



DIRECTORATE GENERAL FOR INTERNAL POLICIES  
POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY

# Financial (in)stability, low interest rates and (un)conventional monetary policy: Potential risks and policy measures

IN-DEPTH ANALYSIS

## Abstract

Since the advent of the global financial crisis of 2007–08, major central banks in advanced economies - the US Fed, the Bank of England, the Bank of Japan and the ECB - have undertaken monetary policies with a view to keep interest rates low. They have also significantly expanded the monetary base (and their balance sheets) through the adoption of unconventional monetary policies, although at different times and in different forms.

Several years of unconventional monetary policies and exceptionally low interest have improved banks' health, eased credit conditions and, ultimately, helped supporting the economy. However, these policies may have undesirable side-effects that could put financial stability at risk the longer they are in place.

Against this background, this paper discusses the main threats to financial stability potentially triggered by unconventional monetary policies, especially in an environment of low interest rates, analyse the interrelation between financial stability and monetary policy at the current juncture and briefly assess the viability of specific measures that could prove helpful to contain such risks, given the current institutional framework.

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## EXECUTIVE SUMMARY

At the zero lower bound, central banks around the globe (in particular the Federal Reserve, the Bank of England, the European Central Bank and the Bank of Japan) responded by expanding dramatically their traditional role as lenders-of last-resort. This was mostly met with targeted liquidity provision, or restoring financial intermediaries' balance-sheets, by offering a back-stop.

Since in this situation the central bank would commit to unconventional monetary policy beyond the duration that their reaction function would normally call for, the problem with such policies is time-consistency overall. Hence, the benefits on financial markets can translate into implementation risks if unconventional monetary policy is withdrawn prematurely or it is not time-consistently signalled.

This implementation risk can reduce or nullify long(er)-lasting effect of unconventional monetary policies, create adverse selection among borrowers, and increase market volatility (especially against the backdrop of a "premature" withdrawn).

Clearly there are financial and real risks of unconventional policy as well (at home as well as abroad, where emerging markets have long complained that expansionary rich-world policy has caused waves of capital inflows). The critical judgment is whether uncertain risks of uncertain magnitude can outweigh the benefits of doing more.

The (more) obvious financial risks to be discussed are:

- High liquidity and a prolonged period of zero interest rate can result in asset price bubbles.
- Another (highly) probable cost of highly expansive monetary policy is high indebtedness.
- In expectation of central bank intervention, banks might engage in excessive maturity transformation.
- Quantitative Easing (QE), in particular, can cause a notorious shrinkage in market depth. The first signals are already showing up in Treasuries, with crowding out of private investors.
- Property prices might inflate, repeating the mistakes of Spain, Ireland and Portugal prior to the Great Recession.
- Future bank defaults are very likely, both on the equity and the profit side.
- Pension funds, as one of the big losers in the QE environment, might become unsustainably risky as annuity rates continue to fall drastically.
- There are many concerns regarding the true effectiveness of the ECB's public sector purchase programme (PSPP), taking into account the currently very low yields and the high level of securities holdings by some national central banks (NCBs).
- There is also a risk of divergences in interests, which might make the QE very short-lived.
- In addition, QE could have an upward effect on commodity prices.
- At the same time, real rates can rise via an increase of inflation expectations and there may be threat to the reserve currency status.

Less obvious real risks include instead the fact that:

- A fiscal expansion must accompany a monetary one in order for QE to be effective.

- QE creates havoc with international trade. New liquidity can be used by consumers and the government to import goods and services from other countries at a very low marginal cost.
- Institutional differences between US and Eurozone rise scepticism on the effectiveness of transferring liquidity to the real economy.
- The supply-side may suffer due to "capital overhang", as prolonged monetary accommodation may leave on the market companies which would naturally be driven out by competition, for instance.
- Related to the exit risk discussed before, there is a risk of inelastic demand once the QE ends.
- Monetary easing may benefit regions that have a highly developed financial (and property) market, as the UK example would suggest.

In order to understand what policies should be implemented to prevent the above mentioned risks from materializing, it is important to analytically distinguish between two types of policy measures: corrective and preventive.

Corrective measures shall be understood as a natural extension of the central banks' traditional lender of last resort role in a timely and consistently manner (including forward guidance). Additional tools might be needed during this phase, mainly on the fiscal side, such as government guarantees and bailouts. This is particularly relevant for some of the real risks discussed before.

Preventive measures, on the other hand, will aim to establish the basis for a healthy recovery, and prevent a similar crisis from reoccurring. Having in mind the current institutional framework, a mix of strong micro-and macro-prudential financial policies should be envisaged, in particular providing the necessary stimulus at the current conjuncture, hence facilitating a healthy recovery.

## 1. INTRODUCTION

Central banks in the United States, United Kingdom, Japan, and euro area adopted a series of unconventional monetary policies with two broad goals. The first was to restore the functioning of the monetary policy transmission mechanism, hence financial markets and intermediation. The second was to provide further monetary policy stimulus at the zero lower bound (ZLB). As underlined by IMF (2013), these two goals, while related, specifically rely on different tools. The first relies on targeted liquidity provision and private asset purchases, such as asset backed securities (ABS). The second rely on forward guidance and bond purchases. Those measures are likely to affect asset prices differently, hence financial stability.

The extent and timing of phasing-in of the different measures largely varied across countries. In particular, the European Central Bank and Bank of Japan had to cope with a bank-centred structure of their financial systems, differently from the Federal Reserve and the Bank of England. Several years of unconventional monetary policies and monetary policy at the ZLB overall have improved banks' health, eased credit conditions and, ultimately, helped supporting the economy. However, these policies clearly can have undesirable side-effects such as excessive liquidity provision and risk taking that could put financial stability at risk the longer they are in place.

Against this background, this paper discusses briefly the main threats to financial stability potentially triggered by unconventional monetary policies, especially in an environment of low interest rates, analyse the interrelation between financial stability and monetary policy at the current juncture and assess specific policy measures that could prove helpful to contain such risks.

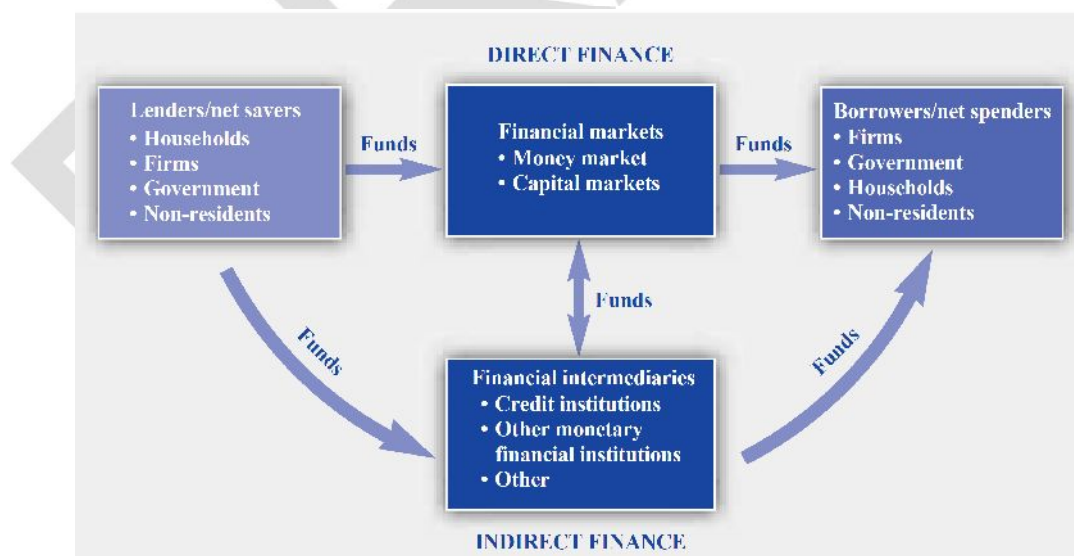
## 2. (UN)CONVENTIONAL MONETARY POLICY AND FINANCIAL STABILITY

It is well known that conventionally central banks can expand the monetary base in essentially two equivalent ways: buying bonds from the public or lending money to the public. Buying bonds reduces the public's bond holdings and increases the amount of currency and bank reserves in the economy. This conventional monetary policy can potentially stimulate the economy through different channels. Albeit these channels are several (ECB, 2011), they can be reduced to two main ones: an asset price channels and a credit channels. The "asset channel" implies purchases of short-term securities, expanding the monetary base. In this way, the central bank can affect a variety of asset prices, including exchange rates and stock prices. The changes in asset prices will then affect economic decisions and influence banks' net worth and balance sheets. Such changes in official interest rates will then affect the supply of credit (hence, the "credit channel").

The definition of those two channels can easily become blurred during crises times, or acute phases of the business cycle. We will return to the point later, but it is worth considering at this stage that, e.g., too low interest rates may boost asset and collateral values, leading both borrowers and banks to accept higher risks via the aforementioned balance sheet channel effect. In addition, low interest rates can make riskier assets more attractive, as agents will search for higher yields. The above effects combined can translate into a softening of credit standards, overall leading to an excessive increase in loan supply (again, via the credit channel).

Prior to the crisis, well-functioning arbitrage ensured that actual and expected standard monetary policy impulses would be transmitted along the yield curve of sovereign bonds and across different asset classes, including bank loans. The severity of the 2007 shock, and ensuing crisis, forced the main central banks around the globe to push their optimal policy rate at the ZLB.

Figure 1: Financial system structure



Source: ECB (2011)

Having nominal rates for most purposes bounded at (or near) zero reduced the scope for further (conventional) policy accommodation. This forced central banks into unconventional monetary policy in order to ease financial disruption and restore the transmission mechanism (Adrian and Shin, 2009).

Financial markets and financial intermediation lessened for three main reasons (IMF, 2013). The first reason relates to the classical problem of (ir)rational runs in which the market can push an economy into a “bad” equilibrium (see also De Grauwe and Ji, 2012), i.e. an equilibrium where it is profitable for investors to run on a sovereign, financial institution or a particular market. The second reason has more to do with a collapse of confidence in certain markets / institutions and the broader fragility of financial systems, because of increased counterparty risk or asymmetry of information. The third reason is the self-reinforcing amplification of asset price cycles and borrowing constraints mentioned earlier. In principle, such an amplification effect works in both directions albeit not necessarily in a symmetric fashion owing to different weights in the policy reaction function. Some comments are warranted in the next sections.

At the ZLB, central banks responded by expanding dramatically their traditional role as lenders-of last-resort. This was met, on the one hand with targeted liquidity provision, or restoring financial intermediaries’ balance-sheets, by offering a back-stop. On the other hand, further monetary policy stimulus was provided at the ZLB. These two goals, while related, undoubtedly rely on different instruments (IMF, 2013). The first relies on targeted liquidity provision and private asset purchases mainly to restore financial market functioning and financial intermediation (indirect finance). The second relied on forward guidance and bond purchases (direct and indirect finance); see Figure 1.

Unconventional monetary policy of the type of bond and private securities purchases—expanding a central bank’s balance sheet (QE) is expected to affect financial markets via three channels. Understanding these channels will help understand the implementation risks of QE. In Section 3 we focus on real and financial risks.

The first channel via which QE affects financial markets is the signalling channel. This channel describes a situation where purchases may convince markets that the central bank is committed to a loose policy stance. Simply announcing that policy will remain loose for long(er) may not be credible. Bond purchases support credibility if market participants perceive a rapid exit as either difficult or costly.

The other two channels are the scarcity and the duration channels. These channels rely on “portfolio rebalancing” (Tobin, 1958) and require frictions — typically preferred habitat or market segmentation (e.g. Kiyotaki and Moore, 2012) — precluding perfect arbitrage between long and expected short rates, allowing at the same time changes in the maturity composition of nominal government debt to affect asset prices. For instance, some investors may prefer to hold or deal with certain assets (e.g., pension funds’ preference for long-term rather than short-term securities) and, in presence of limited arbitrage, asset prices partly reflect the valuations of investors in that particular segment.



### 3. IMPLEMENTATION RISKS

#### 3.1. Signalling risk

Because the central bank can commit to purchases, e.g. bond buying, beyond the duration that their reaction function would normally call for, the problem with such policies is overall time-consistency. Hence, the channels above can translate into implementation risks if unconventional monetary policy is withdrawn prematurely or it is not time-consistently signalled (see also Borio, 2014). In particular, scarcity and duration would work in reverse if the central bank fails to “signal”.

Outright purchases can in principle help resolve the apparent time inconsistency of a commitment to an announced policy path by changing the central bank's incentives through its balance sheet. A central bank that purchases a sizable quantity of, e.g., long bonds when long rates are low will see the value of its bond portfolio weaken if such long rates rise. Equally, the value of long-term loans will decline as long-term rates rise (Fawley and Neely, 2013). This implies the effects of central bank's purchases will depend not only on expectations of the total value of intended purchases, but also on how long the central bank intends to hold them (see also Rogers, Scotti and Wright, 2014). If the central bank buys today but sells tomorrow, clearly there will be little effect on those prices.

Consistency of purchases can also create the danger of inverse selection. Expectations of potentially lower profitability in the future, stemming from an expected change in the monetary policy stance, can discourage potentially creditworthy borrowers from seeking to borrow at all, but they will not discourage fraudulent borrowers who have no intention of repaying. Thus, the pool of firms and individuals seeking loans will become heavily skewed toward fraudulent borrowers. Banks, knowing this, will become increasingly reluctant to make loans. To make large-scale asset purchases programmes (LSAPs) as effective as possible, the Federal Reserve for instance has attempted to communicate the intended path of holdings years into the future.

As underlined by other commentators, special circumstance of the euro area in the last few years meant a different stance and pace of monetary policy reaction, compared to other central banks. Under the Securities Markets Programme (SMP), initiated in May 2010, the ECB bought around €220 billion of Greek, Irish, Portuguese, Italian and Spanish government bonds. At the time, the ECB announced that the bonds would be held to maturity and that the purchases were to be entirely sterilised. The intervention was justified in light of the severe tensions in certain market segments that were hampering the transmission of the ECB's monetary policy. When talking about time-consistency, however, the decision to suspend the sterilisation of the liquidity provided under SMP in 2014 can be seen as falling under this remit, as it represents change of a key parameter of the ECB stance.<sup>1</sup> The ECB has very recently announced a “different” and broader asset purchase programme, public sector purchase programme (PSPP), (M. Draghi, Introductory statement to the press conference, 22 January 2015), started early this March and effectively targeting asset classes beyond the one initially covered by the existing programs (SMP, Covered bonds; see Annex), technically QE. Both positions if evaluated against the backdrop of earlier policy stance may introduce uncertainty about the viability of this and other longer-term ECB commitments (see also Claes, 2014), raising consistency issues.

<sup>1</sup> With inflation not far from the 2% target, ECB's actions were guided before then by the Treaty limitations prohibiting the Eurosystem from conducting purchases of sovereign debt that are interpreted as sovereign bailouts (Article 125) or monetary financing (Article 123).

### 3.2. The risk of “exit”

Before we turn to real and economic risk, let us briefly mention the risk(s) of eventually unwinding unconventional monetary policies. This is in turn related to the signalling problem. The natural assumption would be that monetary policy tightening shocks will have similar effects to that of accommodation via QE, but of opposite sign.<sup>2</sup> The recent market volatility prompted by heightened expectations of looming tapering in the rate of asset purchases after Chairman Bernanke’s testimony on May 22, 2013, and to the FOMC<sup>3</sup> meeting on June 19, 2013 appears broadly in line with this belief (see Rogers, Scotti and Wright, 2014). There is a broad consensus in the literature that risks of exit and subsequent spillover effects (some of which related to the next discussion) will again be mitigated if the “signalling channel” is used effectively (e.g. forward guidance).

While beyond the scope of this discussion, it should be finally mentioned that the heterogeneous nature of the recovery across the euro area, US, Japan and the UK, will imply exit strategies will unlikely be synchronised, making cross-country spillover effects on financial markets particularly relevant looking ahead (Bean, 2013).

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<sup>2</sup> Even if, as Rogers, Scotti and Wright (2014) underlines one can imagine reasons why some financial markets might in principle be more reactive to asset purchases than to their subsequent unwinding.

<sup>3</sup> Federal Open Market Committee

## 4. FINANCIAL AND ECONOMIC RISKS

### 4.1. Financial risks

The merits of unconventional monetary policy are several and the costs of inaction are high.<sup>4</sup> Moreover, the gains from asset purchases seem to be clearest and largest in the euro area due to its low growth perspectives.

But clearly there are financial and real risks of unconventional policy (abroad as well as at home, where emerging markets have long complained that expansionary rich-world policy has caused waves of capital inflows). The critical judgment is whether uncertain risks of uncertain magnitude can outweigh the benefits of doing more. While we acknowledge that it is difficult to foresee all the risks at this early stage of QE implementation, we will outline some of the concerns currently expressed in the academic as well as policy-making community.

There are serious frictions on the supply-side of sovereign bonds. Michael Leister, strategist at Commerzbank, calculates that 2/3 of the Eurozone sovereign debt market is held by sticky investors. ECB already holds approximately 15% of public government bonds, predominantly in shorter maturities while domestic banks and institutional investors have approximately 40% and may be reluctant to sell given scarcity of similar-yielding investment alternatives. Allianz Global Investors are among holders who have already said they won't sell bonds.<sup>5</sup>

A study based on 10-years trade data shows that only about 38% of the euro area's high rated bonds are freely tradable, while the rest are owned by price-insensitive investors.<sup>6</sup> As a result of this friction (or the limited amount of bonds that can change hands), distortions are showing up on the European debt markets. More than EUR 1 trillion bonds in the region have negative yields. According to Alexander Duering, "There is actually fairly little high-grade euro debt available for trading."<sup>7</sup> The risks associated with market drying up from excess demand of high-quality bonds are evident.

High liquidity and a prolonged period of zero interest rate can result in asset price bubbles. Bloomberg strategist Tanvir Sandhu says U.S. and Europe stock indexes are moving back into a trading band that suggests European stocks will outperform. Many others agree there is further upside for European stocks, up 13% and 8% since ECB's January meeting; the balance of fund managers who say Europe is the most favoured region for stocks for next 12 months rose to 51% in Feb. versus 18% in January. In such market conditions, a vast injection of liquidity can easily lead to explosive asset prices, driving them rapidly away from fundamentals.<sup>8</sup> The negative effects will materialize once the ECB decides to exit the QE. If the central bank does try to avert higher inflation and interest rates when the economy starts growing again, it has to drain the money it has pumped into the banks before. The more money was printed, the more money has to be withdrawn. To the extent that high money creation has boosted asset prices, the opposite occurs if liquidity is withdrawn from the system. The more money has been printed, the

<sup>4</sup> Albeit estimating the macroeconomic effects of unconventional measures is clearly challenging, they were estimated to be generally effective both in the euro area (see Ciccarelli et al., 2013; Paries and De Santis, 2013; on the OMT, Altavilla, Giannone and Lenza, 2014) and outside (e.g. for the US, see Krishnamurthy and Vissing-Jorgensen, 2010; IMF, 2013).

<sup>5</sup> Bloomberg (Across the curve). Published on 26-02-2015

<sup>6</sup> According to Deutsche Bank AG's Alexander Duering

<sup>7</sup> Bloomberg. Published on 18-02/2015

<sup>8</sup> Lueder Gerken, director of the Centre for European Policy in Freiburg. The German Finance Minister agrees.

more downward pressure there will be on asset prices if the central bank reverses this process.<sup>9</sup>

Another (highly) probable cost of highly expansive monetary policy is high indebtedness. This could occur through increases in debt and consumption, and decreases in savings and possibly the current account. If these shifts are very large – or vulnerabilities related to overconsumption, over-borrowing, insufficient savings, or large current account deficits continue for very long – they could create a less balanced, less resilient and less sustainable economic growth. This was one of the key causes behind the Great Recession, and repeating it would be highly costly.

The saving rates in the UK are already showing this trend. For the last 48 months, base interest rates have been stuck at 0.5%. The Retail Price Index (RPI) over that period has averaged 3.03%. The average real return is therefore minus 2.53% a year – a swing of 5.38% over the long-term average. British savers have accumulated bank savings of around £1.2tn. However if the long-term real return had remained at the pre-2008 average, the 'lost' interest return has been £65bn a year, or around £2,500 for every family in the land.<sup>10</sup>

In expectation of central bank intervention, banks might engage in excessive maturity transformation. It is well understood that ex ante expectation of liquidity provision causes moral hazard problems, and leads to "imprudent behaviour" on the part of financial intermediaries. The problem is not reduced by the "too big to fail" mentality that still prevails in the financial industry. While banks increased their liquidity risk in run-up to the financial crises from 2007 onwards, the risk of this re-occurring is significant when a vast amount of liquidity is injected back into the market via QE.

Low yields in bond markets pushes investors into riskier assets in search for (satisfying) returns. This can only lead to an inefficient allocation of capital and leave certain investors with more risk than they appreciate. An adjustment in asset prices can bring about losses that are difficult to manage, especially if investments were supported by higher leverage possible due to low rates. If these losses were widespread across an economy, or affected systemically important institutions, they could create substantial economic disruption.<sup>11</sup> This tendency is not only limited to investors, but stretches to commercial banks. Studies have shown that the new inflow of money into commercial banks from QE (in the US and UK) has encouraged banks to use this extra money to increase returns through greater risk taking. The longer the phase with low interest rate, the greater the danger of consequences in the form of speculative price developments and misallocations. A lengthy academic literature has shown that low interest rates often foster credit booms, an inefficient allocation of capital, banking collapses, and financial crises. Prolonged low-interest phases also present the insurance industry and pension funds with considerable challenges. Careful monitoring in risk expansion is therefore required.<sup>12</sup>

QE can cause a notorious shrinkage in market depth. The first signals are already showing up in Treasuries. Trading may be squeezed further as the ECB attempts to buy more than this year's new supply of sovereign bonds, reducing the amount for investors to own and exacerbating illiquidity. And as the market becomes more controlled by Europe's central bank, it may reduce the incentive for private risk-takers to commit capital according to Alexander Duering. There is a potential risk that the more the central bank moves yield

<sup>9</sup> Bloomberg. Published on 26-02-2015/ECR Research/Kristin Forbes – Speech on 24-02-2015

<sup>10</sup> Kristin Forbes – Speech on 24-02-2015

<sup>11</sup> IMF Report on Unconventional Monetary Policies – Recent Experience and Prospects (April, 2013).

<sup>12</sup> ECR Research/Jordan (SNB) – speech on 16-11-2012.

levels, the higher the probability that the market at some point stops following it.<sup>13</sup> This can push the market into a situation where there is really no fundamental demand, distorting (or even killing) private investor incentives.<sup>14</sup>

Property prices might inflate, repeating the mistakes of Spain, Ireland and Portugal prior to the Great Recession. In a recent NBER study of data spanning 140 years of modern economic history across 14 advanced economies, Jorda et al (2014) analyze the link between monetary conditions, credit growth, and house prices. The long-run historical evidence uncovered in the study suggests that the potentially destabilizing byproducts of easy money (via credit and house prices) must be taken seriously. Throughout the entire 20th century, real estate lending became the dominant business model of banks. As a result, the effects that low interest rates have on mortgage borrowing, house prices and ultimately financial instability risks have become considerably stronger.

More recently in the US, house prices to average earnings remain expensive at 4.47 times the salary (close to the bust levels of 1989 and well above the long term average of 4.08 times). However, the total cost of interest payments relative to income are now close to a 30-year low. As long as monetary policy remains loose, a substantial fall in house prices is unlikely. Further, there have been few reposessions during this recession. This is partially due to monetary policy and partially as a result of a deliberate policy to minimise foreclosure. People have acted rationally and re-leveraged. There is no reason to believe that this is different in the Eurozone, where house prices remain high and monetary expansion is comparable in scale to the US.<sup>15</sup>

Future bank defaults are very likely. The IMF Global Report from 2013 noted that the markets in the Eurozone, US, UK and Japan are pricing in rising risks of future bank defaults as a result of a surprise monetary easing.

On the equity side, bank prices weren't really moved by surprise central bank actions in the U.S., though they fell in the U.K. and the euro area. However, the risks of future default did rise. Measured by widening spreads between medium-term bank bonds and government bonds, they find that one basis point of surprise easing increases the spreads by between 0.071 and 0.154 basis points. The reason lies on the profit side.

On the profit side, low interest rates keep the revenues on new loans low. But low rates may put banks at risk by giving an incentive to roll over nonperforming loans. "A delay in balance sheet repair could be one reason for the market expectations of an increase in bank default risk over time that was found in the event study," the IMF said.<sup>16</sup>

While this does not represent an immediate threat, in the medium-term the delay in balance sheet repair is likely. A future rise in interest rates could cause three difficulties. First, it could hit some banks' government bond holdings. Second, there could be market disruptions caused by central banks selling securities. Finally, there might be difficulties in restarting the interbank lending markets.

Pension funds, as one of the big losers in the QE environment, might become unsustainably risky as annuity rates continue to drastically fall. Annuity rates have collapsed since the onset of expansionary monetary policies (see chart 2 below). In 2000 in the UK, a company would have needed to set aside around £115,000 for each £10,000 for a

<sup>13</sup> Christoph Rieger, head of fixed-rate strategy at Commerzbank AG.

<sup>14</sup> Economist. Published on 14-07-2012/Bloomberg. Published on 18-02-2015

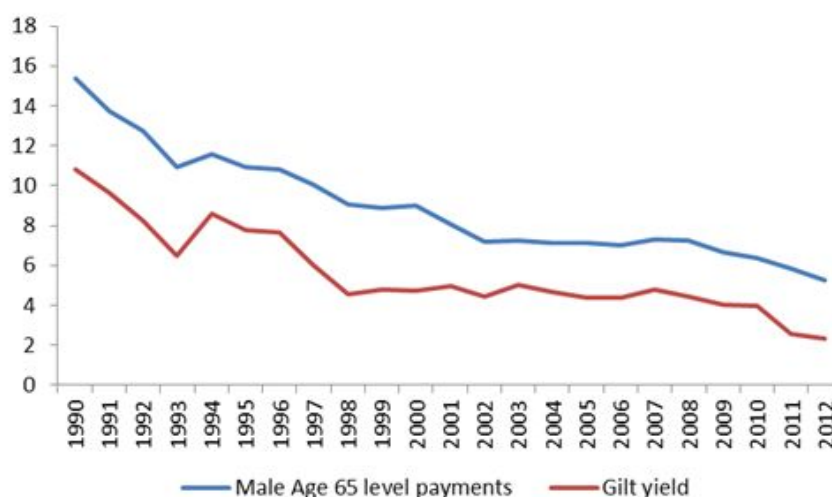
<sup>15</sup> Jorda et al (Dec 2014)/Tim Knox, CPS (March 2013)

<sup>16</sup> IMF Global Financial Stability Report, April 2013.



man aged 65 enjoying an RPI linked pension provision. Today that figure is more than double at £285,000. The annuity rates for that category are around 3.5%. The UK Pension Protection Fund has estimated that companies saw defined benefit scheme deficits increase by £135bn between 2009-10 and 2011-12, linked directly to the falling annuity rates.<sup>17</sup>

Figure 2: Annuity rates of public pension funds and gilt yields



Source: Tim Knox, Centre for Policy Studies, March 2013.

The reason is because the annuity rates of public pension funds are directly related to the gilt yields through the regulatory requirement to hold so-called 'risk-free' security. So companies, instead of directing money towards capital investment, have had to divert earnings into pension schemes, which in turn invest in the supposedly risk-free assets of UK Sovereign Bonds. Similarly those with personal pensions have seen the purchasing power of their funds slashed as annuity rates for a typical 60 year old fell from 8% in 2008 to 5.2% today (for a flat line pension for a male aged 65). An indexed linked pension offers substantially less – closer to £3,500 for each £100,000 invested.<sup>18</sup>

There are many concerns regarding the true effectiveness of the PSPP, taking into account the currently very low yields and the high level of securities holdings by some national central banks (NCBs). Analysts at Danske Bank point out that Banco de Espana already holds around EUR58 billion of securities and the amount of 2-32 year SPGB holdings of the NCBs combined is EUR 70 billion. Taking into account the 25%-and 33% rule imposed in ECB PSPP<sup>19</sup>, the current high holdings suggests that there is little room for further buying of Spanish government debt, despite the fact that Spanish debt requires heavy re-financing. Recently, Howard Archer, Chief Economist at HIS Global Insight expressed his concerns on the effectiveness of the policy measure, stating: "With bond yields already so low across the Eurozone, it is questionable how effective QE will be in pushing them even lower, especially if QE does actually succeed in pushing up markets' inflation expectations for the Eurozone"<sup>20</sup>. Figure 3 compares the bond yields in the Eurozone, US and UK. The yields in the Eurozone are currently lower than both in the US and the UK. Since the ECB's promise to do 'whatever it takes to save the euro' in 2012, borrowing costs around the Eurozone have plummeted – Italian borrowing costs fell by almost 4%, Spanish by almost 5% and Portuguese by over 7%. Yet, all of this has not been

<sup>17</sup> Dr Ros Attman – Speech on 24-10-2013/Kristen Forbes – Speech on 24-02-2015

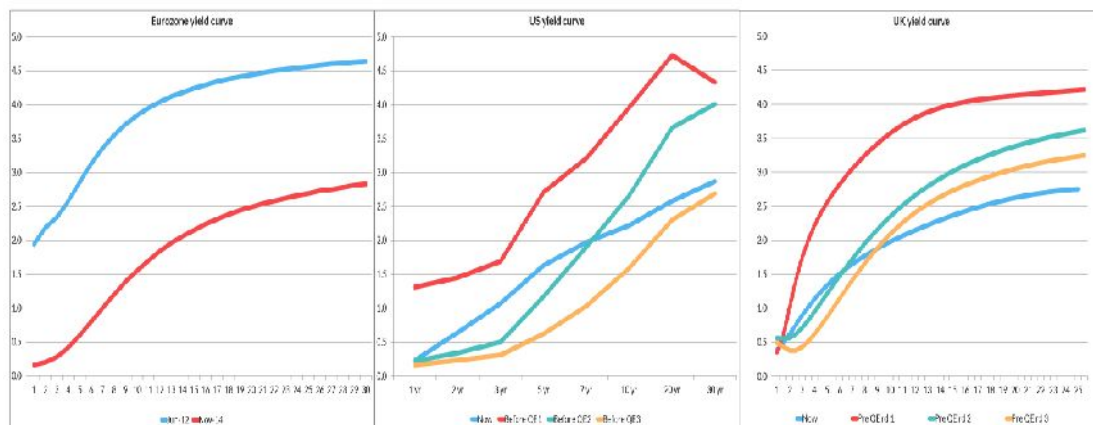
<sup>18</sup> Tim Knox, CPS (March 2013).

<sup>19</sup> See Appendix.

<sup>20</sup> As reported by <http://www.mandg.co.uk/investor/news/intelligence/qa-how-will-eurozone-qe-work/>

coupled with an improvement in economic performance or inflation. The economist and contributor at Forbes, Raoul Ruparei, believes that there is little reason to think recent ECB QE will be any different.<sup>21</sup>

Figure 3: The yield curves in the Eurozone, the US and the UK following unconventional monetary policies



Source: Raoul Ruparei, Forbes Contributor

Moreover, the environment in which the Fed and BoE launched the QE is very different from the current environment in the Eurozone. Analysts at Nitixis point out that Fed's QE worked because long-term interest rates were very low relative to nominal potential growth when it was launched. However, the Eurozone is faced with very low nominal potential growth, which requires the long-term interest rates to be very low during a sustained period. But this in turn entails other dangers, such as a fall in long-term savings and severe problems for banks and institutional investors.<sup>22</sup>

There is also a risk of divergences in interests, which might make the QE very short-lived. In the current set-up, if a NCB does not want to continue to purchase bonds, the ECB cannot stop them from pursuing that route. While this scenario is highly unlikely, it could arise because some NCBs are heavily opposed to the programme and this could be further facilitated if the National Constitutional Court (NCC) ordered the action.<sup>23</sup>

QE may have an upward effect on commodity prices. This liquidity will move towards commodity markets, which will push up the prices. As Western countries and Japan have to import a lot of commodities, that inhibits growth. Moreover, latest sequence of depreciations of Euro has made commodity imports more expensive. While at the moment it is not a credible risk - due to the general fall in oil prices) - it might have important effects for the cost-competitiveness of Eurozone firms if liquidity continues to be poor in on commodity markets and the currency keeps depreciating for a sustained period.<sup>24</sup>

Real rates may rise. Should QE achieve to (temporarily) lift economic growth through higher credit extension, inflation expectations may rise as the same time as money flows into the real economy. In anticipation of this, investors will start selling bonds – the higher the inflation expectations, the more bond price will depreciate. If interest rates rise more than inflation (expectations), real rates would go up, making it increasingly expensive for

<sup>21</sup> Forbes. Published on 19-01-2015.

<sup>22</sup> Bloomberg. Published on 18-02-2015.

<sup>23</sup> Raoul Ruparei (2015), Forbes.

<sup>24</sup> ECR Research.

both the government and the private sector to (re)finance debts, increasing the risks of bankruptcy.<sup>25</sup>

Threat to the reserve currency status. The role of the Euro as a reserve currency may also be negatively affected by QE, as major central banks in particular of emerging economies may lose confidence in the euro-area currency as a result of QE. They might feel that these practices reflect an inability by the monetary union to generate real growth and to honor debts. In addition, the emerging economies feel that the West is engaging in unfair currency war. This can in turn make them weary of lending the individual Eurozone countries more money.

#### 4.2. Real risks

In order to get a complete risk mapping, one must also consider risks to the real economy. While their direct effects on financial stability might be small, their indirect effects, via the macro-financial nexus, might be significant. We therefore analyse a few of them, which might have medium- and long-term impacts on financial market stability.

A fiscal expansion must accompany a monetary expansion in order for QE to be effective. This is highly unlikely to occur in the current context of the Eurozone. In a recent contribution, Giavazzi and Tabellini (2015), claim that the success of QE will only be possible if it is coordinated with an equivalent fiscal policy expansion in order to have permanent or long-lasting effects on the size of the central bank balance sheet. As well explained by Buiter (2014), the logic is the following. When a central bank engages in QE it exchanges government debt for money, which is a non-redeemable liability. As a consequence, the intertemporal budget constraint of the government is relaxed. If the debt is held permanently, then the reduction will equal to full amount of the QE. However, if the debt is held temporarily (or not rolled-over), then the reduction will only equal the interest payments. Therefore, a long-lasting expansion can be achieved by purchasing long-term debt, or rolling over the debt acquired.

There are two scenarios. In an economy where Ricardian equivalence holds, we can achieve an expansion in aggregate demand as long as the expected path of future government spending remains unaltered. If, on the other hand, we are in an economy where the consumers are not Ricardian, the expansion of aggregate demand can only occur if the government exploits the additional fiscal space created by QE to run a larger deficit.<sup>26</sup>

However, the austerity programs that are currently being run in many Eurozone countries go in the opposite direction. In addition, there is very little political will in engaging in tax cuts or spending increases over the foreseeable future in several of the Member States. Therefore, there is a sizeable risk that QE will simply pour liquidity into the financial system, but without the accompanying growth. This can either lead to liquidity being accumulated as bank reserves (thus marginalizing the interbank lending market), or inflate asset prices (but without generating the necessary investments or wealth effects).

QE creates havoc with international trade. New liquidity can be used by consumers and the government to import goods and services from other countries at a very low marginal cost. The problem is that sooner or later other countries end up getting sick of exchanging goods and services for what they feel are worthless sheets of paper. In other words, the

<sup>25</sup> ECR Research.

<sup>26</sup> 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. (Buiter (2014), (Reichlin et al, 2013)).

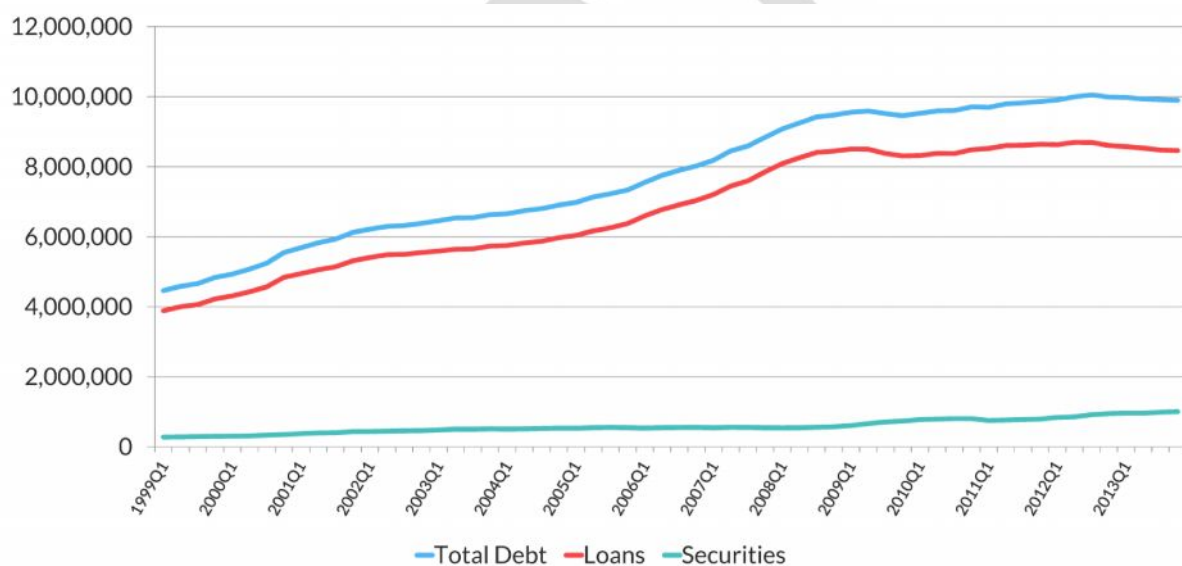


value of the importer's currency depreciates, which can discourage exporters. For example, China stopped exporting valuable minerals to the U.S. due to its QE program.<sup>27</sup>

On the export side, QE is perceived by most emerging market economies as a currency war against their exports. The resulting depreciation from QE makes Western exports cheaper, reducing the market share exports proceeding from emerging economies. Taking into account that many of them heavily rely on export-driven growth, such strategy has proportionally heavier costs compared to the gains for the Western economies. The consequence is an imbalance in global trade. With time this can result in financial reversals, or crisis.<sup>28</sup>

Institutional differences between US and Eurozone rise scepticism on the effectiveness of transferring liquidity to the real economy. Bank lending remains the main channel through which QE would pass-through to the real economy. In the Eurozone, 85% of firm financing comes from banks, meanwhile in the US the number is less than half of this. The lack of lending from the broader capital markets means money will not filter through to the real economy anywhere as effectively as in other jurisdictions. Furthermore, the percentage of net household wealth coming from financial assets is much smaller in the Eurozone compared to the US and UK. While the numbers are 82% and 62% in the US and the UK, it is just under 50% in the Eurozone. This means that the boosting asset prices will not feed through to consumers to the same extent.

Figure 4: Eurozone non-financial corporations funding (thousands of €)

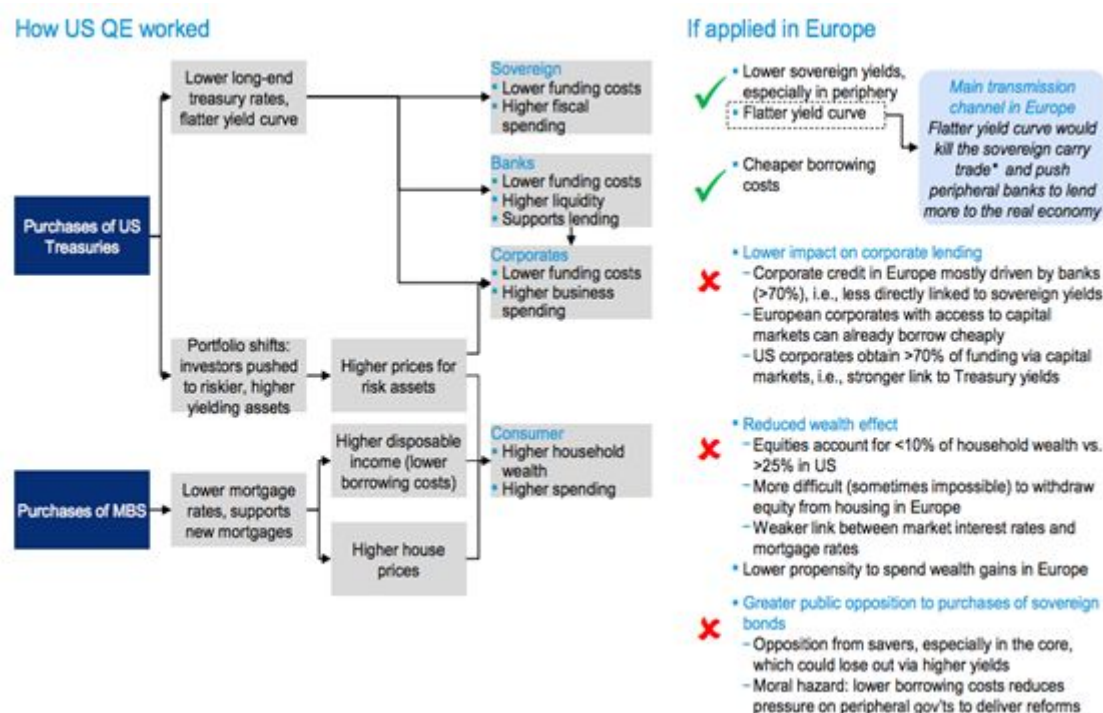


Source: Raoul Rupareil, Forbes Contributor. Published on 19-01-2015.

<sup>27</sup> See, for instance, Bruno&Shin (2014 a,b), Obstfeld (2012), Schularich&Taylor (2012). See also RBI Monthly Bulletin (May 2014) and Moneycrashers.

<sup>28</sup> Global imbalances have been pointed out as one of the causes for the Great Recession. White (2005) analyzed the risk of reversals and disruptions in financial conditions resulting from pre-2008 global imbalances.

Figure : Institutional differences in transmission of a US-type of QE in Eurozone



Source: Deutsche Bank (published on Business Insider on 14-04-2014).

The supply-side may suffer due to “capital overhang”. Following the ZLB and the QE in the UK, BoE launched several studies to examine the effects of unconventional policies on productivity growth. The question is whether a prolonged period of near-zero interest rates is allowing less efficient companies to survive (thus hindering the “creative destruction”) or reduce the incentive within productive companies to carefully assess and evaluate investment projects – leading to a less efficient allocation of capital? The tentative results from the studies confirm this hypothesis. There is currently an excess of capital above the optimal rate, or “capital overhang” given the current business cycle conditions. Under normal circumstances, capital overhang would quickly disappear during recessions as inefficient factories and plants shut down, and new investment slows. However, this process is hindered since excess liquidity and low interest rates do not allow capital to be destroyed. Further down the line, for the financial sector, this may result in an increase in defaults on loans taken by firms as banks’ incentives for due diligence and monitoring decrease under loose monetary conditions.<sup>29</sup>

Related to the exit risk discussed before, there is a risk of inelastic demand once the QE ends. According to the results of Herrenbrueck (2013), quantities can in principle affect prices, but if demand curves in the economy are inelastic, then open market purchases of illiquid assets can be ineffective, or even counterproductive. This follows from two distinct effects. First, the fact that the central bank is demanding such high quantities of the illiquid assets will most likely crowd out private demand for an extended period (by reducing the stock of household real balances), resulting in a post-QE environment of higher interest rates and slower demand for financial assets. Second, an open-market purchase could potentially direct more money into the hands of households with lower propensity to consume. In that case, those households will hold on to the money longer, reducing the

<sup>29</sup> Kristin Forbes – Speech on 24-02-2015. Peek & Rosengren (2005).

velocity of circulation and, consequently, medium-run expectations of the price level. Assuming a fixed flow of public deficits, then the lower velocity of circulation will reduce the medium-term expectations of inflation and may increase real interest rates, reduce capital accumulation, and contract the economy.<sup>30</sup>

Monetary easing may benefit regions that have a highly developed financial (and property) market. In the case of UK, QE has benefited the South over the North. The new money has disproportionately concentrated to London (via its banking and real estate sectors) with a much smaller regional benefit. Translating this to the case of the Eurozone, and taking into account the high disparities in the degrees of financial (and capital) market deepening amongst the Member States, there is a non-negligible probability that QE will have a highly unequal regional impact, directing money (and distributing wealth) to regions with the best developed financial infrastructure. However, these are not necessarily the regions that need the liquidity the most (or where the output gap is the highest).<sup>31</sup>

<sup>30</sup> Herrenbrueck, Dec 2014, SFU Economics.

<sup>31</sup> Tim Knox, CPS, March 2013.

## 5. POLICY MEASURES

In order to understand what policies should be implemented to prevent the above mentioned risks from materializing, it is important to analytically distinguish between two types of policy measures: corrective and preventive.

The key objective of correction measures is to prevent the implosion (or dissolution) of the financial system once a crisis breaks out. The priority of these measures should be to re-instate confidence on the markets. One way of achieving this is to use monetary policy aggressively, through a sharp lowering of the interest rates and actively expanding the central bank balance sheet. The zero-lower bound is an example of the first, meanwhile the ECB Asset Purchasing Programme and PSPP measures are good examples of the latter. As discussed in the previous sections corrective measures shall be understood as a natural extension of the central banks' traditional lender of last resort role in a timely and consistently manner (including forward guidance).<sup>32</sup> Moreover, additional tools might be needed during this phase, mainly on the fiscal side<sup>33</sup>, such as government guarantees and bailouts.<sup>34</sup> This is particularly relevant for some of the real risks discussed before.

Preventive measures, on the other hand, aim to establish the basis for a healthy recovery, and prevent a similar crisis from reoccurring.<sup>35</sup> The priority for these policies is to repair the balance sheets of the financial and non-financial sectors by preventing excessive accumulation of debt and poor quality assets. During this phase, monetary policy is likely to be less effective than financial policy. The reason is that monetary policy typically operates by boosting borrowing, risk-taking and asset prices. However, in a balance sheet recession the economy already suffers from a high level of debt, too much risk-taking and asset-price inflation. There is therefore a tension between the direction the economy should take and the effectiveness of monetary policy. Coupled with a widespread view that a similar recession should be prevented in the future, a policy that fosters prudent behaviour on the part of the financial sector should be implemented. That is why in the current context, a mix of strong micro-and macro-prudential financial policies should be envisaged. Figure 5 depicts the way in which these financial policies interact with monetary in order to generate sustained growth. By maintaining a balanced control over balance sheet expansions of (systemically important) financial institutions (including the shadow banks), a steady flow of liquidity will be provided, and asset price bubbles prevented.<sup>36</sup> There is also a role for fiscal policy, such as depository insurance (to prevent bank runs) and control over deficits (to prevent sovereign debt crisis) under this phase.

<sup>32</sup> Borio and Disyatat (2010)

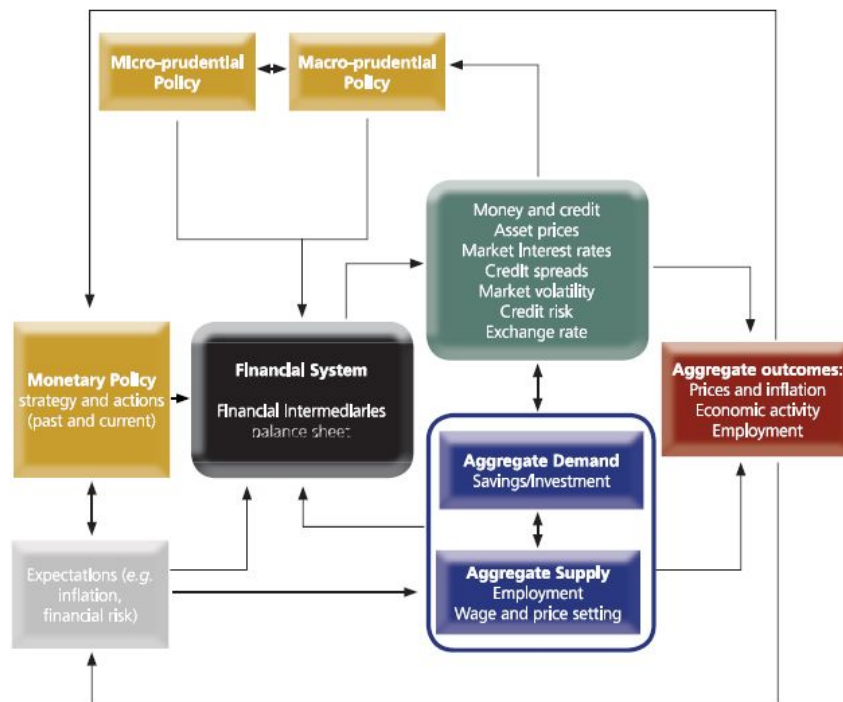
<sup>33</sup> Borio (2014)

<sup>34</sup> Nonetheless, government guarantees and bail-outs are highly prone to moral hazard problems whereby financial institutions engage in excessive leveraging in expectation of a future (public) guarantor.

<sup>35</sup> In an ideal world, a preventive measure should prevent the economy from experiencing any type of crisis in the state-space. However, from history we know that the probability of achieving that is marginally low, and the probability of a new crisis is strictly positive at any period of time.

<sup>36</sup> Gameiro et al (2011)

Figure 5: The monetary transmission mechanism with macro-prudential policy



Source: Gameiro, Soares and Sousa (2011)

However, when designing these policies, we should not forget their asymmetric nature over the business cycle. The risk of policies 'leaning with the wind' (i.e. to lean with financial boom but become excessively aggressive and persistent in financial busts) can end up leaving the authorities with no additional ammunition over subsequent financial (or business cycle) recessions. For that reason, the policies should be implemented yet in an asymmetric manner, 'leaning against the financial boom', but providing the necessary stimulus during busts.

## REFERENCES

- Altavilla, Carlo, Domenico Giannone, and Michele Lenza (2014). The financial and macroeconomic effects of OMT announcements, Working Paper Series 1707, European Central Bank ;  
<http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1707.pdf>
- Altmann, Ros (2013) QE and Its Impact on Pension Funds Presented at Pension Pioneers Forum on 24-10-2013. [www.rosaltmann.com/pdf/PenPioneersForum-QE\\_24\\_Oct\\_2013.pdf](http://www.rosaltmann.com/pdf/PenPioneersForum-QE_24_Oct_2013.pdf)
- Bean, Charles (2013), Global aspects of unconventional monetary policies, Panel remarks given by The Deputy Governor for Monetary Policy, Bank of England at the Federal Reserve Bank of Kansas City Economic Policy Symposium, Jackson Hole, Wyoming;  
<http://www.bankofengland.co.uk/publications/Documents/speeches/2013/speech674.pdf>
- Bernanke, Ben S. "Deflation: Making Sure 'It' Doesn't Happen Here." Speech at the National Economists Club, Washington, DC, November 21, 2002;  
[www.federalreserve.gov/boarddocs/speeches/2002/20021121/default.htm](http://www.federalreserve.gov/boarddocs/speeches/2002/20021121/default.htm).
- Bloomberg (2015) Mechanics of QE in the Eurozone  
<http://acrossthecurve.com/?p=19718> Published in 26-02-2015
- Bloomberg Business (2015). Deutsche Bank Crushing Data Finds Hidden Draghi QE Risks. <http://www.bloomberg.com/news/articles/2015-02-18/deutsche-bank-crunches-data-to-find-hidden-qe-risks-euro-credit> Published on 18-02-2015
- Borio, Claudio (2014) Monetary Policy and Financial Stability: What Role in Prevention and Recovery, BIS Working Paper No. 440, January 2014.
- Borio, Claudio and Piti Disyatat (2009), Unconventional Monetary Policies: An Appraisal, BIS working paper No. 292.
- Bruno, Valentina and Hyun Song Shin (2014 a), Capital Flows and the Risk-taking Channel of Monetary Policy, American University working paper.
- Bruno, Valentina and Hyun Song Shin (2014 b), Cross-Border Banking and Global Liquidity, American University working paper
- Buiter, Willem (2014), The Simple Analytics of Helicopter Money: Why it Works – Always, Economics 8, August.
- Ciccarelli, Matteo, Angela Maddaloni, and José-Luis Peydró, 2013, "Heterogeneous Transmission Mechanism: Monetary Policy and Financial Fragility in the Euro Area," ECB Working Paper Series No. 1527;  
[www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1527.pdf](http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1527.pdf)
- Claes, Grégory (2014), The (not so) Unconventional Monetary Policy of the European Central Bank since 2008, European Parliament POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY, IP/A/ECON/2014-02
- De Grauwe, Paul and Yumei Ji (2012), "Mispricing of Sovereign Risk and Multiple Equilibria in the Eurozone", CEPS Working Documents;  
<http://www.ceps.eu/book/mispricing-sovereign-risk-and-multiple-equilibria-eurozone>
- ECB Webpage (2015). Frequently Asked Questions About the Asset Purchase Programme Available at  
<https://www.ecb.europa.eu/home/html/faqassetpurchaseprogramme.en.html>



- ECB Webpage (2015). Implementation Aspects of the Public Sector Purchase Programme. Available at <https://www.ecb.europa.eu/mopo/liq/html/pspp.en.html>
- ECB Webpage (2015). Press Conference from Cyprus 5-03-2015 Available at <https://www.ecb.europa.eu/press/pressconf/2015/html/is150305.en.html>
- ECB Webpage (2015). Q&A on the the Public Sector Purchase Programme. Available at <https://www.ecb.europa.eu/mopo/liq/html/pspp-ga.en.html>
- ECR Research BV (2015). The Dangers and Drawbacks of Quantitative Easing. [www.ecrresearch.com/world-economy/dangers-and-drawbacks-quantitative-easing](http://www.ecrresearch.com/world-economy/dangers-and-drawbacks-quantitative-easing) Published in 2015.
- European Central Bank (2011), The monetary policy of the ECB, Frankfurt am Main ; [www.ecb.europa.eu/pub/pdf/other/monetarypolicy2011en.pdf](http://www.ecb.europa.eu/pub/pdf/other/monetarypolicy2011en.pdf)
- Fawley, Brett W. and Christopher J. Neely (2013), Four Stories of Quantitative Easing, Federal Reserve Bank of St. Louis REVIEW; <http://research.stlouisfed.org/publications/review/13/01/Fawley.pdf>
- Forbes, Kristin (2015), Low Interest Rates: King Midas' Golden Touch? Speech given by the External MPC Member of Bank of England at the Institute of Economic Affairs, 24-02-2015.
- Giavazzi, Francesco and Tabellini, Guido (2015), Effective Eurozone QE: Size Matters More than Risk-sharing VoxEU.org, 17 Jan
- Herrembrueck, Lucas (2014) Quantitative Easing and the Liquidity Channel of Monetary Policy Simon Fraser University, Department of Economics Working Papers Nr. 14-09.
- IMF Global Financial Stability Report (2013) <http://www.imf.org/external/pubs/ft/gfsr/2013/01/index.htm> Published in April 2013.
- IMF Report on Unconventional Monetary Policies – Recent Experience and Prospects (2013) [www.imf.org/external/np/pp/eng/2013/041813a.pdf](http://www.imf.org/external/np/pp/eng/2013/041813a.pdf) Published in 18-04-2013
- Jorda Oscar, Schularick, Moritz HP and Taylor, Alan M. (2014) Betting The House National Bureau of Economic Research Working Paper No. 20771
- Jordan, Thomas J. (2012) Monetary Policy in the Financial Crisis – Measures, Effects, Risks. Presentation given at the Swiss Banking Global Symposium, Zurich, 16-11-2012. [www.snb.ch/en/mmr/speeches/id/ref\\_20121116\\_tjn%20/source/ref\\_20121116\\_tjn.en.pdf](http://www.snb.ch/en/mmr/speeches/id/ref_20121116_tjn%20/source/ref_20121116_tjn.en.pdf)
- Joyce, Michael, David Miles, Andrew Scott and Dimitri Vayanos (2012), "Quantitative Easing and Unconventional Monetary Policy – An introduction", The Economic Journal, 122(564), F271-F288; [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2168581](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2168581)
- Krishnamurthy, Arvind and Annette Vissing-Jorgensen, 2011, The Effects of Quantitative Easing on Interest Rates, Brookings Papers on Economic Activity 43(2): pp. 215–287 ; [http://www.brookings.edu/~media/Projects/BPEA/Fall%202011/2011b\\_bpea\\_krishnamurthy.PDF](http://www.brookings.edu/~media/Projects/BPEA/Fall%202011/2011b_bpea_krishnamurthy.PDF)
- Kiyotaki, Nobuhiro and John Moore (2012), Liquidity, Business Cycles, and Monetary Policy, NBER Working Papers 17934, National Bureau of Economic Research.

- Matthew Boesler (2014), Why QE Won't Work As Well In Europe As It Does In The United States <http://www.businessinsider.com/qe-in-the-us-versus-qe-in-europe-2014-4?IR=T> Published in 14-4-2014
- Money Crashers, Kalen Smith (2015) [www.moneycrashers.com/what-is-quantitative-easing-explained/](http://www.moneycrashers.com/what-is-quantitative-easing-explained/) Published in 2015.
- Obstfeld, Maurice (2012), Does the Current Account Still Matter ?, Richard T. Ely Lecture, American Economic Association Annual Meetings, Chicago IL.
- Paries, Matthieu and Roberto De Santis, 2013, "A Non-standard Monetary Policy Shock: The ECB's 3-year LTROs and the Shift in Credit Supply," ECB Working Paper Series No. 1508.
- Rajan, Raghuram G. (2014) Competitive Monetary Easing: Is It Yesterday Once More? RBI Monthly Bulletin May 2014.
- Reichlin, L, Turner, A. and Woodford, Michael (2013), Helicopter money as a policy option, VoxEU.org, 20 May.
- Rogers J.H., Scotti C., J.H. Wright (2014), Evaluating Asset-Market Effects of Unconventional Monetary Policy: A Cross-Country Comparison, Board of Governor of the Federal Reserve System, International Finance Discussion Paper 1101; [www.federalreserve.gov/pubs/ifdp/2014/1101/default.htm](http://www.federalreserve.gov/pubs/ifdp/2014/1101/default.htm)
- Schularick, Moritz and Alan M. Taylor (2012), Credit Booms Gone Bust: Monetary Policy: Leverage Cycles, and Financial Crises, 1870-2008. American Economic Review 102, 1029-61.
- The Economist (2012). QE, or not QE? <http://www.economist.com/node/21558596> Published in 14-07-2012
- Tim Knox. Center for Policy Studies (2013) QE – The Side Effects <http://www.cps.org.uk/blog/q/date/2013/03/07/qe-the-side-effects/> Published in 07-03-2013.
- Tobin, James (1958), "Liquidity Preference as Behavior Towards Risk", Review of Economic Studies, No 25, pp. 124-131; [restud.oxfordjournals.org/content/25/2/65.extract](http://restud.oxfordjournals.org/content/25/2/65.extract)



## APPENDIX

Details of the PSPP as of 11 March, 2015:

- Monthly purchases of EUR 60bn in public and private sector securities, purchases under the public sector purchase programme (PSPP) of marketable debt instruments issued by euro area central governments, certain agencies located in the euro area or certain international or supranational institutions. The purchases of what could eventually amount to about €850bn-worth of government bonds will run until September 2016.
- Purchases of nominal marketable debt instruments at a negative yield to maturity are permissible as long as the yield is above the deposit facility rate.
- The remaining purchases of marketable debt instruments issued by international or supranational institutions located in the euro area will be conducted on behalf of the Eurosystem by the Banco de España and the Banque de France.
- The marketable debt instruments purchased under the PSPP will be made available for securities lending.
- An issue share limit of 25% needed to be applied in order to avoid obtaining a blocking minority in the event of a debt restructuring involving collective action clauses. This issue limit thus also covers existing Eurosystem holdings of sovereign bonds in the context of the Securities Markets Programme (under which the 25% issue share limit was not applied at the time of purchase) and any other portfolios owned by Eurosystem central banks. Likewise, the issuer limit of 33% is a means to safeguard market functioning and price formation as well as to mitigate the risk of the ECB becoming a dominant creditor of euro area governments. To this end, the 33% limit is applied to the universe of eligible assets in the 2 to 30-year range of residual maturity. The 33% issuer limit applies to the combined holdings of bonds under all purchase programmes.
- The ECB will buy up government and corporate bonds in proportion to each country's 'capital key'. This is a measure of a country's size, calculated according to their population and gross domestic product. So it will buy more bonds from bigger countries than smaller ones. The ECB won't buy any more than a third of each country's debt.
- These limits will be based on nominal values.
- There will be no primary market purchases under the PSPP, regardless of the type of security, as such purchases are not allowed under Article 123 of the Treaty on the Functioning of the European Union. The ECB strictly adheres to the prohibition on monetary financing by not buying in the primary market. The ECB will only buy bonds after a market price has formed. This ensures that the ECB does not distort the market pricing of risk.
- There is no duration target for the programme.
- The ECB will also continue purchasing asset-backed securities and covered bonds, which the ECB started last year.
- Unlike earlier ECB bond-buying schemes, the latest programme has been designed to ensure that national central banks take most of the losses from any default or restructuring of their country's debt. The national central banks will do most of the buying, accounting for 92 percent of the purchases, while the ECB itself will account for 8.0 percent.
- Only 20% of the QE money subject to 'risk sharing', where any potential losses would be shared across the Eurozone.<sup>37</sup>

<sup>37</sup> ECB website on PSPP. Published in march 2015 and accessed on 11.03.2015.