivial effect on returns, because investors have preferences for specific portfolio compositions. In particular, they would argue that short-term government bonds earn a premium over long-term government bonds, because they are also special.<sup>9</sup> QE reduces the scarcity of short-term government bonds and bank reserves (which are close substitutes at the zero lower bound) and thus pushes the return on long-term debt closer to the return on short-term debt.

Now suppose that QE does lower the yield on long-term government bonds. Would this stimulate the economy? It could if lower yields on long-term government paper induce banks to lend more to firms or induce investors to buy more corporate bonds or buy

8 For example, deposit-issuing financial institutions have to hold reserves.

9 Krishnamurthy and Vissing-Jorgensen (2013) argue that short-term government bonds provide a “safety premium”.

more equity.<sup>10</sup> However, investing in and lending to firms is risky, especially during economic downturns. And it may very well be the case that QE does not induce agents to take on this risk unless the return differentials are really large, and nobody is willing to argue that QE depresses yields on long-term government bonds by a lot. So it is possible that the extra liquidity pumped into the economy through QE purchases may not lead to an increase in real activity. Whether it does or not is ultimately an empirical question.

There is another quite different reason why QE might affect yields and real activity, and that is signalling. The problem is that there are many different signalling theories and they are difficult to distinguish from each other. For example, one could argue that the announcement of a QE programme signals that the central bank will do “whatever it takes” to stimulate the economy and it is this signal that positively affects consumers and investors. Alternatively, one could argue that such an announcement signals that a central bank will not raise short-term rates any time soon, since this would imply that it will suffer losses on its portfolio of long-term government bonds. Alternatively, it may signal that the central bank is very concerned about the real economy, in which case such an announcement may negatively affect the economy.

The relationship between asset supply, asset prices, and aggregate real activity had not received a lot of attention for quite a while. This changed rapidly during the financial crisis. The Vox columns in Part One of this eBook are evidence of this. Joyce, Tong, and Woods (2011) provide empirical evidence in favour of the portfolio balance effect of QE. Their study indicates that the first QE programme of the Bank of England, which involved the purchase of £200bn of UK gilts, led to a decrease in long-term yields of 100 basis points. Moreover, they estimate that it increased GDP by between 1.5% and 2% and increased inflation by between 0.75 and 1 percentage points. Determining the effect of QE on economic variables is difficult. The reason is that one has to disentangle the effect of QE from the effect of the event that triggered the central bank to initiate the QE programme. For example, suppose that the central bank decides to implement a QE programme because it foresees a further deterioration in economic growth. Even if the QE programme is successful, then it may still be possible for the programme to be followed by lower economic growth. To isolate the effect of QE on yields, empirical

10 Muellbauer (2014) points out that such effects are smaller in economies such as the Eurozone in which firms obtain financing mainly from banks and not so much directly from other investors.

studies typically look at the immediate effect on bond prices when the QE programme is announced. As long as this announcement does not provide new information about future economic developments or about other types of monetary policy actions, then it seems reasonable to assume that the observed immediate change in bond prices is due to QE. Determining the effect of QE purchases on variables such as GDP, employment, and inflation is even more difficult and requires estimated structural macroeconomic models.<sup>11</sup> This question has not become easier over time. Banerjee, Daros, Latto and McLaren (2012) argue that subsequent announcements of QE programmes were more predictable and thus contained less news, which makes it harder to identify the effect of QE.

Other Vox columns support the evidence reported in Joyce et al. (2011). Weale and Wieladek (2014) also find that QE lowers long-term yields and stimulates the economy. They argue that part of this effect is due to signalling, as asset purchase announcements have an impact on interest futures in the UK and on measures of financial market uncertainty in the US. Although most empirical evidence is based on recent QE programmes, Chadha (2014) argues that overall bond supply had an impact on longer-term US Treasury yields before the crisis. Walentin (2014) discusses more specific reasons why QE stimulates the economy. Using a structural VAR approach based on US data, he documents that a 100 basis point shock to mortgage rates results in a 1.6% decrease in consumption, a 6.2% decrease in residential investment, and a 1.9% decrease in GDP. QE in the US involved buying mortgage-backed securities, so it makes sense to look at the impact of changes in mortgage rates.

The Vox columns mentioned above focused on the key elements of the transmission mechanism through which QE affects yields on long-term bonds and real activity. Several other columns zoom in on the details. Using micro-level portfolio data of individual life insurance companies and pension funds, Joyce, Liu and Tonks (2015) argue that QE in the UK did lead to portfolio rebalancing, but this has been limited to corporate bonds and did not lead to a shift into equities. Banerjee et al. (2012) consider unanticipated changes in the maturity structure of UK gilt purchases and document that even these affect the yields of different gilts differently. That is, they find that the

11 A structural model is a model with at least some theoretical structure. Examples are structural vector autoregressive (VAR) models and dynamic stochastic general equilibrium (DSGE) models. Reduced-form models would not be able to distinguish between the effect of the underlying cause and the effect QE purchases.

portfolio balance effects are even useful in understanding yield differences *within* the class of UK gilts.

Hosano and Miyakaw (2015) examine bank lending using a panel dataset of Japanese banks. Their results help in understanding when QE is more likely to be effective. One of their findings is that bank liquidity positively affects loan supply, and that this effect is stronger when economic growth is low and less strong when monetary policy is expansionary. The first finding would imply that QE, which increases banks' liquidity, was effective during the recent financial crisis and the second finding would imply the opposite.

Finally, Christensen and Krogstrup (2015) put forward a novel argument according to which QE could reduce long-term rates even if it involves only purchases of short-term debt. Key to their argument is that only banks can hold reserves. If the central bank buys short-term government debt from banks, then their balance sheet does not change very much. They will hold less short-term debt and more reserves, but this is not an important change if short-term rates are close to zero. If the central bank buys short-term government bonds from other financial institutions, then this will lead to an increase in bank deposits (since the proceeds from the sales will be deposited in banks), which will not only lead to an increase in reserves, but also to an increase in the total amount of short-term liquid assets. If the portfolio balance argument applies to banks, then this would mean that banks will try to correct this increase in the fraction of short-term financial assets by buying other types of assets.

## **Part Two: Risks and criticisms**

Several Vox columns argue that some elements of the mechanism through which QE is supposed to affect the economy are unlikely to have been quantitatively important during the financial crisis. For example, Mees (2011) points out that the link between the expected rate of return on physical capital and yields on long-term government bonds has weakened since the beginning of the millennium. The apparent inability of lower yields on government bonds to push down yields on investment in physical capital is interpreted as a sign that “... *something went awry with monetary policy's transmission mechanism*”. Consistent with this observation, Annunziata (2012) argues that increased uncertainty is holding back investment and hiring. Bossone (2013a) argues that QE is also unlikely to stimulate consumption because the induced increases

in bond prices are unlikely to affect the less wealthy, who are the ones with higher marginal propensities to consume. Moreover, reduced reductions in yields on long-term bonds may negatively affect interest they earn on savings accounts.<sup>12</sup> Kaplan and Violante (2014), however, point out that wealthy individuals may have high marginal propensities to consume when an important part of their wealth is in illiquid assets such as houses. As an alternative to QE, Bossone (2013b) proposes that the government finances government spending or transfers to households by ‘helicopter money’ drops. Landau (2014) argues that a decreased stock of safe long-term government bonds available for the private sector is unlikely to lead to increased investment in corporate bonds and/or equity during periods such as the recent financial crisis, when there was a strong demand for safe assets. QE exchanges one safe asset – long-term government bonds – for another – bank reserves. Landau (2014) argues that QE should focus on buying risky assets, which would increase the supply of safe assets in the economy. As the demand for safe assets from the private sector becomes satisfied, the private sector might start to consider investing in risky assets.

It is possible that QE does not have an overall positive effect on the economy even when there is a portfolio balance mechanism that induces investors to invest more in corporate bonds and equity. The reason is that QE may also have some negative effects on the economy. Wood (2011) points out that *“an artificially flat yield curve based on a near-zero interest rate (through excessive quantitative easing), could impart misleading information about underlying risk structures, distort time-dependent investment/purchasing/selling decisions, encourage banks to take on higher-risk positions to maintain profitability, and artificially create illusory, ‘bubble-like’, share market gains”*.

Another possible downside of QE is that it entails risks, and central banks taking on such risks may negatively affect market sentiments and negatively affect the economy. Two types of risk that have been stressed in Vox columns right from the beginning are inflation and losses on the value of assets bought by the central bank through default or reductions in market prices. The question is how the treasury will respond to central bank losses. In the UK, explicit arrangements have been made between the Treasury and the Bank of England regarding potential losses on the Bank’s asset purchases.

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12 Wood (2011) points out that reductions in interest income may not only negatively affect the incomes of the elderly, retirees, and savers, but may also negatively affect the functioning of pension funds and insurance companies.

In the US, no such detailed arrangement exists. Buiter (2009b) argues that this may jeopardise the independence of the Federal Reserve as it “... *will have to go cap-in-hand to the US Treasury to beg for resources*” in case of substantial capital losses. The idea of member countries recapitalising the ECB is, of course, even more problematic as Eurozone countries will view this as transfers to other countries, especially if capital losses are due to default on sovereign debt. The problem of a (lack of) fiscal backup has not gone away and has recently been re-emphasised by Benigno and Nisticò (2015).

One could argue that the need to recapitalise a central bank in case of capital losses only exists if the increase in bank reserves induced by asset purchases is meant to be temporary. In that case, the central bank would need valuable assets when it wants to reduce liquid assets in the economy by selling assets back to the public. If high levels of liquid assets are believed to be permanent, however, then the second potential risk of QE – i.e. inflation – becomes more relevant. Buiter (2009a) argues that “... *quantitative easing has to be reversed when the economy recovers and the demand for base money returns to levels that are not boosted by the extreme liquidity preference of a panic-stricken banking system. Without such as a reversal of quantitative easing, unacceptable inflationary expectations will rise and these inflation expectations, as well as possible inflation risk premia, can raise longer-term and real interest rates.*” He continues by saying that “[i]t is surprising that even at a horizon of five years or more, the markets are not yet pricing in a distinct possibility of double-digit inflation in the US”. Although, the issue of fiscal backing remained an issue receiving attention in Vox columns, especially for the ECB’s QE programmes, it is interesting to note that inflation quickly became less of a hot issue. The slow recovery and the associated concern for deflation are likely to have been important for this.

### **Part Three: Quantitative easing in the Eurozone**

During the recent financial crisis, the Federal Reserve and the Bank of England took the lead in implementing QE. Many Vox contributors have argued that the ECB should have stepped up its unconventional monetary policy activities. Buiter (2009a) wrote: “*Time to wake up and smell the quantitative easing roses*”. He pointed out that there are no treaty-based obstacles preventing the ECB/Eurosystem from buying Eurozone sovereign debt. But he also argues that such purchases should be accompanied by a guarantee by all Eurozone governments for the debt acquired by the ECB. This is, of

course, a politically sensitive issue in the Eurozone. Frankel (2014) points out that *“Germans tend to feel that ECB’s purchases of bonds issued by Greece and other periphery countries constitutes monetary financing of profligate governments.”* He also suggests a creative solution to this dilemma, which is to buy US treasury securities. This would avoid the moral hazard issue, as default on these assets is unlikely. The idea behind this kind of QE programme is that it would stimulate Eurozone exports by lowering the value of the euro.

Others have argued that typical QE programmes are less suitable for the Eurozone. Muellbauer (2014) argues that households in the Eurozone hold relatively large amounts of liquid assets, which means that reductions in rates of return induced by QE may actually reduce spending. Also, capital markets are less important for firm financing in the Eurozone. Consequently, funds made available to investors by QE purchases are less likely to find their way to firms. This reasoning suggests that programmes like the ECB’s Long-Term Refinancing Operation (LTRO) are more suited to the Eurozone, since its main focus is on providing financing to banks. As banks started to repay the loans they received as part of the LTRO and the ECB’s balance sheet started to fall, commentators renewed their calls for a Eurozone QE programme. Levy (2014) stressed that programmes that focus on banks *“would involve the ECB directly in credit policy, greatly muddling its role,”* and regular QE programmes focusing on sovereign debt do not have this disadvantage. Nevertheless, in September 2014 the ECB announced that it would start buying securities backed by loans to households and firms. This new QE programme is discussed in Wyplosz (2014), who points out that the programme has benefits over traditional QE during periods when banks are not functioning well. Szczerbowicz and Valla (2015) also argue that a QE programme for the Eurozone should target assets that are *“closest to job-creating, growth enhancing, and European institutions should be given a prominent role”*. They argue that the ECB should buy financial assets issued directly by the corporate sector and debt issued by the European Investment Bank.

In January 2015, the ECB got serious about QE when it increased their monthly asset purchases from €10 billion per month to €60 billion for the period from March 2015 to September 2016. The total amount of assets to be purchased over this period is €1.1 trillion, roughly 9% of the outstanding stock of Eurozone government debt. This QE programme got closer to traditional QE by including investment-grade bonds issued by governments, national agencies and EU institutions.

De Grauwe and Ji (2015) focus on the widespread criticism of QE programmes that they mix monetary and fiscal policy. This is especially problematic for the Eurozone, which is far from being a fiscal union. The idea of the criticism is that default on sovereign debt bought under the QE programme will lead to capital losses for the ECB and a recapitalisation of the ECB will have to be financed by taxpayers of all Eurozone countries. De Grauwe and Ji argue that QE can be structured in such a way that it does not mix monetary and fiscal policy. The key aspect of his proposed plan is that both the profits and the losses that result from the ECB holding sovereign debt are returned to the national central banks. If a country pays interest and does not default, then the national central bank will receive interest income and the principal when the bond expires. If a country defaults, then this will not be the case. Consequently, default will, therefore, not have consequences for taxpayers in other countries. De Grauwe and Ji argue that the real risk of QE is inflation risk as it increases the amount of liquidity in the economy. This would be a potential burden for all Eurozone countries. Deflation is currently a bigger concern for the Eurozone than inflation, thus the inflation risk is likely to be not very large, at least not in the next couple of years.

Most of the credit risk of the national securities bought under the ECB's QE programme is borne by the central bank of the issuing country.<sup>13</sup> Consistent with the reasoning above, this limits direct consequences of defaults for taxpayers in other Eurozone countries. This lack of risk sharing turned out to be a controversial aspect of the programme, and several Vox columns debated this issue.

Annunziata (2015) argues that the lack of risk sharing will not be problematic in the next couple of years, although it could in principle be problematic and he argues that additional steps to fiscal union would be desirable. Giavazzi and Tabellini (2015) point out that privately held sovereign debt becomes more risky if national central banks hold more sovereign debt, because governments are likely to treat their central bank as a senior creditor. However, they also argue that the benefits of risk pooling should not be over-emphasised. Armstrong, Caselli, Chadha, and Den Haan (2015b) discuss results of a survey of the Centre for Macroeconomics (CFM) that asked macroeconomists whether the limited risk-sharing arrangement limited the effectiveness of the ECB's QE

13 Roughly 90% of government and agency bonds will not be bound by risk sharing.



programme. Roughly half of the respondents reported that the lack of risk sharing does indeed negatively affect the efficacy of the program.

## **Part IV: Exit from quantitative easing**

Massive asset purchases by central banks have ballooned their balance sheets to multiples of their pre-crisis magnitudes. The acquired assets increased the asset side of the balance sheet and paying for these assets increased bank reserves, a central bank liability. High levels of bank reserves can be inflationary when economic conditions improve and banks prefer to have fewer liquid low-return assets on their balance sheet and start lending again. To avoid such inflationary pressures, it may be necessary to ‘unwind’ the asset purchases by selling the assets purchased back to the public. Unwinding QE carries risks. If QE purchases increase market prices of assets bought, then selling them is likely to lower them. This would imply capital losses for the financial sector and the central bank itself. Grenville (2013) discusses the risks of such capital losses to the financial sector when its financial health is still precarious.

The possible need to unwind QE purchases and its associated risks have formed part of Vox columns on QE from the very beginning. Buiter (2009a) argues that a credible exit is necessary to avoid inflationary risk premia. More than six years later it is still not clear if, and if so when, QE positions will be sold back to the markets. Fortunately, inflation expectations have not increased and inflationary risk premia are still not an issue. However, the uncertainty surrounding the unwinding of QE positions and even the prospect of reductions in QE purchases have created sharp movements in asset prices.

Several Vox columns have addressed the uncertainty related to a QE exit. Burns, Kida, Lim, Mohapatra, and Stocker (2014) argue that 12.8% of the increase in capital inflows to developing countries from 2009 to 2013 is due to QE programmes.<sup>14</sup> They study the effect of QE exit on developing countries, arguing that an orderly unwinding of QE positions would lead to only small reductions in capital inflows, but a precipitous QE exit could reduce capital flows to developing countries by as much as 80% for

14 As QE lowers expected rates of return on assets in developed countries, investors’ search for higher yields induces capital flows to more developed countries.

several months, which could have severe effects on developing economies. Weale and Wieladek (2014) describe research that questions whether QE programmes led to increased capital flows to developing countries. They argue that the lower yields may have done so, but the positive effect of QE on real activity has been an important countervailing force.

Gorodnichenko and Coibion (2011) present research that indicates that the Fed's QE exit strategy is likely to be slow. By studying FOMC decisions, they conclude that there is a large amount of policy inertia in the US policymaking process regarding conventional monetary policy, even during normal times. If policymakers are slow in reversing conventional monetary policy decisions, it seems more than plausible that they will be equally cautious in reversing unconventional monetary policy decisions.

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## Part I

# The economics behind quantitative easing





# 1 The new global balance – Part II: Higher rates rather than weaker dollar in 2010

**Eduardo Levy Yeyati, Piero Ghezzi and Christian Broda**

Harvard Kennedy School; Barclays PLC; Duquesne Capital Management

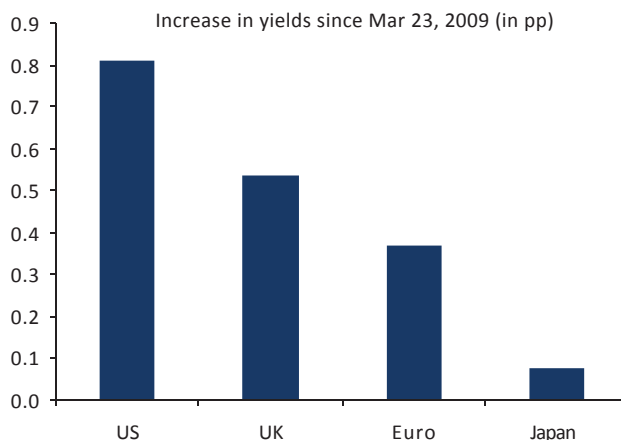
16 October 2009

*Many expect the dollar to continue to depreciate over the foreseeable future. This column suggests that it may strengthen in 2010 if the Federal Reserve exits quantitative easing sooner than its counterparts and the US economy enjoys a strong rebound.*

In the early months of the crisis at the end of 2008, the US dollar rose sharply as US interest rates fell sharply (IMF 2009). In a previous column, we argued that the puzzling response of the dollar and US rates during the panic of the fourth quarter of 2008 – stronger dollar and lower rates – would be temporary and that the return of risk appetite and structural aspects of the new global balance – smaller gross capital flows and the savings drain resulting from global fiscal policies – would steepen rates and weaken the dollar. Since the end of March, ten-year US Treasury yields have increased 76bp (to 3.4%), more than in other G7 markets (Figure 1), and a dollar index relative to major currencies indeed weakened 7.5% (13.8% relative to developing countries, Figure 2).

How will the value of the dollar and long-term interest rates respond in 2010? It seems likely that both US monetary and fiscal policy will join forces to push long-term rates higher when quantitative easing ends. The end of quantitative easing in 2010 and the start of the tightening cycle in the US – both supportive forces for the dollar – should also compensate dollar-negative fiscal considerations. Thus, contrary to the popular view of a continuously weaker dollar, the phasing out of quantitative easing implies that the dollar may strengthen in 2010 relative to other currencies.

**Figure 1** Ten-year yields in the euro area, Japan, UK, and US



Source: Haver, Barclays Capital.

**Figure 2** The recent evolution of the dollar



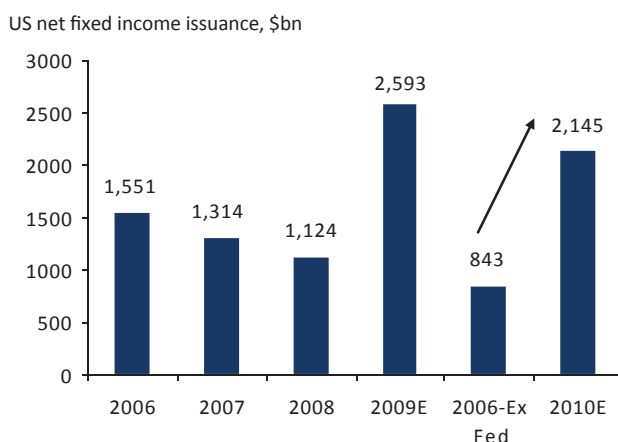
Source: Haver, Barclays Capital.

## Exiting quantitative easing in 2010: Dollar positive, rates negative

A priori, one would have expected the bold US fiscal stimulus to have already shown its teeth by now; after all, the US fiscal deficit will be close to -12% of GDP in 2009. So isn't the mild steepening of US rates (roughly 80bp for ten-year Treasuries since March) disappointing? We believe that the stimulus has barely affected the market yet,

courtesy of the unrelenting efforts of the Fed to purchase long-term risk-free assets. The supply of fixed-income issuance in the US has more than doubled in 2009 relative to the average of recent years (Figure 3), but the net issuance net of the Fed's purchases – that is, the supply of assets that effectively hits the private market – is expected to be only \$845 billion in 2009, around 30% smaller than in normal times. We can safely say that the effect of the fiscal expansion on US bond markets has been dramatically offset by the Fed's quantitative easing.

**Figure 3** Net supply of riskless US assets, net of Fed purchases



Source: Barclays Capital.

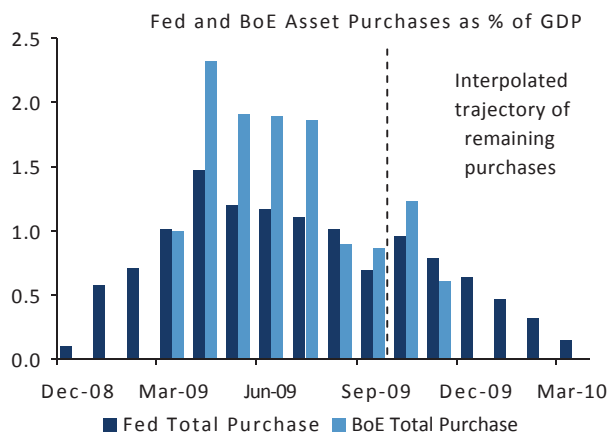
But the supply net of Fed purchases is expected to rise considerably in 2010, both as quantitative easing purchases taper off and the supply of US Treasuries ramps up (an increase to \$2.1trillion seems likely, almost twice as large as a normal year). Moreover, short-term US rates are also likely to increase in 2010 if expectations about the US economy continue to be revised upward. Thus, even if demand for riskless assets remains temporarily high in 2010 (due to a steep yield curve and large demand for riskless assets by capital-scarce banks), these suggest strong upward pressures for US long-term rates.

Quantitative easing purchases also have had crucial implications for currencies. As we highlighted in March, quantitative easing is a policy that favours “rates over currencies” in the sense that the central banker chooses to keep rates low at the expense of a weaker currency. In a recent report, we document how the directional implication of global quantitative easing are consistent with the departures from the so-called recovery trade

observed over the summer months. In particular, they are consistent with the rally in equities without an increase in long-term yields, the fact that the effective dollar index continued its decline (consistent with the strong quantitative easing in the US relative to the rest of the world), the yen appreciated vis-à-vis the dollar (consistent with the relative tightening in Japan), and sterling weakened against the euro and yen (consistent with the relatively stronger quantitative easing in the UK).

As a result, the timing of the remaining asset purchases is critical for the evolution of rates and currencies in coming quarters. Asset purchases of around 3% of US GDP remain in the pipelines (Figure 4). The Fed has said that, without changing the total amount of its agency mortgage-backed securities and agency debt purchases, it would “gradually slow the pace of these purchases in order to promote a smooth transition in markets and anticipates that they will be executed by the end of the first quarter of 2010.” Whether the Fed’s quantitative easing will slow down enough in the coming months to imply higher rates is uncertain. It will likely continue to put downward pressures on the dollar temporarily, but the pressure for lower rates is bound to be smaller. The increase in supply and the continuation of the unwinding of risk aversion should be enough to get long-term yields rising again by the end of 2009.

**Figure 4** Evolution of Bank of England and Federal Reserve asset purchases



Source: Barclays Capital.

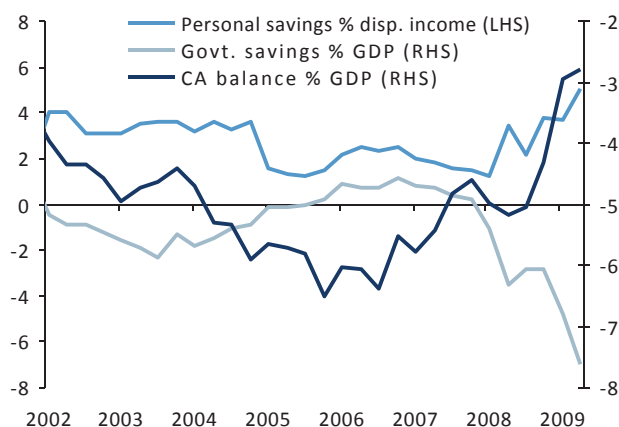
This implies an interesting scenario for 2010 where quantitative easing in the US is set to end. The implications for long-term rates are clear – they can only move up. But contrary to the popular view of a continuously weaker dollar, the phasing out of

quantitative easing implies that the dollar may strengthen in 2010 relative to other currencies, especially if the Fed swings into tightening mode faster than Europe and Japan.

## The misleading undoing of global imbalances

Some commentators would add the sharp improvement in the US current account deficit to the set of supportive factors to the dollar in 2010. Figure 5 shows that the US current account deficit fell from 6.5% of GDP in 2006 to about 3% of GDP in the second quarter of 2009, reducing the net supply of dollar assets to the world by more than half. But the narrowing of the US current account deficit may not be as benign for the dollar as most believe, as it partly reflects temporary considerations that mask the effects of US fiscal policy on the dollar.

**Figure 5** The US current deficit and savings, 2002 – 2009



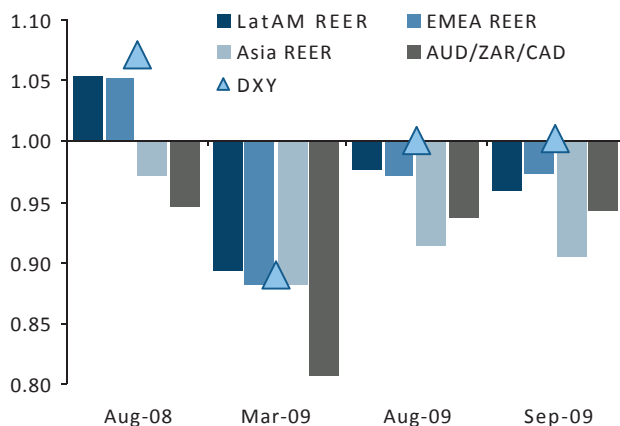
Source: Federal Reserve, Bank of England, Barclays Capital.

First, the reduction of global trade balances is partly the result of the cyclical collapse in global trade. A proportional contraction of imports and exports has the effect of moving deficits and surplus closer to equilibrium. As soon as global trade picks up, the process is likely to be at least partially reversed. Thus, the decline in the US current account deficit has temporary components that may have initially led to an overcorrection. Second, as Figure 5 shows, the improvement in the current account was the result of the sharp fall in investment, as the increase in personal savings has been more than offset by the public dis-saving (the “savings drain” discussed in our previous column). If a strong

US rebound materialises, this could imply that investment finally starts increasing after a long period of contraction and, as risk aversion simultaneously fades away, a growing US current account deficit may face tougher financing terms through 2010. In terms of the value of the dollar, this is likely to have a negative impact, partly compensating the supportive role of the relative tightening of US monetary policy.

The dollar path relative to emerging market currencies may face old challenges. The post-crisis version of the so-called Bretton Woods II – the desire of some emerging markets' central banks to prevent sharp currency fluctuations through leaning-against-the-wind intervention – is likely to imply that the countries with less central bank resistance will likely have their currencies strengthen the most relative to the dollar in the next year.<sup>1</sup> Thus, while currencies in emerging Asia and Latin America appear the natural candidates to appreciate vis-à-vis the dollar, the undoing of global imbalances may also fall disproportionately on more flexible G10 commodity currencies such as the Australian and New Zealand dollars (and even on the euro), a pattern that has become more visible in recent weeks (Figure 6).

**Figure 6** The path of less resistance: G10 vs. emerging markets



Source: Barclays Capital.

In short, in contrast with growing dollar scepticism and even though US external accounts continue to point to dollar weakness despite the recent correction, the fast rebound of the US economy and the undoing of the monetary stimulus may deliver higher rates in lieu of a weaker dollar in 2010.

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## 2 The economic impact of QE: Lessons from the UK

**Michael A S Joyce, Matthew R Tong and Robert Woods**

Bank of England

01 November 2011

*With the Bank of England recently announcing an additional £75 billion of quantitative easing, a reasonable question to ask is whether the last £200 billion has made any difference. This argues that QE may have helped boost real GDP by as much as 2% and inflation by 1.5%, similar to the effect from a drop in the base rate of around 300 basis points.*

The decision by the Bank of England's Monetary Policy Committee (MPC) to extend its QE programme follows a gap of more than a year and a half since the completion of its first round of asset purchases. The first QE purchases (henceforth QE1) were announced in March 2009, at the same time as the MPC cut the Bank Rate to 0.5%, its effective floor. The MPC judged that without additional measures nominal spending would be too weak to meet the 2% CPI inflation target in the medium term. The committee therefore also announced that it would begin a programme of large-scale asset purchases financed by central bank money, with the aim of injecting money into the economy, boosting nominal demand, and thereby helping to achieve the 2% inflation target. Over the period from March 2009 to January 2010, the Bank bought £200 billion of assets, consisting mostly of medium- and long-term UK government securities (gilts). This represented nearly 30% of the amount of outstanding gilts held by the private sector at the time and around 14% of annual nominal GDP.

Some economists have expressed scepticism about the effectiveness of QE. In conventional New Keynesian models, for example, QE is irrelevant unless it signals something about future policy that gets incorporated into expectations of future interest rates or inflation (see eg Eggertsson and Woodford 2003). But this kind of irrelevance result depends on strong Ricardian-like assumptions, which may not hold in practice. Ultimately, judging the effectiveness of QE is an empirical issue. This column reviews evidence on the impact of QE1 on the UK economy, drawing on our latest research

(Joyce et al 2011b). We find that while there is considerable uncertainty about precise magnitudes, the evidence suggests that QE1 had economically significant effects.

## **How did it work?**

The main effects of QE1 seem to have come through higher asset prices and the consequent reduction in borrowing costs and increases in wealth of asset holders.

Although signalling effects may have played a role, our recent work places more emphasis on the portfolio-balance channel, as the main mechanism at work. The portfolio-balance channel depends on the idea of imperfect asset substitutability. When the central bank purchases assets, this increases the money holdings of the sellers. But if money is not a perfect substitute for the assets sold, the sellers will attempt to rebalance their portfolios by buying other assets that are better substitutes. This shifts the excess money balances to the sellers of those assets who may, in turn, attempt to rebalance their portfolios by buying further assets — and so on. This process will raise the prices of assets (reducing their expected returns or risk premia) until investors, in aggregate, are willing to hold the overall supplies of assets and money. The consequent increase in asset prices/lower yields leads to lower borrowing costs and higher wealth.

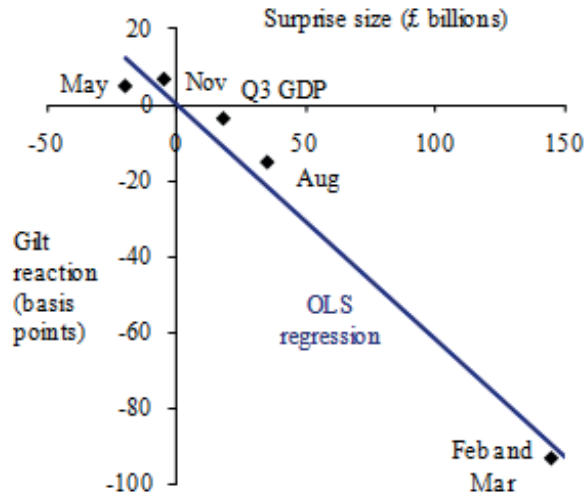
Of course, there are a number of other possible ways QE may work. As well as affecting asset prices, QE may have broader effects on confidence and on bank lending, though the latter channel might be less material during a time of financial crisis when banks are repairing their balance sheets.

## **What is the evidence?**

Most of the evidence comes from financial markets. Event studies show that there were significant falls in medium- to long-term gilt yields after important QE announcements, summing to just under 100 basis points (see Joyce et al 2011a). Using survey data of economists' expectations regarding the total size of QE purchases, it is also possible to calculate the amount of asset purchase 'news' in each announcement and relate the latter to observed yield changes (Figure 1). A simple regression of yield changes against QE news calculated in this way suggests that medium to long-term gilt yields fell on average by 0.6 basis points in response to each additional £1 billion of unanticipated

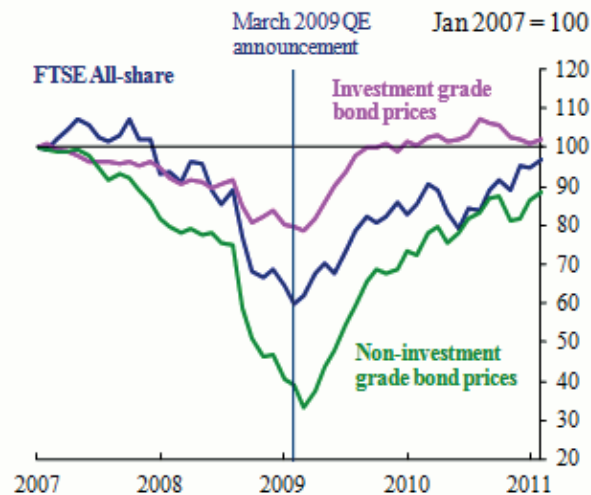
QE purchases that were announced. This would be consistent with an overall effect on yields of more than 100 basis points for the whole £200 billion programme.

**Figure 1** Size of surprise and average gilt yield changes



Source: Joyce et al 2011b (Thompson Reuters Datastream and Bank calculations).

**Figure 2** Changes in major UK asset prices



Sources: Bloomberg, Merrill Lynch and Bank calculations.

The portfolio-balance channel suggests that investors might have tried to reduce their money holdings by buying other assets, to the extent that they were regarded as closer substitutes for gilts than money. Similar event-study analysis of other asset prices shows that corporate bond yields fell broadly in line with gilt yields and sterling fell modestly in line with relative interest-rate movements. Equity prices did not react in a uniform way to QE news, but it seems plausible that any portfolio-substitution effects into equities would not immediately have been reflected in market prices. During 2009 UK asset prices all rose strongly (see Figure 2). Of course, this cannot be wholly attributed to QE1, as it accompanied a more general pickup in international asset prices, but it seems likely that the Bank's asset purchases were a contributing factor.

What about the wider macroeconomic effects? Net equity and corporate bond issuance increased in 2009 (consistent with lower costs of capital-market borrowing). Measures of consumer and producer confidence improved. Short- to medium-term inflation expectations picked up. But it is difficult to isolate the incremental effects of QE1, given other relevant factors, not least the other policy measures taken both domestically and internationally over the same period. We need some kind of counterfactual analysis, though this is obviously not helped by the relative uniqueness of the policy.

We draw on new Bank of England research, which uses a number of different methods to estimate the macroeconomic effect of QE1 (Table 1). One approach uses as its starting point the event-study evidence that QE1 reduced medium- to long-term gilt yields by about 100 basis points. It then asks what effect a shock of this magnitude would be expected to have using a macroeconometric model. The first two rows of the Table show the peak effects on real GDP and inflation that have been derived from this kind of approach using, respectively, a small structural vector autoregression and a range of more sophisticated time-series models incorporating structural change in various ways (taken from Kapetanios et al forthcoming). Another method of estimating the effects of QE is to focus on its impact on the money supply. Bridges and Thomas (forthcoming) first calculate the impact of QE on broad money, allowing for various other influences over the period. They then apply their estimates to two econometric models that allow them to calculate how asset prices and spending need to adjust to make money demand consistent with the increase in supply. Their preferred model estimates are shown in the third row of the Table. As a cross check on these model-based estimates, we can also take a more bottom up approach. First, taking the impact on gilt prices and other asset prices, we use a range of models to link the changes in asset prices through to

consumption and investment. This gives a figure for the impact on GDP, which can be translated into an inflation effect using a Phillips-curve relationship. The results from this analysis are shown in the fourth row of the Table.

**Table 1** Estimates of the macroeconomic impact of QE, peak impact on the level of output and inflation

Method	Level of GDP	CPI inflation
SVAR	1 ½ %	¾ pp
Multiple time-series models average impact <sup>a</sup>	1 ½ %	1 ¼ pp
Monetary approach <sup>b</sup>	2%	1 pp
Bottom up approach	1 ½ - 2 ½ %	¾ - 2 ½ pp
Range across methods <sup>c</sup>	1 ½ -2 %	¾ - 1 ½ pp

*Notes:* a Kapetanios et al (forthcoming) (these estimates are based on the lower variant reported by the authors); b Bridges and Thomas (forthcoming). c Calculated using the centre of the reported range for the bottom up approach.

All the estimates shown in Table 1 are highly uncertain, particularly as none of the methods used to produce them fully capture all the likely transmission channels, but what is interesting is that they all produce figures that are in a similar ballpark. Taking the estimates together, they imply that QE1 could have boosted real GDP by as much as 1.5% to 2% and increased inflation by between 0.75 and 1.5 percentage points. Using a ready-reckoner from the Bank of England's forecasting model suggests that this would be equivalent to a 150 to 300 basis-point cut in the Bank Rate, a significant reduction. Of course, there are large uncertainties even with this range and it is possible that the effects could have been larger or smaller. Nevertheless, they do seem economically significant and broadly comparable with the estimated effects of the Fed's LSAP programmes (see eg Chung et al 2011).

What this implies for QE2 is less clear. The economic and financial circumstances in which further asset purchases are being made are different from those that prevailed in early 2009, so it cannot be assumed that the magnitude of the effects will necessarily be the same. We leave estimating the economic impact of QE2 for a future column.

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### 3 Using changes in auction maturity sectors to help identify the impact of QE on gilt yields

**Ryan Banerjee, Sebastiano Daros, David Latto and Nick McLaren**

Bank of England

20 August 2012

*A central banker's toolkit these days must include a way of estimating the effect of quantitative easing purchases on government bond yields. With markets savvier than ever in anticipating quantitative easing purchases, estimating the effect has become more difficult. This column by four Bank of England economists introduces a novel empirical approach.*

The policy decisions of several of the world's largest central banks turn on a tricky empirical judgement – the effect of quantitative easing purchases on government bond yields. In the UK, the empirics have got much harder.

- When QE was first introduced, the UK Monetary Policy Committee (MPC) announcements about the amount of assets the Bank of England intended to purchase contained significant news for market expectations.

As such, market reaction to these announcements could be used to estimate the effect of QE on gilt yields (for example see Joyce et al. 2011).

- Over time, market participants learned how the MPC's QE decisions depend on the economic outlook.

Subsequent MPC announcements thus contained less news about gilt purchases and this made it harder to identify the impact of QE from these events.

#### **A new empirical approach**

Our recent research overcomes this identification problem by analysing the reaction of gilt yields to so-called operational market notices (Banerjee et al. 2012).

When the Bank purchases gilts in reverse auctions, it distinguishes different groups of gilts depending on their remaining maturity. These groupings or ‘auction maturity sectors’ are specified in advance and have only been changed infrequently and then for operational reasons (e.g. to prevent the Bank from owning large proportions of specific parts of the yield curve). In essence, this establishes a distribution of purchases across maturities that can be expected for any given aggregate level of QE buying.

Our approach is to focus on changes in the distribution stemming from unanticipated operational market notices. It is these changes to the auction maturity sectors (summarised in Table 1) that are the source of the three natural experiments used in this article to identify the impact of QE.

Although this approach might not capture all of the effects of QE on gilt yields, it can help to identify a part of the effect. Furthermore, because the notices (in March 2009, August 2009, and February 2012) span the period of QE purchases, they can also be used to determine if the strength of this effect has changed over time.

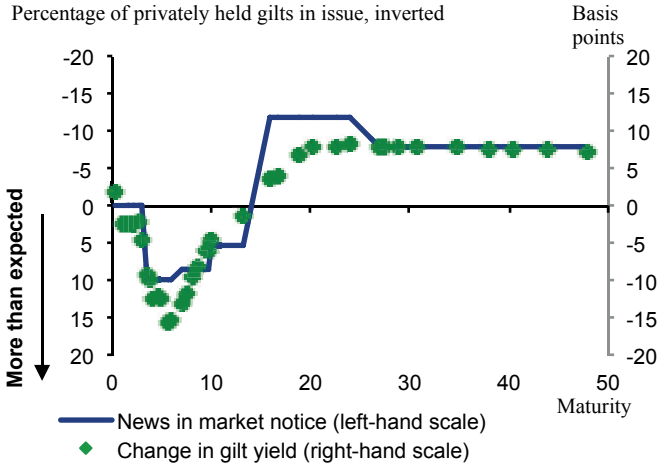
**Table 1** Changes in auction maturity sectors

Market notice	Auction details
11 February 2009	February Inflation Report and associated press conference give strong indication that gilt purchases financed using central bank money are likely. But no details on the quantity or distribution of purchases.
5 March 2009	Gilt purchases financed from central bank money are announced. Purchases split between two auction maturity sectors for gilts with remaining maturities of: (i) 5-10 years (ii) 10-25 years
6 August 2009	Purchases split between <b>three</b> auction maturity sectors for gilts with remaining maturities of (i) 3-10 years (ii) 10-25 years (iii) 25 years and greater
9 February 2012	Purchases split between <b>three</b> auction maturity sectors for gilts with remaining maturities of (i) 3-7 years (ii) 7-15 years (iii) 15 years and greater

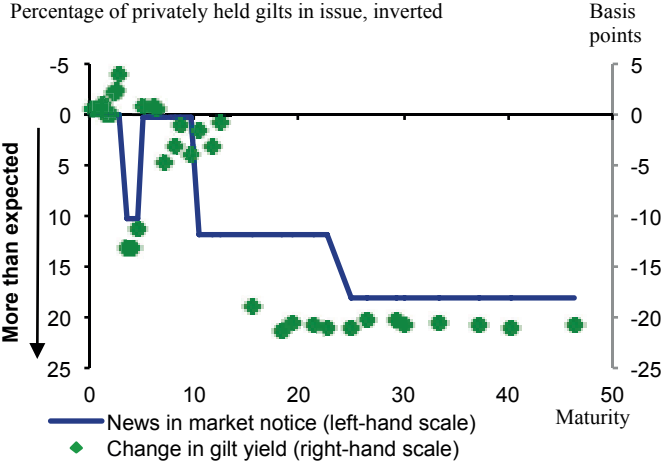
## Quantifying the news in market notices

To assess the reaction of gilt yields to changes in the auction maturity sectors, a measure of the news contained in these market notices is calculated. This measure, which is referred to as the ‘local supply surprise’, captures the difference between expected purchases of each gilt before and after the market notice (measured relative to the outstanding amount of gilts of similar maturity remaining in the private sector).

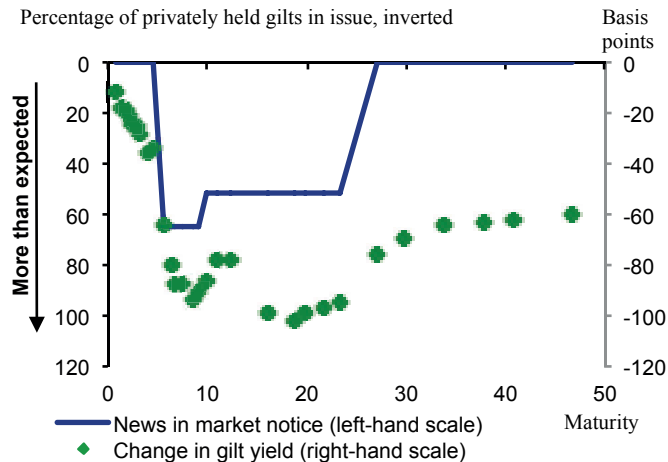
**Figure 1** Relationship between local supply surprise and two-day change in gilt yields, February 2012



**Figure 2** Relationship between local supply surprise and two-day change in gilt yields, August 2009



**Figure 3** Relationship between local supply surprise and two-day change in gilt yields, March 2009



Sources: DMO, Thomson Reuters, Bank of England and Bank calculations

## The relationship between the local supply surprise and gilt yields

Figures 1 to 3 plot the ‘local supply surprise’ (blue line) against the change in gilt yields (green diamonds) for each of the three market notices.<sup>1</sup>

In all three instances, the pattern of changes in gilt yields matches the local supply surprise. This supports the view that local supply effects are one of the channels through which QE affects gilt yields. That said, the relationship is not perfect, so it is likely other channels also play a part. For instance, in March 2009 there was a significant reduction in yields at longer maturities, even though none of the purchases were initially conducted in this part of the yield curve.

As well as through local supply effects, QE could affect gilt yields by:

- Changing the amount of ‘duration-risk’ in the market;

<sup>1</sup> As in Joyce et al. (2011) a two-day window is used to measure the change in gilt yields; and the change in yields for the March 2009 announcement is combined with the change following the February 2009 Inflation Report so as to capture the full impact of the introduction of QE.

- Signalling a change in the expected path of Bank Rate; or
- Improving market liquidity.

It is not possible to separately identify the other effects. But it is possible to control for their joint effect, so a regression can be used to isolate the local supply effects.

## **Details of the estimation**

For each of the three market notices, a separate regression is estimated. The dependent variable is the change in gilt yields after each market notice (for all conventional gilts in issue). The first explanatory variable is the local supply surprise. To account for the other channels, a constant term and the duration of each bond are also included.

In each case, the local supply surprise coefficient is negative and significantly different from 0; consistent with the local supply channel operating. The estimated local supply coefficients are of a similar order of magnitude for all three events, and the hypothesis that they are the same cannot be rejected. So the strength of the local supply channel of QE does not appear to have changed significantly since gilt purchases were introduced in 2009.

There are quite large differences between the constant and duration coefficients across the events. But it is difficult to interpret the size of these coefficients as there are reasons to think that they may be conflating the other channels from QE to gilt yields.

## **Putting the results in context**

To put the regression estimates in context, two approaches are used to compare the contribution of the local supply variable to the overall change in gilt yields. The results suggest that the local supply channel is an important mechanism which may explain around half of the impact of QE on gilt yields. Therefore the natural experiments approach is useful for identifying a considerable portion of the effect of QE.

These results are similar to estimates for the first round of Large Scale Asset Purchases in the US. D'Amico et al. (2011) find that around two-thirds of the fall in US government bond yields could be explained by the local supply channel, albeit using a different methodology.

The other channels from QE to gilt yields have not been separately identified, so it is not possible to draw conclusions about how they may have changed. Furthermore, the impact on gilt yields is only the first leg of the transmission to spending and inflation. Therefore, even though the strength of the local supply channel does not appear to have changed, the analysis cannot necessarily be used to draw conclusions about the wider economic effects of QE.

## Conclusion

The reaction of gilt yields to these market notices closely matches the news they contained about the way in which future purchases were expected to be distributed across gilts of different maturities. This is consistent with an important role for the local supply channel. The regression estimates suggest this channel can account for around half of the reduction in gilt yields due to QE, so the approach is useful for identifying a considerable portion of the impact of QE on gilt yields.

The estimated strength of the local supply channel is broadly similar across the three market notices. These events span the period of QE purchases, so the strength of this particular channel does not appear to have changed significantly since QE was introduced in early 2009.

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## 4 What are the macroeconomic effects of asset purchases?

**Martin Weale and Tomasz Wieladek**

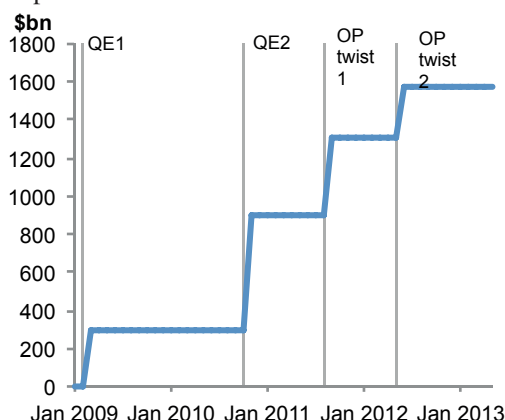
Bank of England

10 June 2014

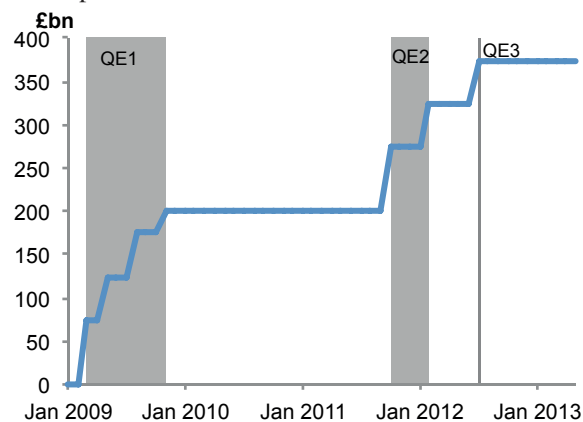
*After reducing their policy rates close to zero in response to the global financial crisis, the Bank of England and the Federal Reserve began purchasing assets. This column assesses the effect of these asset purchases on output and inflation. In line with previous studies, the authors find that asset purchase announcements are associated with increases in both output and inflation in both countries. They also find that quantitative easing had a larger impact on UK inflation, which suggests that the UK Phillips curve is steeper.*

After policy rates fell close to zero in response to the global financial crisis of 2008-09, the scope for further conventional monetary policy easing was exhausted. As a result, both the Bank of England and the Federal Reserve embarked on large-scale asset purchases of government and financial securities (see Figures 1 and 2).

**Figure 1** US asset purchase announcements



Source: FOMC minutes.

**Figure 2** UK asset purchase announcements

Source: MPC minutes.

The aim of these policies was to increase output and prevent deflation, thereby supporting the Bank of England's 2% inflation target and the Federal Reserve's 'dual mandate'. However, the transmission channels and effects of unconventional monetary policy are much less well understood than those of conventional interest rate-based monetary policy.

Studies that examine the impact of unconventional monetary policy on the wider macroeconomy typically adopt Bayesian VAR methods or use structural macroeconomic models. An example of the latter is Chung et al. (2012), which uses a calibrated version of the Federal Reserve Board's US macroeconomic model and finds that real GDP and inflation were respectively 3% and 1% higher as a result of the Federal Reserve's asset-purchase policy. Bayesian VAR studies typically identify a 'spread shock', which is identified as a shock that reduces the spread between the long and short rate, raises output and prices, but does not affect the short rate. Under the assumption that this shock reflects asset-purchase policy, previous studies (Baumeister and Benati 2013, Kapetanios et al. 2012) quantify the impact of this policy on real GDP and CPI in the UK and the US.

## New evidence on the effects of quantitative easing

In recent work (Weale and Wieladek 2014), we re-examine whether these policies had an impact on output and inflation. After all, there are many other factors that could have

been responsible for the economic recovery following asset purchase announcements in these countries.

Unfortunately, the impulse response analysis in previous Bayesian VAR work cannot be used to answer that question, as restrictions on output and prices are imposed as part of the identification scheme. In contrast, we adopt three identification schemes that make no prior assumptions about the effect of the policy on output and inflation. A second important distinction from previous work is that we estimate our Bayesian VAR model on monthly data from March 2009, when asset purchases started, to May 2013. Finally, we identify asset-purchase announcement shocks directly, as opposed to attributing movements in spread shocks to unconventional monetary policy.

Our results suggest that an asset-purchase shock that results in an announcement worth 1% of nominal GDP leads to a rise in real GDP of about 0.36% in the US and 0.18% in the UK; and to a rise in the CPI of 0.38% in the US and 0.3% in the UK. These findings are encouraging, because they suggest that asset purchases can be effective in stabilising output and prices. The implied UK Phillips curve is steeper than in the US, meaning that the same change in output would have a relatively greater impact on UK inflation. Quantitatively, monetary easing leading to a 1% rise in output results in a 1% rise in the US CPI, whereas in the UK the CPI rises by 1.5%. These estimates of the inflation–output trade-off are similar to those that previous studies reported for conventional (interest rate-based) monetary policy. Table 1 compares the implied effect on output and prices with that reported in previous studies of unconventional monetary policy. For real GDP, our reported figures are very similar to those reported in previous studies. For the US, we also find a similar effect on the CPI, but for the UK, our results suggest that the impact on the CPI is almost three times as large as the effect reported in Baumeister and Benati (2013) and Kapetanios et al. (2012).

**Table 1** Comparison of estimated impact of QE1 across various studies

Study/Variable	Baumeister and Benati (2013)	Kapetanios, Mumtaz, Stevens and Theodoris (2012)	Weale and Wieladek
Real GDP (US)	1.08%		0.72 %
Real GDP (UK)	1.8%	2.5%	2.52%
CPI (US)	0.84%		0.76%
CPI (UK)	1.5%	1.5%	4.2%

## Transmission channels of asset purchases

Our approach also allows us to examine the different transmission channels of asset purchase policy. For the UK, asset purchase announcements have an impact on interest rate futures in the UK and measures of financial market uncertainty, suggesting that ‘signalling’ is an important transmission channel. For the US, only long-term yields and the real exchange rate react to asset purchase shocks, which implies a relatively greater role for the portfolio rebalancing channel. But asset purchases in both countries affect measures of financial-market uncertainty, such as the VIX. This suggests that asset-purchase announcements may also provide economic stimulus through a reduction in uncertainty, which is a channel that has not received much attention in previous work.

## Effects on emerging markets

A common complaint by policymakers in emerging market economies is that asset purchases in the UK and the US led to capital inflows to these countries, thereby contributing to rises in domestic asset prices and future financial instability. We do not find an impact on capital flows to emerging markets, but there is an effect on sovereign and corporate spreads, as well as industrial production in those countries. One potential explanation for this pattern is that UK and US asset-purchase policy stabilised economic conditions in the target export markets of these countries. If this is the correct explanation, then one would not necessarily expect a negative spillover effect on emerging market economies from UK and US asset sales, so long as these are accompanied by economic growth in these countries.

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# 5 The impact of the maturity of US government debt on forward rates and the term premium: New results from old data

**Jagjit Chadha**

University of Kent

2 November 2014

*The impact of the stock and maturity of government debt on longer-term bond yields matters for monetary policy. This column assesses the magnitude and relative importance of overall bond supply and maturity effects on longer-term US Treasury interest rates using data from 1976 to 2008. Both factors have a significant impact on both forwards and term premia, but maturity of public debt appears to matter more. The results have implications for exit from unconventional policies, and also for the links between monetary and fiscal policy and debt management.*

## Revisiting the supply effect

The question of the impact of the stock and maturity of net government debt on longer-term US Treasury yields, and the potential implications for central bank balance sheet policies, matters for monetary policy. For Keynes, Tobin, and Milton Friedman, decisions about the maturity of government debt issuance had major implications for the term structure of interest rates (Turner 2011).<sup>1</sup> But earlier empirical studies, arguably starting with Modigliani and Sutch (1967), seemed to find limited support for supply effects, with Ben Friedman ([1981] 1992) a notable exception. In any event, the rise of New Classical Macroeconomics and the mainstream New Keynesian model led many economists to ignore portfolio balance effects. Under this new orthodoxy, that inhabited a world of (near-)perfectly elastic demand for government debt, the relative supply

<sup>1</sup> Indeed, “monetary policy determines the composition of the government portfolio” was the first line in Wallace (1981) that expounded the logic of a Modigliani–Miller theorem for central bank market operations.

of short- and long-dated government bonds had little effect on longer-term interest rates. The yield curve was in turn determined by the current level and expected path of the policy rate. For Ricardian-type reasons, the method of financing a given level of government expenditure would have no impact on the level of consumption, and hence on the path of interest rates. And so the proper focus of monetary policy became solely the assessment of the correct level for the short-term policy rate.

But in trying to assess the prospective and actual impact of large-scale central bank purchases on government bonds, a number of recent studies have attempted to estimate the impact of debt issuance on interest rates. Kuttner (2006) freely admits that his estimates, on quarterly data from 1964–2004, may be ‘too strong’, as he finds that a 2 percentage-point increase in central bank holdings of debt reduces the term premium by around 200 basis points, but they are certainly indicative of the results emerging from several subsequent studies. Greenwood and Vayanos (2013) find that a 1 percentage-point decrease in (maturity-weighted) debt to GDP lowers long-term yields by some 40 basis points.<sup>2</sup> D’Amico et al. (2012), estimated on weekly data from December 2002 to October 2008, suggest that a 1 percentage-point fall in the ratio of privately held debt to total outstanding debt will tend to reduce yields by around 5 basis points, and that a decrease in the duration of Treasury securities by 1 year will tend to push 5- to 10-year yields down by around 100 basis points. Krishnamurthy and Vissing-Jorgensen (2012) find on low-frequency long-run data from 1919–2008 that a reduction in debt to GDP by 1 percentage point will tend to reduce long-term yields by some 2 basis points. Greenwood et al. (2014) find in a weekly regression over 1983–2007 that a 1% increase in the ratio of T-bills to GDP may increase the returns on short-term Treasuries by as much as 16 basis points on 2-week paper, and this *pari passu* will tend to reduce the term premium.

These studies have opened up two questions: what is likely to be the impact of changes in the structure of government debt on interest rates in normal times; and what impact might there be from any future open market operations that change the maturity of government debt? In this note, I summarise some new results from Chadha et al. (2013a and 2013b) and leave the second to subsequent research.

2 Note that they calculate that QE1 and QE2 lowered the maturity-weighted debt to GDP ratio by just under 0.7 percentage points. So they suggest that the impact of these operations on longer-term yields was some 30 basis points.



## Estimating pre-crisis effects

In Chadha et al. (2013a and 2013b), my coauthors and I want to estimate the impact of both overall supply and maturity effects on the 5-year forward 10-year rate and estimates of the 10-year term premia. First, our work differs from these other studies by following Laubach (2009) in the use of CBO 5-year-ahead projections of public debt and deficits. Second, we focus our estimates on the pre-crisis period by using semi-annual data from 1976 to 2008, thus ensuring that our results do not reflect crisis-induced market illiquidity. Finally, we use a series of the average maturity of federal debt held outside the Federal Reserve. We use a number of business cycle and financial controls, as well as surveys of professional forecasters for long-horizon inflation expectations. Whether we model the 5-year forward 10-year interest rate or the 10-year term premium, the results we obtain are remarkably consistent:

- A 1 percentage-point increase in the prospective debt to GDP ratio is associated with an increase in the long-term interest rate by around 2 basis points;
- A lengthening of 1 month in the maturity of public debt held outside the Federal Reserve is associated with an increase in the long-term interest rate by around 10–15 basis points.

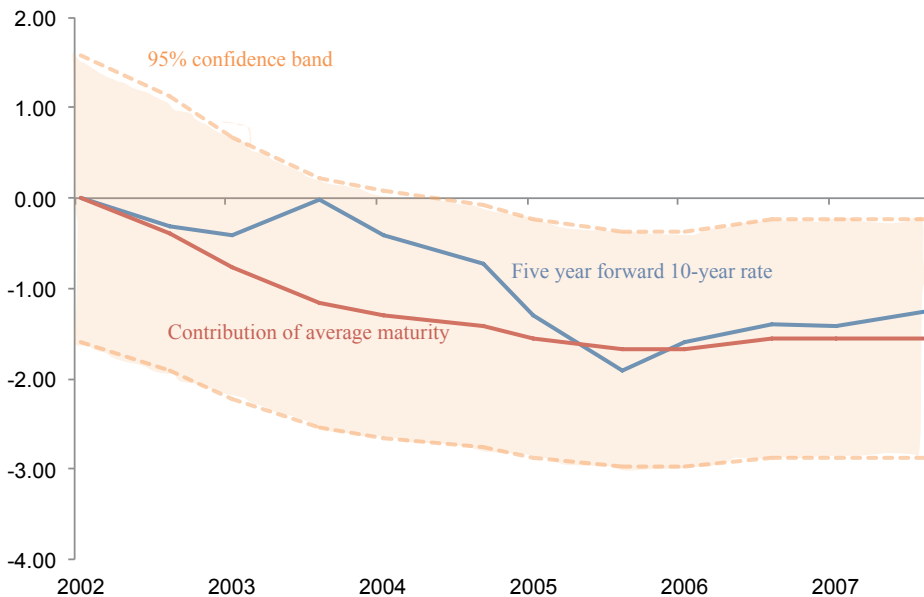
The results suggest that supply effects do play a significant role in driving longer-term interest rates. There are two caveats on these results. First, if debt managers seek to increase the maturity of debt when longer-term interest rates are expected to rise in the future, our results may be somewhat upward-biased. But we note that in the period we study, many changes in the maturity of debt were led by legislation, rather than any short-run response to market conditions (e.g. in 1976 and 2001). And, second, if we extend the estimation sample there is some evidence of structural instability from 2008 onwards, which is perhaps hardly surprising, and further motivates the use of the pre-crisis period.

## The Greenspan Conundrum and the impact of QE

We run two analyses of the model's ability to explain changes in longer-term interest rates. In February 2005, Alan Greenspan lamented that long-term interest rates had continued to fall even though the Federal Funds rate had been raised by 150 basis points to 2.5%. In his view, there was no obvious explanation, and he famously called this a

‘conundrum’. In subsequent months, the Federal Reserve continued to raise the Federal Funds rate, which reached 5.25% in July 2006, but the 10-year long-term rate did not increase as much as it had in previous tightening episodes. Our estimates suggest that an important reason for the level of the long-term rate might have been the shortening of the maturity of public debt – average maturity reached a peak of over 70 months in late 2001 and then it steadily declined to reach a trough of 56 months in March 2005. According to our estimates, a decline in the average maturity of almost 58 months would lead to a reduction of over 150 basis points. In Figure 1, we show the cumulative change in the forward rate from 2002H1 and the estimated contribution of expected future debt and average maturity in terms of a 95% confidence band, as well as the point contribution from maturity alone. And we note that any undershoot in forwards seem reasonably well explained by changes in maturity.

**Figure 1** Net supply, maturity, and the Greenspan Conundrum



QE1 was announced in November 2008. From then to the end of 2012, marketable debt (including Federal Reserve holdings) rose by 28.5 percentage points of GDP. The Federal Reserve absorbed some 7 percentage points of this increase. And so by buying long-dated bonds, the Federal Reserve also lowered the average maturity of debt by

around 7 months. Table 1 shows how much higher the 5-year-ahead 10-year rates and the 10-year term premium would have been if public debt held outside the central bank had been 7 percentage points of debt higher and average maturity 7 months longer. Specifically, the absorption of 7 percentage points of debt translates into a 12–15 basis points lower forward rate and a 0–8 basis points lower term premium, and a 7-month lower maturity translates into an 80–100 basis points lower forward rate and 67–89 basis points lower term premium. Combining these two effects, Fed purchases since November 2008 may have contributed to lowering the 5-year forward 10-year rates by approximately 90–115 basis points and the 10-year term premium by approximately 70–95 basis points.

**Table 1** Potential effects of central bank purchases of Treasuries, November 2008 to end-2012

	Change	5y forward 10y rate				10y term premium			
		Marginal effect (range)		Total effect (range)		Marginal effect (range)		Total effect (range)	
Debt held outside the central bank (% of GDP)	7	1.7	2.1	12	15	0	1.2	0	8
Average maturity (months)	7	11.6	14.3	81	100	9.6	12.7	67	89
Total effect (bps)				93	115			67	97

Note: Change in the first column refers to changes in privately held debt which could be attributed to central bank interventions since November 2008

## Portfolio balance effects: Segmentation and the limits to arbitrage

Portfolio balance effects are a convenient catch-all for why both the size and maturity of public debt can matter for the determination of interest rates. Preferred habitat theories involve segmented markets in which investors demand bonds at a specific maturity, and the price of that bond is thus determined by local demand and supply at that maturity. For example, pension funds may have a strong preference for longer maturities in order to match their liabilities. Furthermore, Krishnamurthy and Vissing-Jorgensen (2012) have argued that government bonds, particularly those of the US, have such a high degree of liquidity and safety that they are close substitutes for money. And so the

prices of government debt may be affected by their relative supply and the demand for money-like debt, rather than simply determined by the expectations hypothesis (e.g. Bauer and Rudebusch 2013). Work by Greenwood and Vayanos (2013) suggests that although inelastic demand and supply for debt at each maturity could be ironed out by arbitrageurs, risk aversion (and liquidity constraints) limit their ability to take on duration risk, and lead them to demand a higher premium when the relative supply of longer-duration government bonds increases. As the price of risk rises, bond prices at all maturities are affected, albeit by more at longer maturities.

## Concluding remarks

That our results are estimated in the 30 or so years prior to the financial crisis allows us to exclude the possibility that they have been driven by extraordinary financial market conditions. Our results apply to the market for US government debt. How well overall supply and maturity effects explain longer-term interest rates in other countries remains an open question. However, Iwata and Fueda-Samikawa (2013), applying a very similar methodology to yields on Japanese government bonds, also found significant overall supply and maturity effects. It seems reasonably clear, though, that in any exit from extraordinary policies these effects will complicate the choice of path for the policy rate, as key benchmark longer-term rates will be buffeted by announcements and actual debt sales, which will alter the net supply and maturity of public debt held outside the Federal Reserve. More generally, it would also appear that fiscal policy and its financing may have more substantive implications for monetary policy than was thought a generation ago. Ultimately, if our findings about the importance of maturity are accepted, then the Federal Reserve may also consider making more use of operations that change the maturity of debt held by the private sector and overseas.

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# 6 Quantifying the macroeconomic effects of large-scale asset purchases

**Karl Walentin**

Sveriges Riksbank

11 September 2014

*Central banks have resorted to various unconventional monetary policy tools since the onset of the Global Crisis. This column focuses on the macroeconomic effects of the Federal Reserve's large-scale purchases of mortgage-backed securities – in particular, through reducing the 'mortgage spread' between interest rates on mortgages and government bonds at a given maturity. Although large-scale asset purchases are found to have substantial macroeconomic effects, they may not necessarily be the best policy tool at the zero lower bound.*

Central banks have used various unconventional monetary policy tools since the onset of the financial crisis yet the debate continues regarding their efficiency. This column attempts to shed light on the 'bang for the buck', or the macroeconomic effects, of one such unconventional monetary policy – the Federal Reserve's large-scale asset purchases of mortgage-backed securities employed during the Fed's QE1 and QE3 programs.

It is now well established that central banks can affect the long-term yields of government bonds and other financial assets. Yet, given the volume of assets that have been purchased by central banks in recent years, the literature on its macroeconomic effects is surprisingly thin. Most studies analyse the effect of QE on the macroeconomy exclusively through the term premium. Chen et al. (2012) and Wu and Xia (2014) are two representative examples of this approach. Chen et al. (2012) provide an estimate of the effect of QE2 by using a dynamic stochastic general equilibrium (DSGE) model with segmented bond markets. They find that effects on GDP and inflation are almost negligible. Wu and Xia (2014) instead apply a statistical model to forward rates on Treasuries in order to compute a 'shadow rate' that applies when the policy rate is constrained at the zero lower bound. In a second step, they compute the macroeconomic

effects from this shadow rate and find that they are small – the Federal Reserve’s unconventional monetary policy during 2009–2013 reduced unemployment by 0.13% by December 2013.

Alternatives to the term premium approach also exist. Gambacorta et al. (2014) use the size of the central bank balance sheet as the instrument affecting the economy in a structural VAR. Alternatively, Weale and Wieladek (2014) include asset purchase announcements in a structural VAR (see also the related Vox column). The latter study finds substantial effects of QE1 on GDP and inflation. For the US (UK), they obtain a GDP increase of 0.7% (2.5%) and a CPI price level increase of 0.8% (4.2%).

## **Effects on the macroeconomy through the mortgage spread**

Another strand of the literature has focused on the macroeconomic effects of the ‘mortgage spread’ – the difference in the interest rate between mortgages and government bonds at a given maturity. Guerrieri and Lorenzoni (2011) and Hall (2011) build theoretical models concerning the effect of the mortgage spread on aggregate quantities.

My recent paper (Walentin 2014) is the first that quantifies the macroeconomic effects of large-scale asset purchases through the reduction in the mortgage spread. The paper uses a structural VAR approach on US mortgage spreads and macroeconomic variables to estimate the effects of mortgage spread shocks on the business cycle. A mortgage shock of 100 basis points yields a decrease of 1.6% in consumption, 6.2% in residential investment, and 1.9% in GDP. These responses are gradual and reach a trough after more than one year. House prices respond faster and decline by 2.6%. Qualitatively similar results are found for the UK and Sweden. However, the mortgage spread shock is more important for aggregate quantities and house prices in these countries compared to the US, and its impact is faster. This difference may be due to the much shorter duration of the typical mortgage contract in the UK and Sweden compared to in the US.

Hancock and Passmore (2011) find that QE1 reduced the mortgage spread in the US by 100–150 basis points, although other studies indicate smaller effects. This implies that the above example of a 100 basis point shock is a decent approximation of how much QE1 affected the US economy through a reduction in the mortgage spread. Note that



this calculation abstracts from any effect of QE1 on the macroeconomy through the term spread – the channel emphasised by earlier studies.

## Concluding remarks

In contrast to the earlier literature on macroeconomic effects of asset purchases, my recent paper (Walentin 2014) focuses on mortgage rates and their spread against government bonds. An important conclusion emerging from my research is that unconventional monetary policy in the form of central bank purchases of mortgage-backed securities has substantial macroeconomic effects. However, this does not necessarily imply that large-scale asset purchases are the best policy tool at the zero lower bound. Clearly, many other aspects of these purchases are not yet fully explored – for example, their effects on agency problems or their distributional effects.

*Author's note: The views expressed in this column are solely the responsibility of the author and should not be interpreted as reflecting the views of the Executive Board of Sveriges Riksbank.*

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# 7 Institutional investor investment behaviour during the Crisis and the portfolio balance effect of QE

**Michael A S Joyce, Zhuoshi Liu and Ian Tonks**

Bank of England; Bank of England; Univeristy of Bath

03 January 2015

*Central banks in advanced economies implemented quantitative easing (QE) as a response to the Global Crisis. A key transmission mechanism of QE, emphasised by policymakers, has been the ‘portfolio balance’ channel. This column describes behaviour of insurance companies and pension funds using sectoral and micro-level data from the UK. The results show that investors shifted their portfolios away from government bonds towards corporate bonds. But portfolio rebalancing has been limited to corporate bonds and did not extend to equities.*

## **QE as a response to the Crisis**

The Global Economic and Financial Crisis led central banks in advanced economies to adopt a variety of standard and non-standard measures to ease monetary conditions. In the US, the UK, and Japan the centrepiece of these non-standard measures has been large-scale purchases of financial assets, also known as quantitative easing (QE). The Bank of England began its programme of asset purchases financed through the creation of central bank reserves in March 2009. During the first wave of purchases from March 2009 to January 2010, the Bank purchased a cumulative total of £200 billion of medium- to long-term UK government bonds (gilts). In a subsequent wave of purchases that began in November 2011, it bought a further £175 billion of gilts, an overall amount equivalent to nearly 25% of annual GDP.

While the objectives of the Bank’s QE purchases were clear in terms of meeting its price stability mandate, there has been some debate over how the policy would work, i.e., what is the transmission mechanism. Policymakers in the UK and elsewhere have, however, consistently emphasised the role of the so-called portfolio balance channel

as a key element in the expected transmission of asset purchases to the rest of the economy (see e.g., Bean 2011 for the UK, and Yellen 2011 for the US). According to this mechanism, purchases of financial assets financed by central bank money increase liquidity and push up asset prices, as those who have sold assets to the central bank rebalance their portfolios into riskier assets. This, then, stimulates expenditure by increasing wealth and lowering borrowing costs for households and companies. In the UK, policymakers were explicit in structuring their purchases with the aim of buying primarily from institutional investors, such as life insurance companies and pension funds (ICPFs), who are the traditional holders of long-term gilts.

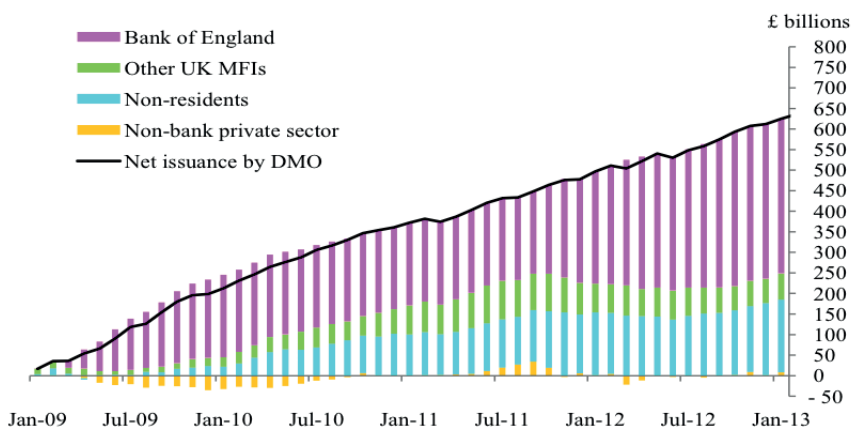
The origins of the portfolio balance channel go back to the work of Tobin and others in the 1960s. However, the role of portfolio balance effects in modern macroeconomic theory remains a subject of some controversy, as most models imply that policies such as QE can only work if they change the private sector's expectations of future policy rates, while the transferring assets between the private and public sectors under QE has no effect on the behaviour of the private sector per se (Woodford 2012). This neutrality result sits awkwardly with the large financial market reactions often observed after QE announcements, but other explanations may be possible and most of the empirical research on the topic has inferred the importance of this channel indirectly from the behaviour of government bond prices/yields and other asset prices (see Joyce et al. 2011 and Breedon et al. 2012 for evidence from the UK), rather than from direct evidence on the behaviour of investors.<sup>1</sup> In this column, we address this gap in the literature by describing our recent research (Joyce et al. 2014) on the behaviour of insurance companies and pension funds, using both sectoral and micro-level data on individual institutions.

1 There are some honourable exceptions. Goodhart and Ashworth (2012), for example, examine recent trends in the UK national accounts data on aggregate net investment behaviour by ICPFs, but they do not attempt to model investor behaviour to form a counterfactual. For the US, Carpenter et al. (2013) model sectoral flow of funds data for the US over the Crisis, but they do not look beyond the aggregate data.

## What is the sectoral evidence?

Figure 1 illustrates cumulative monthly changes in gilt holdings by different investor categories during 2009-2013, a period of strong gilt issuance. It can be seen that the Bank of England was a significant purchaser of gilts. Other monetary financial institutions were also net purchasers of gilts, as was the overseas sector. But, as Figure 1 shows, during this period the non-bank private sector, which includes insurance companies and pension funds, purchased unusually small quantities of gilts, which would be consistent with them selling gilts to the Bank of England. The same picture also emerges from ONS financial accounts data on ICPFs' annual net investment flows.

**Figure 1** Cumulative monthly changes in UK gilt holdings by category of investor



Source: Bank of England.

But the raw data can only tell us so much.

- If QE worked through a portfolio balance channel, then we would expect institutional investors to have reduced their holdings of UK government bonds (gilts) and to have increased their demand for riskier assets relative to what they would otherwise have done.

This requires addressing the difficult issue of the 'counterfactual' in the absence of QE.

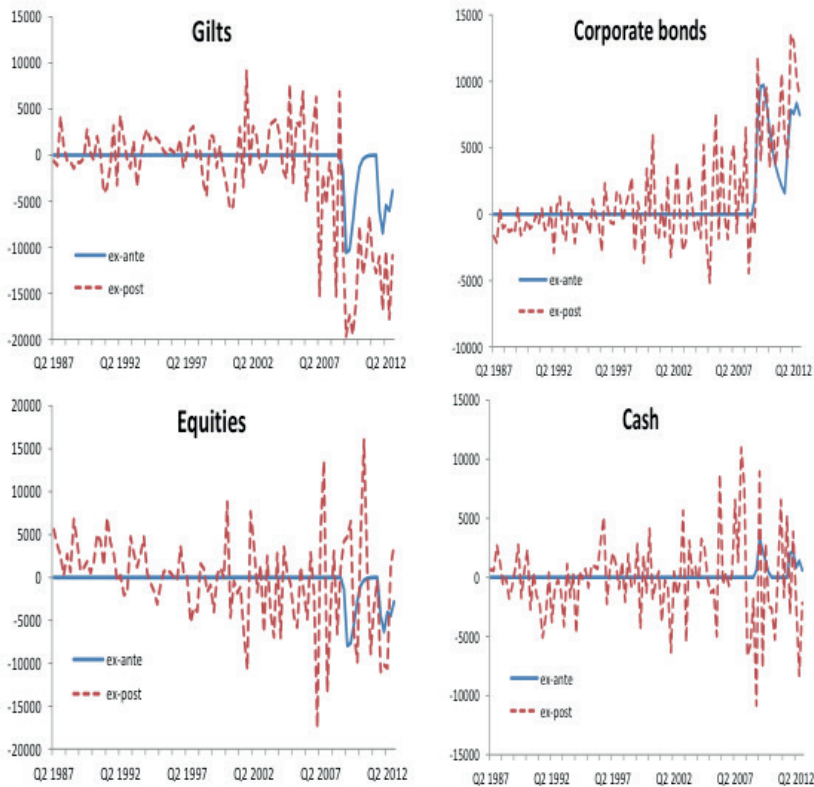
## Counterfactual analysis of investment behaviour

For counterfactual analysis, we need to make some allowance for other factors that may have been relevant in driving investors' portfolio allocations. At the same time, allowing for the influence of other factors that may have been influenced by QE (e.g. domestic financial conditions) may lead to understating the potential effects of the policy (a switch into riskier assets will be attributed to better financial conditions rather than QE, even though the policy may have been behind the improvement). Following the approach advocated by Pesaran and Smith (2012), we deal with this issue by allowing only for factors that influence portfolio allocations, but at the same time are unaffected by the Bank's purchases. More concretely, we run regressions explaining net investment by insurance companies and pension funds into different asset classes in terms of gilt issuance, various US financial control variables, and the amount of QE purchases. The size of the QE coefficient provides a metric of the impact of QE. For conciseness, rather than reporting the regressions results (see Joyce et al. 2014 for more details), we report the associated ex-ante and ex-post measures of the impact of QE on insurance companies and pension funds investment behaviour (Figure 2).

The ex-ante impact is measured by taking the difference between the model predictions for net investment with and without QE and the ex-post measure is based on comparing the actual (i.e., ex-post) out-turn with what would have been expected by using the model estimated over the pre-crisis period to predict net investment over the QE period. So, in each case a positive impact implies QE led to net investment being higher, and a negative impact implies it led to a lower impact.

- From the figure, it seems clear that both measures suggest that net investment in gilts fell as a result of QE.
- Moreover, there is evidence of rebalancing into corporate bonds, as net investment out-turns and predictions under QE were substantially greater than the model counterfactuals would suggest.

For net investment into equities and cash the pattern is much less clear cut, with the results, if anything, suggesting that net investment in equities was even lower than expected.

**Figure 2** Impact of QE on ICPFs, ex-ante and ex-post QE effects, £ million

### What is the micro evidence?

A similar approach can be applied to the micro-level data on individual life insurance companies (using annual data on life insurers provided by SynThesys for 1985-2012) and pension funds (using annual data provided in anonymised form by the Pension Protection Fund for 2005-2010). In this case, panel regressions are used to explain the annual portfolio share of each asset class in terms of a variety of controls, including the characteristics of the respective insurance company or pension fund, and QE purchases.

- In each case, the results indicate that QE is associated with lower asset allocations to gilts and higher allocations to corporate bonds, while the results for equities tend to show lower allocations.

The main advantage of using the micro-data is that it enables us to examine how heterogeneous the responses to QE are across different types of institutions. To do this, we interact the QE purchase variable with a range of other individual variables to see whether this increases or reduces the effect. Table 1 summarises some of the results for pension funds from running separate sets of regression, of which each included a different QE interaction term. We show five interactions for:

- Fund risk-appetite (measured by being above or below the cross-sectional median allocation to equities);
- Pension fund size, measured by number of members in the scheme;
- Maturity of pension scheme, measured by the ratio of pensioners to all members;
- Whether the fund is in surplus or deficit, as measured by the funding ratio; and
- Whether the pension scheme was open or closed.

**Table 1** Asset allocation regressions for pension funds: summary of interaction effects with fund characteristics (2005-2010)

Dummy variables	Equities	Nominal govt. bonds	Indexed govt. bonds	Corp bonds	Cash
QE dummy: less equity investment	0.00065	-0.00552***	0.00231	0.01036***	-0.00234
QE dummy: more equity investment	-0.00048	-0.00577***	0.00481**	0.00926***	0.00586**
QE dummy: smaller funds	-0.00063	-0.00573***	0.00464**	0.00905***	-0.00255
QE dummy: larger funds	0.00040	-0.00579***	0.00274	0.01314***	-0.00061
QE dummy: lower ratio of pensioners	0.00023	-0.00662***	0.00238	0.01043***	0.00246*
QE dummy: higher ratio of pensioners	-0.00042	-0.00508***	0.00441**	0.01248***	0.00105
QE dummy: lower funding ratio	-0.00159	-0.00475**	0.00427*	0.01183***	-0.00329
QE dummy: higher funding ratio	0.00165	-0.00670***	0.00290	0.01097***	0.00015
QE dummy: Close funds	-0.00070	-0.00582***	0.00417**	0.01222***	-0.00153
QE dummy: Open funds	0.00286	-0.00551**	0.00081	0.00786**	-0.00185

Note: Significance level: \*\*\*1%; \*\*5%; \*10%. Models are estimated using data provided by the Pension Protection Fund



The results in Table 1 indicate that although there is some heterogeneity in the response to QE across different types of funds, there are also many similarities. The main heterogeneities are with respect to index-linked bonds, but reduced allocations to conventional gilts and increased allocations to corporate bonds seem to have been similar across most pension fund types. However, the relative size of the coefficients suggests that the switch out of gilts was more pronounced for those funds that were better funded and for those funds that were younger (with a lower ratio of pensioners).

## **Conclusions**

The evidence seems consistent with the hypothesis that the Bank of England's QE policy resulted in some portfolio rebalancing behaviour by institutional investors. But it appears that portfolio rebalancing was limited to corporate bonds, with most of the findings suggesting that institutional investors moved out of equities during the period of QE purchases. This does not necessarily imply equity prices were not supported by portfolio reallocation behaviour, still less from QE, as the analysis only considers insurers and pension funds and does not consider the behaviour of other financial institutions such as mutual and hedge funds. The portfolio investment behaviour of these other financial institutions during the Crisis would be worthy of additional research.

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# 8 Identifying and quantifying monetary policy transmission through bank balance sheets

**Kaoru Hosono and Daisuke Miyakawa**

Gakushuin University; Hitotsubashi University

09 August 2014

*In the wake of the Global Crisis, several central banks have adopted unconventional monetary policies. This column presents new evidence from Japan on the transmission of monetary policy through banks' balance sheets. Overall, the evidence suggests that bank net worth affects loan supply, that the effect depends on monetary policy and economic growth, and that this bank balance sheet channel has a significant impact on firms' financing and investment. Exiting from unconventional monetary policies when bank balance sheets are weak could thus have a severe adverse impact on investment.*

How does monetary policy affect firm activities? While there is long-standing literature on this issue, the transmission mechanism of monetary policy is currently attracting renewed attention. The reason is that many central banks – including the US Federal Reserve, the Bank of England, the ECB, and the Bank of Japan – have introduced unconventional monetary policies such as quantitative easing and credit easing in the wake of the Global Crisis, and sooner or later will have to exit from these policies.

Apart from the ‘textbook channels’ of monetary policy transmission via interest rates and exchange rates, monetary policy can potentially affect firm activities through its impact on firms’ and banks’ balance sheets. In a seminal study on this balance sheet channel, Bernanke and Gertler (1989) showed theoretically that negative shocks to borrowers’ net worth increase the agency costs of financing investment, and thus reduce investment. Following their theoretical model, Bernanke et al. (1996, 1999) further showed that monetary tightening leads to a decrease in borrowers’ net worth, and consequently reduces borrowing and investment. They also show that an economic downturn has a greater effect on the availability of credit, investment, and output for firms with lower net worth. This implies that the impact of an aggregate shock on firms differs depending on firms’ net worth.

While the above studies focus on the credit demand side, Holmstrom and Tirole (1997) applied the argument to the banking sector, and showed that banks with lower net worth supply fewer loans. Their argument implies that banks with lower net worth will supply less credit when monetary policy is tightened or economic growth is lower. The reason is that, in addition to taking insured deposits, banks need to raise funds by issuing uninsured debt, which, as in the case of firms, is susceptible to agency costs.

The argument that monetary policy is also transmitted through the supply of credit is often labelled as the ‘bank-lending view’. According to this view, monetary policy shifts banks’ loan supply curve, and thereby affects investment and other activities of bank-dependent borrowers (e.g. Bernanke and Blinder 1988, Kashyap and Stein 1994). Furthermore, shifts in loan supply depend on banks’ balance sheets. For example, when the central bank sells securities to a bank through open market operations, this decreases the bank’s reserves, and the bank may have to decrease its loans unless it makes up for any shortfall in deposits by selling security holdings or by issuing nonreservable debt. Banks with fewer liquid assets will need to decrease loans more if they cannot issue nonreservable debt or can do so only at a higher cost than deposits (Stein 1998).

A substantial number of empirical studies have sought to examine the role of bank net worth in loan supply. They purport to show that bank liquidity or capital have a significant effect on lending, and that these effects are stronger when monetary policy is tight.<sup>1</sup> However, these studies tend to use aggregate-level or bank-level data, meaning that they cannot clearly disentangle shocks to loan supply and shocks to loan demand.

## Identifying shocks to loan supply and loan demand

Given this identification problem, recent studies have employed loan-level or firm-bank match-level data to isolate loan supply shocks from loan demand shocks (for a survey,

1 Examples include the studies by Romer and Romer (1990), Bernanke and Blinder (1992), Kashyap et al. (1993), Hoshi et al. (1993), Ueda (1993), and Ramey (1993), who use aggregate data to examine the bank lending channel of monetary policy. On the other hand, Jayaratne and Morgan (2000) use bank-level data to study the relationship between bank liquidity and loans, while Bernanke and Lown (1991), Peck and Rosengren (1997), Woo (1999), and Ito and Sasaki (2002) use bank-level data to examine the relationship between bank capital and loans. Meanwhile, Kashyap and Stein (2000), Favero et al. (1999), and Hosono (2006) use bank-level data to investigate the bank lending channel of monetary policy.

see Hosono and Miyakawa 2014a). Khwaja and Mian (2008) were the first to employ the strategy of identifying (bank-specific) loan supply shocks as changes in loans after controlling for firm-level fixed effects, which are assumed to reflect firm-specific loan demand shocks (as well as aggregate loan supply shocks). They examined whether banks that experience a larger withdrawal of deposits due to an exogenous shock (a nuclear experiment in Pakistan) reduce their lending to client firms more than other banks, and found that this is indeed the case.

Meanwhile, using data on loan applications in Spain, Jiménez et al. (2012) examined how changes in aggregate variables such as interest rates and GDP, as well as the interaction between these variables and lender bank characteristics, affect the likelihood of loans being granted. Extending the empirical strategy employed by Khwaja and Mian (2008), they controlled for the time-variant quality of potential borrowers by considering either firm-month or loan-level fixed effects.<sup>2</sup> They found that higher short-term interest rates and lower GDP growth reduce the probability for a loan to be granted, and that this tendency is stronger for banks with low capital (in periods of higher short-term interest rates and lower GDP growth) or low liquidity (in periods of higher short-term interest rates).

However, although the study by Jiménez et al. (2012) successfully overcame the identification problems in testing the hypothesis that bank net worth plays a more important role when monetary policy is contractionary or economic growth is low, they do not:

1. estimate the quantitative impact of bank capital and liquidity on changes in loan supply,
2. estimate the impact of the bank balance sheet channel on firms' total loans and investment, or
3. analyse the impact of unconventional monetary policies.<sup>3</sup>

2 They used information on a firm's successive loan applications to different banks when they controlled for loan-level fixed effect

3 Amiti and Weinstein (2013) also use matched bank-firm loan data to identify idiosyncratic bank shocks, i.e. movements in bank loan supply net of borrower characteristics and general credit conditions. Using Japanese firm-bank data, they showed that idiosyncratic bank shocks have a large impact on firms' investment. However, they did not examine the bank balance sheet channel of monetary policy and GDP growth rates.

## New evidence on bank lending in Japan

Against this background, in Hosono and Miyakawa (2014b), we set out to test the bank balance sheet channel hypothesis by addressing the identification problem using a unique dataset for Japan. Our dataset is a panel that covers firms listed on Japanese stock exchanges, and spans almost three decades. It contains information on the banks with which each firm transacts, on the amount of outstanding loans that each firm has with each bank, and on the balance sheet variables of each firm and bank. We combine this with information on monetary policy operations, including the beginning and ending of quantitative easing by the Bank of Japan.

Using this dataset, we examine:

- First, whether banks' net worth and liquidity (measured in terms of capital and liquidity, respectively, relative to total assets) affect changes in loan supply, and
- Second, whether tighter monetary policy or lower economic growth strengthens the effects of bank net worth and liquidity on changes in loan supply.

We focus on the variation in changes in outstanding loans across banks for the same firm and year to disentangle bank loan supply from demand. Furthermore, we focus on the variation in changes in outstanding loans over time for the same bank and firm to control for assortative matching between banks and firms. We can therefore estimate the quantitative impact of monetary policy and business cycles on changes in outstanding loans purely through bank net worth and liquidity. Using data on the amount of loans, we quantitatively assess the bank balance sheet channel, i.e. changes in bank lending caused by changes in the real GDP growth rate and monetary policy through bank balance sheets. Finally, we investigate how the bank balance sheet channel affects firms' overall borrowing and investment by focusing on the average level of banks' net worth and liquidity computed over all the lender banks for each firm.

The main findings of our analysis can be summarised as follows.

1. Banks with a higher liquidity-to-asset ratio tend to supply more loans.

Suppose, for example, that the liquidity ratio of lender bank  $i$  for firm  $j$  declines by one standard deviation (i.e. 0.068) in year  $t-1$ , and that monetary policy does not change in year  $t$ , while the real GDP growth rate is zero in year  $t$ . Given the estimated parameters, the model predicts that the growth rate of loan provision from bank  $i$  to firm  $j$  will



be 2.6% smaller than in the case that bank liquidity had not declined. Considering that the sample mean and the standard deviation of match-level loan growth are -0.3% and 48.8%, respectively, this implies that bank liquidity has an economically sizeable impact on the growth rate of loans.

2. The effects of bank capital on loan supply were significant during the 2000s, when Japan's regulatory authorities strictly enforced capital adequacy regulations.
3. The effects of bank capital and bank liquidity on loan supply are stronger when the economic growth rate is lower.

Suppose, for example, that the real GDP growth rate is -2% in year  $t$ . Assuming a one-standard-deviation decline in the liquidity ratio of lender bank  $i$ , the growth rate of loan provision from bank  $i$  to firm  $j$  will be 3.4% lower than in the absence of a decline in bank liquidity. This decline in the growth rate of loan provision is larger than in the case above (2.6%) where the real GDP growth rate is 0%.

4. The effects of bank liquidity on loan supply are weaker when monetary policy is loosened and stronger when monetary policy is tightened or the central bank exits from quantitative easing. In particular, the impact of bank liquidity more than doubled when quantitative easing was terminated in 2006 compared to the case of no change in monetary policy.<sup>4</sup>
5. Fluctuations in economic growth and monetary policy are transmitted to capital investment through the bank balance sheet channel in the case of firms with high investment opportunities. For example, firms with better investment opportunities tend to invest more when their lender banks are more liquid, and this link is stronger during an economic downturn.

Overall, our findings support the hypotheses that bank net worth affects loan supply and that the effect depends on monetary policy and economic growth. Moreover, this bank balance sheet channel has a significant impact on firms' financing and investment. The results imply that from a policy perspective, it is important to carefully choose

4 In the case that quantitative easing is terminated, the estimated growth rate of loan provision from bank  $i$  to firm  $j$  is 6.0 percentage points smaller than without a decline in bank liquidity.

the timing of the exit from expansionary monetary policy. In particular, exiting from unconventional monetary policies when bank balance sheets are weak could have a severe adverse impact on firms' activities. It should also be noted that such an adverse impact would potentially be particularly strong for firms with better investment opportunities, which are expected to be the main drivers of economic growth.

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# 9 New thinking on the transmission of QE to long-term yields

**Jens Christensen and Signe Krogstrup**

Federal Reserve Bank of San Francisco; Swiss National Bank

10 June 2015

*Quantitative easing (QE) is thought to work by reducing expected future short-term policy rates and the supply of long-term bonds. This column argues that a third channel may be at work, namely a reserve-induced portfolio balance channel. It operates through the increase in central bank reserves on commercial banks' balance sheets and is independent of which assets the central bank purchases. Central banks can implement QE programmes through purchases of other assets than long-term bonds and still reduce long-term yields.*

## **Transmission of QE on long-term interest rates**

Quantitative easing (QE) aims to reduce long-term interest rates, either broadly or in specific markets. Empirical evidence suggests that QE has indeed been effective. The preliminary experience with QE by the ECB's QE lends further support. Yet, we still do not know exactly why QE programmes are effective at reducing long-term interest rates.

The literature has focused on two main channels of transmission. One is a signalling channel, which works through lowering market expectations about future policy rates (see, e.g., Bauer and Rudebusch 2011 and Christensen and Rudebusch 2012). Another is a supply-induced portfolio balance channel arising from reductions in the supply of the purchased asset available to market participants (see, e.g., Gagnon et al. 2011 and Krishnamurthy and Vissing-Jorgensen 2011).

## **New evidence on QE's transmission**

In a recent paper, we argue that the expansion of central bank reserves that is a defining feature of QE programmes, is likely to also play an important role in the transmission

(Christensen and Krogstrup 2015). The basic idea builds on Bernanke and Reinhart (2004) who suggest that an expansion of reserves could give rise to asset price changes through portfolio balance effects. Our contribution is to propose how this channel might work.

- Central to our argument is that central bank reserves can only be held by banks, and that this segmentation of the market for reserves matters for how central bank asset purchases affect private financial sector balance sheets, and hence, the financial market reaction.







Short of a full-fledged model, we propose a mechanism in the form of a stylised example. Consider a financial system consisting of a banking sector, a non-bank financial sector, and a central bank. Figure 1 illustrates the aggregate balance sheets for these types of financial institutions. Suppose that there are four types of financial instruments, namely short-term bills, long-term bonds, deposits, and central bank reserves. Bills and bonds are in a fixed supply. The central bank has a monopoly on issuing reserves. Only banks can issue deposits. Both banks and non-banks can hold deposits, bills, and bonds, but only banks can hold reserves. Suppose further that short-term bills and reserves are highly substitutable from the point of view of reserve holding banks, and that non-bank financial institutions consider bank deposits and short-term bills to be highly substitutable at the zero lower bound.

Now consider the initial impact on the various balance sheets of a central bank purchase of a short-term bill, and consider an impact period sufficiently short so that banks do not adjust their credit portfolios to changes in funding conditions. The red arrows in Figure 1 reflect changes in the central bank balance sheet.



First, suppose that the counterparties to the central bank's transactions happen to be banks exclusively. The resulting impacts on banks' balance sheets are given by the green arrows in Figure 1. In the aggregate, the size of banks' balance sheets is left unchanged, but the balance sheet composition shifts from short-term bills toward reserves. As these assets are highly substitutable, this 'asset swap'-like transaction would not substantially change banks' portfolio composition or duration. Also, banks' liabilities would remain unchanged. Hence, there would be no obvious reason for banks to adjust their portfolios, and no asset prices would change. This is indeed the standard argument against QE in short-term bonds near the zero lower bound.



Figure 1. Balance sheets of key financial market participants

<b>Banks</b>		<b>Central Bank</b>	
<u>Assets</u>	<u>Liabilities</u>	<u>Assets</u>	<u>Liabilities</u>
Reserves  	Equity(bank)	Short bonds 	Equity(CB)
Short bonds 	Deposits 	Long bonds	Reserves 
Long bonds	Other assets	Other Assets	
incl. loans Other Debt			

<b>Non-Bank Fin. Sector</b>	
<u>Assets</u>	<u>Liabilities</u>
Long bonds	Equity
Short bonds 	Debt
Deposits 	
Other Assets	

*Note:* Stylised balance sheets of three key players in financial markets: the central bank, reserve holding banks, and non-bank financial institutions. The central bank can transact with both types of institutions.

But this is not all that happens. Suppose instead that it is mainly non-bank firms that sell short-term bills to the central bank. The balance sheet implications are now shown with black arrows in Figure 1. Since non-bank financial firms cannot accept reserves as payment directly, the central bank credits the reserves with the correspondent banks, which then credit the deposits held by their non-bank customers.

Under high asset substitutability, the balance sheets and portfolio compositions of the non-bank financial firms would be largely unchanged and not provide incentives to engage in any portfolio adjustments. In short, there are no supply-induced portfolio balance effects arising from such central bank purchases. The same is not true for the banks' aggregate balance sheet, which, as a result of their customers' transactions with the central bank, has grown on the asset side by the amount of new reserves and on the liability side by the new deposits. Their share of short- to long-term asset holdings thereby increases. That is, for the banking sector as a whole, the duration of the asset portfolio falls. If banks had individually optimised the duration of their portfolio before

the central bank asset purchases, then they may seek to make up for the lower duration after the purchases by increasing their demand for long-term assets, while trying to sell reserves or other short-duration assets. This bids up the price (or equivalently, lowers the yield) of long-term assets.

This reserve-induced channel differs from the supply-induced portfolio balance channel hitherto considered in the literature by being independent of the specific assets purchased by the central bank. Note also that if a central bank buys long-term assets in a QE programme, both portfolio balance channels can be operating at the same time, and cannot be separately identified empirically. This is the case for all three QE programmes conducted by the Federal Reserve since 2008, and for the Bank of England's asset purchase programmes.

That reserve-induced effects have played a role in the transmission of these QE programmes is nevertheless likely. Carpenter et al. (2013) provide evidence that banks were not the main sellers of assets to the Federal Reserve during its QE programmes. Moreover, the Bank of England's QE programme was, at least initially, designed to have mainly non-bank counterparties (Joyce et al. 2011).

## **Concluding remarks**

We provide supportive empirical evidence of the reserve-induced channel in Christensen and Krogstrup (2015) by analysing the large expansion of reserves undertaken by the Swiss National Bank in August 2011. These reserve expansions were unique and different from QE programmes implemented at other central banks, in that the Swiss National Bank only acquired short-term claims and left the available stock of long-term securities unchanged. By design, therefore, this programme cannot have had any supply-induced portfolio balance effects on long-term yields. We find that Swiss long-term government bond yields declined following the three key Swiss National Bank announcements, and show that these declines came predominantly from the reserve-induced portfolio balance channel.

Our research suggests that the strength of the reserve-induced channel depends on the specific market participants, their asset preferences and substitutability, and market structure in the economy in question. Such features have not yet been analysed in connection with assessments of the effectiveness of QE. If reserve-induced effects are

material, the implication is that QE programmes can be implemented through purchases of assets other than long-term bonds and still reduce long-term yields.

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## Part II

### Risks and criticisms



# 10 Lost in transmission

**Heleen Mees**

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21 June 2011

*With the US economy still faltering, some are suggesting it may be time for a third round of quantitative easing. This column explores the transmission mechanism of monetary policy and how it has broken down in recent years. It argues that, in this climate, the Fed would be wise to avoid another bond-buying programme.*

The past decade has been characterised by record-low interest rates, which has given rise to a whole new batch of economic literature on global imbalances, or the so-called saving glut. What has attracted much less attention is the fact that – while US Treasury yields have dropped to an all time low – the yield on equity capital has actually risen.

After a series of dismal economic data and the Eurozone crisis slowly but surely spinning out of control, the markets seem to be counting on the Fed to step up to the challenge yet again. Changes in the stance of US monetary policy are in principle transmitted to the real economy in three stages.

- First, the Federal Reserve raises or lowers its federal funds rate target. Bank reserve provisions are then adjusted to push the actual federal funds rate to approximate the target.
- Second, the change in the federal funds rate affects other interest rates, including LIBOR and commercial paper rates, Treasury bill and bond rates, and corporate bond yields, as well as the exchange value of the dollar and the valuation of corporate equities.
- Third, changes in interest rates, the dollar, and the level of equity prices then affect the real economy.

The slew of recent data releases suggests that the US economy has slowed markedly in recent months. With its traditional policy instrument currently set as low as possible, the Fed has few instruments left to ease its monetary policy stance. The Fed may try to convince the markets through its communications that it will keep the federal funds rate at a record low for an extended period of time (Yellen 2011). The Fed may also

endeavour to drive up inflation expectations by setting an explicit inflation target of, for instance, between 3% and 4%. Or the Fed may engage in yet another round of quantitative easing.

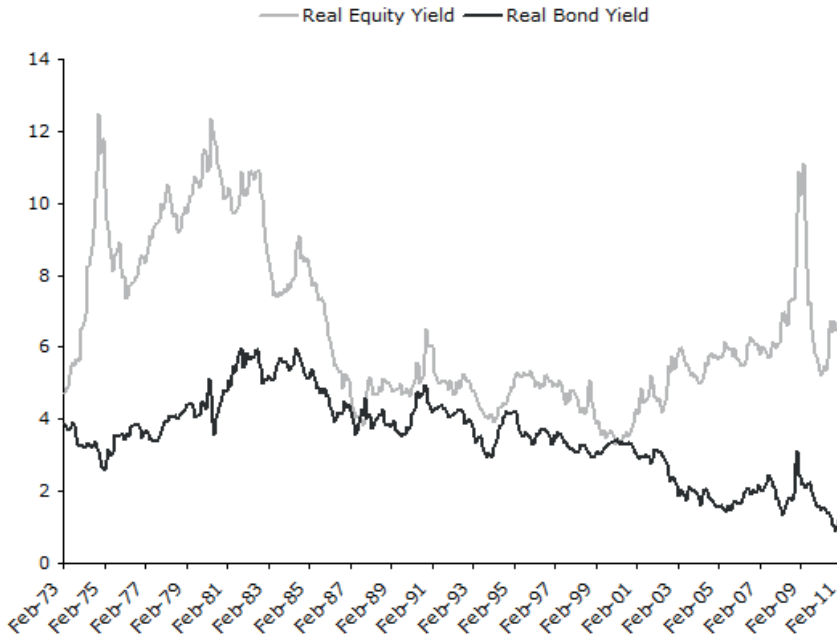
In 2008 and 2010 the Fed already rolled out 2 bond-buying programs, buying respectively for approximately 1.4 trillion US dollars government bonds, mortgage backed securities and bank debt in 2008/09 and for approximately 600 billion US dollars government bonds in 2010/11. This so-called quantitative easing implies that the Fed actually skips the first step of monetary policies' transmission mechanism and proceeds directly to step 2 by driving up the price and driving down the yields of longer-term bonds. QE1 and QE2 have been estimated to lower yields by 30 to 100 basis points for the first round and around 20 basis points for the second (Gagnon 2010 and Krishnamurthy 2011).

As my recent research shows (Mees 2011b), the Fed's easy monetary policy stance in the years leading up to the financial crisis has sparked the refinancing boom and ensuing spending spree. It was primarily through this transmission mechanism that the record-low federal funds rate (compared to pre-crisis years) affected the real economy in the years leading up to the financial crisis (Mees 2011a). Preliminary evidence suggests that the most recent spate of QE2 affected the real economy mainly through a weaker dollar, which reduced imports, and through higher stock market prices, which encouraged (high-end) consumer spending. QE1's transmission mechanism was somewhat more diffuse, as the large-scale purchases of mortgage backed securities improved market liquidity and removed assets with high risk from private portfolios, which helped to further unfreeze financial markets.

Why the Fed's accommodating monetary policy affected the real economy mainly through consumption, and less through investment, becomes self-explanatory if you compare the yield on long-term government bonds to the yield on capital, as shown in Figure 1.



**Figure 1** Global ex ante earnings yield and real ex ante 10-year government bond yield



Source: Goldman Sachs

The fact that Treasury yields remained puzzlingly low in 2004 and 2005, in spite of the 200-basis points increase in the fed funds rate, has often been attributed to the saving glut (Bernanke 2005). However, the rising ex ante return on capital as shown in Figure 1 is not consistent with the saving glut theory. As Daly and Broadbent (2009) point out, the global increase in the forward yield on quoted equity together with the decline in bond yields implies a sharp increase in the global equity risk premium. Emerging economies' savings have been heavily skewed towards fixed-income assets, either because emerging economies' investors are genuinely more risk averse, and/or because they are institutionally constrained to invest in equity capital. Institutional constraints include emerging economies' underdeveloped financial markets and the reluctance of most Western countries to allow emerging economies' sovereign wealth funds to invest in equity capital of Western companies.

The rising yield on capital at a time that bond yields worldwide were falling, suggests that something went awry with monetary policy's transmission mechanism. It may

explain why monetary policy had limited traction in the 2000s. While bond yields and capital yields moved largely in sync during the period dubbed the Great Moderation (1982 to 2001), the opposite happened from 2002 onwards. Fuelled by the Fed's easy monetary policy, the American spending spree in the early 2000s spurred economic growth and savings in China and oil-exporting nations (Mees 2011b).<sup>1</sup> These countries subsequently invested a major part of the proceeds in fixed-income assets, driving down bond yields and driving up the global equity risk premium.

The higher equity risk premium does not only discourage investment in general, it also favours sectors in the economy that are characterised by relatively high debt-to-equity ratios (e.g. the financial sector). It may explain why – by the mid-2000s – bank profits accounted for 40% of S&P 500 companies' profits combined. The “financialisation” of the economy is often attributed to deregulation. However, the combination of low bond yields and high equity risk premiums, which favoured the banks disproportionately, contributed to the financialisation as well. Another consequence of the high equity risk premium is that sectors with high debt-to-equity ratios – which are more profitable because of low finance costs and therefore can offer higher wages – impose a brain drain on sectors with lower debt-to-equity ratios (Philippon and Reshef 2008).

In light of the – at best – mixed results of almost a decade of monetary easing, the Fed would be wise to refrain from bond-buying programmes this time around. If anything, there is still an undue global zest for government bonds (with some notable exceptions, that is).

There is – unfortunately – no easy fix for the high global equity risk premium. The Fed buying stocks instead of bonds, skipping not only the first stage of the monetary policy's transmission mechanism but part of the second stage as well, does not seem much of a solution. Even if the Fed would manage to drive down the average yield on existing stock, it is unlikely to drive down the marginal yield on capital, which drives investment. Also, the law actually prevents the Fed from buying stocks. And the US would end up looking an awful lot like China with all those state-owned enterprises.

1 Modigliani and Cao (2004) suggest that high household's saving rates that characterise fast-growing emerging economies like China are largely consistent with the life cycle hypothesis.

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# 11 QED: QE3

## **Marco Annunziata**

General Electric Co.

17 September 2012

*As the Fed announces a third round of quantitative easing, this column argues that it is unlikely to work. Investment and hiring are held back by huge uncertainty over the long-term outlook and the stimulus provides a monetary bridge over the election gap but little more.*

In a brief press release, the Fed launched an extremely aggressive stance (Federal Reserve 2012):

- As signalled in the last released FOMC minutes and in Bernanke's Jackson Hole speech, the Fed recently launched QE3, its third attempt to boost growth and employment via asset purchases. It will buy US\$40 billion worth of mortgage-backed securities (MBS) a month.
- It confirmed that Operation Twist (extension of maturities held in its portfolio) will be extended though the end of this year.
- In addition, the Fed has extended its forward guidance, indicating it now expects interest rates to remain exceptionally low at least through mid-2015.
- Even more importantly, the Fed now "expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens".
- Finally, the statement opens the door to continuing MBS purchases, launching new purchases of other assets (such as US Treasuries), and deploying "other policy tools" until they can achieve a substantial improvement in the labour market outlook in a context of price stability.

The Fed has meanwhile upgraded its growth forecasts: GDP growth forecasts for 2013 are raised to a 2.5%-3.0% range (from 2.2%-2.8%) and for 2014 to 3.0%-3.8% (from 3.0%-3.6%); the growth forecast for 2015, released for the first time, is 3.0%-3.8%. The longer-run forecast, which should give us the FOMC's view of potential growth, is unchanged at 2.3%-2.5%. Unemployment is forecast at 7.6%-7.9% in 2013, 6.7%-7.3% in 2014, slightly lower than previously projected, and 6.0%-6.8% in 2015.

The Fed sets its sights straight on the labour market, and stays true to its mantra that there has been no change in the US' natural rate of unemployment. The statement that the Fed "expects that a highly accommodative stance of monetary policy will remain appropriate for a considerable time after the economic recovery strengthens" sounds at first like an oxymoron. Once the recovery strengthens, there should be no need to maintain an extraordinary degree of monetary accommodation. But the Fed projects that in 2014, with GDP growth running a full percentage point above potential, unemployment will be barely lower than it is now, and only in 2015 it will get closer to 7%.

To be clear: the Fed's position fully reflects its mandate, which is to pursue "maximum employment and stable prices". (Actually, the mandate includes "moderate long-term interest rates", see [here](#), and [here](#) a few doubts could arise). With no visible inflation pressures so far, the Fed is drawing the logical conclusion that it should try as hard as it can to reach maximum employment. The question is what maximum employment is –whether it is still at a 5%-6% unemployment range, or 7% or higher, in which case structural measures would be required to bring it down. Linked to this is the question of whether potential growth might be significantly lower than we think – Robert Gordon (2012) has provocatively argued that economic growth might be entering a new era of lower growth.

This is admittedly an uncertain and controversial point. In a recent Vox column Calvo et al. (2012) make a strong case that a persistently higher rate of unemployment might reflect the nature of the financial crisis rather than a higher natural rate of unemployment, and that monetary policy can therefore help bring it back to pre-crisis levels. Their prescription, however, is that the Fed should act in coordination with the Treasury to remove toxic assets and bolster the stock of safe assets; a strategy with a strong structural component, which seems to me absent from the Fed's current approach.

Investment and hiring are held back by uncertainty over the fiscal picture, which is compounded by the political uncertainty of the November elections. And the uncertainty is substantial for two reasons. First, Republicans and Democrats are on very divergent positions, to the point that the presidential election is being cast as a referendum on small versus big government. Second, the underlying fiscal challenge is substantial; just look at the Congressional Budget Office's scenarios. Liquidity is not the problem, and more liquidity is unlikely to be the solution. For now, it's the best we get, and in the short term, it is better than the disappointment we could have seen after the Fed

had raised expectations. But we know from the movies that sequels can often have diminishing returns. I think that is even truer for QE.

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## About the author

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# 12 Unconventional monetary policies revisited (Part I)

**Biagio Bossone**

Group of Lecce and Centre d'Études pour le Financement de Développement Local

4 October 2013

*In response to the Global Crisis and Great Recession central banks have embarked on a variety of unconventional monetary policies. This column, part of a two-column series, reviews the range of unconventional measures that have been implemented or proposed. The second instalment will compare the various policies.*

The 2007 financial crisis and the following economic slump led central banks in advanced economies to undertake *unconventional* monetary policies.<sup>1</sup> The crisis evolution, especially in debt-ridden European nations, and the limits of the unconventional approaches adopted, triggered proposals for new heterodox responses. Below is a discussion of the unconventional measures implemented and the major proposals submitted. Key pointers will be discussed in Part II of this commentary.

## **Making money easier and cheaper: Quantitative and credit easing**

As the crisis erupted, major central banks intervened to fix the broken financial markets by starting quantitative easing (QE). They committed to issuing liquidity by purchasing assets (including toxic) from banks and nonbanks, at a time when banks stopped lending

1 See IMF (2009). Although several taxonomies have been employed in the literature to discuss unconventional monetary policies (Stone et al 2011), all of them refer to their characterisation as “balance sheet” policies, introduced by Borio and Disyatat (2009) in the first systematic review of the issue, whereby the central bank actively uses its balance sheet to affect directly market prices and conditions beyond a short-term, typically overnight, interest rate. In contrast to the traditional interest rate policy, unconventional monetary policies result in substantial changes in the central-bank balance sheet, in terms of size, composition and risk profile, as they target market segments that go beyond that for bank reserves and over which the central bank has far less control.

to each other, households and firms were credit squeezed, and policy rates were running against the zero lower bound.<sup>2</sup>

When the crisis spilled over to the real sector, the objective of QE in some countries shifted from financial markets repair to revamping economic activity (“a step into the dark”, as Rajan (2013) dubbed it). In the US, UK, and Japan, QE turned at stimulating demand by lowering the cost of money and by raising inflation expectations (Bank of England 2011).

QE has been crucial to avert financial meltdown, and has had some effects on the macroeconomy (see, for instance, Joice et al. 2011, Gambacorta et al. 2012, and Cúrdia and Ferrero 2013). Yet there are reasons to be critical about its effectiveness for macroeconomic stabilisation relative to its costs and risks. QE has dramatically increased base money, but not the money supply that drives aggregate demand. QE injects money to owners of assets (e.g., traders, hedge funds, investors, banks, high-wealth individuals, and speculators) who benefit from QE-stirred bond and asset-price rises, but represent a tiny minority with a low propensity to consume. Conversely, QE does not reach common people (with higher propensity to consume) and deprives them of interest incomes: with given or falling incomes, and prices expected to rise, they may

2 Still in early 2000, referring to the complex of unconventional monetary policy tools that had been introduced in the US, Federal Reserve chairman Ben Bernanke spoke of “credit easing”, to distinguish the approach followed by the Fed from the “quantitative easing” adopted by the Bank of Japan during 2001-2006. Whereas the latter had aimed at increasing the quantity of money to support prices and improve economic activity, the former aimed at changing the asset composition of the central bank’s balance sheet in order to facilitate credit access to financial and non financial institutions under stress (Carlson et al 2009). In Europe, the ECB initially focused on measures to enhance interbank and nonbank credit market conditions; subsequently, it introduced instruments to purchase government debts in the secondary markets with a view to addressing the malfunctioning of securities markets, and to restoring an appropriate monetary policy transmission mechanism. For a detailed recounting of QE operations in Europe, Japan, UK, and the US, see Fawley and Neely (2013). Central banks in emerging market economies have not engaged in unconventional policy since they were not confronted with deflationary trends. Exceptions were the central bank of Turkey, where monetary policy has aimed at managing capital flows and credit controls were used to check inflation, and the central bank of Brazil, which has intervened in FX futures markets to counteract speculative activity on exchange rates. I am grateful to Otaviano Canuto for sharing information on monetary policies on emerging-market countries.

even reduce consumption.<sup>3</sup> Although research on this issue is warranted, indications are that QE has significant distributional effects.<sup>4</sup>

Under QE, share prices rise and business cash holdings grow. Larger companies have used QE money to buy their own assets – through share buy-backs and debt-equity swaps, with little effects on output and employment. Smaller companies, with limited access to capital markets, have still had hard times borrowing from banks.

Where QE flattens the yield curve, risk pricing becomes distorted. Capital gets directed to otherwise unproductive and unprofitable uses. Money growth feeds bond and asset-price bubbles, and high-risk structured financial instruments re-emerge (Stein 2013 and IMF 2013). Voices of exit from QE increase interest rates and uncertainty (Grenville 2013 and Rajan 2013).

A major factor conditioning the macroeconomic effects of QE is its interaction with fiscal policy. Pulling QE alongside a restrictive fiscal policy is like pushing on the car's accelerator and brake pedals at the same time, which is what has happened in the US and UK. The alternative is what Japan is doing under Abenomics, providing for a simultaneous expansionary use of the monetary and fiscal levers. But how is such a mix eventually going to play in an economy that is already plagued by a huge public debt? And what are the implications for central-bank independence?

## **Steering market expectations through forward guidance**

Although conceived earlier than QE, at least in its original understanding, what has recently come to be known as forward guidance (FG) has evolved as a natural complement to QE, and has gained prominence among central banks as a way to

3 See, for instance, the result of the Bank of Japan's public expectations survey [http://www.boj.or.jp/en/research/o\\_survey/ishiki1308.pdf](http://www.boj.or.jp/en/research/o_survey/ishiki1308.pdf), and the comment by Binder, 2013.

4 The Bank of England (2012) points that the overall impact of QE on household wealth – by pushing up asset prices – is likely to be substantial, but notes that the benefits from wealth effects accrue to those households holding most financial assets, and that financial asset holdings are heavily skewed with the top 5% of households holding 40% of the assets and with the median household holding only around £1,500 of gross assets.

influence market expectations on future interest-rate levels.<sup>5</sup> When the central bank is constrained by the zero lower bound in its capacity to reduce the short-term rate, it can use FG to communicate its intention to keep the policy rate at the current level for some time in the future, even beyond the point when normalising it would be in order. Thus, FG implies a willingness to tolerate higher future inflation,<sup>6</sup> and helps engineer an easing of credit conditions even at a constant short-term interest rate (Praet 2011). Importantly, FG marks the heightened attention from the monetary authorities to the level of economic activity and resource employment. It is expected that FG help central banks better explore the scope for economic expansion without jeopardising price and financial stability.

On the critical side: first, research has found only partial evidence that FG improves market participants' ability to forecast short-term rates, and shows no evidence that it has increased monetary-policy efficacy in New Zealand, the country with the longest history of FG (see Kool and Thornton 2012). Second, it appears that standard central banks' macroeconomic models tend to grossly overestimate the impact of FG on the macroeconomy – a phenomenon called the 'forward guidance puzzle'.<sup>7</sup> Third, it is not clear what makes FG credible: what ensures the commitment underpinning it: will central-bank governors stick to the explicit promise or will they renege on it, when the time comes, by saying that long-term expectations have become less well anchored? (See Rajan 2013, and Clarida 2012). Finally, while preserving central-bank independence, FG does not resolve monetary-policy impotency at the zero lower bound.

## **The world beneath zero: Running negative interest rates**

When the economy is in deep recession, liquidity preference keeps interest rates high, and policy rates run proximate to zero, the lower bound could be removed by

5 Krugman (1998) and Woodford originated the line of thinking underpinning FG, which was later further developed by Eggertsson and Woodford (2003). As was the case with inflation targeting, the Reserve Bank of New Zealand was the first central bank to adopt FG. In 1997 it started announcing a path for the three-month bank bill rate.

6 This stands out quite clearly in the illustration of FG in the UK, by Dale and Talbot (2013).

7 Del Negro et al. (2013), who have coined this expression, show that, as long as FG extends far into the future, the modelled impulse response to the extended peg will lift the short-term rate in the previous period, thus requiring a cascade of shocks over that period in order to push the interest rate back down. As a result of this feedback-loop mechanism built into the models, even a modest amount of FG is predicted to produce unrealistically large real effects.

allowing interest rates to go negative. Negative interest rates would apply to central-bank reserves, and possibly to bank deposits and other saving instruments. Cash would have to be suppressed or taxed (stamped), or a new currency would have to replace the one in circulation at a depreciated exchange rate vis-à-vis the unit of account, say, the dollar, which would remain the numéraire. NIR aims to make money such a ‘hot potato’ that banks and people should want to get rid of it: the former by lending it, the latter by spending it.

Mankiw (2009) resurrected the idea publicly, and Buiter (2009a,b) identified the above conditions for effective removal of the zero lower bound.<sup>8</sup> The objections to negative rates are many (See for instance discussions by Coppola 2012, 2013, and the more analytical contributions by Garbade and McAndrews 2012, and by Van Suntiun et al. 2011). Besides the odious idea of taxing money or of seemingly subsidising banks with negative rates on reserve lending, critics hold that negative rates would push people toward cash hoarding and safe asset accumulation, rather than spending. They argue that banks would still hold up lending if they perceived risks to be too high, and that their margins’ compression would lead them to charge higher, not lower, lending rates. Critics either ignore Buiter’s conditions or emphasise their practical hurdles. Kimball (2013b) points that the problem can be addressed by transferring legal tender from cash to electronic money, and proposes a detailed plan to do so.

While unconventional, negative rates do not involve central bank’s balance-sheet alterations, and does not infringe central-bank independence. It is not clear, however, if and what legal issues would be raised by its implementation.

Experience with negative rates is very limited. The central bank of Sweden charged a negative rate on its deposit facility as a response to the 2008 crisis, but without shifting the monetary-policy regime, and the central bank of Denmark introduced a negative rate on deposit certificates in 2012, only to lessen exchange rate pressures. In early

8 Buiter and Panigirtzoglou had already discussed NIR in the early 2000s (see <http://ideas.repec.org/c/pbu137.html>). The idea goes back to the original proposal by the (unduly neglected) German businessman and economist Silvio Gesell (see DeLong (2009), and Kimball (2013a)). The idea was successfully experimented with in the Austrian city of Wörgl in the 1930s. It is to be noticed, however, that negative rates were applied only after a new complementary currency was issued by the city authorities and used to finance public spending programmes (see <http://www.reinventingmoney.com/documents/worgl.html>). The Wörgl experiment resembles closely the overt monetary financing of fiscal deficits discussed below.

2013 the Bank of England has considered the possibility of a negative rate for macro stabilisation, and last June the ECB has indicated to be technically ready for it. Both central banks, however, have refrained from taking commitments.<sup>9</sup>

## Overt money financing of fiscal deficits

The idea was revived by Bernanke (2003). He recommended that Japan fight deflation through public deficits explicitly financed with incremental – and permanent – central-bank purchases of government debt. The money created would finance tax cuts or new spending programmes. If the money had gone to finance tax cuts – Bernanke argued – consumers and businesses would likely spend their tax-cut receipts, since no current or future debt-service burden would be created to imply future taxes.<sup>10</sup>

Yes, but what about the debt implications of Overt money financing? The key element is the *permanency* of the purchases of public debt, which rules out that the new debt will ever be placed on the market.<sup>11</sup> Permanency eliminates Ricardian equivalence effects, and prevents new debt accumulation,<sup>12</sup> but raises government-central bank relationship issues, to be discussed in Part II.

Overt money financing comes as close as possible to putting money into the public's hands for spending: it's 'helicopter money'. More extreme forms are proposed by Wood, and by Cattaneo and Zibordi.<sup>13</sup> They submit that in highly leveraged and

9 See official communications, respectively, at <http://www.bankofengland.co.uk/publications/Documents/other/treasurycomm...>, and <http://www.ecb.europa.eu/press/pressconf/2013/html/is130606.en.html>). On the ECB's thinking about negative rates, see Nowakowski (2012).

10 McCulley and Pozsar (2013) and Adair Turner (2013) review the combined use of monetary and fiscal policies in a deleveraging context, and conclude that OMF provide the most effective way to address deflationary conditions.

11 In studying an economy with a consolidated fiscal and monetary authorities, Buiter (2004) indicates that the increase in the nominal stock of money must be permanent for it to have positive real effects. In the case of OMF, as these are run by separate and independent authorities, the condition of permanency must be extended to cover the central bank's purchases of public debt.

12 In fact, with no repayment obligation, deficits financed with OMF do not even constitute debt, but fiat money allocation from the State to itself. Bossone and Wood (2013) discuss this issue and its implication for central bank finances.

13 See Wood (2012a,b,c), and Wood (2013). In a forthcoming book, Cattaneo and Zibordi (2013) submit a proposal for Italy, which could well be adopted by other eurozone countries currently in deep recession; see also <http://bastaconleurocrisi.blogspot.it/2013/09/tax-credit-certificates-ce...>. All these proposals can be theoretically situated within the Neo Chartalist school (see Wray (2000), and Tcherneva (2007)).

depressed economies the minister of finance should be granted the power to issue a form of complementary money, with legal tender, to be used to finance fiscal deficits large enough to stimulate demand. The government would have full sovereignty on the issuance of the complementary money.<sup>14</sup>

## **Monetising the debt**

Considering the public debts of some Eurozone countries as unsustainable, Pâris and Wyplosz (2013) propose that the ECB purchase and subsequently eliminate these debts through debt monetisation. In practice, the ECB would purchase the outstanding debt of a euro member in exchange for a zero-interest loan of an equal amount. The loan would stay indefinitely on the ECB books, and will never be repaid. Notice that, like in the case of overt monetary financing, the monetisation would be permanent. The counterpart of the operation would be an equal supply of euro monetary base, which would represent the cost of monetisation. The monetisation would be a one-off measure, and would not be intended directly at supporting economic activity; yet it would regain fiscal space to the government and spending capacity to the economy. The inflation risk would be remote, according to the monetisation proponents, due to the weak economic conditions of the countries considered but, if necessary, the ECB could sterilise the money issued. The proposal does not deal with the institutional issues underpinning monetisation in a context of a multi-national setting with a strongly independent central bank.

This review above points to a number of considerations. I discuss these in the second of this two part series to be posted tomorrow.

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14 Interestingly, these proposals have an historical antecedent in the special government bonds that Germany issued in the 1930s, under central banker and finance minister Hjalmar Schacht, to survive the Great Depression as the country was heavily indebted and finally vexed by the winning power of the First World War. The operation succeeded in pushing the German economy through a speedy recovery.

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# 13 Unconventional monetary policies revisited (Part II)

**Biagio Bossone**

Group of Lecce and Centre d'Études pour le Financement de Développement Local

5 October 2013

*So-called 'helicopter money' policies – those in which government spending or transfers to households are paid for by printing money – involve both monetary and fiscal policy. This means they require extraordinary cooperation between the government and the central bank, which potentially undermines central-bank independence. However, emergency policies of this type may be justified during extreme systemic crises. Injections of helicopter money can increase net wealth and thus stimulate spending, and this mechanism is particularly important when conventional monetary policy is stuck at the zero lower bound.*

## **Unconventional monetary policies: From quantitative easing to debt monetisation**

The first column in this two-part series (Bossone 2013) reviewed the unconventional monetary measures adopted by a number of central banks following the financial crisis of 2007, and the major policy proposals that were submitted as the crisis evolved into a deep economic recession or depression. The policies were: quantitative easing (QE); forward guidance; negative interest rates; overt monetary financing of fiscal deficits, including in extreme neo-chartalist forms; and debt monetisation. Although debt monetisation is primarily intended to avert default by highly indebted countries, once implemented it would increase public and private spending – thus helping to stabilise output and employment.

Table 1 offers a snapshot of what I consider to be the main features of each policy type. In the table, policies are reported from left to right in ascending order of the directness of their impact on spending – from those that rely on changes in prices and expectations to those that affect spending by adding money balances to the economy.

**Table 1** Unconventional monetary policies: A synopsis

Policy types Indicators	FG	NIR	QE	OMF	MMT	DM
Impact on aggregate demand:						
• Transmission channel	Indirect (via expectations on future interest rates)	Indirect (via interest rates)	Indirect (via asset prices and inflation expectations)	Direct (via helicopter money balances)	Direct (via helicopter money balances)	Direct (via helicopter money balances)
• Effectiveness	Short gestation Limited by ZLB Uncertain impact	Short gestation Poor public acceptance Strong and quick impact	Short gestation Slow and moderate impact	Long gestation Quick and strong impact	Long gestation Quick and strong impact	Long gestation Quick, strong, and long lasting impact
Central bank independence	Full	Full	Full	Central bank / Government cooperation required	Central bank not involved in complementary money policy	Central bank / Government cooperation required

The policies that have greater direct impact on spending (overt monetary financing, neo-chartalism) are those that combine expansionary fiscal impulses with permanent monetary financing ('helicopter money'). This combination requires a degree of cooperation between the government and the central bank, with implications for central-bank independence (see below). Government (and political) involvement, as well as the necessary coordination with the central bank, entail longer policy gestation periods than for policies involving the central bank exclusively (forward guidance, negative interest rates, and QE). On the other hand, the transmission from the fiscal-plus-monetary policy impulse to the spending response – which is inherent in helicopter money options – is more direct, quicker and stronger.

## Key pointers

The features of the different unconventional monetary policies discussed in Part I suggest a number of interrelated considerations:

- **Monetary effectiveness.** In a highly-leveraged economy in a deep recession under deflationary expectations – with policy rates already at the zero lower bound – economic activity is constrained by aggregate demand rather than by the cost of money. Liquidity preference is high, lenders don't lend, borrowers don't borrow, and investors' response to interest rates is weak. Under such conditions, the money

issued by the central bank – typically against purchases of assets or through lending to banks – fails to yield enough economic stimulus. Interest rates lose their power to affect spending unless the large premium on liquidity is offset by a negative interest rate. Instead, money should be *given out* or *granted* for it to be effective, as occurs under helicopter money policies. Giving out money belongs to the realm of fiscal policy, not monetary policy.<sup>1</sup> However, fiscal policy alone cannot implement helicopter money options, unless the government and the (independent) central bank cooperate (overt monetary financing) or if the government takes on full monetary sovereignty and finances deficits with money issuance (neo-chartalism).

- Central bank–government cooperation. Monetising fiscal deficits (or indeed fiscal debts, as under debt monetisation) constitutes a *joint* monetary *and* fiscal policy decision. With the exception of neo-chartalist operations (where money is issued by the government, or by the central bank as a government department), cooperation between the government and the central bank is necessary to engineer helicopter money policies, and such policies require a specific framework for assigning duties and responsibilities to the two institutions.<sup>2</sup> Obviously, this impairs or calls into question central-bank independence, but in times of crisis this kind of cooperation may be necessary for the collective good.<sup>3</sup> It is critical in such times to have an appropriate framework in place for emergency policy action. This framework should specify which institutions do what under which circumstances, and under which accountability rules. It should also be clear who is responsible for activating the emergency framework. In other words, just as in wars or national emergencies ordinary rules may be suspended and decisions delegated to a chief commanding

1 Grenville (2013). For an economy based on ‘noncredit’ money, see Bossone (2002) and Bossone and Sarr (2003).

2 Bossone (2013) identifies some essential elements of an operational cooperative framework.

3 Nothing makes the point more authoritatively than quoting the words spoken on this subject by Governor Bernanke (2003):

“[I]t is important to recognize that the role of an independent central bank is different in inflationary and deflationary environments. In the face of inflation, which is often associated with excessive monetization of government debt, the virtue of an independent central bank is its ability to say ‘no’ to the government. With protracted deflation, however, excessive money creation is unlikely to be the problem, and a more cooperative stance on the part of the central bank may be called for. Under [these] circumstances, greater cooperation for a time between [central banks] and fiscal authorities is in no way inconsistent with the independence of the central banks, any more than cooperation between two independent nations in pursuit of a common objective is inconsistent with the principle of national sovereignty.”

body, so might economic policy decisions be delegated during particularly severe systemic crises.

- Money in central-bank models. In the macroeconomic models typically adopted by the central banks, there is no role for helicopter money. In these models, monetary policy operates through an interest-rate feedback rule – in which the interest rate is set in response to deviations from an inflation target and some measure of economic activity – and fiscal policy is usually restricted to a Ricardian setting (Tovar, 2008). There is no role in these models for money to be added directly into the public's hands, or for the channels through which this money is spent. As a result, these models are not capable of gauging the real effects of such monetary-fiscal policies. At least for critical economic circumstances, there should be a way of introducing this type of money into the models in a meaningful way. This issue is discussed next.

## **Microfoundations of helicopter money**

As argued by Buiter (2004), fiat money is not a liability of its issuer (the monetary authority), but it is an asset for its holder (the private sector). It is thus an integral part of the system's net wealth. More generally, if the state is able to finance its own liabilities with permanent fiat-money issuances, the latter – for given current prices – add to the system's net wealth.

In a dynamic stochastic general equilibrium model – with rational agents maximising utility over an infinite time horizon subject to inter-temporal budget constraints – an increase in net wealth through helicopter money issuance would lead agents to increase their current and future consumption – a 'monetary wealth effect'. This means they plan to consume more than the income they earn by selling their labour for production. However, due to rational expectations, they realise that if they all behave this way then either:

- Output in each period grows by enough to satisfy planned consumption (which is possible only if there are unemployed resources), or
- The price level or the real interest rate rise so as to bring planned consumption back into equilibrium with output.

It follows that the Euler equation (which determines the solution to the agents' optimal consumption programmes) reflects the monetary wealth effect, consistent with the



current and expected resource-employment conditions. The same real effect would surely obtain in a model with an agent (the monetary sovereign state) that can spend and finance its own spending with helicopter money. This result vindicates the proposed measures to expand the money supply via overt monetary financing or neo-chartalism, which aim to inject new money independently of central banks' interest-rate policies – especially if these are limited by the zero lower bound.

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As an economist and former official of the Banca d’Italia, he headed the international payment system division and has been involved in international financial analysis and relations issues. He has been a member of various EU and G10 central banking groups and task forces. He has been Professor of international financial markets at Università degli Studi di Palermo and Università del Salento, Italy. He has (co-)authored various academic and policy studies in the areas of money and banking, international and development finance, and international financial relations.

# 14 Why is euro inflation so low?

**Jean-Pierre Landau**

Sciences Po

02 December 2014

*Eurozone inflation has been persistently declining for almost a year, and constantly undershooting forecasts. Building on existing research, this column explores the conjecture that low inflation in the Eurozone results from an excess demand for safe assets. If true, this conjecture would have definite policy implications. Getting out of such a ‘safety trap’ would necessitate fiscal or non-conventional monetary policies tailored to temporarily take risk away from private balance sheets.*

Inflation in the Eurozone stood at 0.4% (year on year) in November. It has been persistently declining for almost a year, and constantly undershooting forecasts. The Eurozone is now clearly diverging from many advanced economies, where inflation is either on the rise – albeit at moderate levels – as in the US, or, when falling, still remaining close to target, as the UK.

Inflation has kept falling even in ‘core’ economies, where employment remains strong and the output gap has been reduced, such as Germany. Recent data show little prospect for improvement. According to the October World Economic Outlook (IMF 2014b), under current policies, the Eurozone inflation rate “is expected to remain substantially below the ECB’s price stability objective through at least 2019”.

This column explores one specific conjecture, that underpinning those evolutions, including the lack of growth, is one single and common factor – an excess demand for ‘safe assets’. Essentially, economic agents develop a strong inclination for holding money and government bonds, in preference to any other financial or real assets; and, doing so, are induced to cut down on their expenditures. This is both a sign and a consequence of extreme risk aversion. As a result, Europe may be caught into a ‘safety trap’ from which there is no escape other than a temporary transfer of risk from private to public balance sheets.

If true, this conjecture would have definite policy implications. The column brings no new insights. Rather, it builds on existing research (Caballero and Fahri 2013), to analyse the situation in the Eurozone.

## **The current situation**

Disinflation in the Eurozone has been accompanied by symptoms commonly associated with a lack of aggregate demand: stagnant or negative growth, and increasing unemployment, especially in peripheral economies. The causation from demand to inflation may seem obvious, as the output gap has simultaneously increased in 2013 (from 2.5% to 3%).

However, it seems difficult to relate the recent downward shift in inflation to pure demand factors. Nominal wage growth is still robust, with compensation per employee rising by 1.1% in annual terms for 2014Q2. While fiscal policy has been a sizeable drag on the economy in 2012–2013, it is not the case anymore, and the Eurozone structural fiscal balance is stabilising. Finally, according to the IMF, the Eurozone output gap (at approximately 3%) is smaller than in the US (3.5%).

On the supply side, the appreciation of the euro could account for the decline in inflation in 2013. But that pass-through is now over and the effective exchange rate has depreciated by 5% in the last seven months. Import prices have been stable over the last six months, and may be expected to increase following the recent depreciation.

In sum, demand and supply factors could explain the low inflation prevailing up to the first quarter of 2014. They cannot account for the constant, and unexpected, fall in inflation that has occurred since.

Something deeper may be at work. Inflation is a process – while impacted by temporary shocks, it is fundamentally driven by endogenous dynamics and expectations. There are many signs of such deteriorating dynamics in the Eurozone. Core inflation (excluding food and energy), is now at 0.7%. Most significantly, inflation expectations are dropping fast. At a short horizon, they now stand below 0.7% for 2016. Longer-term expectations, broadly stable until June, are now falling too. For the first time in 15 years, the ‘5 years in 5 years’ swap stands below 2%, at 1.84%, down from 2.4% at the beginning of the year, prompting the ECB President to note this in his speech at Jackson Hole in

August 2014. This is dangerous – as Japan’s experience has shown, long run inflation expectations are very rigid and, once destabilised, may move irreversibly down.

### **Safe assets shortage: How does it work?**

The intuition is straightforward. In a safety trap, there is a strong demand for precautionary balances that cannot be satisfied under prevailing economic and financial conditions. In order to accumulate more safe assets, economic agents have to reduce their consumption or investment, thus depressing aggregate demand for goods. There is a close analogy with a basic monetarist model in which an excess demand for money translates, for given income and wealth, into an excess supply of goods. There is also some analogy with a liquidity trap, where the demand for money (one specific safe asset) becomes infinite.

In developed contemporary models (e.g. Caballero and Fahri 2013), the safe asset shortage works through the interest rate. An excess demand for safe assets drives down the risk-free natural interest rate, possibly to negative levels in real terms. When inflation is already low and the economy hits the zero lower bound, it becomes impossible to reach the necessary (negative) real interest rate. The economy falls into a ‘trap’ with cumulative disinflation and the possibility of an ever-deeper recession. Just like a liquidity trap, there is a self-perpetuating aspect in the safety trap because lower inflation increases real interest rates which, in turn, leads to lower inflation. In a sense, however, a safety trap is more serious. Increasing preferences for safety can constantly push the equilibrium interest rate further down, thus widening the gap between effective and equilibrium interest rates. An increased demand for safe assets therefore acts as an endogenous tightening of monetary conditions (Fisher 2013).

One important insight is that in a safe asset trap, the lack of demand is not the ultimate cause of disinflation. Rather, both low demand and low inflation are joint manifestations of an underlying disequilibrium in asset markets. This disequilibrium may persist for a long time, as real interest rates cannot adjust.

The safe asset hypothesis therefore explains the persistence of low inflation and no growth despite extremely easy financial conditions. It also helps to clarify some of the puzzles currently affecting advanced – and more specifically, European – economies.

### Three puzzles

Take, first, the financial behaviour of corporate firms. Considered in aggregate, they have been simultaneously issuing debt (most often with high yields and light covenants), hoarding cash (in the order of 18% of GDP in France and Germany) and buying back their shares. Admittedly, this is not purely a European characteristic, and such behaviours may result from tax arbitrages. The phenomenon, however, shows that low inflation and low demand cannot fully be explained by a ‘balance sheet recession’ (Koo 2009) triggered by the deleveraging occurring in the private sector. Actually, outside the banking sector, little deleveraging is taking place in aggregate. In the Eurozone, corporate debt is up by 7% of GDP as compared to 2007 (Hannoun 2014). There is strong issuance of new debt, but proceeds are used to finance precautionary cash hoarding. Policy debates may be excessively focusing on debt. For the Eurozone, at least, the main economic problem lies on the asset – not the liability – side of corporate balance sheets.

Indeed, a second puzzle relates to physical investment, which remains well below pre-crisis levels (by an order of 2% of GDP) despite extremely easy financial conditions. The safe asset hypothesis brings some elements of clarification. In a safe asset trap, risk-free assets are abnormally attractive since they offer an excess return (as compared to equilibrium). This creates a disincentive to invest – high risk-free rates compress the spreads with other assets to levels insufficient to compensate for perceived economic risk.

Still, while reluctant to take ‘economic’ risk, investors show a great appetite for ‘financial’ risk. This is a third puzzle, recently illustrated by the IMF in its latest Global Financial Stability Report (IMF 2014a).

Here, it is useful to identify the two main characteristics of a safe asset. First they are ‘information insensitive’ – they keep the same value (and therefore protect their owner’s wealth) in all possible states of the world (this is the definition of safety). And, second, they are liquid and can be exchanged for money without loss of value at any single moment in time. It has been shown (Dang et al. 2012) that those two properties are closely related. But they are not identical. They provide a matrix through which one can look at the investment universe.

Physical investments are the exact opposite of safe assets. They are both illiquid and fully exposed to economic risk (and, therefore, sensitive to uncertainty). Risky financial instruments – such as high yield debt or equity – are in an intermediary situation. Their value is information sensitive. But, under the assumption of market liquidity, they can be transformed into a safe asset (and money). Therefore they do not suffer from the irreversibility attached to physical assets. Easy monetary policies strengthen the perception of liquidity and increase substitutability between safe and risky financial assets. They do not affect, however, the illiquidity of physical assets. Hence the currently observed disconnect between economic and financial risk.

### **Why could there be an excess demand for safe assets?**

Many causes can explain a shortage of safe assets – some global, some more specific to the Eurozone.

In the Eurozone, like in the rest of the world, the demand for safe assets is mechanically bound to increase, as they are needed to meet new regulatory and market requirements. Banks will hold more Government debt and other ‘high quality’ assets to meet the liquidity standards set up by the Basel Committee. Market transactions, whether or not intermediated by central clearing counterparties, will increasingly depend on the provision of high quality collateral.

At the same time, and more specific to the Eurozone, the supply is shrinking. The Eurozone crisis has resulted in a large chunk of government debt losing its ‘safe asset’ status, as markets have become increasingly sensitive to credit and liquidity risks. This annihilation of previously safe government debt amounts to several trillions of euros. It is conceivable that it will produce macroeconomic effects on a large scale and for a long time while investors adjust their behaviour to a new, and unforeseen, environment.

Finally, and more relevant to recent evolutions, economic uncertainty and expectations of deflation generate their own preference for safety. An excess demand for safe assets is just one consequence and manifestation of strong aversion to risk.

## Policy implications

If the conjecture proves correct, any policy response must necessarily increase the net supply of safe assets. Measures that would simply substitute one safe asset for another would not work. It turns out that some monetary policy actions, including non-conventional ones, fall into that last category. This requirement – increasing the net supply of safe assets – therefore provides a useful criterion through which to assess various policy initiatives.

In the Eurozone, the excess demand for safe assets has been, until recently, satisfied by an expansion of central bank liabilities – notably through the ECB's long-term refinancing operations (LTROs). This is a useful but imperfect solution. Access to the central bank's balance sheet, while much broader in the Eurozone than in the US, is still limited to financial institutions. If households and firms need to hold additional safe assets, they depend on banks to 'transform' that central bank liquidity into other safe assets, i.e. to issue money through credit. As is well known, this process is currently severely impaired in the Eurozone. Broad money aggregates are growing at an annual pace of 2.5%, but external counterparties play a major role and domestic credit is shrinking (-1.5% year on year in October).

Would quantitative easing (QE) – i.e. purchase of government bonds by the central bank – work? In a first step, it would simply substitute one safe asset (money) with another (government debt), leaving the total net amount unchanged. What follows will depend on the degree of preference for safe assets. It is usually assumed that, with less government debt in their hands, investors will 'rebalance' their portfolios by purchasing additional risky assets, thereby pushing their price up and driving their yields down. This portfolio rebalancing is essential for QE to have an impact on the real economy, through a reduction in spreads and an increase in financial wealth.

Crucially, however, the process relies upon some (imperfect) substitutability between safe and risky financial assets. Investors must be willing to swap money and government debt for riskier corporate debt, real estate, or equity in order to get a higher return. A strong preference for safe assets would inhibit that arbitrage and significantly impair or paralyse portfolio rebalancing.

Things are very different when the central bank engages in direct and massive purchases of private (risky) assets. In that case, the net amount of safe assets does increase. This



is exactly what the ECB is currently doing through its programme of asset-backed securities (ABS) and covered bond purchases. This action will potentially bring huge benefits to the Eurozone economy.

In the short run, it will increase the net volume of safe assets, although by limited amounts and mainly in the hands of the banking sector. Should, however, the demand be 'satiated', some portfolio rebalancing towards risky assets could occur, credit would increase again, and one could expect some resumption of consumption and growth, together with an increase in inflation.

In the longer run, the ECB can help to create a new class of safe assets in the Eurozone and significantly increase their supply. Plain vanilla (not structured) ABS are very safe (with an average default rate of 2%), and will remain so if strict rules are implemented and liquidity is guaranteed. ABS have no 'nationality' as they can be made of assets originated in different countries and be traded across borders. A vibrant ABS market will further delink sovereign, banking, and credit risk, offering investors a truly 'European' asset class. It will help to overcome the geographical segmentation of European capital markets and improve the transmission of monetary policy in different countries.

At present, however, the European ABS market is only one-fifth of the size of the US market. The ECB is now creating the conditions for it to grow. As the ultimate buyer, it can impose the conditions that ABS would have to meet and quickly standardise the market, thus bypassing the complicated and burdensome process of EU regulation. (see Bank of England and ECB 2014). Ideally, the ECB should set itself as a 'market maker of last resort', committing to sell and buy ABS and guaranteeing market liquidity for some period of time.

Admittedly, this is no ordinary job for a central bank. And it involves taking some risks. This may be unavoidable in a safe asset trap when the only remedy is for the public sector to temporarily take additional risk by itself, on its consolidated balance sheet. If the strategy is successful, such action will be costless as aggregate risk in the economy will diminish and so will the excess demand for safe assets.

While this remains extremely controversial inside the Eurosystem, the necessity to take risk away from private balance sheets now seems well internalised by policymakers. Through its recent communication, the ECB is signalling its willingness to significantly increase the size of its balance sheet. It implicitly aims at a certain level of leverage, and, therefore, seems to accept some additional and temporary risk-taking.

Finally, of course, issuing new government debt and spending the proceeds could increase the amount of safe assets. The private sector would then hold both money and newly issued bonds. The power to tax gives governments a comparative advantage in creating safe assets. This advantage, however, is fragile and heavily dependent on fiscal and debt sustainability. Preserving ‘fiscal capacity’ (Caballero and Fahri 2013, 2014) is essential. It raises difficult issues of fiscal policy governance and moral hazard. Fiscal rules increase the fiscal space to the extent that they credibly ensure debt sustainability in the long run. Disagreements on how they should be implemented in current circumstances have the opposite effect. Setting up an appropriate, robust, and commonly agreed fiscal governance becomes crucial at a moment when the Eurozone is just regaining some fiscal credibility.

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# 15 Deflation, debt, and economic stimulus

**Richard Wood**

Private consultant

03 March 2011

*The US, Japan, and Ireland are threatened by the spectres of deficient private demand, rising debt, and a tendency to deflation. This column questions current monetary policy directions, i.e. quantitative easing, and argues that printing money to directly finance fiscal stimulus may be a better option.*

The US, Japan, and Ireland are suffering from deficient private demand, rising debt, and a tendency to deflation. This column asks what can be done about it.

We begin by assuming that relevant authorities have decided that new money creation is necessary to work against deflationary tendencies and to stimulate the economy. The central issue explored here then is how should such new money creation best be deployed to create the required economic stimulus?

## **Policy A: Further quantitative easing**

Under Policy A the central bank creates new currency to purchase government bonds on the secondary market. The principal purpose is to finance a rise in bond prices and lower interest rates and, thereby, stimulate private investment.

Considerable risks and side-effects could arise from the continued application of this policy *in the current environment of historically low interest rates.*

If the consumption/investment preferences of bond holders are unchanged, then, under Policy A, bondholders may simply purchase new domestic bonds (or other close substitutes) with the newly created currency received from the central bank, or they may purchase higher yielding foreign bonds/assets offshore. On this basis, the additional money supply would not go directly, if at all, to domestic consumers, wage-earners,

the unemployed, or to non-finance businesses – the areas where it is most needed to generate widespread domestic demand growth.

Additional reductions in interest rates will further lower interest incomes of state and local governments, mutual funds, and pension funds etc., including the incomes of the elderly, retirees, and savers, which could, in turn, impact adversely on consumption expenditure. As well, at some point the return for not hoarding becomes too low, and with uncertainty high, and financial and borrowing fears elevated, economic agents may prefer to hold cash (and safe currencies) as a store of value. In other words, the liquidity trap could be strengthened (Krugman 1999).

As medium- to longer-term nominal lending interest rates fall toward their lower bounds, the margin between borrowing and lending rates may come under downward pressure, making difficulties for banks in extending credit. As these interest rates fall, insurance companies, heavily reliant on low-risk bond interest income, may be adversely impacted, potentially damaging their effectiveness.

Beyond some point, further rises in bond prices could set the stage for a sell-off of US government bonds, particularly when quantitative easing bond purchases are completed, resulting in potential disruption to financial and exchange rate markets.

Working toward an artificially flat yield curve based on a near-zero interest rate (through excessive quantitative easing), could impart misleading information about underlying risk structures, distort time-dependent investment/purchasing/selling decisions, encourage banks to take on higher-risk positions to maintain profitability, and artificially create illusory, “bubble-like”, share market gains.

To the extent that quantitative easing is successful in reducing longer-term interest rates, there will be an increased incentive for “carry trade” and other cross-border capital flows. The likely effect on capital outflows, and the exchange rate, could be relatively large in open economies where medium-term interest rates approach their lower bound. Foreign jurisdictions may be disadvantaged as domestic inflation there could increase, asset price bubbles could develop, and local exchange rates could rise. This could complicate global economic adjustments and international policy coordination.

The effectiveness of Policy A is highly uncertain. No one knows how much new money needs to be created, and how many government bonds need to be purchased, to force the sought after reduction in business and personal borrowing interest rates. When the

time comes to raise interest rates, from their artificially low levels, public debt will increase.

The Fed is limited to holding no more than 35% of any single issue of US Treasury bonds. These limits are rapidly being approached as the second phase of quantitative easing unfolds and may, if maintained, preclude further rounds.

## **Policy B: New money financed budget deficits**

The alternative approach involves the central bank printing new money to directly finance fiscal stimulus. This neglected policy option – apparently largely overlooked by officials during the global economic crisis – is likely to be appropriate for countries where prices are falling (or inflation drops toward zero), private demand is deficient, interest rates are already too low and where public debt is excessive.

Policy B provides a capacity to:

- finance budget deficits without raising public debt levels further;
- simultaneously stimulate private demand; and
- retreat from deflation.

In order for the central bank to expand the monetary base (the liability side of its balance sheet), there must be a matching expansion on the asset side. This would have to be matched by a liability on the central government's balance sheet. This involves the central bank purchasing newly created bonds from the ministry of finance, thereby creating new intra-governmental debt, which, nevertheless, would normally need to be serviced and repaid.

The interest outflows to the central bank would, over time, be returned as budget revenue to the government, and taxpayers would, on that account, accumulate no liabilities.

In relation to the redemption value, the government could either refinance the debt in the market or else pay down the debt. Paying down the debt would create a liability for taxpayers when the redemption date is reached. In extraordinary times the government's liability (the bond) could be issued as "perpetual" debt (i.e., it would provide no set maturity date). This approach would leave a long-term liability on the government's balance sheet and a long-term asset on the balance sheet of the central bank. There is no

effective increase in the overall net debt of the government (considered broadly), and taxpayers would not incur taxation liabilities to finance the deficit.

Policy B would be appropriate if domestic demand is deficient, excess productive capacity exists, unemployment is high, inflation is low or negative, and there is a desire to apply fiscal stimulus without raising the level of publicly-held debt. These prior conditions exist in different degrees in the US, Japan, and Ireland, and potentially in some other European countries.

Policy B directs new money creation to locations in the economy where the marginal propensities to consume, and to invest in *real productive* assets (as distinct from *financial* assets under quantitative easing), are the highest. Policy B, therefore, could be expected to impact relatively favourably on consumption and investment spending and provide the time, increased incomes, suitable inflation rates, confidence, and appropriate interest rates needed to work-out of liquidity traps.

Policy B would be wound-down as sustainable economic recovery is established.

Both Policy A and Policy B involve new money creation and, if taken too far, may eventually lead to rising inflation and excess liquidity that may, possibly, later need to be withdrawn by raising bank reserve requirements, asset and mortgage sales, or sales of government bonds.

## **The policy change and its implications**

The application of Policy B to Ireland (a country without its own sovereign currency) could be challenging at the political level, but not necessarily precluded by policy design. The European Central Bank could conceivably directly finance budget deficits of selected small countries, addressing growing “debt” problems at their source. Attempting to resolve debt-crises, as is currently the case, by generating even more (relatively high interest) debt seems counter-intuitive and self-defeating – especially where early economic recovery is unlikely.

There are not endless shots left in the policy armoury. Great care needs to be taken so as not to fire-off the remaining monetary policy shot in the wrong direction. Each creation of new money is not costless, as eventually it could result in a higher rate of inflation



than is desirable, and may, therefore, need to be withdrawn from the economy, reducing the scope for more constructively applied money creation in the interim.

If monetary policy is considered on its own then there could be a case for terminating current quantitative easing programmes. This would steer Japan and the US away from the shoals of triple jeopardy (Leijonhufvud 2011).

*Quantitative easing* could be replaced with a policy of *printing new money with an explicit objective to assist in the financing of future budget deficits* (see suggested money-financed tax cut: Bernanke 2002 and analysis by Corden 2010). The deployment of new money creation in this manner would take some pressure off the need for severe fiscal austerity measures (at a time when continued stimulus is still required); minimise further increases in public debt; provide clear signals of policy intent (in relation to interest rate objectives, the method of financing deficits and the approach to delivering economic stimulus); and be more effective, have fewer adverse side-effects, and deliver stronger economic stimulus than further quantitative easing.

Countries experiencing a deflationary tendency and deficient private demand that introduced laws in times of high inflation which preclude the printing of new money to finance budget deficits, and the ability of central banks to lend directly to Ministries of Finance, could consider repealing them.

*Editor's note: The views expressed in this private paper are those of the author alone and may not be shared by his employing agency, the Australian Treasury.*

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# 16 Fiscal dimensions of central banking: The fiscal vacuum at the heart of the Eurosystem and the fiscal abuse by and of the Fed: Part 2

**Willem Buiter**

Citigroup

24 March 2009

*The second of this four-column series on fiscal aspects of central banking discusses the institutional constraints on quantitative easing. It argues that the ECB can and should engage in quantitative easing since its independence gives it a credible non-inflationary exit strategy. The Fed, however, seems heading for a bout of inflation stemming from Congressional pressure. Buiter argues that the Bank of England's situation lies between.*

Why has there not been quantitative easing in the Eurozone? Good question.

## **No treaty-based obstacle**

There is no treaty-based obstacle to the ECB/Eurosystem buying Eurozone government securities in the secondary markets. Indeed, both the ECB and the 16 national central banks of the Eurosystem hold Eurozone government securities on their balance sheets. Article 101.1 of the Consolidated version of the Treaty Establishing the European Community reads as follows:

*“Overdraft facilities or any other type of credit facility with the ECB or with the central banks of the Member States (hereinafter referred to as ‘national central banks’) in favour of Community institutions or bodies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the ECB or national central banks of debt instruments.”*

So, no ‘ways and means advances’ to national governments and no direct purchases by the Eurosystem of Eurozone government debt in the primary issue market, but nothing about the secondary market. Governments sell their debt to any party other than the Eurosystem, and the Eurosystem can buy any amount of this debt from these parties in the secondary government debt markets. There is the minor complication of deciding on how much of each of the 16 Eurozone governments’ debt to buy, but resolving that should take no more than five minutes. Obvious national government debt shares in some sovereign debt basket purchased by the Eurosystem would be the shares of these nations’ central banks in the capital of the ECB (normalised for the share of the 16 Eurozone member states in the total capital of the ECB, which is owned by all 27 EU member state national central banks).

### **So why aren’t they doing this?**

Probably because of the intergenerational transmission of memories of Weimar in the case of some of the ECB Executive Board members and for some NCB governors, that is, because of the fear that “printing money” or its electronic counterpart will ultimately lead to the Zimbabwe-ification of the Eurozone. I am one of nature’s great pessimists, always ready to see a dark lining around a silver cloud, but the fear that unbridled monetisation of public debt and deficits in the Eurozone would tip the region into high inflation, or even hyperinflation, does not exactly keep me awake at night. The risk of deflation, on the other hand, is serious. Time to wake up and smell the quantitative easing roses.

### **There is a material risk that some Eurozone national governments could default**

Perhaps a reason for the reluctance of the Governing Council to start large-scale purchases of sovereign debt is that there is a material risk of default on the debt of some Eurozone national governments. The 20 March 2009 spreads of 10-year government bonds over Bunds were 2.76% for Ireland, 2.66% for Greece, 1.50% for Portugal, 1.27% for Italy and 1.04% for Spain. In addition, sovereign CDS spreads suggest that even the German government’s creditworthiness is not beyond doubt. Neither, of course, are the creditworthiness of the US and UK governments.

Because there is a non-negligible risk that, without external support, one or more Eurozone national governments will default on their debt, it is reasonable for the EBC/Eurosystem to insist on a joint-and-several guarantee by all 16 Eurozone governments for any Eurozone government debt acquired by the ECB. Indeed, I would extend this requirement for a joint-and-several guarantee to any sovereign Eurozone debt accepted as collateral by the ECB in its reverse operations and collateralised loans. Such a joint-and-several guarantee does not exist at the moment – a reflection of the absence of a fiscal Europe and a fiscal Eurozone. More about that later.

### **Need for an exit strategy to avoid inflation**

Finally, it is clear that any large-scale quantitative easing has to be reversed when the economy recovers and the demand for base money returns to levels that are not boosted by the extreme liquidity preference of a panic-stricken banking system. Without such a reversal of quantitative easing, unacceptable inflationary consequences are likely. If the reversibility, when needed, is not credible, longer-term inflationary expectations will rise and these inflation expectations, as well as possible inflation risk premia, can raise longer-term nominal and real interest rates.

Credibility of the future reversibility of quantitative easing ought not to be an issue for the Eurozone. The ECB is the world's most independent central bank. When it decides it wants to contract its balance sheet again – reverse the quantitative easing – it will simply dump the surplus-to-its-requirements government debt into the open market. The government debt becomes the problem of the respective Eurozone governments again. Either these governments are capable of generating the primary (non-interest) budget surpluses required to make the debt sustainable (and perceived as capable by the markets), or they will default on their sovereign debt.

The option of forcing the central bank not to reverse the quantitative easing is not present in the Eurozone, because of the independence-on-steroids of the ECB. Short of sending a tank column to surround the Eurotower in Frankfurt and blast it into submission, the ECB cannot be forced to monetise government debt against its will. This is why, given obvious doubt about the ability and/or willingness of some Eurozone sovereigns to pursue and achieve long-term fiscal sustainability, default on the public debt is considered by the markets and by expert observers to be a distinct possibility for

some Eurozone nations, but little if any likelihood is attached to the scenario where the ECB colludes in inflating away the real value of Eurozone government debt.

### **The Fed exit strategy? Or will Congress tell them to inflate away the debt?**

I consider the opposite outcome to be more likely for the country with the least independent of the leading central banks – the US. The Fed has always acted like what it is: a creature of Congress: “...*the Federal Reserve is subject to oversight by Congress, which periodically reviews its activities and can alter its responsibilities by statute.*” More recently, it has also consented to become an off-balance sheet and off-budget dependency of the US Treasury.

If, as I consider likely, the US federal government will not be able to commit itself credibly to future tax increases or future public spending cuts of sufficient magnitude, US public debt will, during the next two or three years, build up to unsustainable levels. When faced with the choice between sovereign default and inflating away the real value of the public debt, there is little doubt about the alternative that will be chosen by the US Executive and the US Congress. The Fed will be instructed to inflate the public debt away. Either Ben Bernanke or a more pliable successor will implement these instructions.

### **Double-digit inflation in the US at a horizon of five years or more**

It is surprising that even at a horizon of 5 years or more, the markets are not yet pricing in a distinct possibility of double-digit inflation in the US. The announcement of quantitative easing in the US did weaken the external value of the US dollar, but long-term sovereign interest rates fell for the maturities targeted by the Fed (two to 10 years) and did not rise materially for longer maturities. At some point, probably not too far into the future, the future inflation expectations effects of quantitative easing that is unlikely to be reversed when required to maintain price stability should overcome the immediate demand effect of the Fed’s quantitative easing on the prices of longer-term nominally denominated US sovereign debt instruments.

## **The UK's exit strategy**

The UK is somewhere between the Eurozone and the US as regards central bank independence and as regards the likelihood that current quantitative easing will be reversed in time to prevent inflation and inflationary expectations from escalating. The UK Treasury can take back the power to make monetary policy using the Reserve Powers granted in the Bank of England Act 1998. This only requires retroactive approval by Parliament. However, the degree of polarisation of the UK polity and of UK society in general is probably rather less than that of the US. In addition, because the UK political regime is an elected dictatorship, the UK Executive is subject to minimal checks and balances and may well be able to impose the future tax increases (I am less sure about future spending cuts) required to maintain government solvency without the need to inflate away much of the real burden of the public debt.

## **Why no credit easing in the Eurozone?**

When asked this question, the members of the ECB's Governing Council tend to reply that the Eurozone is much more dependent on banks than on capital markets for financial intermediation. This is in contrast to the US and the UK where the markets-mediated or transactions-oriented model of financial capitalism has achieved a much greater degree of prominence than in the Eurozone, where the relationships-oriented model of financial capitalism still rules the roost.

It is true that banks are a more important source of funds for households and non-financial enterprises in the Eurozone than in the US or the UK. However, there is an analogue to outright purchases of private securities (the expression of credit easing in the transactions-oriented model) in the relationships-oriented model. This is unsecured lending by the ECB/Eurosystem to the banks. Unsecured lending by the central bank to the commercial banks is the straightforward expression of credit easing in the relationships-oriented or banking model of financial intermediation. There is an even more aggressive version of this, which has the central bank lending directly and unsecured, to non-bank counterparties, bypassing the banks completely.

The ECB/Eurosystem are not lending without collateral to the banks, let alone to non-bank counterparties (indeed the ECB/Eurosystem is not lending even with collateral to non-bank counterparties). The only valid reason for the ECB/Eurosystem not to make

unsecured loans to the banks would be that the banking system is in such good shape, and that financial intermediation through the banks remains sufficiently functional, that unsecured lending is redundant. If that is indeed what the ECB/Eurosystem believe, they should go to the eye doctor. It is clear that even those Eurozone member states whose banks were by-and-large not involved directly in the financial excesses that brought us the financial collapse of the North Atlantic border-crossing banking and shadow-banking system are now gasping for financial air.

The quality and size of banks' balance sheets are declining swiftly, as the rapid contraction of real economic activity feeds back on the financial intermediaries. With both the demand for credit and the supply of credit collapsing, the ECB/Eurosystem may be deriving misplaced comfort from the fact that bank finance is not necessarily the binding constraint on economic activity.

### **A dangerously shortsighted belief**

That would be dangerously shortsighted. First, there are always otherwise viable enterprises for which external finance is the binding constraint on production, employment, and investment, even when the surveys indicate that for most firms demand is the binding constraint. Second, if and when the recovery starts, non-financial enterprises will have to fund their expansion plans to a large extent from external sources – retained profits will be few and far between. Banks will be more likely to meet these demands from the non-financial enterprise sector if they can fund themselves unsecured through the Eurosystem.

One particularly useful form of unsecured lending by the ECB/Eurosystem to the banks would be for the national central banks of the Eurosystem to become universal counterparties for inter-bank lending and borrowing.

### **Banca d'Italia example**

The Banca d'Italia has implemented such a scheme, the MIC, but only for banks with head-offices, subsidiaries, or branches in Italy, and for banks from other Eurozone jurisdictions that have reciprocal arrangements for Italian banks. This of course means a deplorable balkanisation of Eurozone monetary and liquidity management. Indeed, it undermines the essence of the Eurosystem as an institutional arrangement setting



and implementing a common monetary policy for 16 Eurozone member states. It is surprising that the Banca d'Italia has been permitted to create such a distortion of the monetary and liquidity level playing field.

But if a scheme like the MIC were to be implemented uniformly across the Eurozone, it would be a helpful measure, which would strengthen the Eurosystem rather than threaten to deconstruct it into a collection of imperfectly linked subsystems.

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# 17 Fiscal dimensions of central banking: the fiscal vacuum at the heart of the Eurosystem and the fiscal abuse by and of the Fed: Part 4

**Willem Buiter**

Citigroup

25 March 2009

*The last column in this series on fiscal aspects of central banking reviews the differences in fiscal backing for the Bank of England, the US Federal Reserve, and the European Central Bank.*

## **The Bank of England**

When the Bank of England gets around to making outright private asset purchases, it will do so with an indemnity provided by Her Majesty's Government to cover any losses arising from the use of the Facility. This is as it should be. In principle, a central bank should only take the credit risk of its sovereign – the state. If its monetary, liquidity, or credit-easing operations expose it to the credit risk of the private sector, it ought to do so with a full indemnity (guarantee for any losses) from the Treasury.

The Bank of England has a full indemnity for outright purchases of private securities, but not for the private credit risk it assumes through repos and other forms of collateralised lending to banks where the collateral offered consists of private securities. I believe the UK Treasury should insure the Bank of England – for free – against all losses incurred as a result of the Bank of England taking private credit risk on its portfolio.

## The Fed

The Fed does not have a full indemnity from the US Treasury even for its outright purchases of private securities. It has no guarantee or indemnity for private credit risk assumed as a result of its repo operations and collateralised lending.

For the Fed's potential \$1 trillion exposure to private credit risk through the Term Asset-Backed Securities Loan Facility, for instance, the Treasury only guarantees \$100 billion. They call it 10 times leverage. I call it the Fed being potentially in the hole for \$900 billion. Similar credit risk exposures have been assumed by the Fed in the commercial paper market, in its purchases of Fannie and Freddie mortgages, in the rescue of AIG, and in a host of other quasi-fiscal rescue operations mounted by the Fed and by the Fed, the Federal Deposit Insurance Corporation, and the US Treasury jointly.

I consider this use of the Federal Reserve as an active (quasi-)fiscal player to be extremely dangerous and highly undesirable from the point of view of the health of the democratic system of government in the US.

There are two reasons for this. First, it undermines the independence of the Fed and turns it into an off-budget and off-balance sheet special purpose vehicle of the US Treasury. Second, it undermines the accountability of the Executive branch of the US Federal government for the use of public resources – taxpayers' money.

As for the Fed's independence (whatever independence remains), first, even if the central bank prices the private securities it purchases appropriately (that is, there is no ex ante implicit quasi-fiscal subsidy involved), it is possible that, should the private securities default, the central bank will suffer a capital loss so large that the central bank is incapable of maintaining its solvency on its own without creating central bank money in such quantities that its price stability mandate is at risk. Without a firm guarantee up front that the Federal government will fully re-capitalise the Fed for losses suffered as a result of the Fed's exposure to private credit risk, the Fed will have to go cap-in-hand to the US Treasury to beg for resources. Even if it gets the resources, there is likely to be a price tag attached – that is, a commitment to pursue the monetary policy desired by the US Treasury, not the monetary policy deemed most appropriate by the Fed.

As regards democratic accountability for the use of public funds, even if the central bank has sufficient capital to weather the capital losses it suffers on its holdings of private securities, the central bank should never put itself into the position of becoming

an active quasi-fiscal player or a debt collector. The ex post transfers or subsidies involved in writing down or writing off private assets are (quasi-)fiscal actions that ought to be decided by and accounted for by the fiscal authorities. The central bank can act as a fiscal agent for the government. It should not act as a fiscal principal, outside the normal accountability framework.

The Fed can deny and has denied information to the Congress and to the public that US government departments like the Treasury cannot withhold. The Fed has been stonewalling requests for information about the terms and conditions on which it makes its myriad facilities available to banks and other financial institutions. It even at first refused to reveal which counterparties of AIG had benefited from the rescue packages (now around \$170 billion with more to come) granted this rogue investment bank masquerading as an insurance company. The toxic waste from Bear Stearns' balance sheet has been hidden in some SPV in Delaware.

The opaqueness of the financial operations of the Fed in support of the financial sector (which are expanding in scale and scope at an unprecedented rate) and the lack of accountability for the use of taxpayers' resources that it entails threaten democratic accountability. Even if it enhances financial stability, which I doubt, democratic legitimacy and accountability are damaged by it, and that is too high a price to pay.

## **The ECB**

The ECB has no fiscal backup. There is no guarantee, insurance, or indemnity for any private credit risk it assumes. This huge error and omission in the design of the ECB and the Eurosystem threatens to make the ECB significantly less able than the Bank of England and the Fed to engage in unconventional monetary policy, including quantitative easing and credit easing.

The exposure of central banks to private sector default risk applies, of course, not only to central banks making outright purchases of private securities. It applies equally to central banks that make loans to the private sector using private financial instruments as collateral. Repos are an example. The Eurosystem has taken private sector credit risk onto its balance sheet ever since it was created. It now accepts a vast collection of private securities as collateral in repos and at its discount window (just about anything issued in euro and in the Eurozone that is rated at least BBB-).

The Eurosystem has already taken some significant marked-to-market losses on loans it made to eligible Eurozone counterparty banks against rubbish ABS collateral. In the autumn of 2008, five banks (Lehman Brothers Bankhaus AG, three subsidiaries of Icelandic banks, and Indover NL) defaulted on refinancing operations undertaken by the Eurosystem. The amount involved was just over €10 billion, and over €5 billion of provisions have been made against these impaired assets, because the mainly ABS dodgy collateral is, under current market conditions, worth rather less than €10 billion.

Any losses incurred as a result of these defaults are, like all losses incurred by the Eurosystem in the pursuit of its monetary and liquidity operations, to be shared by all 16 national central banks in proportion to their shares in the ECB's capital. But while the Eurosystem as a whole shares any losses incurred by its individual national central banks, there is no mechanism for recapitalising the Eurosystem as a whole.

The ECB/Eurosystem is not yet hurting financially, however. The Eurosystem's income from monetary policy operations was probably around €28.7 billion in 2008. A high degree of price stability and large denomination notes (including €500 and €200 notes, while the best the US can come up with is a \$100 bill) make the euro the currency of choice for tax evaders, tax avoiders, money launderers, and other criminal elements everywhere. This makes for massive seigniorage revenue for the ECB and the Eurosystem.

The combination of the obvious willingness of the ECB/Eurosystem to take serious private sector credit risk through collateralised lending to banks and its unwillingness to consider outright purchases of private securities or to engage in unsecured lending to the banking sector is difficult to rationalise.

*Editors' Note: This first appeared on Willem Buiter's blog *Maverecon*. Copyedited and reposted with permission.*

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# 18 Quantitative easing: Who's backing currency?

**Pierpaolo Benigno and Salvatore Nisticò**

LUISS Guido Carli; Sapienza University

15 June 2015

*In the aftermath of the Global Crisis, many central banks have engaged in unconventional purchases of risky securities. Such operations can entail possible losses on their balance sheets. This column argues that neutrality of open-market operations holds only in specific policy regimes, such as when central banks' losses are covered by taxes levied on the public sector. In absence of such support, losses should be resolved through a prolonged increase in inflation.*

## **Unconventional monetary practices after the Crisis**

In the aftermath of the Global Crisis, 'unconventional' purchases of risky securities by many central banks around the world have uncovered a 'new style' of central banking, which entails possible losses on central bank's balance sheets and contrasts with the existing conventional view.<sup>1</sup>

Since the birth of paper money, a lively debate has developed on how to control the value of money – the inverse of the price level – in connection with the assets that central banks hold in their balance sheets. At the beginning of the debate, gold was advocated to provide the appropriate backing of currency. Then, mixed fractional systems emerged, later replaced by holdings of reserves denominated in certain 'strong' currencies. As time goes by, what seems to be the prevailing view shares common traits with the 'real bills doctrine', according to which central banks should issue money backed by short-term securities free of risk.<sup>2</sup> In a system of this kind, it is understood that the central bank can control the value of money by setting the interest rate on the

1 See Hall and Reis (2015).

2 See for the original incipit Adam Smith (1806).

safe assets held in its portfolio. Moreover, if central banks are monopolists in issuing money, they are also profitable otherwise, if a sort of ‘free-banking’ system emerges, they break even.

## **Irrelevance of open-market operations**

In light of the old debate, and given the unconventional policies undertaken by many central banks, it is natural to wonder who is backing the currency under such new style. A popular result comes to rescue, namely Wallace’s irrelevance of open-market operations (Wallace 1981). Let monetary policy fix its stance by setting the nominal interest with the aim of controlling inflation and growth. Consider the implied equilibrium; it is surprising to discover that inflation and growth remain unchanged, regardless of what the central bank holds in its portfolio of assets.

On the one hand, this neutrality result challenges those who argue in favour of unconventional policies but, on the other hand, it reassures them of the absence of collateral damages that could impair the value of money. Digging deeply in the mechanism behind this result, one discovers who is really backing the currency. Consider a central bank that grasps some risky securities from the hands of the private sector and have risk materialised in losses. For the irrelevance result to hold, the treasury must be ready to promptly cover those losses by transferring resources to the central bank. Key is, however, that at the end these resources come from higher taxes levied on the private sector. It is therefore not gold, nor reserves, nor ‘real bills’ that back money – taxpayers do. In light of this, it should not be a surprise to hear in the European debate the public opinion questioning what the ECB buys. And even more will come if the ESM is asked to acquire the Greek debt held by the ECB.

In practice, the mechanism supporting the irrelevance of unconventional monetary policies can break down along either one – or both – of two directions. One is going from the taxpayer to the treasury, and the other going from the treasury to the central bank. If the treasury is unable or unwilling to tax citizens for the losses made by the central bank, and keeps them in its own balance sheet, then whoever unloaded the risky securities experiences a positive blip in financial wealth. Demand will surge and so will inflation. The value of money will fall.

## **Losses on central bank's balance sheets**

On the other side, looking at the relationship between treasury and central bank, automatic transfers in the case of losses are often excluded.<sup>3</sup> An exception is the recent experience of unconventional operations of the Bank of England.<sup>4</sup> Different is the case of the Federal Reserve and the ECB, in which full fiscal backing cannot be taken for granted. However, even in these cases, the central bank has still a way to keep the value of money unchanged. It can eventually shift the entire burden of the loss to the treasury by lowering future remittances to it, when profits turn positive again. For this way to be viable, however, losses should be limited in time and size. The time requirement points toward the use of unconventional operations only as extraordinary ones. The size requirement is particularly interesting. Large losses, indeed, can irrevocably impair the central bank's profitability, unless the value of money is appropriately reduced – i.e. inflation rises – up to the point in which private agents are forced to hold more currency, so that the seigniorage earnings of the central bank can increase and its profitability can be restored.

It could be argued that the above circumstances are very abstract and never apply in practice since we won't see significant losses on central bank's balance sheets. But this could be observationally equivalent to a central bank that navigates these uncharted waters by changing its ordinary monetary policy stance to avoid negative profits, perhaps because it feels the pressure of the public or the treasury for the unconventional purchases undertaken. The way to avoid losses altogether is again to reduce the value of money, push inflation, and even delay exit strategies from zero interest-rate policies. Indeed, something we are starting to see.

Too bad for the proponents of this new style of central banking, if currency is unbacked, the value of money might fall. On the other hand, this might be good news for central banks trapped in dangerous disinflationary spirals, as they can signal a change towards a more inflationary policy stance.

3 See Sims (2005) for a seminal contribution and later works by Bassetto and Messer (2013), Reis (2013) and Del Negro and Sims (2014).

4 The Bank of England and the Treasury established the Bank of England Asset Purchase Facility Fund Limited in January 2009 with the responsibility of buying private and public long-term securities through funds that the same Bank of England raised by increasing reserves. The created company is fully indemnified by the Treasury since any financial losses resulting from the asset purchases are borne by the Treasury and any gains are owed to the Treasury.

However, it is always worth keeping in mind that unbacked currency can disappear. A rare event that, however, has already occurred in the past to the florin – the international reserve currency of the late 18th century – as a consequence of the losses made by the Bank of Amsterdam in lending to the East India Company.<sup>5</sup>

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5 See Quinn and Roberds (2014).

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## Part III

# Quantitative easing in the Eurozone





# 19 Considering QE, Mario? Buy US bonds, not Eurobonds

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*The Eurozone needs to further ease monetary policy because under the current low inflation and high unemployment periphery countries need to suffer painful deflation. However, the ECB faces challenges other central banks do not face. This column proposes a way to overcome some of these hurdles. It argues that the ECB should buy US treasury securities, lowering the foreign exchange value of the euro. That would be the best way to restore the export sector of the periphery countries.*

The ECB should further ease monetary policy. Inflation at 0.8% across the Eurozone is below the target of ‘close to 2%’, and unemployment in most countries is still high. Under the current conditions, it is hard for the periphery countries to bring their costs the rest of the way back down to internationally competitive levels as they need to do. If inflation is below 1% Eurozone-wide, then the periphery countries have to suffer painful deflation.

The question is how the ECB can ease, since short-term interest rates are already close to zero. Most of the talk in Europe is around proposals for the ECB to undertake Quantitative Easing (QE), following the path of the Fed and the Bank of Japan, expanding the money supply by buying the government bonds of member countries. This would be a realization of Mario Draghi’s idea of Outright Monetary Transactions (OMT), announced in August 2012, but which never had to be used (De Grauwe and Ji 2013).

QE would present a problem for the ECB that the Fed and other central banks do not face. The Eurozone has no centrally issued and traded Eurobond that the central bank could buy (and the time to create such a bond has not yet come, see Frankel 2012). That would mean that the ECB would have to buy bonds of member countries, which in turn means taking implicit positions on the creditworthiness of their individual finances. Germans tend to feel that ECB’s purchase of bonds issued by Greece and other periphery

countries constitutes monetary financing of profligate governments and violates the laws under which the ECB was established. The German Constitutional Court believes that OMTs would exceed the ECBs mandate, though last month it temporarily handed the hot potato to the European Court of Justice. The legal obstacle is not merely an inconvenience but also represents a valid economic concern with the moral hazard that ECB bailouts present for members' fiscal policies in the long term. That moral hazard was among the origins of the Greek crisis in the first place (Frankel 2011).

Fortunately, interest rates on the debt of Greece and other periphery countries have come down a lot over the last two years. Since he took the helm at the ECB, Mario Draghi has brilliantly walked the fine line required for 'doing what it takes' to keep the Eurozone together (After all, there would be little point in preserving pristine principles in the Eurozone if the result were that it broke up. And fiscal austerity was never going to put the periphery countries back on sustainable debt paths). At the moment, there is no need to support periphery bonds, especially if it would flirt with unconstitutionality.

## **Why should the ECB go back to the foreign exchange market?**

What, then, should the ECB buy, if it is to expand the monetary base? It should not buy euro securities, but rather US treasury securities. In other words, it should go back to intervening in the foreign exchange market. Here are several reasons why.

- First, it solves the problem of what to buy without raising legal obstacles. Operations in the foreign exchange market are well within the remit of the ECB.
- Second, they also do not pose moral hazard issues (unless one thinks of the long-term moral hazard that the 'exorbitant privilege' of printing the world's international currency creates for US fiscal policy).
- Third, ECB purchases of dollars would help push the foreign exchange value of the euro down against the dollar.

Such foreign exchange operations among G7 central banks have fallen into disuse in recent years, in part because of the theory that they don't affect exchange rates except when they change money supplies (Fratzscher 2004, Dominguez and Frankel 1993a, 1993b). There is some evidence that even sterilized intervention can be effective, including for the euro (Sarno and Taylor 2001, Reitz and Taylor 2008, Taylor 2004,

Fatum and Hutchinson 2002). But in any case, we are talking about an ECB purchase of dollars that would change the euro money supply. The increased supply of euros would lower their foreign exchange value.

Monetary expansion that depreciates the currency is effective. It is more effective than monetary expansion that does not, especially when, as at present, there is very little scope for pushing short-term interest rates much lower.

Depreciation of the euro would be the best medicine for restoring international price competitiveness to the periphery countries and bringing their export sectors back to health. Of course, they would devalue on their own if they had not given up their currencies for the euro ten years before the crisis (and if it were not for their euro-denominated debt). Euro depreciation is the answer.

The strength of the euro has held up remarkably during the four years of crisis. Indeed, the currency appreciated further when the ECB declined to undertake any monetary stimulus at its March 6 meeting. The euro could afford to weaken substantially. Even Germans might warm up to easy money if it meant more exports rather than less.

## **Concluding remarks**

Central banks should – and do – choose their monetary policies primarily to serve the interests of their own economies. The interests of those who live in other parts of the world come second. But proposals to coordinate policies internationally for mutual benefit are fair. Raghuram Rajan, head of the Reserve Bank of India, has recently called for the central banks in industrialized countries to take the interests of emerging markets into account by coordinating internationally.

How would ECB foreign exchange intervention fare by the lights of G20 cooperation? Very well. This year the emerging markets are worried about tightening of global monetary policy. The fears are no longer monetary loosening as in the ‘currency wars’ talk of three years ago. As the Fed tapers back on its purchases of US treasury securities, it is a perfect time for the ECB to step in, and buy some itself.

*Author’s note: A shortened version of this column is to appear as a Project Syndicate op-ed.*

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# 20 Combatting Eurozone deflation: QE for the people

**John Muellbauer**  
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23 December 2014

*Eurozone deflation is likely to become reality when the annual inflation figure for 2014 is announced in January. This column argues that the ECB should develop a strategy that works in the Eurozone's unique financial setting, instead of following the Fed's lead. The author proposes that the ECB should pursue 'quantitative easing for the people', such as sending each adult citizen a €500 cheque.*

The US was the first to try quantitative easing (QE), which success depended on special features of the US financial setting. The Fed initially provided liquidity support for the banking system and bought government bonds to drive down yields and put cash into the financial system. It also rapidly brought down the policy interest rate to close to zero. There were spill-over effects on corporate bond yields, equity prices, and mortgage rates, closely linked to treasury yields.

In later rounds of QE, the Fed bought large volumes of mortgage-linked agency debt issued by Fannie Mae and Freddie Mac. This directly lowered mortgage rates and added to credit flows available for financing mortgages. Very likely, the QE also lowered the dollar exchange rate, pressuring central banks around the world to ease policy to prevent excessive appreciation of their currencies against the dollar.

## **US mortgages and QE effectiveness**

A crucial part of the US transmission mechanism operates via mortgages, the housing market, and the household sector – where the subprime crisis had triggered massive contractionary forces (Duca et al. 2011). The collapse of residential investment alone reduced GDP by around 4%. The fall in house prices had a direct negative effect on consumer spending by reducing the collateral backing for borrowing. The ratcheting up of foreclosures and payment defaults radically reduced the asset base of the banking system. Therefore, together with far higher risk spreads on non-bank loans, credit

availability for households fell sharply, particularly in the mortgage market. This was a double whammy for consumer spending. Reversing these trends and repairing this part of monetary transmission was a central and successful aim of Fed policy. The housing market began to recover in 2012, household deleveraging came to an end, and building activity gradually began to pick up.

In our research, we can track the impact of lower house prices on consumer spending, on the contraction of availability of mortgages and consumer credit, and on the subsequent recovery (Duca and Muellbauer 2013). We can also measure the effect of higher equity prices on consumer spending and the effect of lower interest rates on spending. The direct effect of the latter was substantial in the US, in addition to the indirect effects via housing and equities. The reason is that total US household debt is large relative to total liquid assets. Indeed, between 2001 and 2008, debt actually exceeded liquid assets, as was also the case in the UK. Lower interest rates benefit borrowers and hurt savers. Another important element in monetary transmission in the US, despite mainly fixed rate mortgages, is the ability to refinance at a typical cost of only about 1% when mortgage rates fall. The combination of low interest rate and QE worked in the US, even though at first the headwinds from the subprime crisis were so massive that some concluded that the policy wasn't effective.

## **Reasons why US-style QE is less effective in the Eurozone**

- In Germany, and to a lesser extent in France, the total liquid asset holdings of households are far larger than total household debt, so much so that lower policy rates translate into lower deposit rates, and reduce total household spending – the opposite of what occurs in the US and the UK.

Moreover, households in the Eurozone hold far less in equities relative to income than do US households, so the undisputed uplift on consumer spending from higher stock market valuations is small compared to that in the US.

- The housing collateral channel does not work in the core Eurozone, and the down-payment constraint for mortgages is far tighter than in the US.



As our research confirms, higher house prices in France and Germany reduce total consumer spending.<sup>1</sup> In Germany, France, and Italy, higher house prices spur non-owners to save more for the mortgage down payment and inspire caution among tenants, who expect future rent hikes. And the housing wealth of existing owners does not translate into significantly higher spending, given the lack of access to home-equity loans and cheap mortgage refinancing.<sup>2</sup> The ECB, therefore, deserves praise for excluding mortgage lending from its targeted long-run refinancing operation (TLTRO), its version of the Bank of England Funding for Lending Scheme, which aim was to offset some of the credit crunch due to the contraction of bank credit.

- When it comes to credit provision, capital markets do far less of the heavy lifting in the Eurozone (where banks matter more) than in the US.

As a result, bringing down yields on government, corporate, and asset-backed bonds has less impact. That is an important reason why ECB intervention to provide liquidity support for the banking system, for which it was the global leader as early as August 2007, accounted for a much larger share of its balance sheet expansion compared to the US.

- The final factor impeding QE's impact in the EZ is the fact that low bond yields, by increasing measured pension-fund deficits, make some companies reluctant to invest and thus more likely to raise contribution rates and limit pension benefits.

In the US, more generous assumptions regarding discount rates are used to calculate pension-fund liabilities (see Bank of England 2014).

At the same time, one should question whether the euro exchange rate – the one mechanism whereby current policies could still make an important difference – can be pushed down much further. It could meet strong international resistance, given the EZ's giant trade surplus.

1 Chauvin and Muellbauer (2013) for France and Geiger et al. (2014) for Germany. Earlier research by Boone and Girouard (2004) had pointed to the negative effect of higher house prices on aggregate consumer spending in Italy. Aron et al. (2012) confirm a similar effect in Japan. Japanese households are world champions in the ratio of bank and saving deposits held relative to income and to debt. As a result, lower real interest rates reduce total household spending, given income and equity prices. Applying US-style thinking to Japanese monetary policy led to erroneous lessons from Japan for the US, see Muellbauer and Murata (2011), and explains the failure of Abenomics so far to raise growth in Japan.

2 In the UK, where variable rate mortgages dominate, monetary policy was even more potent than in the US since cash flows of mortgage borrowers immediately improved.

## Two generic problems with QE

- One current generic problem with QE in the form of large-scale bond purchases when yields are already at record lows is that risks of significant losses for the central bank increase, e.g. should it need to reverse QE in the future.
- The second problem is that if bond yields are driven lower, this tends to have adverse distributional implications because it channels more money toward the wealthy who own the assets whose prices are boosted by QE.

They have a lower propensity to spend, with little trickle-down to the poorer people who would use it to consume more.<sup>3</sup> In the Eurozone, the distribution issue is also one between countries since institutional differences between countries can give the impression of discrimination among them. For example, purchases of corporate debt would favour countries with large corporate debts such as France.

## €500 per citizen

Clearly, the ECB must develop a strategy that works in the Eurozone's unique system, instead of attempting to follow the Fed's lead. Such a strategy should be based on Friedman's assertion that 'helicopter drops' – printing large sums of money and distributing it to the public – can always stimulate the economy and combat deflation. But, in order to maximise the impact of such an operation, the ECB would also have to find a way to ensure fair distribution.

One simple solution would be to distribute the funds to governments, which could then decide how best to spend them in their countries. But the EZ's rule against using the ECB to finance government spending bars this approach.

A more reasonable option would be to provide all workers and pensioners with social-security numbers (or the local equivalent) with a payment from the ECB, which governments would merely aid in distributing. Another alternative would be to

3 In November 2008, I was an early enthusiast for QE (Muellbauer 2008). In circumstances of market meltdown, mounting solvency, liquidity problems, as well as heavy disruption of credit flows, QE made complete sense. Indeed, as I argued would be the case, its use proved highly profitable for central banks. There is, therefore, no contradiction between my views then and now.

use the electoral register, a public database that the ECB could use independently of governments. Of the roughly 275 million adults in the Eurozone, some 90% are on the electoral register. Nothing in EZ law forbids the ECB from undertaking such an independent action.<sup>4</sup>

There is an important difference between the ECB implementing a €500 per-adult-citizen hand-out as part of monetary policy and governments doing this as traditional fiscal policy. Economists have long worried about myopic politicians over-spending, for example, just before an election in order to influence the voters and thus creating a ‘political’ business cycle, or simply perpetually spending too much, and as a result running too high government deficits. That is an important reason why the ECB is not allowed to directly finance government spending. But it is quite a different matter for an independent central bank, subject to its governing council and the representation of different countries on that council, to directly hand out cash to households as part of its method of meeting its inflation mandate. That is why I would classify this as monetary policy and not just a devious way of by-passing Eurozone rules.

### **Would it work? Evidence on the spending impact**

In 2001 and 2008 there were tax rebates in the US, carefully studied by economists. A study of the 2001 rebate by Johnson et al. (2006) suggests between 20 and 40 % was spent in the quarter in which the cash was received – and about another third in the quarter afterwards – and the authors looked only at non-durable spending. The study of the 2008 rebate concluded that “Households spent 12-30% (depending on specification) of their payments on nondurable goods during the three-month period of payment receipt, and a significant amount more on durable goods, primarily vehicles, bringing the total response to 50-90% of the payments”, see Parker et al. (2013). In an Australian study of the 2009 tax rebate, called a ‘bonus’, Leigh (2012) suggests around 40% was spent in the quarter of receipt.

Such evidence contradicts simple textbook versions of the permanent income hypothesis of consumption. In our Kendrick Prize winning paper (Aron et al. 2012), we find time

4 Friedman, great communicator as he was, almost certainly had multiple reasons for the helicopter image. One was for dramatic effect of the visualisation. Second, for a central bank to resort to helicopters emphasises its independence from governments and the fact that this is not standard fiscal policy.

series evidence for Japan, the US, and the UK that the marginal propensity to spend out of permanent income is between about 40 and 60%, and not 100%. This is confirmed for Germany by Geiger et al. (2014) and for France by Chauvin and Muellbauer (2013). The implication is that between 40 and 60% of a surprise transfer of €500 would be spent fairly quickly.<sup>5</sup> The US studies find evidence of heterogeneity between households, with poorer households and those with mortgage debt having higher spending propensities.

This would suggest that in Germany, where many households already have a lot in their saving accounts, the spending impact could be less than in the US but that, in Spain, Portugal, and Greece, where many households are cash-poor, the effects would be as large or larger as those in the US. I would, therefore, expect between 1.1% to 2% of GDP effects in Spain, Portugal, and Greece but probably as low as 0.5% in Germany.<sup>6</sup>

Beyond lifting the Eurozone economy out of deflation, such an initiative would have massive political benefits, as it would reduce resentment toward European institutions, especially in struggling countries like Spain, Portugal, and Greece, where an extra €500 would have a particularly strong impact on spending. In this way, the ECB could prove to disgruntled citizens as well as investors that it is serious about meeting its inflation target, and help to stem the rise of nationalist parties.

## The arguments against

- Like other types of helicopter money this proposal would be costly from the point of view of a public sector balance sheet combining the ECB with governments. Since households can see this clearly, they will increase their private savings to offset this cost and neutralise the addition to base money.

5 This simplifies the argument slightly. The models imply that not all the impact is felt in the same quarter, so the full effect takes several quarters to come through. However, once the initial surprise impact is over, the unspent amounts are added to liquid assets, whose marginal propensity to spend we estimate at about 10%, which implies a longer lasting and slightly larger overall impact.

6 The calculation is based on the following assumptions. Suppose in Spain, Portugal, and Greece, 60% of the €500 is spent in the first year. With annual GDP per adult of around €28,000, €20,000 and €15,000 respectively in Spain, Portugal, and Greece, this would imply a 1.1% of GDP boost in Spain, 1.5% in Portugal, and 2% in Greece. Assuming 40% is spent in Germany in the first year, and GDP per adult of around €42,000, the boost in Germany would be around 0.5% of GDP.

The first point to make is that the overwhelming evidence cited above against the simple form of the permanent income hypothesis implies that, even if the basic accounting proposition were true, we can reject the hypothesis that households ‘can see this clearly’.<sup>7</sup> Secondly, as Buiter (2014) shows, the objection is highly implausible even with full visibility. As long as money yields services such as transactions utility or liquidity services, and as long as households regard the addition as irreversible, household expenditure will increase. Such a helicopter drop relaxes the government budget constraint – unless an irrationally hair-shirted government insists on tightening fiscal policy to offset the helicopter drop.<sup>8</sup> Indeed, the additional tax revenue from the initial round of spending increases and from the multiplier effects of the additional employment, income, and spending it generates will actually improve the government budget constraint.<sup>9</sup>

- A second argument against is the possibility that the proposal could be subject to moral hazard of two types. First, the over-leveraged private sector would back off its efforts to de-leverage on the expectation that money printing would always rescue it from the consequences of its imprudence, which would increase future risks. Secondly, highly indebted EZ governments would step back from unpopular fiscal reforms.

The best way to de-leverage is to improve growth and the immediate effect of the policy is to improve both private and public sector balance sheets. Within the context of a highly disciplined inflation targeting policy it is unlikely that private sector expectations would be shifted in this direction any further than monetary policies pursued to date might already have done so. Structural reforms of labour and product markets should have priority over fiscal austerity since they address problems of competitiveness and growth. In principle, the ECB could make the €500 per adult conditional on credible reform commitments.

7 Behind this are credit constraints, myopia of some households and fundamental uncertainty.

8 Also see Bernanke (2003), the 2013 voxu debate on helicopter money between Turner and Woodford, chaired by Reichlin, Turner (2013) and Wren-Lewis(2014).

9 One might ask: why resort to the printing press when conventional fiscal expansion would work? see Jorda and Taylor (2013) for literature discussion and innovative new evidence on fiscal policy effectiveness. However, ‘fiscal space’ is currently poor given the high government debt to GDP ratios of many EZ countries and political pressures for austerity are strong.

- It will undermine ‘faith in the currency’.

This can only mean that the proposal will somehow lead to high future inflation. On the cusp of deflation and with the EZ in deep stagnation, this makes little sense. Maintaining the credibility of its inflation target is a sure-fire way for the ECB to prevent such risks.

- It will undermine the incentive to work.

High unemployment in the Eurozone is not the result of people simply being work shy or not wanting to work, much more a result of the jobs not being there.

- Handouts to poor people who ‘don’t deserve it’ are unethical.

This argument neglects that conventional monetary policy and QE involves raising the prices of assets, which benefits the people who own the wealth. Some members of elites see this as a ‘natural’ benefit, but resist offering the same benefit to the poor. The rise of populist anti-euro parties is part of the popular response to this distorted point of view.

## Concluding remark

After years of austerity, infighting, and unemployment, it is time to implement a QE programme that delivers what Europe needs.

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Recent work includes research on sovereign debt spreads in the Eurozone; research with economists from the Banque de France, Bundesbank and ECB on interactions between finance, housing and the real economy focused on the household sector; with Janine Aron on inflation forecasting and exchange rate pass-through, and for DCLG, on mortgage delinquencies and foreclosures in the UK; with John Duca and Anthony Murphy, both at the Dallas Federal Reserve, on lessons from the role of housing in the financial crisis, on what drives US house prices, and on the implications of the long-term shift in US credit market architecture. His research, with colleagues, on the impact of credit market liberalization on consumer debt, spending and housing markets in the UK, US, South Africa and Australia and non-liberalisation in Japan and Germany aims to throw new light on monetary transmission, financial stability and monetary policy. His 1980 paper with Angus Deaton, “An Almost Ideal Demand System” in the *American Economic Review* was selected as one of the top twenty papers published in the first one hundred years of that journal. His 2012 paper with Janine Aron, John V. Duca, Keiko



Murata, and Anthony Murphy, “Credit, Housing Collateral, and Consumption: Evidence from Japan, the U.K., and the U.S.” received the 2014 Kendrick Prize, awarded for the best macro-paper published in the *Review of Income and Wealth* in 2012 and 2013.

Before coming to Nuffield College in 1981, John was Professor of Economics at Birkbeck College, London, and Lecturer at Warwick University. He obtained his first degree from Cambridge University, England and his Doctorate from the University of California.



# 21 ECB: An appropriate monetary policy

**Mickey Levy**

Blenheim Capital Management

16 May 2014

*As banks repay their loans from the Long-Term Refinancing Operation, the ECB's balance sheet is shrinking. This column argues that, given the slow recovery and sustained low inflation, the ECB should replace its bank lending programme with quantitative easing. Buying short-term government debt would be consistent with the ECB's inflation target, would keep the ECB's monetary policy separate from its role in bank supervision, and would create a built-in exit strategy from unconventional policy.*

Europe's modest economic recovery and uncomfortably low inflation put the ECB in a bind. Although economic conditions are improving gradually (European Commission 2014), concerns about the potentially negative impacts of deflation persist (Armstrong et al. 2014). The ECB's top near-term priorities are to avoid deflation (and apparently even sustained low inflation) and extend the economic recovery. It also does not want to extend monetary policy beyond its natural scope and take pressure off EU nations to proceed with economic and regulatory reforms that will lift longer-run potential growth. ECB President Draghi indicated at his press conference at the conclusion of the May Governing Council meeting that the central bank would likely ease monetary policy at its June meeting. An array of alternatives are being considered.

Under current circumstances – in the economy, monetary policy, and banking – I recommend that the ECB announce that it will replace its Long-Term Refinancing Operation bank lending programme with a quantitative easing programme in which it purchases shorter-term sovereign debt. There's a rationale for this kind of monetary policy. Europe's growth in aggregate demand is too slow to facilitate healthy real growth and low inflation while accommodating further necessary economic adjustments. The ECB's balance sheet is shrinking and monetary policy is effectively getting tighter. Commercial bank lending is constrained and the monetary policy channels are clogged. A well-designed QE programme that enhances liquidity and stimulates aggregate

demand, but also avoids unnecessary credit policy and involves a predictable exit policy, would be consistent with the ECB's 2% long-run inflation target.

## **Slow recovery and low inflation**

European economies are recovering slowly from financial crisis and recession, but aggregate demand remains soft. Through 2013Q4, nominal GDP has been growing slower than real potential. It rose 0.4% in the year ending 2012Q4 and 1.6% in the year ending 2013Q4. This is less than half of the average nominal growth during the 2002–2007 expansion.

The insufficient growth in aggregate demand and lingering double-digit unemployment, accentuated by austerity policies and private sector adjustments, have exerted downward pressure on wages and unit labour costs. No surprise, inflation has declined, to 0.7% from 1.3% a year ago and 2.6% in April 2012.

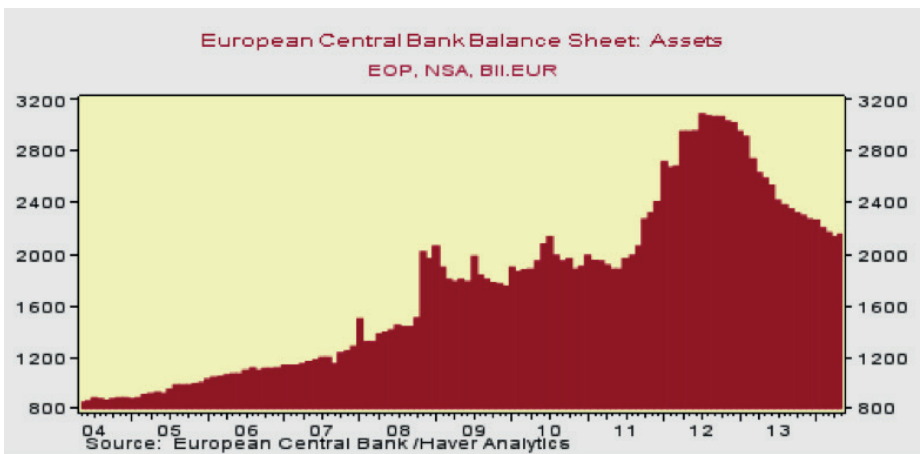
Although the probability of deflation is low, it cannot be ruled out in the context of Europe's modest growth in aggregate demand and the need for further wage and price adjustments. The concern among policymakers is that even a temporary, modest deflation (or even sustained very low inflation) could generate expectations of future price declines that would deter consumer spending and business investment. Japan's two decade-long bout with deflation and recession highlights the downside of misguided policies that resulted in virtually flat nominal GDP and sustained under-performance (Levy 2014).

Painful adjustments following Europe's earlier excesses of wages, unit labour costs, and debt-financed spending are contributing to the lower inflation, but in reality they are part of Europe's solution and reflect progress toward future healthy sustained growth. Without those downward adjustments in inflation and wages, Europe's economy would be languishing, it would be lacking international competitiveness, and its outlook would be dim. Now, European economies are benefiting from earlier reforms and conditions are improving. But further economic progress and deleveraging is required, and slow growth in nominal spending is elongating the adjustments.

## The ECB's shrinking balance sheet

Under current conditions, the current shrinkage of the ECB's balance sheet and declines in bank lending are unwelcome trends. European banks have been paying back loans from the ECB's LTRO lending programme, and some have stepped up repayments as they prepare for the ECB-supervised Asset Quality Reviews and subsequent stress tests. Although these loan repayments reflect improved bank balance sheets and perhaps fewer attractive lending and investment opportunities, they shrink the ECB's balance sheet and lower the amount of excess reserves in the banking system. At the same time, the lower inflation has raised the ECB's real refi rate. The ECB's monetary policy is effectively getting tighter. Looking forward, the residual of the LTRO loans are due to expire in October–November 2014, and this will contribute to a further diminution of bank reserves.

**Figure 1** The ECB's balance sheet



## Bank lending and credit standards

At the same time, bank lending continues to decline. Loan demand tends to lag the cycle, so with real GDP still 2.7% below its pre-recession (2008–2009) peak, it's not surprising that loan demand is soft. In the US, commercial and industrial loans – which fell nearly 25% from their peak – declined for more than a year into economic recovery, and didn't recover to their prior peak until late 2013, nearly 4 1/2 years into expansion.

US consumer loans are now increasing, but commercial banks are losing market share to other sources of credit, including credit unions and the Federal government (student loans). Europe is just concluding its first year of recovery, so it will take time for loan demand to rebuild. Patience is required.

The weak loan demand in Europe has been accompanied by constrained bank credit supply. Banks have been undercapitalised, and are striving to reduce nonperforming loans and increase credit quality. Faced with the rigours of the ECB's AQRs and upcoming stress test, banks have been raising capital and are striving to reduce risk-weighted assets. Although the ECB's most recent bank lending surveys indicate that credit standards on loans to enterprises and households have eased, most indicators suggest ongoing credit restraint (ECB 2014).

## **Good news in Europe**

Positive themes dominate Europe's economic and financial news. The expansion continues to take hold in both troubled and core nations, supporting forecasts of sustained moderate growth. Consumption and business fixed investment are rising modestly, as are exports, despite the strong euro. Confidence surveys are pointing up, undeterred by policymakers' concerns about low inflation. Bank capital and liquidity have improved. The rather dramatic declines in sovereign bond yields are reducing debt-service costs. Key troubled EU nations no longer need financial support. Greece's successful bond issuance epitomises Europe's significant financial progress.

While Europe's outlook is becoming increasingly favourable, conditions remain fragile. This is an inappropriate time for the ECB's unintended monetary tightening. Taking steps to offset this monetary trend would help to sustain the recovery in aggregate demand as economic reforms and austerity are implemented, and would be consistent with the ECB's long-run 2% inflation target.

## **A quantitative easing proposal**

The ECB should announce a quantitative easing programme that replaces its rapidly diminishing LTRO programme. A properly structured QE programme would carefully define the magnitude and type of assets purchased by the ECB, with the following characteristics:

- It should focus directly on the ECB's mandate of maintaining aggregate demand growth consistent with its long-run inflation target;
- It should confine itself to monetary policy while steering clear of credit policy; and
- It should have a built-in exit strategy that facilitates a smooth monetary policy normalisation.

Here, the ECB can learn from the communications challenges faced by the US Federal Reserve's open-ended QE.

The ECB's QE should involve a year-long purchase programme of up to €400 billion of sovereign debt securities with three-year or less maturities. These asset purchases would offset the shrinkage of reserves in the banking system as banks repay the remainder of their LTRO loans. Replacing bank loans with purchases of sovereign debt would remove the ECB from credit policy and improve its credit quality by reducing its exposure to risky bank loans.

The composition of the ECB's purchases of sovereign debt by country should be consistent with its role as central banker of the EMU. This may involve aligning the purchases with the ECB's distribution of seigniorage to the national central banks, or a weighting based on their relative capitalisation.

The financial crisis has passed, and banks are rebuilding capital and liquidity. A QE programme of purchasing sovereign debt to replace bank loans would enhance the ECB's monetary stimulus while creating separation between the ECB's monetary policy and its role in supervising the bank AQRs and stress tests. In contrast, alternative suggestions that the ECB purchase asset-backed securities or implement a funding-for-lending programme – both in attempts to stimulate bank lending – would involve the ECB directly in credit policy, greatly muddling its role. Bank lending is on a cyclical course toward recovery – it will take time regardless of the monetary policy remedy. Monetary-credit policies designed to boost bank lending are unnecessary and only generate undesired distortions in credit markets.

Limiting the QE to three-year and under sovereign debt securities would build in an eventual natural unwinding of the ECB's balance sheet. The Fed has made the mistake of buying mostly long-dated securities such that the unnecessary bloat in its balance sheet and excess reserves in the US banking system will remain long after the economy and banking system have fully repaired. This has greatly complicated the Fed's communications about when it will normalise monetary policy.

Three years from now, if all goes well, Europe's economy will be on a sustainable growth path, five years into the economic expansion, and the banking system will be almost fully capitalised and liquid. At that time, a natural run-off of excess reserves would facilitate a smooth monetary policy normalisation for the ECB.

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# 22 Is the ECB doing QE?

**Charles Wyplosz**

Graduate Institute, Geneva and CEPR

12 September 2014

*Last week, the ECB announced that it would begin purchasing securities backed by bank lending to households and firms. Whereas markets and the media have generally greeted this announcement with enthusiasm, this column identifies reasons for caution. Other central banks' quantitative easing programmes have involved purchasing fixed amounts of securities according to a published schedule. In contrast, the ECB's new policy is demand-driven, and will only be effective if it breaks the vicious circle of recession and negative credit growth.*

The 4 September announcement by Chairman Mario Draghi has been greeted with enthusiasm by the markets and the media. It has been long awaited, and many believe that the ECB has finally delivered. This is not sure. The ECB intends to buy large amounts of securities backed by bank lending to households (mortgages) and to firms.

- Traditional quantitative easing (QE) is demand-driven since the central bank buys assets in predetermined amounts.
- The ECB's version is supply-driven.

This means that it is not certain that the liquidity injections of “hundreds of billions” will materialise.

## **Size of the operation**

The ECB has announced its intention to boost liquidity. With traditional QE, as practiced by the US Federal Reserve, the Bank of England, and the Bank of Japan, the central bank buys securities – mostly public debt instruments – in pre-announced amounts according to a published schedule. As a result, the amount of liquidity creation is known ex ante and certain to happen.

In the case of the ECB, this will require market participants to securitise existing or new loans. The existing amounts of Eurozone asset-backed securities is presently believed

to be of the order of €1 trillion, to be compared with the \$2.4 trillion created by the Fed through its various QEs.<sup>1</sup> Not all of it will be accepted by the ECB for quality reasons. A rough guess of the outstanding amount of Eurozone covered bonds is €2 trillion, much of which was issued by German institutions.<sup>2</sup> Over 2009–2010, the previous covered bond purchase programme of the ECB led to purchases of €60 billion.

This demand-driven process means that no one knows how much liquidity the ECB will be able to create. Its signalling power, therefore, is limited relative to traditional QE. One can already anticipate financial markets debating the size and timing of the programme. In the US, doubts only surfaced when the Fed started in 2013 to send warnings that QE was not forever. The ‘taper tantrum’ is an indication of how poorly markets deal with uncertainty (Feroli et al. 2014, Neely 2014).

The hope is that the existence of the ECB programme will encourage lenders to lend more under the assumption that these loans will then be sold to the central bank. Two assumptions come into play here.

- First, that current bank lending, which has been negative in net for several years, is restrained by a lack of liquidity.
- Second, that securitisation of these new loans will develop.

The first assumption is contradicted by the fact that banks hold some €100 billion in excess reserves, for which they receive a negative interest rate. Lack of liquidity cannot explain negative credit growth. The alternative explanation is that there is not enough demand, which is plausible in the midst of a recession. If so, the programme will not have any impact. Yet another explanation is that banks do not lend because they are too risk averse. The ECB programme will succeed if the securitisation process allows them to pass the risk on to the ECB.

## **Risk-taking by the ECB**

The ECB programme will encourage securitisation. By selling their loans to securitisation agents, banks will get rid of the associated risks.<sup>3</sup> Thus, the best hope

1 Source: Securities Industry and Financial Markets Association (SIFMA).

2 Based on data from the European Covered Bond Council.

3 This is only true for asset-backed securities. Covered bonds do not remove the risks.

is that risk-averse banks will start peddling large amounts of loans, and convince their customers to take them, because they will not bear potential losses.

The ECB considers that European asset-backed securities will not be as risky as their toxic US counterparts of 2008 because they will not rely on the infamous subprime loans. Indeed, subprime loans cannot really exist in Europe because consumer protection laws effectively ban them. In addition, Mario Draghi insists that the asset-backed securities will be fully transparent so that subprime loans can be detected. He rightly notes that loan delinquency levels are much smaller in Europe than in the US. All this is true, but one still has to explain why banks are so afraid to lend.

- One reason is that banks are busy repairing their balance sheets through deleveraging because of new regulation and stricter stress tests.
- Another reason is that the on-going recession cuts into corporate rates of return, and that high unemployment rates mean that lending to households is inherently risky.

The first reason may evaporate later this year as the result of the Asset Quality Review and tough stress tests that will force weak banks to recapitalise. It may also mean that banks will have one more argument to delay, or possibly even roll back, the new regulation designed to make them less fragile and costlier to bail out. That would be a disaster.

The second reason describes a vicious circle. The ECB must hope to break it. Yet, it is hard to see how the process starts other than through more risk-taking by banks, passed on to the ECB. The bet, then, is that loans that now appear risky will turn out to have been safe because the process will have triggered a recovery. In that view, in the end of it all, the ECB will not suffer significant losses. Maybe, but the ECB will have to take the risky bet.

## **Why not traditional QE?**

The ECB programme is more complex, less certain to work and riskier than traditional QE. There must be good reasons for the ECB to have chosen such a convoluted route. To start with, the European banking system remains fragmented. That means that the normal channels through which liquidity trickles down throughout the Eurozone are not operating well (Al-Eyd and Berkmen 2013). The ECB programme is designed to lend to lenders, indirectly through securities, thus bypassing the broken channels.

In addition, traditional QE involves buying large amounts of public debt. In the Eurozone, this is highly contentious. Ideologues will be prompt to describe QE as the backdoor for debt monetisation. To be effective, the ECB would have to choose public debts of countries in bad shape, since national bonds are now concentrated on the balance sheets of the respective national banks. That will reinforce the debt monetisation syndrome. Furthermore, if one believes that many countries face unsustainable public debt levels, this means that some restructuring is unavoidable.<sup>4</sup> It could well be that public bonds are riskier than the loans that will be created under the new ECB programme.

### **A virtuous circle?**

No one should believe that the ECB's task is an easy one. With inflation way below its definition of price stability, the ECB must 'do something'. Indeed, had 'something' effective been done a year ago, the situation today would be less pathetic. Its version of QE, however, is both uncertain and risky. It all comes down to a bet that easier lending conditions will restart the Eurozone economy. Is the bet likely to pay off?

One can only wish so, even though it rests on many dubious assumptions, as described above. The main source of optimism may lie elsewhere. If liquidity does increase by a few hundred billion euros, the euro will depreciate. A sizeable and early depreciation is really the best that can happen. Rising exports will trigger the recovery, which will encourage borrowing. Lending will follow as risk aversion declines, leading to more liquidity creation and yet more depreciation.

Maybe this "hundred billion" debt is the best that the ECB can do given the Eurozone's complex political situation. But it remains a bet, with a highly risky downside. Traditional QE, on the other hand, may not produce wonder, but certainty of liquidity creation seems to work and it can provoke the desired depreciation that is the key to success (Krishnamurthy and Vissing-Jorgensen 2011).

4 See Pâris and Wyplosz (2014).

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## 23 QE, 'European style': Be bold but parsimonious

**Urszula Szczerbowicz and Natacha Valla**

CEPII

09 April 2015

*Sovereign bonds are the latest and biggest quantitative easing (QE) policy conducted by the Eurozone. This column argues that instead of sovereign bonds, the Eurozone should focus on assets that are the closest to job-creating, growth-enhancing, and innovation-promoting activities. In particular, instruments issued by agencies and European institutions should be given a prominent role. But they should also be selected to promote the financing of long-term growth and jobs, not of unsustainable government expenditure.*

Sovereign bonds are a natural target for the ECB's Public Sector Purchase Programme (PSPP), the latest – and by far the biggest – of the Quantitative Easing (QE) policy conducted in the Eurozone. The pool of outstanding sovereign debt instruments is indeed the deepest and the most liquid, especially for highly rated bonds. Sovereign purchases are also expected to compress bond yields across the board (Carpenter et al. 2013), reduce interest rate risk along the yield curve (Greenwood and Vayanos 2015), and generate spillovers to other markets at similar maturities (Szczerbowicz 2014).

But shortcomings of sovereign purchases by the Eurozone have been subject to criticism even before their implementation. First, some have said 'too little, too late'. Second, the geographic allocation of purchases, set to follow the share of each European Monetary Union member state in the ECB's capital (the 'capital key'), mechanically allocates almost half of all purchases to German and French bonds. Those markets already benefit from exceptionally low interest rates, and net secondary market supply is expected to fall short of planned purchases (both because current bond holders might stick to their portfolios, and because primary market issuance, in particular in Germany, will be small over the foreseen horizon of the Purchase Programme). Third, their market impact (flattening of yield curves) and macroeconomic effects (hiking inflation, spurring credit growth) are expected to be limited. Fourth, the Public Sector Programme might exacerbate tensions in the interbank market by extending the pool

of outstanding sovereign debt trading at negative rates. That could in turn accessorially drain the already scarce collateral.

### **Twisting the programme to diversify the funding structure of the Eurozone economy**

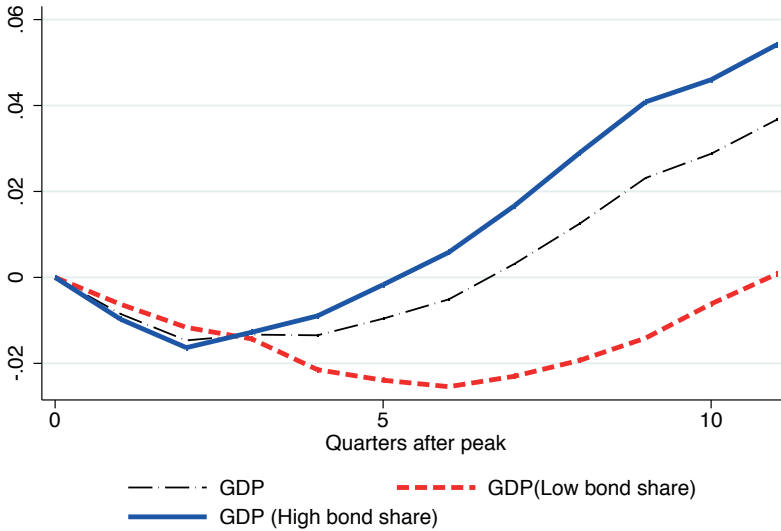
What if the Eurozone flipped its QE strategy around and selected assets based on their final economic use rather than on their issuer or on the asset class they belong to? In fact, a reasonable operational target for the ECB's QE could be to facilitate the financing of growth-enhancing private sector activities, to stimulate investment, and to underpin European investment projects or joint initiatives, such as – but not only – the Juncker Plan.

The first way to implement a non-sovereign QE is to focus on private assets. These can be either issued by the financial sector or by non-financial corporations themselves. In fact, purchases of financial sector securities have been the ECB's first asset purchase programmes. Way back in 2009, they started going quantitative by conducting outright purchases of covered bonds. They then followed suit in November 2014 with an ABS programme.

But this exclusive focus on securities issued by banks turned problematic. By doing so, the ECB did put all its eggs in the same basket, fully conditioning the transmission of its monetary policy on bank balance sheets. Looking forward, at a time when banks are engaged in a decade long process of balance sheet consolidation, the scope to kick start bank credit supply will remain constrained for a while (Bologna et al. 2014). But also, evidence suggests that there are many benefits in diversifying the sources of financing for firms so that they can find funding in all cyclical circumstances, in particular in early stages of upturns. Grjebine et al. (2014) show that economies with high share of bonds in corporate debt and high degree of substitutability of bonds for bank loans tend to perform better after economic downturns, i.e. they recover faster and more steeply (see Figure 1). Supporting the diversification of financing sources seems like a reasonable objective for the ECB as it provides the ECB with alternative channels for monetary policy transmission (Coeuré 2015, Mersch 2015).



**Figure 1** Economies with high share of bonds in corporate debt perform better in recoveries



Source: CEPII, Grjebine et al. (2014).

Financial instruments issued directly by the corporate sector would therefore be a premium candidate for QE. By purchasing them, the ECB would foster the development of those markets and most surely improve and speed-up the nascent recovery of the Eurozone economy. En passant, that would also be a plus to move the Eurozone towards a Capital Markets Union (CMU), as foreseen by the European Commission (EC 2015).

What size of corporate bond purchases could the ECB aim for? Corporate bonds are already accepted as collateral in the ECB open market operations (OMOs). In fact, according to the most recent published numbers, the ECB identifies an outstanding amount of €1 393 billion of such assets eligible to its OMOs, of which only a mere €74 billion have actually been pledged! This leaves a substantial outstanding stock that could be bought outright by the ECB without running the risk of creating a collateral squeeze. In the recent past, corporate bonds were bought by the Bank of England and the Bank of Japan to facilitate corporate refinancing and investment. The Fed also purchased unsecured corporate commercial paper and asset-backed commercial paper. So, that would not be such an exotic endeavour after all.

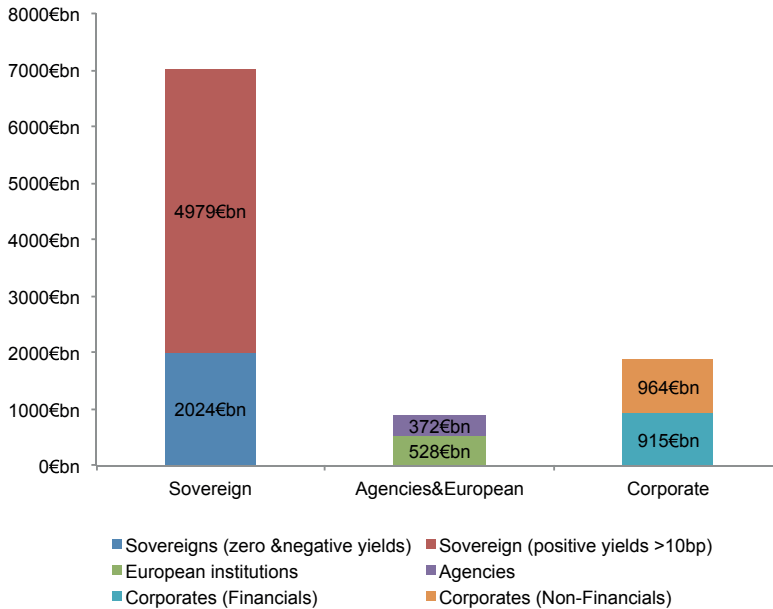
But we should keep in mind that by buying corporate bonds, the ECB would directly interfere in the development of bond markets in Europe – again a matter to be looked

at, and perhaps levered within the Capital Markets initiative. This can be constructive if done carefully. First, the development of European bond markets must go along with appropriate regulation. Second, the impact of ECB massive interventions on market liquidity should also be anticipated and fine-tuned. The BIS and others have recently pointed to bond market liquidity as a cause of concern (Fender and Lewrick 2015). This issue should be considered seriously, bearing in mind that the ECB purchases might also stimulate bond issuance by firms that would otherwise not be active in those markets.

### **Purchases of agencies and international European institutions: Be massive, but parsimonious**

A more direct financing of the real economy could take yet another form. In fact, the ECB's QE programme already explicitly includes securities of European institutions that finance European investment projects, such as the European Investment Bank (EIB). Not only would these purchases support the Eurozone deficient demand in a way that is geared towards long-term growth objectives, but they would also deepen European integration. At the current juncture, this is no luxury as low investment and weak growth is a source of concern in Europe (Giovannini et al. 2015). The total available euro-denominated pool of bonds issued by the EIB is of around €200 billion. As the ECB programme currently stands, the purchases of such securities are subject to loss sharing and limited to 12% of the programme. It seems that substantially increasing this limit beyond 12% would make QE more efficient (see Figure 2).

**Figure 2** The universe of purchasable agencies and European Institutions should not be underestimated



Source: RBS, ECB.

## Purchases of 'agencies' and 'European institutions'

In its Public Sector Purchase Programme, the ECB distinguishes between 'agencies' and 'European institutions'. This has gone unnoticed, but might in fact be key. While the ECB purchases of European institutions securities are constrained by 12% ceiling, the purchases from agencies are not subject to the same limit. When publishing the nitty-gritties of its programme, the ECB even indicated that national central banks could choose between sovereign or agencies, and that if they were not in a position to execute the planned monthly purchases of sovereign or agencies debt instruments (for example, because there would be none to sell in the market), they would have the possibility to buy European institutions instead. This means that the ECB would be in a position to massively support public investment simply by buying bonds from national promotional banks such as the German Kreditanstalt für Wiederaufbau (KfW) or Spain's Instituto de Credito Oficial (ICO), or from the EIB, or even instruments issued under the heading of the Juncker Plan, instead of their sovereign counterparts.

Yet, while we fully support ECB's purchases of agencies (and in fact we believe that they should be the backbone of QE), parsimony in the choice of agencies will be critical. Indeed, the list of eligible agencies as published by the ECB covers a range of very different animals. For instance, the list includes CADES (a body created to bear the debt of the French social security system) and UNEDIC (body in charge of France's unemployment insurance, which is largely in deficit). These bodies have little to do with investment and long-term growth, and it is not clear that European public opinions will be that pleased when they find that out. When selecting its eligible agencies, the ECB might be well advised to select them not only on the credit worthiness grounds but also according to their economic purpose.

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# 24 Quantitative easing in the Eurozone: It's possible without fiscal transfers

**Paul De Grauwe and Yuemei Ji**

London School of Economics; Brunel University

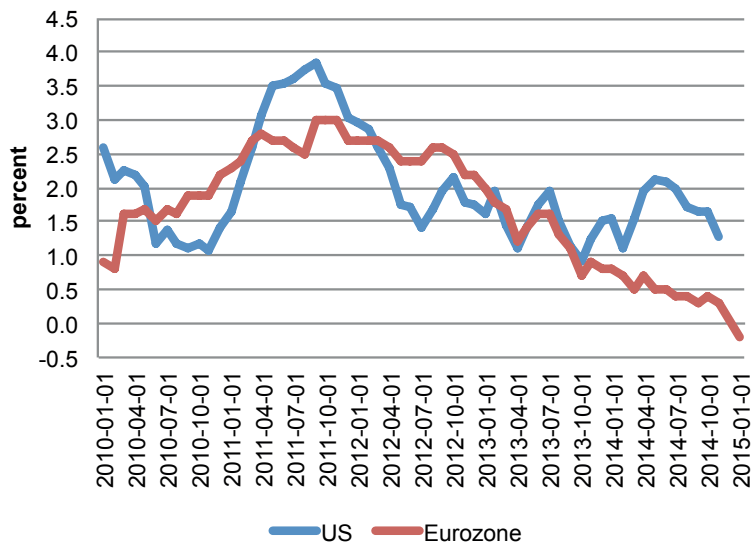
15 January 2015

*The ECB has been struggling to implement a programme of quantitative easing (QE) that would successfully target deflation. The main difficulty is political, stemming from opposition from German institutions. Their argument against is that a government bond buying programme by the ECB would mix fiscal and monetary policy. This column argues the opposite – such a programme can be structured so that it does not mix fiscal and monetary policy. It, therefore, would not impose a risk on German taxpayers.*

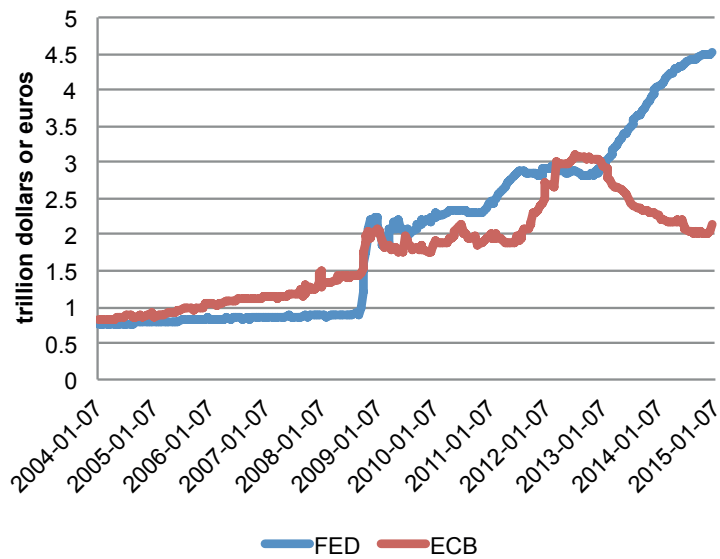
## Introduction

The ECB has been struggling to implement a programme of quantitative easing (QE) to counter the deflationary forces in the Eurozone. What one can say today is that it has not been very successful in stopping deflationary forces as is made vivid in Figure 1. We observe that since 2012 inflation has declined steadily in the Eurozone and became negative at the end of 2014. This trend has coincided with a spectacular decline in the balance sheet of the ECB and a concomitant decline in the money base (the liabilities side of the ECB's balance sheet) since 2012. Figure 2 shows the balance sheets of the Fed and the ECB, and the strong contrasts in the development of the balance sheets of these two central banks. Figure 3 shows the money base in the Eurozone since 2010 and the spectacular decline in the money base since 2012.

**Figure 1** Inflation in US and Eurozone



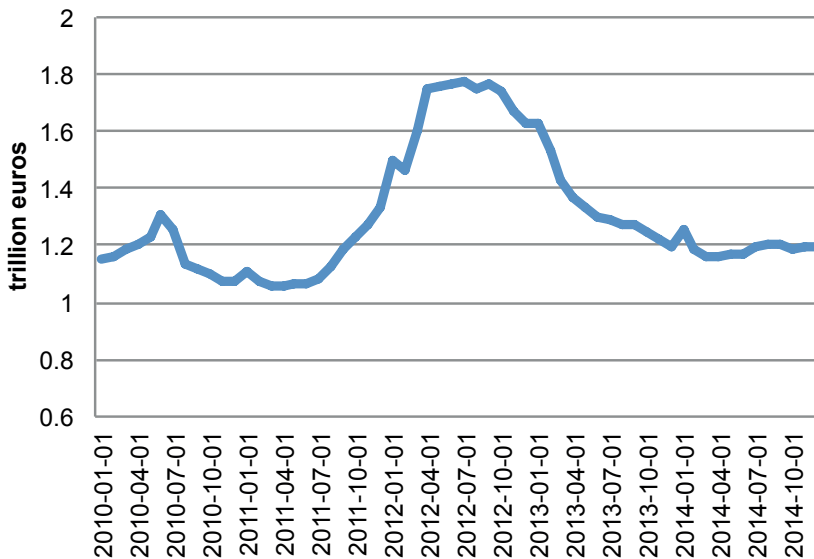
**Figure 2** Balance sheet FED and ECB (2004-2014)



Source: ECB and Federal Reserve.



**Figure 3** Money base in Eurozone



Source: ECB.

In order to raise inflation, it will be necessary to increase the money base again. Note, however, that while necessary, this is not sufficient. The central bank liquidity must ultimately lead to an increase in bank credit and the money stock (see Friedman and Schwartz 1960). It is interesting to note that Friedman and Schwartz criticised the failure of the Federal Reserve in the 1930s to prevent the decline in the US money base. They argued that this failure contributed to the Great Depression. According to Friedman and Schwartz, the Fed failed to stop the decline of the money base as a result of a refusal to buy a sufficient amount of government securities.

An increase in the money base can be achieved by quantitative easing. The technically easiest way to implement QE consists in buying government bonds in the secondary markets. The reason why this is technically the easiest way to implement QE is that the market for government bonds is large and very liquid. As a result, it has been the standard approach in most central banks of the world. The Federal Reserve and the Bank of England have not hesitated to buy large amounts of government bonds to counter deflation in their respective countries, and they seem to have been more successful than the ECB.

The ECB, however, has found out that the technically easiest instrument of QE has become politically the most difficult one to use. This has to do with the intense hostility

of the German Bundesbank, the German Constitutional Court, and of many German economists against the use of a government bond buying programme.

The most important argument used by the German opponents of a government bond buying programme by the ECB is that such a programme mixes monetary and fiscal policy.<sup>1</sup> The argument goes as follows. When in the context of QE the ECB buys government bonds from fiscally weak countries it takes a credit risk. Some of these countries may default on their debt. This then will lead to losses for the ECB, which, in turn, means that the taxpayers of the fiscally sound member countries of the Eurozone (mainly Germany) will be forced to foot the bill. Thus, when the ECB buys government bonds, it creates a risk that future taxpayers will be liable to bear losses. Put differently, the ECB is, in fact, conducting fiscal policies in that it organises fiscal transfers between member states. The ECB has no mandate to do so.

This argument has been defended in various wordings by the Bundesbank (2012), Weidmann, the President of the Bundesbank, the German Constitutional Court (BvR 2014), and well known German economists (Sinn 2013, Weber 2010, among others). It has now become the generally accepted narrative among many German economists. Yet, it is wrong.

We will argue in this column that a government bond buying programme by the ECB can be structured in such a way that it does not create any risk for the German taxpayer and that, therefore, there is no mixing of monetary and fiscal policies when the ECB buys government bonds.

## The basics

Let us start with the basics. When a central bank buys government bonds, it substitutes one type of liabilities of the public sector with another one. Government bonds that promise a fixed interest rate are replaced by a monetary liability without interest but carrying an inflation risk. At the moment of the purchase, the government bonds cease

<sup>1</sup> We have analysed the other arguments often used in Germany in De Grauwe and Ji (2013) and found them wanting. See also Winkler(2014) and Gerner-Beuerle, et al.(2014). Also we do not go into legal arguments. A preliminary ruling of the European Court of Justice suggests that a bond-buying program in the context of the ECB's monetary policy is legal.

to exist. All that is left of the bonds is a monetary liability of the central bank (which is one branch of the public sector).

Of course, typically the central bank keeps the government bonds on its balance sheet, thereby creating the fiction that these bonds still exist. These bonds, however, are just a claim of one branch of the public sector (the central bank) against another branch of the public sector (the government). These two branches should be consolidated into the public sector, and then it turns out that these claims and liabilities cancel out.

Another way to see the same thing is by considering the flows. When the government bonds are kept on the balance sheet of the central bank, the government transfers interest to the central bank. The latter then transfers this interest revenue back to the government. The central bank could easily stop this fiction and put the bonds in the shredding machine. It would make no difference. No taxpayer is involved. The fact that the bonds are destroyed does not produce a new risk for the taxpayers.

Note that the fiscal implications arise at the moment of the purchase of the bonds by the central bank. At the moment these bonds are taken out of circulation, the government does not have to pay interest anymore. (The interest payments to the central bank are just a bookkeeping affair because the government gets them back). Prior to the purchase, the government had to make these interest payments and thus had to tax citizens to make this possible. Therefore, the purchase of the bonds by the central bank relieves taxpayers. The price the taxpayers pay is that there might be more inflation. But when this operation is performed to fight deflation (i.e. to increase inflation) as is the case today, this should, in fact, increase the taxpayers' welfare. What happens afterwards with these bonds on the balance sheet of the central bank is of no importance to the taxpayers.

Put differently, the value at which the bonds are kept on the balance sheet of the central bank has no bearing for the taxpayer.

These bonds could be given a value of zero or any other value without any taxpayer suffering or gaining from this. Does this conclusion also hold in a monetary union like the Eurozone? The answer is yes, provided we structure the bond buying programme carefully. We show this in the next section.

## Government bond purchase and fiscal transfers in a monetary union

Suppose the ECB buys an amount of government bonds of €1,000 (this is the amount by which the ECB wants to increase its balance sheet) and distributes the purchases of individual countries' bonds according to the equity shares of the member countries in the Eurozone. We show these equity shares and the corresponding amounts of national bond purchases in Table 1.

**Table 1** Equity shares of member countries in ECB and distribution of bond purchase

	Equity shares	Bond purchase (€ billion)
Nationale Bank van België	3.5	35
Deutsche Bundesbank	27.1	271
Central Bank of Ireland	1.6	16
Bank of Greece	2.8	28
Banco de España	11.9	119
Banque de France	20.3	203
Banca d'Italia	17.6	179
De Nederlandsche Bank	5.7	57
Oesterreichische Bank	2.8	28
Banco de Portugal	2.5	25
Suomen Pankki – Finlands Bank	1.8	18
Others	2.3	23
Total	100.00	1,000

These government bonds are held on the balance sheet of the ECB and lead to interest payments of each government to the ECB. These interest payments are profits made by the ECB that will have to be returned to the national central banks, which will return these to the national treasuries. If we use the same equity shares to return the interest payments and if the interest rates on these national bonds are the same, the ECB will return exactly the same amount of interest it has received from the national treasuries back to the same treasuries. (We discuss the case where the interest rates are not the same later).

The purchase has the following fiscal implications in each country. Taxpayers in each country have to pay less tax because the bonds held by the ECB do not lead to interest

expenses of the respective governments anymore. The taxpayers have an inflation risk instead. But since the purpose of the purchase is to increase inflation to a higher and more optimal level, the welfare of the taxpayers increases.

The important point to make, however, is that no fiscal transfers between member countries are involved. The German taxpayers gain because part of the German debt is monetised; the Italian taxpayers gain because part of the Italian debt is monetised. This is the effect each of these countries had before they were in the monetary union when their national central banks in the context of their monetary policies were buying national government bonds.

Now suppose that one of the member countries' governments defaults (the big scare of most German economists). To make it more dramatic, suppose it is Italy. In that case, the Italian treasury will cease to pay interest to the ECB. If the ECB then uses the rule (which is easy to enforce) that it will not transfer interest to the Banca d'Italia, the other governments will get back exactly what they have paid to the ECB. German, Dutch, Finnish, etc. taxpayers will not be involved and will not have to pay a penny extra. In fact, the Italian taxpayers will not gain anything either. The Italian treasury does not pay interest to the ECB anymore and does not get anything in return from the ECB.<sup>2</sup> Thus, this particular way of structuring the bond purchase and interest payments leads to the same neutrality result that we discovered in the case of a single country – the value of the bonds held by the central bank has no bearing for the taxpayers. There are no fiscal transfers arising from the fact that the Italian government has defaulted. The German taxpayer does not have to foot the bill.

We made the assumption that the interest rates on the government bonds held by the ECB are equal. In general, this is not the case. The interest rate on the government bonds of the fiscally prudent governments is usually lower than the interest rate on the bonds of fiscally less prudent governments. Thus, the interest rate on German bonds is lower than on Italian bonds. What are the implications?

It is easy to show that this will lead to a fiscal transfer towards the taxpayers of the fiscally prudent country, Germany in our example. The reason is that the Italian treasury pays more interest to the ECB than the German treasury. Thus, the profits that the ECB

2 Note that this neutrality effect only holds for the Italian government bonds held by the ECB, not for the Italian bonds held by the public.

makes contain relatively more Italian than German interest revenues. But this profit is redistributed according to the equity shares. Thus, Germany will receive a net positive interest flow made possible by a net negative interest flow from Italy.

- There is a fiscal transfer, but it is not the one so much feared by the President of the Bundesbank and German economists. The German taxpayer is a net recipient from this QE operation.

What happens if in this case Italy were to default? The answer is that the net positive interest flow in favour of the German taxpayer stops. It would be stretching the meaning of words to call this ‘footing the bill’ by German taxpayers.

- An Italian default would only imply that the German taxpayer stops enjoying the fiscal transfer resulting from the bond buying programme by the ECB.

It is possible to completely eliminate this type of fiscal transfer between Italy and Germany, however. This can be achieved by following a somewhat different interest distribution rule. Instead of pooling the interest payments the ECB receives and then distributing them according to the equity shares, one could also use a rule of ‘juste retour’. This would mean that the ECB redistributes the exact amounts of interest payments it has received from each member government back to the same government. If this rule is applied, it can easily be seen that the neutrality result holds perfectly. There would be no net interest transfer from Italy to Germany before or after the default. Complete neutrality is restored and taxpayers are shielded from movements of the value of the bonds on the ECB’s balance sheet.

## **Permanent vs. temporary bond purchases**

The previous discussion developed the case of a permanent purchase of government bonds, i.e. the government bonds are permanently kept on the ECB’s balance sheet. It is likely, however, that, in the future the ECB will want to sell part of the governments bonds it has acquired today back in the secondary market. At that moment, monetary liabilities of the ECB (and thus the money base) will decline again and government bonds will be put back into circulation. This will have a fiscal implication, i.e. the national governments will have to pay interest to the new holders of these bonds (private investors) that will not be reimbursed anymore, as was the case when the bonds were held by the ECB.

However, if the sales of government bonds occur according to the same equity shares used for the purchase, there will be no fiscal transfers between countries. The German government will be confronted with the need to pay interest on German government bonds as it did before the bonds were bought by the ECB. The same is true for the other governments. Thus, future sales of government bonds can be tailored in such a way that they do not lead to fiscal transfers between member countries. German taxpayers can sleep peacefully – they will not have to foot the bill of other governments.

What happens if before the future sales of government bonds a member country defaults? Let us assume again this is Italy. In this case, the issue arises of whether the ECB will have enough government bonds left over to sell. It can immediately be seen that this is not likely to lead to a problem, at least if the ECB does not want to sell the full amount of the bonds acquired by the QE operation. Since the ECB has shrunk its balance sheet so much since 2012 (see Figure 2), it will want to restore a balance sheet size corresponding to the one existing before the Crisis. Extending the trend that existed before 2008 to the present period implies that the ECB is likely to keep at least €500 billion of the €1 trillion acquired through QE on its balance sheet. In that case, only €500 billion would have to be sold. One would need a catastrophic number of countries defaulting before the ECB runs out of bonds to sell.

One can conclude that the need to create additional money base to achieve the inflation target of 2% makes it possible to write down a significant part of the government debt on the ECB's balance sheet without creating fiscal transfers between member states. This is also the conclusion arrived at by Paris and Wyplosz (2014).

## **Conclusion**

The ECB has been prevented from doing what is necessary, i.e. to increase the money base so as to maintain its objective of keeping inflation close to 2%. It has been prevented from acting as a result of an intense opposition of major German institutions and of a large segment of the community of German economists. The surprising thing about this opposition is that it has been based on a wrong interpretation of the fiscal implications of QE, i.e. that this will lead to fiscal transfers between member countries. One could have expected that German central bankers and German economics professors understand the nature of monetary policy in a monetary union. One is surprised that this knowledge has been set aside and a myth has been created that has helped to stir an irrational fear

in Germany against the use of a monetary policy instrument that in most developed nations is considered to be best practice.

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# 25 The ECB's QE decision

**Marco Annunziata**

General Electric Co.

23 January 2015

*The European Central Bank has just launched full-fledged quantitative easing. This column argues that the ECB's watershed decision highlights both the strengths and the persistent vulnerabilities of the Eurozone. The limited-risk-sharing provision flags the need for greater fiscal union; and governments should use the respite that QE provides to launch much-needed structural reforms.*

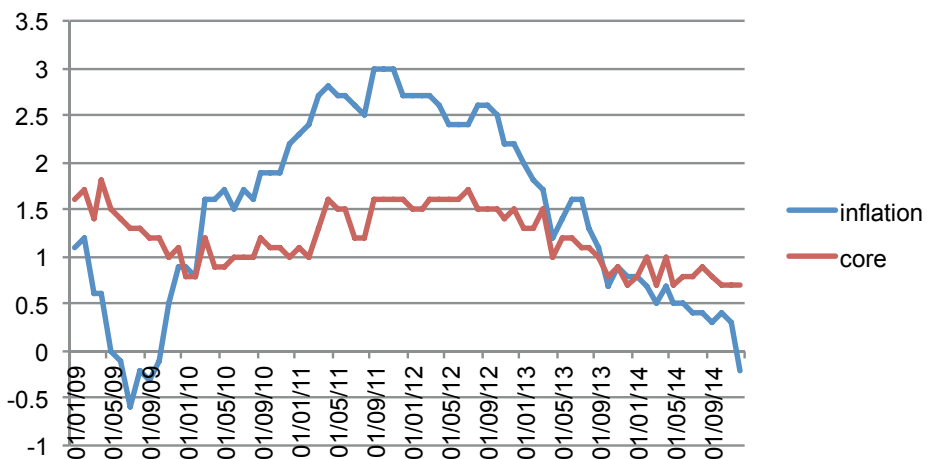
The launch of Eurozone QE (ECB 2015) was eagerly awaited by investors and preceded by contentious discussions in Eurozone policy circles. Countries still struggling with weak growth saw it as a necessary step to help a recovery, while Germany and other northern EZ members were worried that ECB purchases of government bonds would 'mutualise' government debts and undermine incentives for fiscal prudence. The ECB has done its best to square the circle.

## **QE justification and structure**

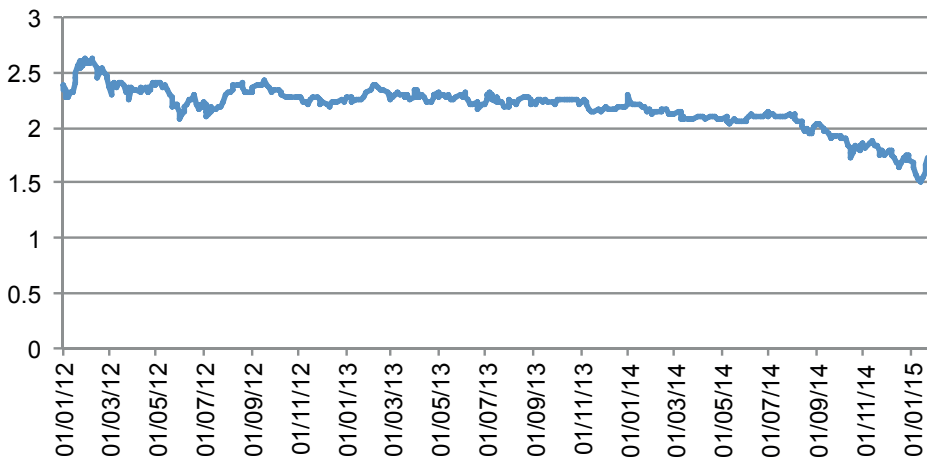
It's important to note that the ECB's decision is fully justified by its inflation mandate.

- The ECB was already forecasting inflation below target for the next two years;
- The collapse in oil prices has increased downside risks, and inflation expectations have moved lower.

**Figure 1** Eurozone inflation (%)



**Figure 2** Eurozone inflation expectations (5Y5Y forwards)



The QE structure is clear:

- Purchases will be substantial – €60 billion per month (comparable to the Fed's QE3, Annunziata 2012) until end-September 2016, for a total of over €1.1 trillion.

QE could be extended beyond September 2016 if the inflation target is not yet within reach.

- Asset purchases will now encompass investment-grade bonds issued by governments, national agencies and EU institutions.

This is in addition to asset-backed securities and covered bonds, which were already included in existing programs. Since the latter were running at about €10 billion per month, additional purchases will be in the order of €50 billion per month. This is near the top end of what market were expecting.

- Purchases will be proportional to the shares of EZ national central banks in the ECB's capital.

These capital shares are proportional to the respective countries' GDP and population sizes. This aspect was the obvious choice. It reinforces the idea that government bond purchases are undertaken for monetary-policy purposes and not to alleviate the funding needs of specific countries.

Conveniently, this feature will benefit Italy, which has the third largest ECB capital share and the largest public debt burden.

- There will be specific conditions for bonds of countries (like Greece) under EU/ ECB/IMF programs.

This, presumably, will require the countries to be in compliance with the program's conditionality. It may also open the possibility of eligibility even with a sub-investment grade rating. QE could encompass Greek bonds, depending on how things develop after this weekend's Greek elections.

## **Risk sharing: Devil in the details**

The devil is in the risk-sharing details (also see Giavazzi and Tabellini 2015).

- 12% of new purchases will consist of EU institutions bonds, and will be subject to risk-sharing.

This is perfectly logical, and these should have very little risk anyway.

- The ECB will hold 8% of additional purchases, and these will also be subject to risk sharing;
- The EZ national central banks will shoulder the risk for the rest of the purchases.

Assuming the 8% held by the ECB does not include EU institutions bonds, this means that  $12\% + 8\% = 20\%$  of new purchases will be subject to risk sharing—as per Draghi’s statement at the press conference.

- Put it a different way, this implies that 91% of government and agency bonds will not be subject to risk sharing.

For every €100 of additional purchases, 88 will be government and agency bonds, which minus the 8 held by the ECB will leave 80 out of 88 as a risk of national central banks.

## **What the limited risk-sharing means**

The limited risk-sharing sends a message.

- As long as fiscal policy is national, the risk of government debt should stay largely within national borders.

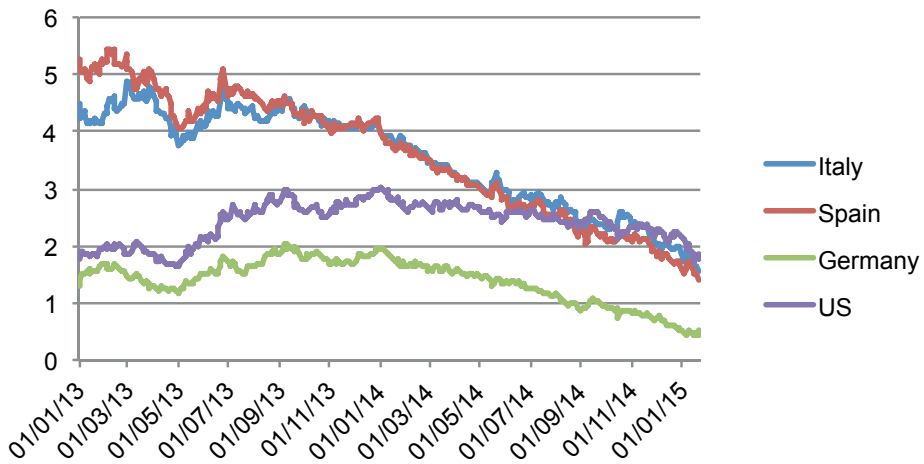
This is an important reminder that additional steps towards fiscal union are needed.

- Without greater centralized control on national public finances, Germany and other northern member countries will always be reluctant to be on the hook for the debt of their more profligate partners.

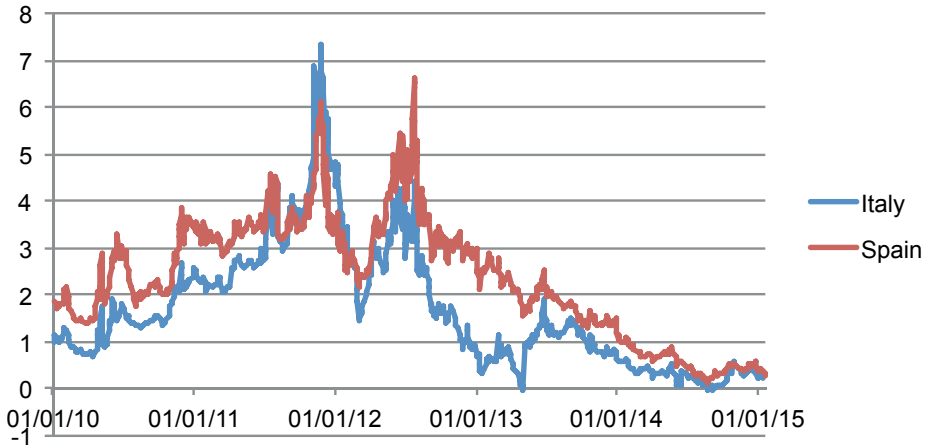
Sooner or later, this will be a problem. QE, however, suggests this problem is unlikely to arise over the next couple of years.

- QE will ease financing conditions and help keep government funding rates at low levels, including for high debt countries.

**Figure 3** Ten-year government bond yields



**Figure 4** Italy, Spain spreads versus Germany (2Y)



- QE is not enough to restore growth, but it will help.

In 2015, the Eurozone will benefit from lower oil prices and stronger US growth. With QE supporting low interest rates for longer, and an even weaker currency, I see increased potential for upside surprises to Eurozone growth this year.

QE and a better growth outlook, sadly, increases moral hazard risk. Stronger and sustainable growth requires difficult structural reforms to make markets more flexible and create the conditions for more innovation and higher productivity. For governments, however, the temptation to rely on ECB bond buying and a weaker currency will be strong. QE will buy the Eurozone some precious time. But we need progress in structural reforms, improvements in national fiscal policies, and a strengthening of Eurozone institutions for this window of opportunity not to be wasted.

**Figure 5** EURUSD



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Marco joined GE in January 2011 after a long experience in the financial sector, where he was most recently Chief Economist at Unicredit, and previously Chief Economist for the Eastern Europe, Middle East and Africa region at Deutsche Bank in London. Prior to Deutsche Bank, he spent six years at the International Monetary Fund in Washington, where he split his time between emerging markets and the Eurozone. While at the IMF, Marco was involved in regular consultations with the Italian government, the Bank of Italy, the European Central Bank and the European Commission, and took part in loan negotiations in several European and Latin American emerging economies.

Marco holds a PhD in Economics from Princeton University and a BA in Economics from the University of Bologna.



# 26 Effective Eurozone QE: Size matters more than risk-sharing

**Francesco Giavazzi and Guido Tabellini**

Bocconi University and CEPR

17 January 2015

*The ECB may soon launch QE. Two of Europe's leading macroeconomists argue that QE is the ECB's last anti-deflation tool – it must not be sacrificed to political expediency. The risk-sharing debate is secondary to the programme's size and duration – one example would be €60 billion per month for one year, or until inflation expectations rose to near 2%. The ECB should also explain that no matter how well the monetary part of the programme is designed, an accompanying fiscal expansion is critical to QE's effectiveness.*

Now that a European quantitative easing (QE) is almost a sure thing, the question is how it will be implemented. Implementation details are of first-order importance for the success of the programme. Fudges or opaque wording are to be avoided at all costs, because QE also works through expectations. Indeed, the experience of other major central banks suggests that announcement effects are key.

## **Risk-pooling amongst central banks?**

Most of the attention so far has been on risk-sharing.

- Will the default risks be pooled through the ECB balance sheet?
- Or will sovereign debt be separately held by each national central bank, which would thus fully bear any losses?

The objections to risk-pooling are well known, and are mainly political (the recent opinion of the European Court of Justice has dispelled any legal concerns).

The benefits of risk-pooling are more subtle. One of the goals of QE is to restore confidence in debt sustainability in Southern Europe, narrowing sovereign spreads and reducing the cost of capital to firms. Achieving this goal would certainly be easier if risks were pooled, and not only for symbolic reasons. Suppose that, in the event

of a default, governments are forced to recapitalise their central banks for the losses incurred. If the recapitalisation burden falls exclusively on the defaulting country, then essentially a government cannot default on its central bank. This means that the national central bank is a senior creditor relative to the market, and privately held debt becomes more risky. If instead the burden of recapitalising a national central bank is shared among all Eurozone governments, the seniority of debt held by central banks is correspondingly diluted. Hence risk-pooling through the ECB balance sheet contributes to reduce the residual risk born by private holders.

This benefit of risk-pooling should not be over-emphasised, however. A default by a major Eurozone country is such an extreme event that speculation on what exactly would happen in such circumstances is almost impossible. Would debt default be followed by recapitalisation of central bank losses? Perhaps central banks would remain with negative equity, as the Bank of Chile and the Czech National Bank did for several years. Would default lead to a Eurozone breakup or exit? Would it be associated with inter-government assistance as in the case of Greece? Answering these questions is almost impossible.

Importantly, the main effect of QE is to reduce the overall risk of default by raising aggregate demand and hence nominal income. Even if some of the remaining risk is shifted onto private debt holders, spreads will nevertheless shrink if default becomes less likely.

## **The size, speed, and duration of balance sheet expansion**

Important as risk-sharing might be, this is not the central issue. What matters most is how many bonds will be bought, of what maturity, and how rapidly. Which central bank will hold them is a secondary issue.

QE increases aggregate demand through several channels:

- Liquidity and portfolio effects.

There is general agreement that the effects through the first channel will be small. In many countries credit demand remains very weak. Capital rather than liquidity is the main constraint on banks, and interest rates are already very low.

- Exchange rate effects.

The exchange rate channel is more important, but here too there are some doubts: the Eurozone is not a small open economy (external exports are only 20% of GDP) and the euro has already weakened considerably. This leaves the fiscal implications of QE as one of the most important channels to raise aggregate demand.

- Fiscal implications.

As explained by Buiter (2014), when a central bank engages in QE it exchanges government debt for money, which is a non-redeemable liability. This relaxes the intertemporal government budget constraint. The reduction equals the full amount of QE – if the debt is held permanently. The reduction equals the interest payments – if debt is held only temporarily held or it is not rolled over at maturity.

This immediately implies that the fiscal consequences of QE are directly related to the duration of the balance sheet expansion of the central bank. A long-lasting expansion can be achieved by purchasing long-term debt and holding it until maturity, or rolling over the debt purchased.

Even if consumers are Ricardian, the relaxation of the government budget constraint leads to an immediate expansion of aggregate demand – if the expected path of future government spending remains unaltered. This expansion comes because consumers spend more in anticipation of their now larger permanent-disposable-incomes. If, as is plausible, Ricardian equivalence does not hold, the expansion of aggregate demand can only occur if the government exploits the additional fiscal space created by QE to run a larger deficit, through tax cuts or spending increases.

Hence, QE can be a powerful tool to stimulate aggregate demand. Just like ‘helicopter money’, these direct expansionary effects do not rely on portfolio adjustment, liquidity effects, or exchange rate movements (Reichlin et al. 2013).

- The key is that QE needs to be coordinated with fiscal policy and have permanent or long-lasting effects on the size of the central bank balance sheet.

## **Implications for QE in the Eurozone**

Since an important channel through which QE works are announcements effects, the ECB ought to announce specific quantities and a clear horizon. For instance, €60 billion long-term government bonds purchased per month for at least one year – with the

commitment to keep buying until the price level returns close to its previous 2% growth path. (For comparison, the Fed was buying \$85 billion per month in its last QE effort.)

Ideally these bonds should be held by the ECB, and any risk mutualised.

- If consensus on the Governing Council required a compromise, it is better to give up on risk-pooling rather than on the size and duration of QE.

The amounts and the time frame (in terms of speed and duration) of the balance sheet expansion should not be watered down. It is far better to give up risk-pooling and do an open-ended QE, than to pool risks on a limited programme. Finally, the ECB should explain clearly that an accompanying fiscal expansion is crucial for the effectiveness of QE. Otherwise the bank could be blamed for a failure for which it is not responsible, no matter how well the monetary part of the programme is designed. This is the last tool that the ECB has to fight deflation. It should not be wasted through blunders or bad compromises.

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# 27 Risk-sharing and the effectiveness of the ECB's quantitative easing programme

**Angus Armstrong, Francesco Caselli, Jagjit Chadha and Wouter den Haan**

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23 October 2015

*Will the risk-sharing arrangements within the ECB's quantitative easing programme reduce its effectiveness? The views of leading UK-based macroeconomists are exactly evenly divided on this question, according to the latest survey by the Centre for Macroeconomics. The responses reported in this column suggest that this divergence reflects differences in views about the channels through which quantitative easing operates.*

In January 2015, the ECB announced a substantial increase in its asset purchase programmes.<sup>1</sup> Under its existing programmes, the ECB had been buying asset-backed securities and covered bonds of around €10bn in total per month. Following the January 2015 announcement, the total assets purchases would increase to €60bn per month between March 2015 and September 2016. The total assets to be bought in this window are €1.1 trillion, 9% of the stock of central and other government debt of Eurozone nations, widely referred to as quantitative easing (QE).<sup>2</sup>

The additional €50bn of asset purchases per month is through the Public Sector Purchase Program (PSPP). This consists of €6bn of debt securities of EU supranational institutions and €44bn of debt securities of sovereign, national agencies and national utilities. These national securities will be bought in proportion to the Eurozone's

1 See the ECB's press release: 'ECB announces expanded asset purchase programme', 22 January 2015. [https://www.ecb.europa.eu/press/pr/date/2015/html/pr150122\\_1.en.html](https://www.ecb.europa.eu/press/pr/date/2015/html/pr150122_1.en.html) on 22nd January 2015

2 The total nominal value of outstanding central government debt was €6,798bn and other general government debt was €608bn. See ECB <https://www.ecb.europa.eu/stats/money/securities/debt/html/index.en.html>

national central banks' shareholdings of the ECB (in effect, in proportion to the size of national economies).

## **Risk-sharing in the ECB's QE**

In the latest of its monthly surveys of leading UK-based macroeconomists, the Centre for Macroeconomics (CFM) focused on the risk-sharing arrangements within the QE programme. The ECB indicated that the credit risk of the €6bn debt of the supranational EU institutions and €4bn of the national debt securities would be shared across the Eurosystem according to shareholdings.<sup>3</sup> The credit risk of the remaining €40bn of national securities would remain with the national central bank of the issuer. This is in contrast to the ECB's earlier Securities Market Programme (SMP) in 2010-2012, which involved the acquisition of €220bn public and private debt securities from Greece, Ireland, Italy, Portugal and Spain to be held to maturity. Profits and losses are to be shared across national central banks according to the ECB's shareholdings rather than borne by the national central bank of the issuing government.

## **Effectiveness of QE**

According to press reports, the decision to allocate the major fraction of national securities back to national central banks reflects a compromise decision.<sup>4</sup> A number of arguments have been put forward in favour of this approach:

- First, this is a direct means of coupon payments being kept within national borders.
- Second, as long as fiscal policy is nation-specific, any credit risk should also stay within borders. If credit risk is perceived as shared across the Eurozone, national governments may be less inclined to implement reforms.
- Third, as QE increases in size, the ECB may risk its solvency, whereas the national central banks would (potentially) continue to have the fiscal backing of their governments.

3 The credit risk on the supranational bonds is marginal. In the case of the European Investment Bank, the 28 EU members are shareholders and have joint liability. Over 90% of the capital is callable on the member states.

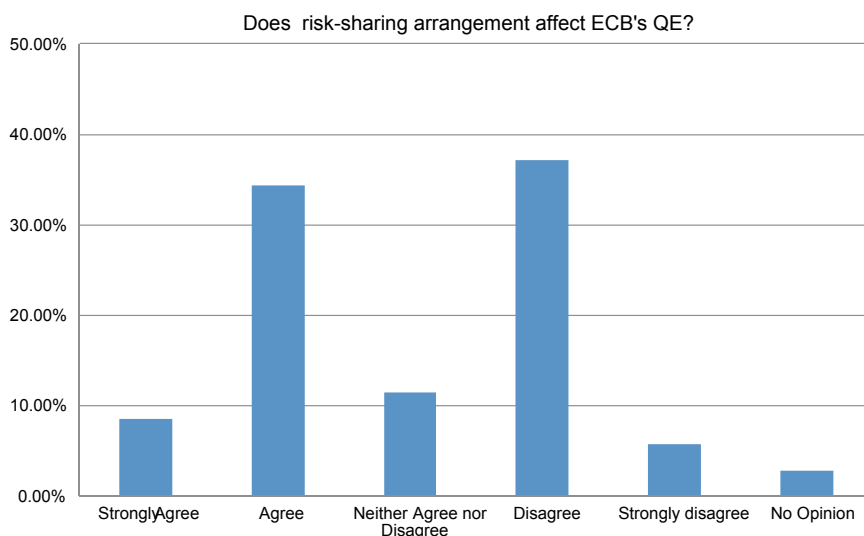
4 For example, see <http://www.bloomberg.com/news/articles/2015-01-22/draghi-commits-ecb-to-trillion-euro-qe-plan-in-deflation-fight>

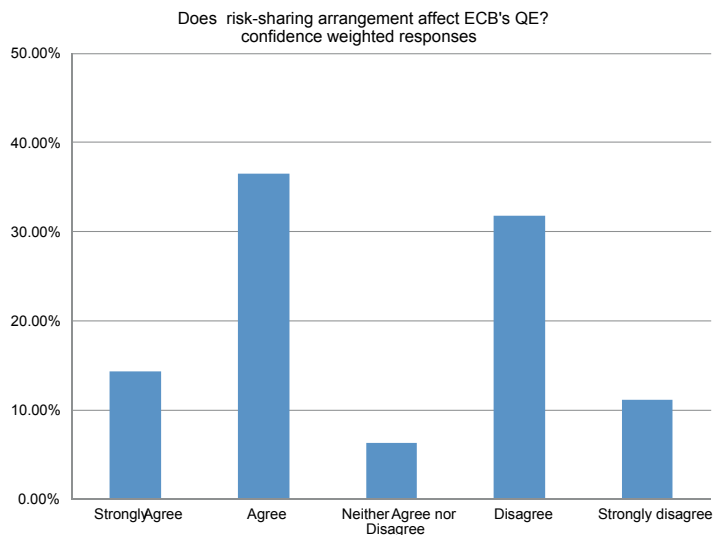
- And fourth, more generally, risk-sharing may have no effect on the efficacy of QE since it has no bearing on the total amount of liquidity (money base) created or where this money will flow.

There are also arguments in favour of greater risk-sharing:

- First, a rationale for the European Banking Union is to break the link between governments and national banking sectors (the so-called 'doom loop'). Requiring national central banks to hold greater amounts of their sovereigns' debt may re-establish the link. If the government were to default, this may make the national central bank insolvent and depositors less certain about repayment, possibly leading to capital flight.
- Second, QE with limited risk-sharing where a government's solvency is in doubt might increase the cost of market funding relative to a QE programme with more risk-sharing. Giavazzi and Tabellini (2015) point out that if it is recognised that the government cannot default on its bonds to its central bank, then the central bank becomes a senior creditor and private investors become junior creditors. This would increase the cost of market funding in high-risk countries.

*Q1: Do you agree that the design of the ECB's QE programme reduces its effectiveness?*





A total of 35 economists replied to the question in the CFM survey. Leaving aside the five who expressed no opinion or who neither agree nor disagree, our respondents are exactly split between those who agree and those who disagree with the proposition. Taking account of self-declared expertise, 54% agree with the proposition.

Those who agree with the proposition tend to emphasise interest rates as the channel through which QE affects activity. Panicos Demetriades (Leicester) notes that several countries are likely to face higher borrowing costs and David Bell (Stirling) describes it as “entirely fanciful that the market will ignore the allocation of risk”.

Others are more concerned with signalling. Sir Christopher Pissarides notes that “national central banks are to take on the risk but cannot monetise the debt in the event the government cannot pay and cannot affect interest rates. It’s an odd situation that might deter private lenders.” Ethan Ilzetzki (LSE) asks the question: “If the EU is not willing to bet on its own survival, who should?” Angus Armstrong (NIESR) goes further, suggesting that limited risk-sharing is likely to increase the risk of capital flight if there is concern about government solvency.

Those who disagree with the proposition either emphasise the monetary base channel by which QE affects activity, or think the consequences simply too small to matter. Wouter den Haan (LSE) notes that QE involves adding liquidity to the economy and

how risks are shared has no effect on this operation. Similarly, Jagjit Chadha (Kent) says that monetary conditions are determined by the liabilities of the central bank, hence the “risk-sharing has little impact on the effectiveness of QE”. Patrick Minford (Cardiff Business School) describes the very notion that credit risk is not shared by the ECB as “far-fetched”.

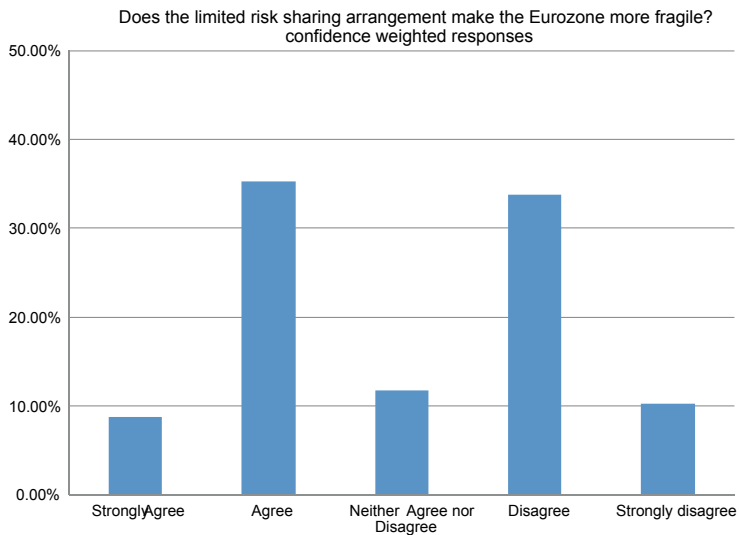
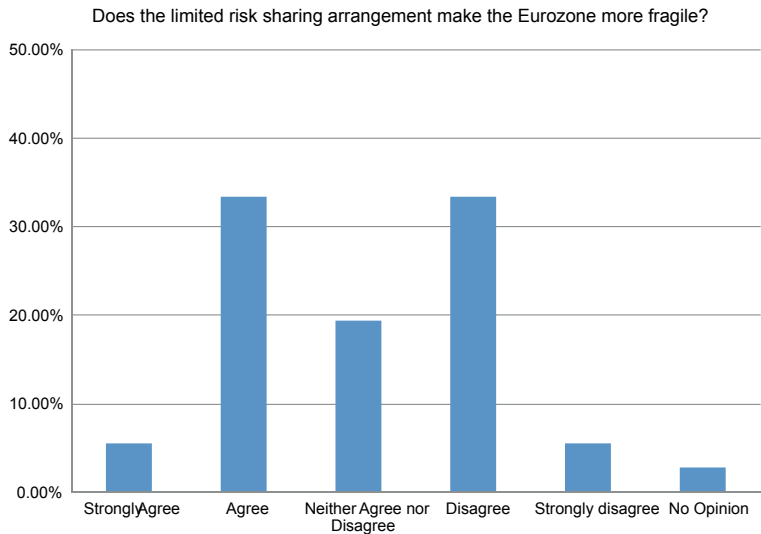
## **Fragility of the Eurozone**

The limited risk-sharing on the €40bn of additional national securities is in contrast to another major monetary union and the ECB's previous actions. In the United States, assets bought under QE are held in the System Open Market Account (SOMA) at the New York Federal Reserve and any losses are shared across the Federal Reserve System. Moreover, while ECB President Mario Draghi has made clear that “in Outright Monetary Transactions (OMT) full risk-sharing is fundamental for the effectiveness of that monetary policy measure”, Benink and Huizinga (2015) suggest that subsequent risk-sharing arrangements within QE may embolden those would prefer risks to be contained within national boundaries (the vote for OMT was not unanimous).<sup>56</sup>

5 Quoted from the ECB's 'Introductory statement to the press conference (with Q&A)', 22 January 2015. <https://www.ecb.europa.eu/press/pressconf/2015/html/is150122.en.html>

6 The lack of unanimity in the vote for QE is reported in the ECB's 'Introductory statement to the press conference (with Q&A)', 6 September 2012. <http://www.ecb.europa.eu/press/pressconf/2012/html/is120906.en.html>

*Q2: Do you agree that the structure of the ECB’s QE programme makes the Eurozone more fragile and increases the risk of one country leaving the euro?*



A total of 36 economists responded to this question in the CFM survey. Leaving aside the eight who expressed no opinion or who neither agree nor disagree, the votes are again evenly split between those who agree and those who disagree with the proposition.

Those who agree with the proposition include Ricardo Reis (LSE and Columbia) who notes that if we consider the possibility of a country leaving the Eurozone, reneging on TARGET II and/or ELA balances, then this arrangement encourages a “run on their local banks and force an exit”. Others are concerned about the signal of political commitment. Martin Ellison (Oxford) suggests that QE risk-sharing arrangements do not “bode well for the type of risk-sharing reforms that will ultimately be needed to keep the Eurozone together”; and Nicholas Oulton (LSE) notes that the failure of Eurozone countries to agree that “we are all in this together” surely makes the exit of one or more countries more likely.

Those who disagree with the proposition tend to emphasise that whatever fragilities exist in the Eurozone, they are not the result of the QE programme. Ray Barrell (Brunel) supports the risk-sharing arrangements as they minimise moral hazard and so prevent higher debt by countries trying to ‘game the system’ by issuing even more debt. Costas Milas (Liverpool) expresses the view that the limited risk-sharing reflects a lack of structural reform, and that it is this lack of reform that undermines growth and creates the fragility. John Driffill (Birkbeck) acknowledges that the QE programme could have been better designed, but says that it does not increase the fragility of the Eurozone.

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**Wouter den Haan** is professor of economics at London School of Economics and Political Science, programme director of CEPR, and co-director of the Centre for Macroeconomics. Professor den Haan graduated cum laude from the MA program at Erasmus University, he received his PhD degree at Carnegie Mellon University in 1991. This dissertation won him the Alexander Henderson Award for excellence in economics. After earning his PhD he became an assistant professor at the University of California at San Diego, where he was a professor from 2001 to 2004. At the beginning of 2003 he moved back to Europe and became a professor of economics at London Business School. In 2006 he received a VICI award and became a professor of economics at the University of Amsterdam. He has been a visiting professor at the University of Rochester and the Wharton School and also a visiting scholar at the European Central Bank, the Board of Governors of the Federal Reserve System in Washington DC, and several regional Federal Reserve Banks. His research interests are business cycles, frictions in financial and labor markets, and numerical methods to solve models with a large number of heterogeneous agents.



## Part IV

### Exit from quantitative easing



# 28 Unwinding quantitative easing

**Stephen Grenville**

Lowy Institute for International Policy

22 June 2013

*Chairman Bernanke's hints about the end of quantitative easing (QE) have produced volatility in financial markets. This column argues that financial markets were startled because an end to QE is likely to cause capital losses for bond holders since term premium is substantially negative. Bank regulators should be alert to the possibility. This fundamental explanation is teamed with widespread confusion among market participants about how quantitative easing actually works.*

Fed Chairman Ben Bernanke's prepared statement on 22 May was the epitome of even-handed non-committal drafting (Federal Reserve 2013b) but the mention of "stepping down" and "in the next few meetings" in the discussion sent a shiver through financial markets worldwide. Bond yields jumped just about everywhere; the Abenomics euphoria in Japan deflated; and capital flows to emerging markets reversed direction. Bernanke was just pointing out the obvious and he went on to say that "we could either raise or lower our pace of purchases going forward". Why were financial markets so startled?

The problem is twofold: the first relates to the intrinsic nature of quantitative easing; the second reflects market confusion about how QE operates.

QE is not simply a continuation of conventional monetary policy by alternative means. It works by lowering the longer-term interest rates below what would be indicated by the profile of expected short-term rates. When conventional monetary policy is tightened in line with market expectations, there are no capital losses experienced by bond-holders. But QE has succeeded in getting the term premium not just negative (which would be unusual enough), but substantially so, as acknowledged by Bernanke in March (Federal Reserve 2013a).

At some stage during the unwinding of QE, bond-holders will suffer a painful capital loss as yields return to normality. Bernanke's remarks on 22 May, innocuous though they were, reminded bond-holders that they need to be ahead of the pack when the moment

comes to lighten the bond portfolio. With markets on tenterhooks, the adjustment could easily be sudden, and just as easily involve a price overshoot. No matter how careful Bernanke is, this adjustment is likely to look something like the 1994 bond shock because it has an intrinsic ‘tipping point’.

The capital losses on bonds are not the only tipping point ahead. The most prominent and consistent QE effects were on equity prices and exchange rates – effects which were not explicitly foreshadowed when QE began. While these effects might have been helpful in boosting economic activity, these distortions will reverse when QE is withdrawn. Equity markets and the international capital carry trade have become as dependent on QE as any drug addict.

If markets had a clear understanding of how QE operates, they might effectively anticipate the unwinding and soften the tipping point. Some (perhaps many) market participants have, however, misunderstood the nature of QE. They expected an automatic increase in lending through the credit multiplier and a boost in money supply (it was almost invariably referred to as ‘printing money’), hence pushing up inflation. In fact money just maintained its trend growth. Credit growth has been weak. Underlying inflation has actually fallen. None of this should have come as a surprise. There was never going to be CPI inflation while unemployment was so high and the slow cyclical recovery is enough to explain lethargic credit demand. But when outcomes have been far from market expectations, participants are disoriented.

In these confused circumstances, market responses have been based on expectations of policy changes rather than on fundamentals. Asset prices untethered to fundamentals will be volatile. If market participants don’t understand how we got here, they will be ready to panic at the thought of how we will exit. Markets were ready to seize on a spontaneous response in Bernanke’s testimony, rather than the finely honed text, which pointed to a careful and drawn-out unwinding.

Unwinding QE doesn’t have to be too traumatic. The Fed can shift short-term policy interest rates up as appropriate, while leaving the disposal of its abnormally large bond holdings to a later date. Even if it makes capital losses in the process, these can be absorbed without too much drama. Concerns about inflation from ‘printing money’ were always totally misplaced.

That said, some of the private-sector capital losses discussed above will fall on vulnerable sectors, especially the banking system. The prudential authorities need to

be on top of these, and some carefully-modulated public discussion (and data) on bank balance sheets might be helpful.

We are currently witnessing a tug-of-war between financial markets that are pressuring the authorities to keep QE going, and those who see it as having served its purpose, losing its potency and storing up further problems in unwinding. Bernanke has always acknowledged that QE has a downside, but he has justified it on the basis of its support for economic activity. If it has reached the stage where the current dosage simply delays the inevitable painful withdrawal, it may be harder to resist the pressures to unwind.

If the balance of these forces results in QE being wound back soon, this will be occurring in an economy which is still much weaker than might have been hoped. As well, policymakers might have hoped for a financial sector which had a better understanding of how this process will work and thus more ability to make the transition with composure. There is still time to achieve this better understanding, but the flightiness of markets since Bernanke's tentative attempt to prepare for the unwinding is a reminder of how difficult it is to have a sensible conversation with the financial sector.

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## About the author

**Stephen Grenville** is a visiting fellow at the Lowy Institute for International Policy in Sydney, and is currently a visiting fellow at the Asian Development Bank Institute in Tokyo. He was Deputy Governor at the Reserve Bank of Australia. He also worked for the OECD, the IMF, the Australian National University and the Australian Department of Foreign Affairs. He has a PhD from the Australian National University.





## 29 Unconventional monetary policy normalisation and emerging-market capital flows

**Andrew Burns, Mizuho Kida, Jamus Lim, Sanket Mohapatra, and Marc Stocker**

World Bank; World Bank; World Bank; Indian Institute of Management; World Bank

21 January 2014

*The Federal Reserve has begun to ‘taper’ its programme of quantitative easing. The ‘taper tantrum’ that followed the announcement of tapering in May 2013 suggests that the normalisation of rich countries’ unconventional monetary policies may lead to capital outflows and currency depreciations in emerging markets. This column presents the results of recent World Bank research into these effects. In the baseline scenario, the unwinding of QE is predicted to reduce capital inflows by about 10%, or 0.6% of developing-country GDP by 2016. However, if markets react abruptly, capital flows could decline by as much as 80% for several months.*

Quantitative easing (QE), which started in 2008, swelled the Federal Reserve’s balance sheet to an unprecedented \$3.4 trillion. In May 2013, the Fed announced that it would evaluate the possibility of a reversal of its unconventional monetary policies – QE in particular.

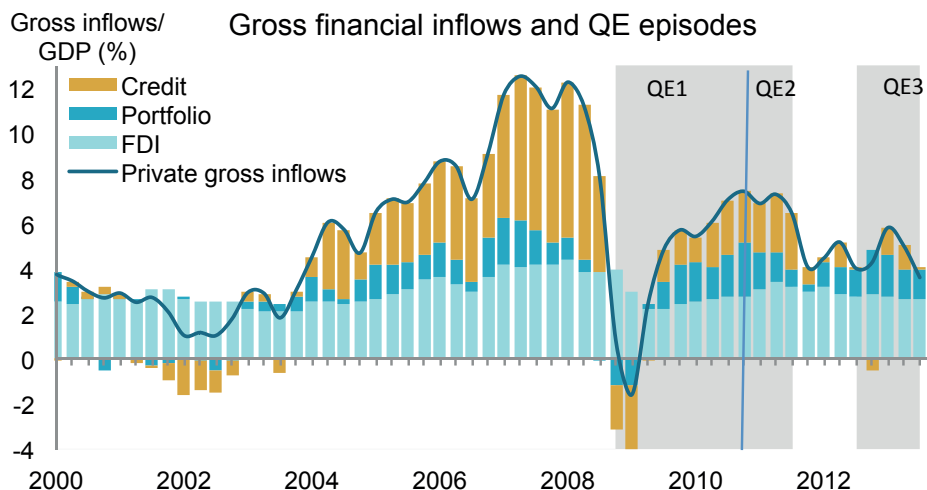
The event, which has come to be known as ‘tapering’, prompted a sharp, negative response from financial markets (the so-called ‘taper tantrum’):

- US long rates rose by almost one percentage point between late May and August; and
- The concomitant rebalancing of global portfolios away from emerging-market assets resulted in capital outflows and currency depreciations in several large emerging-market countries.

Brazil, India, Indonesia, South Africa, and Turkey were particularly affected.

Surprised by the strength of the market response – and further bolstered by somewhat tepid labour market data – the Fed held back on actual tapering action over the course of the rest of the year. In the interim, it pressed on with conditioning market expectations for an eventual slowdown in large-scale asset purchases. The long-awaited taper eventually began in early January 2014.

**Figure 1** Capital inflows to developing countries



Source: World Bank staff calculations, from IMF Balance of Payments and BIS Locational Banking Statistics.

Note: Cumulative gross inflows computed as the sum of quarterly changes in foreign holdings of direct investment, portfolio (BOP), and bank lending (LBS) flows, net of disinvestment.

## How will Fed policy normalisation unfold in the years ahead?

This question is crucial for developing economies, since they have benefitted substantially from increased inflows over the period in which QE policies have been in place – total gross inflows as a share of GDP appear to have picked up over the course of all three QE episodes (see Figure 1). The risk of reversals in such inflows is therefore a genuine concern as the Fed embarks on its normalisation plans.

Much work has been done on identifying factors associated with financial inflows (Alfaro et al. 2008, Bruno and Shin 2013, Forbes and Warnock 2012, Fratzscher 2012, Gelos et al. 2011). Our recent research builds on this to address the effects of monetary

policy normalisation on financial flows to developing countries (World Bank 2014). Our approach relies on a suite of three models for financial flows and crisis that incorporate elements designed to capture the effects of QE unwinding.

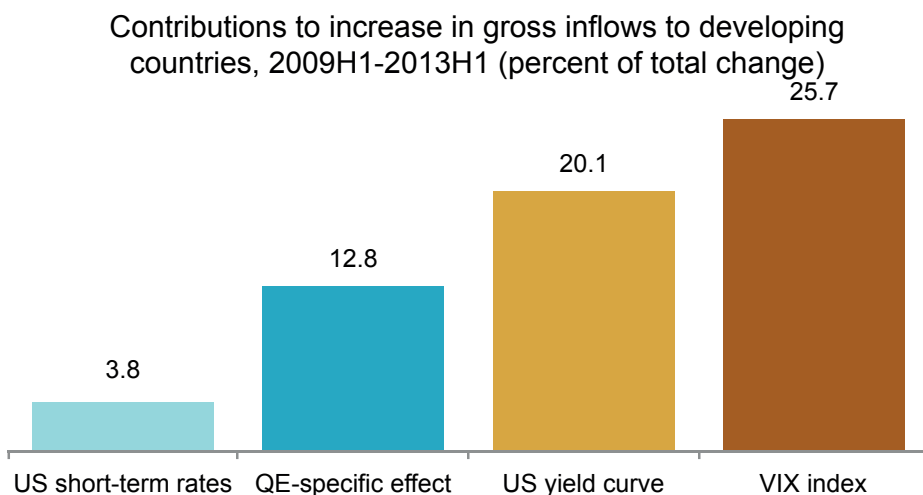
The first model that we use to establish our baseline scenario is a dynamic panel model.<sup>1</sup> This model allows for the tremendous cross-country heterogeneity in gross financial flows, while also accounting for the effects accruing to global and domestic factors that can potentially affect inflows. These include real (growth and growth expectations) and financial (interest rates, interest rate differentials, and the VIX index) conditions, alongside institutional drivers (such as country credit ratings). Crucially, in addition to (time-invariant) country fixed effects, we also include a series of indicator variables that are designed to capture whether episodes of QE may have had an effect on financial flows over and above the observable channels.<sup>2</sup>

The estimates from this model are summarised in Figure 2, which shows the response of capital inflows to a change of one standard deviation in each of the explanatory variables. The estimates – which are broadly consistent with the existing literature on factors associated with financial inflows (Alfaro et al. 2008, Bruno and Shin 2013, Forbes and Warnock 2012, Fratzscher 2012, Gelos et al. 2011) – indicate that while observable factors at both the global and domestic level account for much of the cross-country variation in flows, an (unobservable) QE-specific effect remains, which can account for the larger-than-expected financial flows during the period in which unconventional monetary policies were in place. Between the first half of 2009 and first half of 2013, our estimates indicate that observable global factors explained slightly less than two-thirds of the increase in inflows, of which around a fifth was due to this QE-specific effect (see Figure 2).

1 Due to the well-known (Nickell) bias for panel estimates when lagged dependent variables are included, our estimates are obtained using bias-corrected least squares dummy variables (Bruno 2005).<sup>0</sup>

2 Additional modeling details are documented in Lim et al. (2014).

**Figure 2** Factors linked to capital inflows



*Source:* World Bank staff calculations.

*Note:* Estimates of the relative contribution of different factors were calculated by multiplying the observed changes in short-term policy rates, yield curve, the QE episode dummy, and the risk index between the first half of 2009 and the first half of 2013 by the coefficient estimates obtained from the benchmark model.

We then use this model to simulate a baseline scenario for financial flows as global conditions normalise. These simulations are conditioned on the following underlying assumptions:<sup>3</sup>

- Developing and high-income country GDP growth gradually strengthens in line with the projections reported in World Bank (2014);
- QE tapering by the US Federal Reserve spans from January to December 2014, and has a very gradual effect on market conditions. It adds 50 basis points to US long-term interest rates by the end of 2015 and a cumulative 100 basis points by the end of 2016. Policy rates in the US start to increase in Q3 2015, from 0.25% to 2% by the end of 2016;
- The ECB, the Bank of Japan, and the Bank of England start to unwind their own quantitative/qualitative policies in the course of 2015–2016, adding 50 basis points

<sup>3</sup> To discipline the dynamic interactions between the global factors and gross financial flows, we rely on a VAR model (described below) to generate paths for the relevant independent variables, which we then return to the panel model to obtain our baseline estimates.

to their long-term yields by the end of the forecast horizon, and tighten policy rates later than the US Fed does.

The results for the baseline are a decline of capital inflows – relative to a ‘no change’ status quo – of about 10% by 2016, or 0.6% of developing-country GDP by 2016 (see Table 1).

**Table 1** Baseline simulations for monetary policy normalisation, 2014–16

	History		Baseline		
	2012	2013	2014	2015	2016
Developing GDP growth	5.0	5.4	5.5	5.8	5.9
G4 GDP growth	1.4	1.1	2.2	2.4	2.4
G4 yield curve	1.7	2.1	2.5	2.6	2.3
G4 10-year bond yields	2.2	2.4	2.9	3.2	3.6
G4 3-month interest rates	0.4	0.2	0.3	0.6	1.2
VIX	18	15	16.9	18.2	18.9
<i>Deviation of gross flows from a “no change” status quo</i>					
as % of flows			-3.7	-7.4	-10.0
as % of developing GDP			-0.2	-0.4	-0.6

The foregoing results assume that monetary authorities in high-income countries are able to engineer a gradual increase in long-term interest rates as quantitative easing is withdrawn in line with improved growth conditions. However, the ‘taper tantrum’ in the middle of 2013 suggests that a smooth market reaction to the actual tapering of quantitative easing is far from assured. The second model we consider is a six-dimensional vector autoregression model (VAR) – comprising gross inflows, developing-country GDP growth, G4 GDP growth, short-term interest rates, yield curves, and the VIX – that offers greater flexibility in capturing such disequilibrium scenarios. The two scenarios that we explore with this model are:<sup>4</sup>

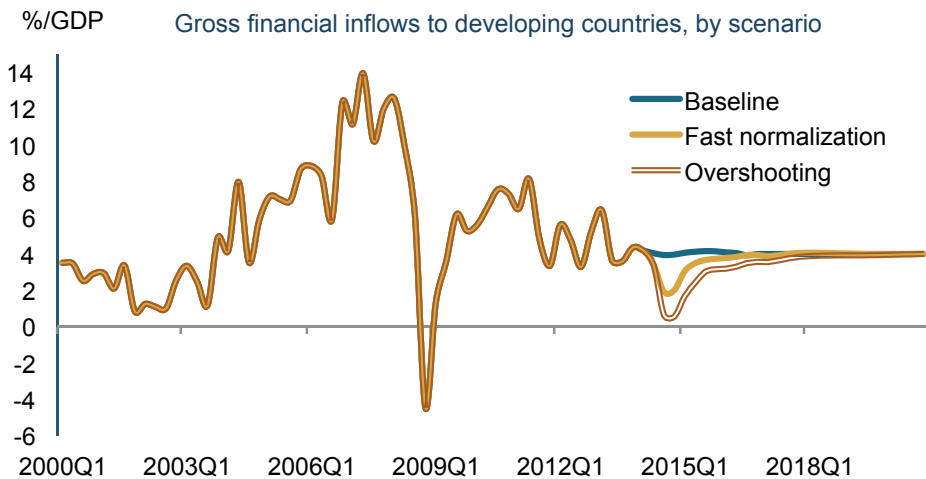
- Fast normalisation: long-term interest rates snap up by 100 basis points in the first half of 2014, before gradually converging back to baseline levels over the subsequent two years; and

4 As a consistency check, we also compared the baseline estimates for the VAR against those of the equilibrium panel model. The results are very similar to those in the panel model, with the share of capital inflows to GDP in developing countries declining by 0.5% over the projection horizon.

- **Overshooting:** market reactions are assumed to be more abrupt, resulting in a sharp, 200 basis-point increase in long-term interest rates in first half of 2014, followed by a more protracted adjustment back to the baseline.

In the fast normalisation scenario, the resulting increase in market volatility and rising risk aversion leads to a sharper but partially temporary correction in flows. In this context, private capital inflows drop by an average 30% in 2014, with a peak impact of 50% toward the end of the year. In the overshooting scenario, flows drop by 45% in 2014 as whole, and up to 80% at the peak impact. These simulations are captured in Figure 3.

**Figure 3** Simulation results



Source: World Bank staff calculations.

Note: Baseline paths are from the panel model, and fast normalisation and overshooting paths are from the VAR.

The preceding analysis suggests that in the long run, the withdrawal of quantitative easing and a return to a tighter monetary policy in high-income countries will have a relatively small impact on capital inflows, reducing them from 4.6% of developing-country GDP in Q3 2013 to 4.0% by the end of 2016. However, the path to this new normal level of flows will matter. If market reactions to tapering decisions are precipitous, developing countries could see flows decline by as much as 80% for several months. That would raise the likelihood of abrupt stops at the country level, with more than 25% of individual economies experiencing such an episode in these circumstances.

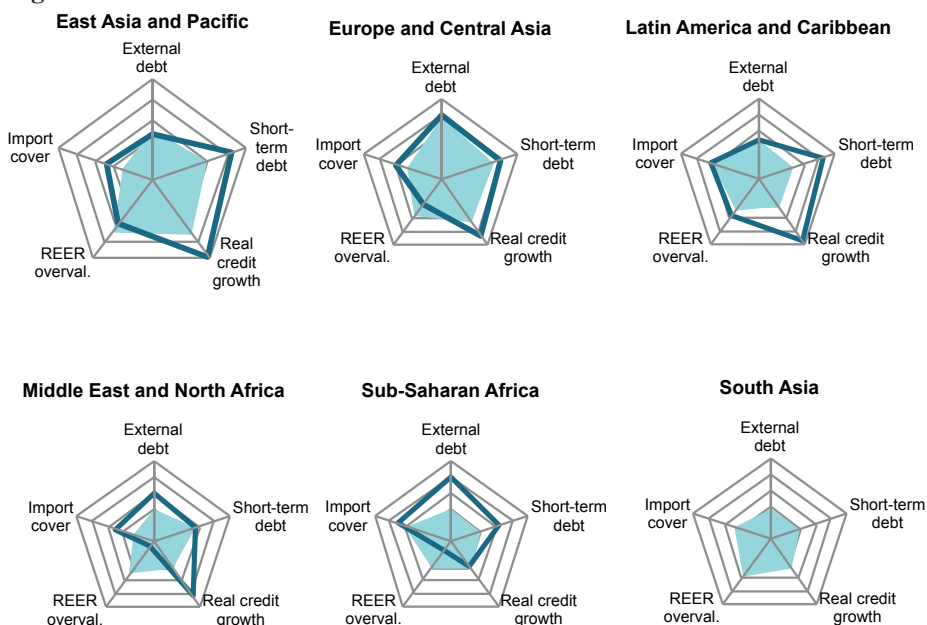
We thus rely on a third model, a (pooled) Probit for banking crises, to examine the vulnerability of countries in the extreme case where monetary policy normalisation precipitates crises in emerging markets.<sup>5</sup> The probability that a country suffers a banking crisis is modelled as a function of global factors (such as global risk appetite and liquidity), contagion factors (such as trade and financial linkages), and domestic factors (such as the current account and fiscal balance).

The model points to all three of these sets of factors contributing to increased banking crisis risk. Based on these estimates, we construct representative radar charts to illustrate domestic sources of risk, by region (see Figure 4).

Although conditions on the ground will vary and the indicators need to be interpreted with caution, the results are suggestive that:

- In the East Asia and Pacific region, rapid credit expansions over the past five years and a rising ratio of short-term debt to total debt are common areas of concern.
- A high external debt to GDP ratio, which exposes countries to exchange-rate and rollover risk, is an issue in several Central and Eastern European economies.
- In Latin America and the Caribbean, fewer countries appear to be at immediate risk, with rapid credit growth combining with significant short-term debt ratios as the main sources of risk.
- In the Middle East and North Africa, risks stem mainly from exposure to domestic credit quality and government financing needs, against the background of a deterioration in current-account positions.
- Based on existing data, risks in South Asia and Sub-Saharan Africa appear low, but there are concerns that non-performing loans in India have increased, and several Sub-Saharan African economies appear to have elevated risk, with deteriorating reserve positions a common thread.

5 We consider banking, rather than other forms of crises (such as currency crises), for three main reasons. First, in a world in which developing countries are increasingly accumulating large reserve holdings and maintaining floating exchange-rate regimes, currency crises due to sudden stops in financial flows are likely less of a risk than they may have been historically. Second, emerging-market borrowing over the past decade has relied less on foreign currency-denominated debt, which reduces their vulnerability to currency crises. Third, to the extent that banking and currency crises often occur in tandem in emerging economies (Glick and Hutchison 1999), it is sufficient for our purposes to focus on one phenomenon.

**Figure 4** Domestic sources of risk

Source: World Bank staff calculations.

Notes: Radar charts summarise areas of elevated risk in each region. Each segment corresponds to significant domestic risk factors from the Probit analysis. The centre is the least risky area, and the further away from the centre, the greater the risk. The thick line in each region represents the average value of each indicator among the countries whose predicted crisis risk is particularly elevated (one standard deviation above the average predicted risk of the entire sample). The teal area represents the average values of each indicator for the region as a whole. There are no countries whose predicted risk is more than one standard deviation above the average predicted risk in South Asia. Indicator values are standardised using percentile ranks.

## Policy implications

Although the probability of disorderly adjustments remains low at present, policymakers in developing countries need to make contingency plans and be prepared for the inexorable tightening of global financing conditions. Countries with adequate policy buffers and investor confidence may be able to rely on market mechanisms, and counter-cyclical macroeconomic and prudential policies, to deal with a retrenchment of foreign capital. In other cases, where the scope for manoeuvre is more limited, countries may be forced to tighten fiscal and monetary policy to reduce financing needs and attract additional inflows. Where adequate foreign reserves exist, these can be used to moderate the pace of exchange-rate depreciation, while a loosening of capital inflow regulation and incentives for foreign direct investment might help smooth adjustments.



Eventually, reforming domestic economies by improving the efficiency of labour markets, fiscal management, the breadth and depth of institutions, governance and infrastructure will be the most effective way to restore confidence and spur stability.

*Disclaimer: The findings, interpretations, and conclusions expressed in this article are entirely those of the authors. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.*

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# 30 How inertial is monetary policy? Implications for the Fed's exit strategy

**Yuriy Gorodnichenko and Olivier Coibion**

University of California, Berkeley; UT Austin

28 January 2011

*As the US economy recovers in fits and starts, attention is turning to exit strategies. How will the Fed unwind its quantitative easing? This column presents evidence of substantial levels of policy inertia in monetary policy. It says that we should not expect rapid policy changes in the near future – barring clear signs of economic distress.*

As the US economy recovers in fits and starts, market and policymaker attention is turning to the exit strategy. How will the Fed exit from its loose monetary policy? In particular, how will it winding down its second bout of quantitative easing, known universally as QE2?

The speed of the exit strategy is likely to hinge in part on the amount of inertia inherent in US monetary policymaking process, i.e. the speed at which policy adjusts to incoming information. Some anecdotal evidence points towards significant inertia, such as the following quote from the Federal Open Market Committee (FOMC) minutes of 15 October 2010:

In their discussion of the relative merits of smaller and more frequent adjustments versus larger and less frequent adjustments ..., [FOMC] participants generally agreed that large adjustments had been appropriate when economic activity was declining sharply in response to the financial crisis. In current circumstances, however, most saw advantages to a more incremental approach that would involve smaller changes ... calibrated to incoming data. (FOMC 2010)

Because the Federal Reserve has used non-traditional monetary policy tools in response to the financial crisis, there are few directly comparable historical precedents to assess the likely speed of the exit strategy. Nevertheless, we can still use the available historical

evidence on interest rate decisions to determine how much policy inertia is typically present in the Fed's decision-making process.

The source of persistence in Fed decision-making has critical implications for how we might forecast future monetary policy. The sources, however, are subject to significant controversy in the research literature.

In new research (Coibion and Gorodnichenko 2011), we shed light on this using a variety of methods – all of which point to very significant levels of policy inertia. In short, we should not expect rapid policy changes in the near future – barring clear signs of economic distress.

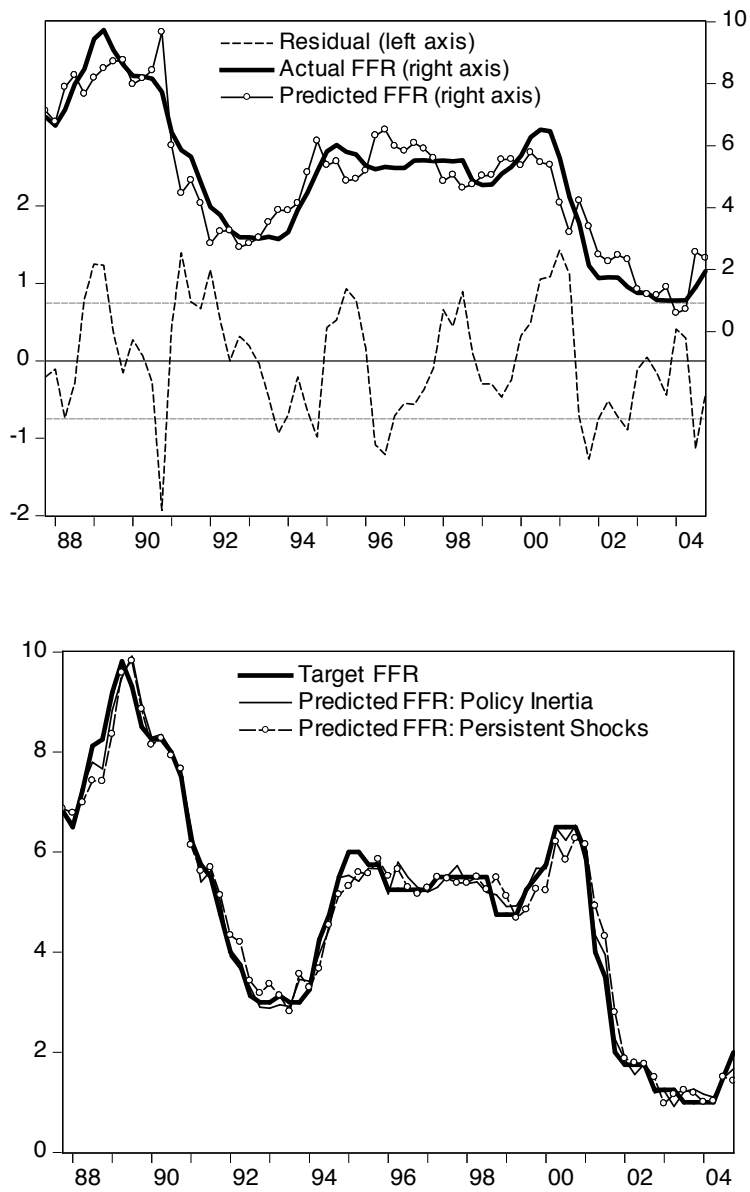
## **The analytical framework**

Since Taylor (1993) macroeconomists have relied on simple interest rate reaction functions to characterise the endogenous response of monetary policymakers to economic fluctuations. Our own baseline formula for predicting monetary policymakers' desired interest rate is an extension of the classic "Taylor rule"; it looks at the central bank's forecast of inflation, the growth rate of output, and the output gap. Our rule departs from the classic Taylor specification in that it allows for responses to both the output gap and the growth rate of output and also in that it allows for the central bank to respond to the forecast of future macroeconomic variables consistent with the notion that monetary policy changes take time to affect the economy so policymakers should be forward-looking in their policy decisions.

The top panel of Figure 1 plots the predicted interest rate from this Taylor rule estimated using the forecasts made by the staff of the Federal Reserve prior to each FOMC meeting (the Greenbooks) relative to the actual interest rate set by the FOMC over most of the Greenspan era.

As emphasised by Taylor (1993), a simple specification such as this can account for much of the policy changes over this time period. However, the predictions of the Taylor rule are noticeably more volatile than actual interest rates. The average size of the predicted change in interest rates (in absolute value) is approximately 60% larger than actual quarterly changes in interest rates (57 basis points to 35 basis points). Actual interest rates are also significantly more persistent than predicted interest rates (autocorrelations are 0.98 versus 0.93) and the residuals are positively serially correlated.

Figure 1



To account for this difference between the behaviour of actual interest rates and those predicted from baseline Taylor rules, two explanations have been suggested.

- The first and most common interpretation is policy inertia.

That is, policymakers do not set interest rates equal to the desired rate each period but rather move interest rates in a sequence of steps towards the desired interest rate (Clarida et al. 2000).

This is commonly modelled as “interest rate smoothing”. Applying such formulas to our baseline formula, we find a very high levels of interest smoothing (see paper for details). The assumption that interest rate persistence primarily reflects policy inertia has dominated both empirical and theoretical macroeconomics research.

- The second interpretation is that the observed serial correlation in policy rates reflects persistent monetary policy shocks (Rudebusch 2002, 2006). This can be modelled by assuming the errors in our baseline formula are serially correlated.

The bottom panel of Figure 1 shows the fitted values of the Taylor rule under the two interpretations of the Fed’s behaviour – a policy inertia and persistent shocks – are essentially indistinguishable to the naked eye (see paper for more precise comparisons and technical details).

Importantly, the two interpretations have very different implications for understanding the determination of monetary policy.

## **Differentiating between policy inertia and persistent shocks**

In Coibion and Gorodnichenko (2011), we provide robust evidence that policy inertia is a more likely source of the persistence in interest rates than the persistent shocks hypothesis. The key pieces of evidence are:

- Nested specifications

We show that once we allow for sufficiently general specifications of both interest smoothing and persistent shocks (i.e. more than first-order processes), specifications of the Taylor rule which include both policy inertia and persistent shocks strongly favour the inertial policy interpretation.

- Conditional identification



A key difference between the two explanations is that, under policy inertia, the gradual adjustment of interest rates should occur irrespective of the underlying source of economic fluctuations, whereas the alternative points to additional persistence only after monetary policy shocks. Using exogenous shocks to identify innovations to the Fed's forecasts of future macroeconomic conditions that are not driven by monetary policy shocks, we continue to find high estimated levels of interest smoothing, consistent with the policy inertia interpretation.

- Interest rate predictability

Rudebusch (2002) argues that if policy inertia was important, then future interest rate changes should be quite predictable, yet he documents that financial futures markets fail to predict future interest rate changes beyond the one-quarter horizon. However, the inability of financial markets to predict future interest rate changes could also reflect uncertainty about the policy rule or more limited information about the economy than what is available to the Fed. Consistent with this, we find that the assumptions about future interest rates made by the staff of the Fed for each set of Greenbooks do a significantly better job of predicting future interest rate changes than private sector forecasts.

## **Was the Fed responding to other factors?**

Rudebusch (2002) also suggests that serially correlated shocks in the Taylor rule should really be interpreted as the result of the Fed responding to time-specific concerns not controlled for in the Taylor rule. While we can never completely rule out omitted variables, we consider estimates of the Taylor rule augmented with a variety of measures of some of the more likely candidates for omitted variables.

- Financial market factors

The most likely sources of policy actions not directly tied to output and inflation are credit conditions and financial considerations. However, when we include measures of credit spreads, stock prices, and uncertainty in the Taylor rule, these are generally insignificant and do not qualitatively affect the estimated degree of interest smoothing.

- Real-time forecast revisions

Another omission from the baseline Taylor rule which could potentially and misleadingly lead to the appearance of policy inertia is the importance of data lags and revisions of

Fed forecasts about the current state. When we augment the Taylor rule to control for changes in the Fed's forecast of macroeconomic conditions, we find no evidence of significant Fed responses to these measures and the estimates of policy inertia continue to be high.

- Private sector forecasts

We also consider the possibility that the Fed responds not just to its forecasts of future macroeconomic conditions but also those of the private sector. This could occur if the central bank is unsure about the quality of its forecasts when they differ from those of other agents or if the central bank is concerned about the effect of its policy decisions on the expectations of other agents. We find statistically significant evidence that the Federal Reserve does respond to deviations of its forecasts from those of the private sector, but controlling for these differences eliminates the evidence of persistent shocks while leaving the estimate of policy inertia unchanged.

## Conclusion

The historical decisions of the Federal Reserve with respect to interest rates, at least during the Greenspan period, consistently point to very significant inertia in the policymaking process. To the extent that this translates to the exit strategy and the non-interest rate tools used by the Fed during the current crisis, our results suggest that the policy reversal is likely to be gradual, in the absence of additional significant economic shocks.

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Seven years since the near collapse of the financial system following the Lehman Brothers bankruptcy, we now seem to be at a point where some central banks – the Federal Reserve and the Bank of England in particular – are close to beginning the process of reversing the very loose monetary policy they have pursued in the last seven years. But this process is likely to go very slowly. Moreover, other central banks – the ECB in particular – are not yet in such an enviable position. This means that quantitative easing is likely to remain a fascinating policy that will be discussed on VoxEU.org and elsewhere for quite some time to come.

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