



DIRECTORATE-GENERAL FOR INTERNAL POLICIES

**POLICY DEPARTMENT**  
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**Effectiveness of the ECB  
programme of asset purchases:  
Where do we stand?**

**Monetary Dialogue  
June 2016**

**COMPILATION OF NOTES**





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

# Effectiveness of the ECB programme of asset purchases: Where do we stand?

Monetary Dialogue 21 June 2016

## COMPI LATION OF NOTES

### Abstract

More than one year after the first implementation of the ECB programme of asset purchases, it is appropriate to assess its effectiveness and discuss pros and cons of potential further expansions. An in-depth analysis by key monetary experts is provided in this compilation. The notes have been requested by the Committee on Economic and Monetary Affairs as an input for the June 2016 session of the Monetary Dialogue.

This document was requested by the European Parliament's Committee on Economic and Monetary Affairs.

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## INTRODUCTION

The European Central Bank (ECB) Expanded Asset Purchase Programme (EAPP) adds the purchase programme for public sector securities to the existing private sector asset purchase programmes to address the risks of a too prolonged period of low inflation. It consists of a third covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP) and public sector purchase programme (PSPP).

Monthly purchases in public and private sector securities amount to EUR 80 billion (from March 2015 until March 2016 this figure was EUR 60 billion). They will be carried out until the end of March 2017 and in any case until the ECB Governing Council sees a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below, but close to, 2% over the medium term.

The process through which monetary policy decisions affect the economy has changed with the adoption of unconventional monetary policy. While standard monetary policy measures produce effects on the economy mainly via the interest rate channel, large asset purchases have more direct impact on bank's balance sheet and the availability of credit for firms and households. The ultimate goal is the same, namely to stimulate spending, but quantitative measures changing the size/composition of the balance sheet remain the only effective tools to achieve further monetary policy accommodation, when the lower bound for policy interest rates is reached.

However, as the transmission mechanisms of monetary policy remains characterized by long, variable and uncertain time lags, the impact of asset purchases on the real economy continues to be a matter of discussion as confirmed by the slow recovery in bank lending. Some economists even argue that the most effective transmission channel of unconventional monetary policy is the exchange rate, i.e. via the depreciation of the euro.

More than one year after the first implementation of the ECB programme of asset purchases, it is appropriate to assess its effectiveness and discuss pros and cons of potential further expansions. An in-depth analysis by key monetary experts is provided in this compilation. The main conclusions and policy options are summarised below.

The papers have been requested by the Committee on Economic and Monetary Affairs as an input for the June 2016 session of the Monetary Dialogue.

The results presented in Bernoth et al. (DIW Berlin) show that, on average, the unconventional monetary policy interventions were effective both at stimulating the real economy and at exerting upward pressure on inflation and several measures of inflation expectations. The report finds that the effects do not differ substantially from what the literature already documents for the period of conventional monetary policy. It also shows that the stimuli are transmitted to the real economy mainly through variations in public and private interest rates and credit volumes.

However, the authors raise a word of caution: the results should not be necessarily interpreted as supporting the recent extension of the asset purchasing program. Sovereign bond yields in the euro area are currently lower than they were during most of the analysed sample period. Thus, there is potentially less room for beneficial macroeconomic effects from non-standard monetary policy measures, as the room for lowering bond yields further is potentially smaller.

According to Demertzis and Wolff (Bruegel), monetary policy so far has helped to extend new credit to the euro-area economy and has positively contributed to growth. These effects are visible but small in relation to the size and type of monetary policy interventions. There are no inflationary risks while slack continues to exist in the euro area. At the same

time, they do not see any immediate financial risks arising from excessive debt as long as there is a need to reduce existing levels of debt to lower and more productive levels. But, Quantitative Easing (QE) can pose risks to the profitability of banks, a factor that could hamper the creation of new credit. This risk would increase if banks do not divert to other business models, a reason why the European banking supervision has called for revisions to business models. While a correction of bank margins was probably inevitable, the longer this pressure exists, the greater the threat to financial intermediation.

Draghi's "whatever it takes" speech was sufficiently convincing to remove risks to the system's financial stability. The QE that followed has helped to sustain progress made since then. Investment, employment and growth continue to move in a positive direction. At the same time, QE has made an important contribution to lowering the exchange rate (aided also by US monetary policy). Given the underlying uncertainties about the global economy, it is difficult to imagine how this result would have been attained without such aggressive intervention.

Also, confidence appears to have stabilised with bond yields and spread volatility substantially lower and more stable. However, this confidence is beginning to wane given the scale and unconventional nature of the measures taken and the absence of inflation. It is unlikely that confidence will be sustained for long in the absence of a visible increase in aggregate demand and inflation. Given also that the marginal benefits of more central bank action are disputable, more of the required stimulus would have to come from elsewhere. This includes better use of fiscal space where it is available and more effective resolution of unproductive debt.

According to Gerba and Macchiarelli (LSE) it is still too early to grant a full objective evaluation of the ECB's policies. In the paper they provide some insights into the Expanded Assets Purchase Programme (EAPP) impact on the different segments of the financial market and the real economy. The results are quite mixed. While inflation expectations rose during the last month, they are still well below the 2 percent target. Moreover, most of the rise can be attributed to the recovery in crude oil prices rather than the Quantitative Easing (QE) policy itself, and the Professional Forecasters' outlook for the next years is on the downside. Also bank lending has increased, including lending to SME's. However, following the bank lending survey carried on by ECB, the direct effects of QE on their bank-lending decisions has been estimated to be very limited. The impact on the exchange rate and growth has been more clear and visible. More needs to be done if the trend is not to be reverted. The report calls for further fiscal stimulus in the euro area, while the ECB should monitor the markets for any potential shortage of supply risk (particular in the core), and most importantly, push banks in the periphery to engage in their local lending markets and buy their own country's bonds instead of those from the core - all in all - to ensure the ECB's expected boost to the economy to be more evenly distributed across countries.

For Gros (CEPS) the bond purchases of the ECB have helped to reduce interest rates somewhat, especially for the countries facing high risk premia, and this might have sustained demand in these countries. But bond purchases have not been effective in achieving the official goal of the ECB, namely bringing area-wide inflation closer to 2%.

How can one explain the muted impact of Quantitative Easing (QE) on inflation expectations? It is well known that the reaction of investment to lower interest rates is always difficult to predict. One should thus expect that investment does not react much in a low-rate environment to additional small changes. Moreover, low interest rates increase the income of debtors, but reduce those of the creditors. The net impact on the economy of going from low to very low, and sometimes even negative rates should in any event have been expected to be small. Most evaluations of QE assume this problem by using

standard models that imply, by construction, that lower rates stimulate the economy and increase output and inflation.

As the ECB's asset purchases programme has only been in operation since March 2015 it is too early to give a definitive judgment on its effectiveness, according to Hallett (University of St. Andrews). But the results so far are in line with those in other economies where Quantitative Easing (QE) has been used: a small reduction in long run interest rates, increased output growth of around 0.3%, no inflation.

To get a wider perspective on the effectiveness of the ECB's programme, comparisons with QE programmes elsewhere are useful. These comparisons suggest that a major gain is the stabilisation of the financial markets and the consequent lowering of risk premia. The main difficulty seems to be damage to the transmission mechanism and from debt deleveraging. This suggests that asset purchases should be extended to financial institutions, corporate bonds, other asset backed securities beyond the banks; that the effects of deleveraging needs to be offset; and that a range of other mechanisms be considered to combat the loss of transmission (pass-through) to investment and spending. Several are reviewed in the report.



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# **Effectiveness of the ECB programme of asset purchases: where do we stand?**

**Kerstin BERNOTH, Michael HACHULA,  
Michele PIFFER, Malte RIETH**

## **IN-DEPTH ANALYSIS**

### **Abstract**

The ECB has engaged in several forms of unconventional monetary policy since 2007. This report documents empirically that the implemented measures were effective. In a counterfactual analysis, the report simulates the effects of an unconventional monetary policy shock of -10 basis points to euro area sovereign yields, consistent with the effect of the first announcement of the Expanded Asset Purchase Programme (EAPP). The simulation shows that the surprise expansion led to significant increases of output, prices, and inflation expectations, as well as to a drop in the unemployment rate. The shock is transmitted to the economy through lower public and private interest rates, and an increase in bank credit to the private sector. The results also suggest that the effects of unconventional monetary policy interventions do not differ much from those of conventional policy measures.

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## EXECUTIVE SUMMARY

- Since 2007, the European Central Bank (ECB) has employed a wide variety of non-standard policy measures to calm financial markets, stabilize the macro-economy, and bring the inflation rate to its target of close to, but below, 2%.
- In particular, in 2015 the ECB introduced an Expanded Asset Purchase Program (EAPP), which has already been extended both in duration and amount of assets purchased.
- This report uses a vector autoregressive (VAR) model to investigate empirically how the non-standard monetary policy measures employed by the ECB affect the euro area macro-economy.
- In a counterfactual analysis, the effects of an unconventional monetary impulse that changes euro area sovereign yields by -0.1 basis points are simulated. In particular, the monetary impulse that is fed into the model is scaled so that it is consistent with the financial market impact of the initial announcement of the EAPP.
- The simulation shows that non-conventional monetary surprise expansions are effective in stimulating real activity, reducing unemployment, and increasing inflation in the euro area.
- The responses of both output and prices to the non-standard monetary expansion are sluggish, reaching their peak after about two years. This timing is similar to the one often documented for output and prices following a 'standard' (conventional) monetary policy expansion, which works through changes in the policy rate.
- The results also show that non-standard monetary policy interventions increase different measures of inflation expectations (survey data and financial market-based inflation expectations).
- Moreover, policy expansions are found to positively impact the conditions and volume of credit issued to both non-financial firms and households in the euro area.
- Further results indicate that non-standard monetary policy is transmitted to the real economy through changes in public and private interest rates of different maturities, as well as higher stock market returns. In contrast, on average the euro is not found to depreciate against the US dollar after a policy expansion.
- Overall, the estimations show that ECB non-standard monetary policy can be effective in stimulating the euro area economy. Regarding the most recent extensions of the EAPP, however, results must be treated with caution, given that the announcements of the extensions have not eased financial markets conditions as much as the initial EAPP announcement.

## 1. INTRODUCTION TO THE REPORT

Since the onset of the financial crisis in 2007, the European Central Bank (ECB) has engaged in a wide variety of non-standard monetary policy measures. These include, for instance, enlarging the pool of assets accepted as collateral for refinancing operations and liquidity provision to banks with longer maturities. In the light of an overall subdued outlook for inflation and credit dynamics, in September 2014 the ECB announced an Asset-Backed Securities Purchase Program (ABSPP) and a third Covered Bond Purchase Program (CBPP3). Further, in January 2015 it introduced the Expanded Asset Purchase Program (EAPP). The EAPP encompasses both the ABSPP and CBPP3, but adds the purchase of secondary market sovereign bonds. Less than a year after its introduction, the programme's duration was extended from September 2016, the previously announced minimum end-date, to March 2017, or beyond, if necessary. From March 2015 through March 2016, every month €60 billion public and private sector securities were purchased under this program; from April 2016 onwards, monthly purchases increased to €80 billion.

The announcement and introduction of these unconventional monetary policy measures, in particular that of the EAPP, has resulted in an intense debate. Given the slow recovery of lending and credit in the euro area, doubts regarding the effectiveness of the ECB's measures in stimulating the real economy have been raised. Moreover, it is uncertain through which channels unconventional monetary policy affects the real economy. In comparison to conventional monetary policy measures that mainly work through the interest rate channel, unconventional monetary policy tools are expected to impact the economy through various additional channels, including the banks' balance sheet channel, the credit channel, and the exchange rate channel.

The following report assesses empirically how the ECB's unconventional monetary policy measures affect the macro-economy in the euro area. Moreover, it evaluates through which channels unconventional monetary policy interventions are transmitted to the real economy. For this purpose, a structural vector autoregressive model (SVAR) is employed. Given the small number of policy actions specifically related to the EAPP, the SVAR model is identified using data covering all unconventional policy interventions since 2007. The estimated SVAR model is then used to perform a counterfactual analysis. Specifically, a hypothetical unconventional monetary policy shock is fed into the model; how this shock propagates through the euro area economy, holding constant the other driving forces of the model-economy, is analysed. The hypothetical shock is scaled such that it lowers the two-year yield on euro area government bonds (excluding Germany) by 10 basis points. This initial impact is similar to the change in the estimated announcement effect of the first announcement of the EAPP (about 0.08 percentage points).

## 2. EXISTING EVIDENCE ON NON-STANDARD MONETARY POLICY

Previous studies analysing the macroeconomic effects of unconventional monetary policy, in particularly large scale asset purchasing programmes like quantitative easing (QE), focus mostly on US and UK evidence, where the measures were introduced earlier than in the euro area. These studies show that QE significantly lowered sovereign and corporate bond yields on the days when the measures were announced by central banks. Moreover, QE is often found to stimulate both output and prices. There is, however, considerable variation in the existing estimates of the magnitude of the macroeconomic effects.

For the euro area, existing studies mainly focus on how non-standard monetary policy measures affect financial markets. These studies analyse the effect of long-term refinancing operations (LTROs) on credit conditions, the impact of the securities market program (SMP) on bond yields, or the general consequences of the announcement of outright monetary transactions (OMT) on euro area financial markets. The announcements of OMT, for instance, reduced sovereign bond yields significantly for most member countries. Similarly, the SMP lowered yields on sovereign bonds, particularly for those countries covered by the program, generating large declines in yields on the days in which the information about the program was disclosed. LTROs, in turn, seem to have unlocked the bank lending channel and stimulated credit growth.

Regarding the macroeconomic effects of unconventional monetary policy, Boeckx et al. (2014) and Gambacorta et al. (2014) show that unexpected ECB balance sheet enlargements positively impact economic activity and prices in the euro area. By construction, these estimates exclude ECB policies that are not associated with shifts in the balance sheet. In particular, they do not take into account the effects that function only through policy announcements like e.g. forward guidance or the announcement of OMT.

Focusing on the more recent programmes and, in particular, on their effects on inflation expectations, Briciu and Lisi (2015) analyse the impact of unconventional monetary policy announcements on various economic and financial variables through January 2015. Using an event study design, they find that central bank announcements on the SMP, CBPP2 and EAPP contributed to higher long-term inflation expectations. On the other hand, a study by Van den End and Pattipeilohy (2015) finds no significant effect on inflation expectations in the euro area of the policies implemented through December 2014. However, the latter paper analyses only the impact of actual changes in balance sheet size or composition, thereby disregarding the effects of policy announcements. Thus, the estimates may underestimate the total effect of ECB monetary policy on inflation expectations.

### 3. MACROECONOMETRIC APPROACH

To take into account that communication is typically considered to be a main policy tool of central banks, this report assesses the effectiveness of ECB policies by focussing on the macroeconomic effects of monetary policy announcements. In particular, it uses the unexpected changes in sovereign bond yields on those days when the ECB communicated its unconventional policies to the public, and assesses how these movements in government bond yields affect financial markets and the macro-economy.

The macroeconometric approach employed to analyse the effectiveness of unconventional monetary policy by the ECB follows Gertler and Karadi (2015). It uses a vector autoregressive model (VAR) for the euro area. In its benchmark specification, the model contains six variables: (1) the average two-year yield on euro area government bonds excluding Germany as a measure for monetary policy stance<sup>1</sup>; (2) a measure of implied stock market volatility (the VStoxx index); (3) the volume of credit to non-financial firms; (4) the index of consumer prices; (5) real GDP; and (6) the unemployment rate.

To separate the different driving forces of the variables included in the model and to isolate the effect of unconventional monetary policy, it is necessary to construct a measure for the unexpected component of unconventional monetary policy (monetary policy shock). For this, the study builds on Altavilla et al. (2014) and extracts the average surprise variation in government bond yields on the days when the ECB announced changes in monetary policy.<sup>2</sup> Specifically, it uses a panel model covering bond yield spreads of Italy, Spain, Portugal, and Ireland to Germany with maturities of two, five, and ten years. All in all, the study considers 34 announcements occurring between August 2007 and March 2016. A list of the announcements and further details are provided in Table 1. They refer to all non-standard policy measures that the ECB employed from the beginning of the global financial crisis in 2007 through March 2016. These measures include liquidity and funding operations (like LTROs), the SMP, the OMT, as well as forward guidance and credit easing. Importantly, they contain all the announcements regarding the asset purchase programmes, but they are not confined to these measures.<sup>3</sup>

Once a measure for the surprise component of unconventional monetary policy announcements is estimated, it is used to recover the structural monetary policy shocks that drive the variables included in the vector autoregressive model, following Stock and Watson (2012) and Mertens and Ravn (2013). This approach allows for isolating the impact of a monetary policy shock on the endogenous variables, holding constant the other driving forces of the variables. To improve the accuracy of the estimation, the study follows Rogers et al. (2015) and computes estimates directly using daily data for the variables available on a daily frequency, rather than on a monthly frequency.

<sup>1</sup> Because they were treated as a safe haven asset during the euro crisis (Altavilla et al., 2014, Fratzscher et al., 2014), German bonds are excluded. Compared to the short-term interest rates usually used in VAR studies on conventional monetary policy, government bond rates with longer maturity are more likely to reflect unconventional monetary policy innovations, as these measures are specifically aimed at influencing expectations and, thus, yields over longer horizons. Moreover, short-term interest rates, like the Eonia or the Euribor, have been constrained by the zero lower bound in recent years.

<sup>2</sup> To control for other factors that could influence the daily evolution of spreads, economic data releases of 139 macroeconomic indicators for the euro area as a whole, for the individual member countries, the UK, and the US, are also controlled for.

<sup>3</sup> Using only announcements regarding the latest asset purchase programmes would not yield a sufficient number of observations to estimate the structural VAR model.

**Table 1: Dates of the ECB monetary policy announcements considered**

<b>Date</b>	<b>Policy Announcement</b>
22.08.2007	Supplementary liquidity-providing longer-term refinancing operation (LTRO) with a maturity of three months
28.03.2008	LTROs with a maturity of six months
29.09.2008	Special-term refinancing operation
08.10.2008	Fixed rate tender procedure with full allotment on the main refinancing operation (MROs)
15.10.2008	Expansion of the list of assets eligible as collateral in Eurosystem credit operations
07.05.2009	LTROs with a maturity of one year
04.06.2009	Details on purchase program for covered bonds (CBPP)
03.12.2009	Phasing out of 6-month LTROs, indexation of new 1-year LTROs
04.03.2010	Phasing out of 3-month LTROs, indexation of 6-month LTROs
10.05.2010	Securities Markets Program (SMP)
28.07.2010	Review of risk control measures in collateral framework
03.03.2011	Further LTROs
09.06.2011	MROs as fixed-rate tender procedures with full allotment (FRFA) for as long as necessary, at least until October 2011
04.08.2011	Further LTROs with a maturity of three and six months
08.08.2011	ECB will actively implement its Securities Market Program
06.10.2011	New covered bond purchase program (CBPP2)
08.12.2011	Two additional LTROs with a maturity of three months
21.12.2011	Results of first 3-year LTRO
09.02.2012	ECB's Governing Council approves eligibility criteria for additional credit claims
28.02.2012	Results of second 3-year LTRO
06.06.2012	FRFA on MROs as long as necessary, and at least until January 2013
26.07.2012	"Whatever it takes" speech by ECB President Mario Draghi in London
02.08.2012	Outright Monetary Transactions program (OMT)
06.09.2012	Technical features of OMT
06.12.2012	FRFA on MROs as long as necessary, and at least until July 2013
22.03.2013	Collateral rule changes for some uncovered government-guaranteed bank bonds
02.05.2013	FRFA on MROs as long as necessary, and at least until July 2014
04.07.2013	Open-ended forward guidance: The Governing Council expects the key ECB interest rates to remain at present or lower levels for an extended period of time
08.11.2013	FRFA on MROs as long as necessary, and at least until July 2015
05.06.2014	Targeted longer-term refinancing operations (TLTROs)
03.07.2014	Details on TLTROs published
22.01.2015	Expanded asset purchase program
03.12.2015	Duration of Expanded asset purchase program extended (among others)
16.03.2016	Monthly purchases under Expanded asset purchase program increased (among others)

## 4. EMPIRICAL RESULTS

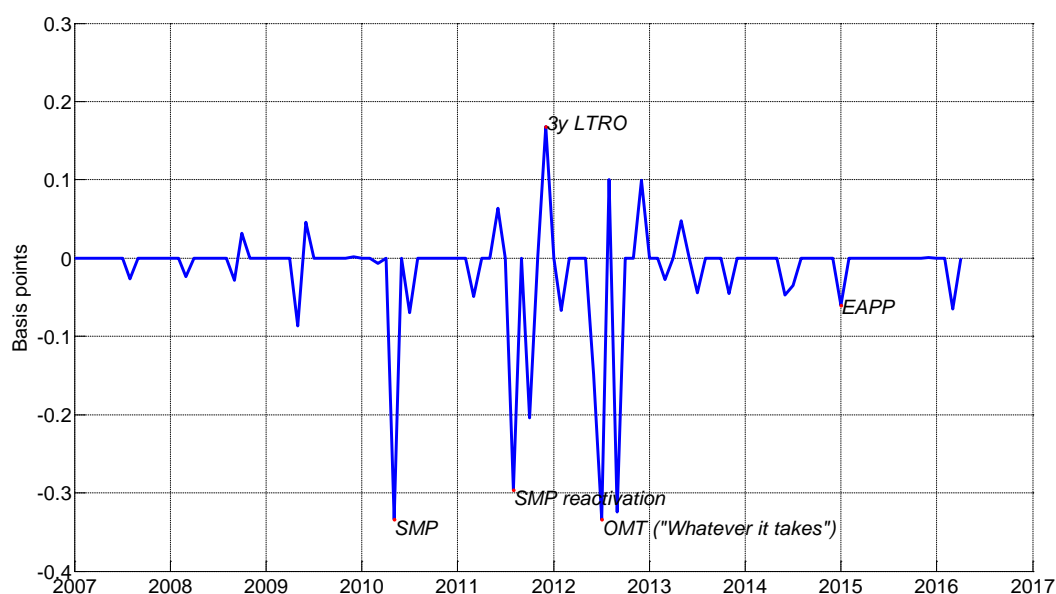
### 4.1. Surprise component of unconventional monetary policy announcements

Figure 1 displays the magnitude of the common effects that the various announced monetary policy measures exerted on the sovereign bond yield spreads of the four considered countries. They serve as a measure of the unexpected components of the unconventional monetary policy announcements. A monetary expansion is associated with falling yield spreads, measured in basis points. An announcement that is associated with increasing spreads reflects monetary policy news that is less expansionary than what was expected by market participants.

It shows that the Securities Markets Programme, as well as the ‘whatever it takes’ speech by ECB president Mario Draghi in London, led to strong decreases in bond spreads. On the other hand, the announcement of the 3-year LTROs came short of market expectations. Here, market participants expected a reactivation of the Securities Market Programme and were disappointed by the announcement of the 3-year LTROs. The first announcement of the EAPP programme constituted an expansionary surprise. However, the figure also shows that the effect on spreads was considerably smaller than the major announcements during the euro area sovereign debt crisis.

**Figure 1: Surprise component of unconventional monetary policy announcements**

(Basis point changes of bond yield spreads)



**Source:** Own calculations.

Finally, it should be noted that these estimates are only an approximation of the true underlying exogenous changes in monetary policy. The effect of the latter is retrieved in the next subsections using the methodology of external instruments. This step of the empirical analysis does not distinguish between these different types of policy announcements. Instead, announcements regarding all different types of non-standard monetary policy measures are pooled and the average reaction of the euro area economy to a hypothetical ‘average’ unconventional monetary policy shock is analysed.



## 4.2. Effectiveness of non-conventional policy

The effectiveness and transmission of the policies analysed is discussed by means of estimated impulse response functions to an unconventional monetary policy innovation. The idea of these impulse functions is to feed the estimated model with a hypothetical monetary policy shock and to see how this shock propagates through the economy, holding constant the other driving forces of the variables. The hypothetical shock is scaled such that it lowers the two-year yield on euro area government bonds (excluding Germany) by 10 basis points. This initial impact is similar to the change in the estimated announcement effect of the first announcement of the EAPP (see Figure 1).

The report first addresses the question of whether non-standard policies are effective in the euro area with regard to the stimulation of output, the price level, the credit volume to non-financial corporations, as well as to the decrease of the unemployment rate. Figure 2 reports the first set of results. The solid line shows the point estimate and the dotted lines depict the 90 percent confidence intervals. The latter are used to evaluate whether the point estimate is statistically significantly different from zero.

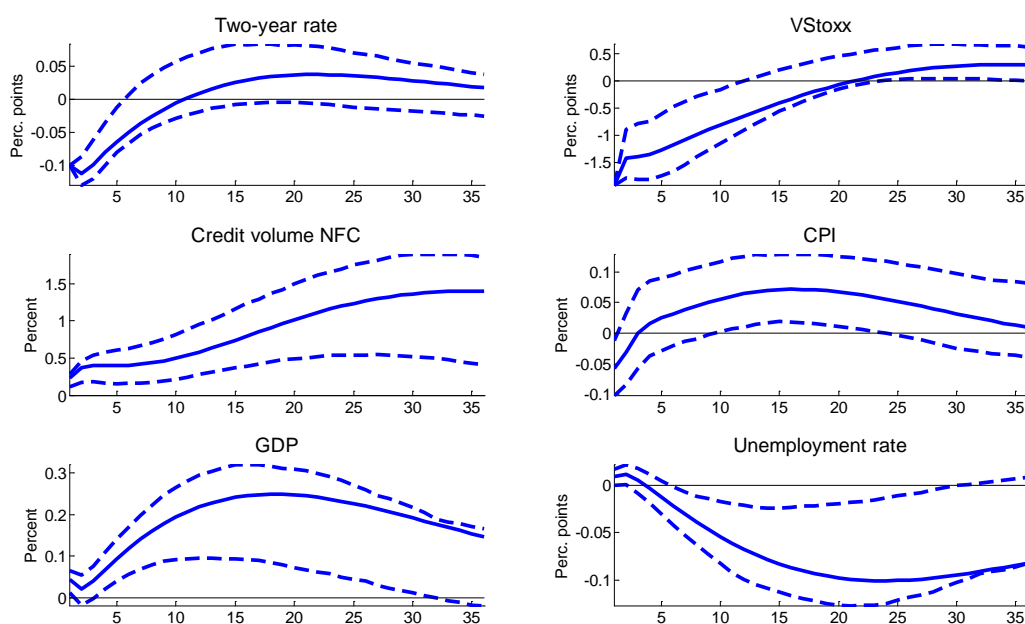
The top left panel shows that the two-year rate drops on impact. This impact effect holds by construction, given that the shock is scaled to lower the two-year rate by 10 basis points. The estimates show, however, that for about one year, the two-year rate remains below the level where it would have been without the surprise monetary expansion. It then slightly overshoots, before finally returning to the trend. The next panel shows that the monetary impulse leads to a significant and prolonged reduction in uncertainty on financial markets, as measured by the VStoxx. Moreover, the volume of credit to non-financial corporations gradually increases, reaching a peak after three years. This overall change in financial conditions is associated with a gradual increase in prices as well as in the real GDP, with output peaking after 18 months, slightly earlier than prices. The responses of output and inflation are mirrored in the unemployment rate, which reaches its minimum after approximately two years, before returning to trend.

All in all, the simulation shows that, on average, the unconventional policy measures employed by the ECB can significantly stimulate the macro-economy. In particular, a shock that lowers the two-year rate by 10 basis points leads to a peak increase of GDP and inflation of 0.2 percent and 0.05 percent, respectively. The unemployment rate drops by about one-tenth of a percentage point.

While these results generally confirm previous estimates of the effectiveness of unconventional monetary policy, there are several interesting differences. Specifically, the above-mentioned studies that measure the stance of monetary policy using central bank balance sheets rather than government bond yields typically find that output and prices respond more quickly, peak earlier (after about six months), and reach their maximum simultaneously. Instead, the results in this report show a more sluggish response of both variables, peaking only after roughly two years, and with output leading prices. Interestingly, the output and price dynamics implied by the estimates provided here are more similar to the behaviour of these variables following a 'standard' (conventional) monetary policy shock that works through changes in the policy rate. As such, the results lend some support to the idea that unconventional monetary policy can have similar effects as conventional interventions via changes in the policy rate.

**Figure 2: Macroeconomic effects of ECB policy in the euro area**

(In percent / percentage points deviations from trend)



**Source:** Own calculations. Solid lines are point estimates; dashed lines are 90 % confidence intervals.

#### 4.3. Effects on prices and inflation expectations

The primary mandate of the ECB is the maintenance of price stability over the medium term, which is quantified as a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) of close to, but below, 2%. Figure 2 shows that the ECB expansionary unconventional monetary policy impacts the euro area price level positively in the medium term. To further assess this finding, the study next evaluates the effects of unconventional monetary policy innovations on core consumer prices and on several measures of inflation expectations in the euro area. The assessment of the effects on inflation expectations is of particular importance, given that the ECB aims at firmly anchoring inflation expectations. Inflation expectations are crucial for effective monetary policy, as anchored expectations indicate public trust in the central bank's commitment to price stability. Moreover, anchored inflation expectations avoid self-fulfilling expectations of increasing or decreasing inflation.

The core price level, depicted in the upper left panel, is found to increase gradually and peak after approximately two years. The response of core inflation qualitatively mirrors the development of headline inflation after the unconventional monetary innovation. However, the effects are quantitatively smaller, not statistically significant, and materialize with a lag of up to one year, reflecting the higher degree of stickiness in core consumer prices.

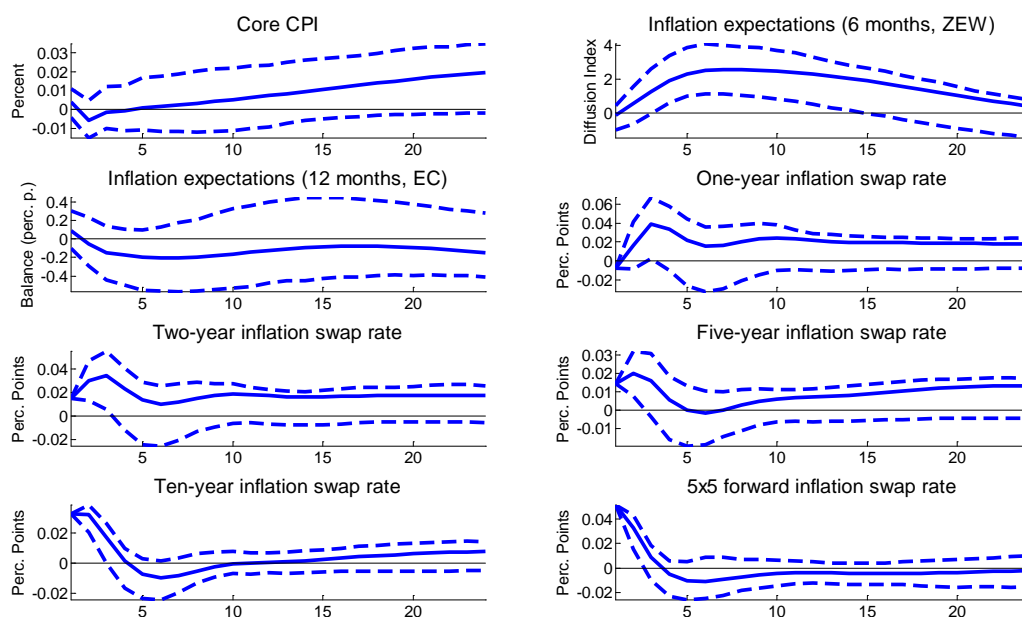
The next two panels show the responses of two survey-based measures of inflation expectations. The first is a survey conducted by the Centre for European Economic Research (ZEW) of financial market experts. The experts are asked for a qualitative assessment of their inflation expectations for the euro area over the next six months. The figure shows that, as headline prices increase, the difference between the share of analysts who expect a rising inflation rate and the share who anticipate a falling inflation rate widens significantly, by about two percentage points five months after the monetary policy intervention. The second measure of inflation expectations is taken from the European Commission consumer survey. It provides a qualitative assessment of respondents'

expectations about the development of consumer prices over the following twelve months. According to this measure, there is no statistically significant relation between ECB unconventional monetary policy and inflation expectations.

As the two survey-based react differently, the behaviour of financial market-based measures of inflation expectations are also analysed. The figure shows that all inflation swap rates increase in response to the expansionary policy shock. As expected, swap rates for shorter maturities increase by more than those for longer maturities and the effects last longer. From the impulse response of the five and ten-year swap rates, the five-year, five-year forward swap rate can be computed, which has been one of the ECB's preferred measures of inflation expectations in recent years. This indicator increases significantly on impact, by about five basis points, and for about two months. All in all, the results suggest that ECB unconventional monetary policy increased inflation expectations in the euro area, but, quantitatively, to only a rather modest extent.

**Figure 3: Effects of ECB policy on inflation in the euro area**

(In percent / percentage points deviations from trend)



**Source:** Own calculations. Solid lines are point estimates; dashed lines are 90 % confidence intervals.

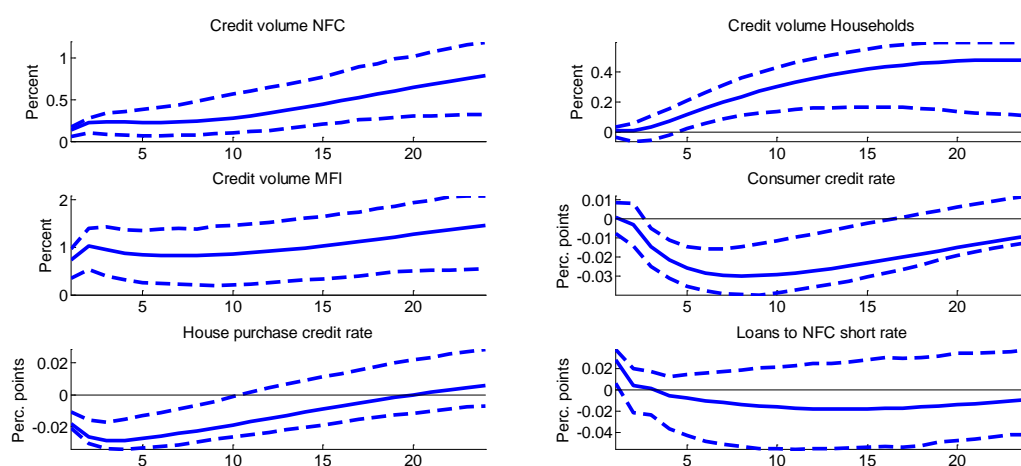
#### 4.4. Effects on credit volume and credit conditions

Next, the report evaluates in detail how unconventional monetary policy measures impact credit developments in the euro area. For comparison, the response of credit volume to non-financial corporations from the baseline specification in Figure 2 is repeated in the upper left panel. The remaining panels show the dynamics of further credit variables that replace this variable in the VAR specification. Credit volume to households, depicted in the upper right panel, is found to increase significantly about six month after the impulse and for two years. Consistent with previous evidence by Boeckx et al. (2014), the peak in credit to households is earlier than that of credit to non-financial corporations and considerably lower. In contrast, there is an immediate and long-lasting jump in credit to monetary and financial institutions (middle left panel). Lastly, except for the rate on loans to non-financial corporations, the increase in credit volume is matched by lower credit costs. The consumer

credit rate and the mortgage rate decline by approximately three basis points several months after the shock and only slowly return to trend. Overall, the results suggest that unconventional monetary policy by the ECB eases credit conditions and boosts credit volume in the euro area. These effects are economically relevant. However, it takes about two years for peak effects to materialize.

**Figure 4: Effects of ECB policy on credit in the euro area**

(In percent / percentage points deviations from trend)



**Source:** Own calculations. Solid lines are point estimates; dashed lines are 90 % confidence intervals.

#### 4.5. Effects on the exchange rate and interest rates

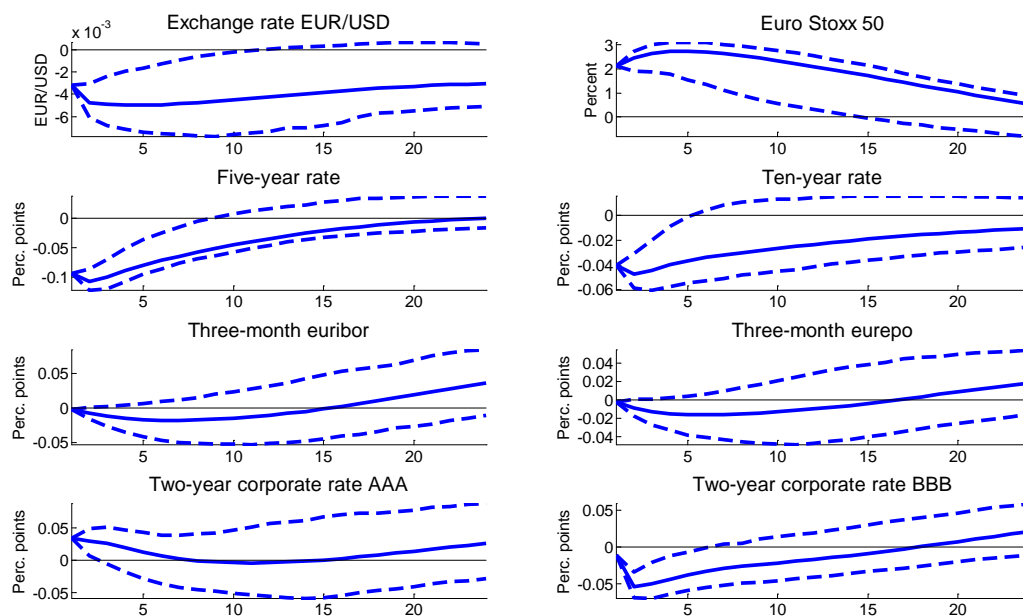
Lastly, the report further examines through which channels the unconventional monetary policy surprises are transmitted to economic activity, prices, and credit volumes. First, the top left panel shows the effect of the policy interventions on the EUR/USD exchange rate, as exchange rate depreciation is often believed to be an important channel through which expansionary monetary policy stimulates the real economy. However, in line with the results of Rogers et al. (2015), the impulse responses show that, on average, an expansionary unconventional monetary policy impulse leads to an appreciation of the euro. This finding can be explained by the fact that the estimates reflect the average effect of the unconventional monetary policy measures adopted since 2007, and hence those measures that were also taken during the European debt crisis. Thus, the effect on the exchange rate seems to reflect a reduction in break-up premia that led to an appreciation of the euro. The effect is relatively small. Conversely, there is a strong and long-lasting effect on equity prices. The Euro Stoxx 50 increases by nearly two percent on impact and remains above trend for about two years. This potentially stimulates the real economy through wealth effects, but also through reduced costs of equity financing for corporations.

Next, the responses of several bond yields and interest rates are analysed to assess how different financial market segments are affected by the policy surprises. The second row shows the effect on average government bond yields in the euro area (without Germany) for five-year and ten-year maturity, i.e. rates with longer maturity than the two-year rate in the baseline specification. Both rates decline significantly on impact, before slowly returning to their initial levels. Compared to the effect on the two-year rate, the impact effects are smaller, but the effects are more persistent for longer maturities. The third row shows the responses of the Euripo and the Euribor, two short-term interest rates strongly influenced by ECB conventional monetary policy. Neither rate responds significantly to the monetary innovation, suggesting that the monetary policy actions identified in the VAR

framework are orthogonal to conventional policy rate changes by the ECB, hence supporting the claim that the model identifies unconventional policy actions. Finally, the last row shows the response of two corporate bond yields with different credit ratings in order to analyse the impact of unconventional monetary policy on corporate financing costs in the capital markets. For the corporate bonds with AAA rating there is a short-lived increase in two-year yields, while the two-year yield on corporate bonds with a BBB rating drops for several months. Whereas the latter response is as expected and can affect the real economy through the easing of financing conditions for corporates, the former seems to reflect a reduction in safe haven demand, as the expansionary policy shock reduces risk aversion and uncertainty in financial markets.

**Figure 5: Transmission channels ECB policy in the euro area**

(In percent / percentage points deviations from trend)



**Source:** Own calculations. Solid lines are point estimates, dashed lines are 90 % confidence intervals.

## 5. CONCLUSIONS

The unconventional monetary policy expansions implemented by the ECB and other central banks have triggered an extensive public debate on the effectiveness and transmission of such policies. As a relatively unprecedented period for the conduct of monetary policy, considerable uncertainty exists about the ability of such monetary policy actions to stimulate the economy, exert upward pressure on inflation expectations, and help the euro area exit a long period of unsatisfactory growth.

This report first discusses recent empirical research on the effectiveness and transmission of unconventional monetary policy by the ECB. Then, compared to the existing literature, the empirical analysis gives particular emphasis to the announcements of the monetary interventions, rather than to the actual implementations of such measures through variations in the ECB balance sheet. Given the important role played by communication in the ability of monetary policy to impact agents' behaviours and, ultimately, the real economy, the analysis of announcements of unconventional monetary policy should play an important part in the empirical analysis of the effectiveness of such policies.

The report finds that, on average, the unconventional monetary policy interventions were effective both at stimulating the real economy and at exerting upward pressure on inflation and several measures of inflation expectations. It finds that the effects do not differ substantially from what the literature already documents for the period of conventional monetary policy. It also shows that the stimuli are transmitted to the real economy mainly through variations in public and private interest rates and credit volumes.

However, a word of caution: the results should not be necessarily interpreted as supporting the recent extension of the asset purchasing program. Sovereign bond yields in the euro area are currently lower than they were during most of the analysed sample period. Thus, there is potentially less room for beneficial macroeconomic effects from non-standard monetary policy measures, as the room for lowering bond yields further is potentially smaller.

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## NOTES



# The effectiveness of the ECB's Asset Purchase Programme

Maria DEMERTZIS, Guntram B. WOLFF

## IN-DEPTH ANALYSIS

### Abstract

The general macroeconomic situation and weak inflation dynamics justified quantitative easing (QE) in the euro area. Doubts have emerged about its effectiveness as inflation numbers have remained weak. However, one does not know where inflation would have been without QE and the still large slack in the economy suggests that inflation numbers may increase only in a few years. Important channels through which QE operates are proving effective: a weaker exchange rate, lower long-term yields, a stronger stock market. Investment and housing have somewhat increased. Banks have not shed sovereign debt from their balance sheets at a significant scale. Bank profitability is squeezed by QE but we do not see a generalized financial stability risk. The expansion of the Public Sector Purchase Programme had no visible effect on any variable. Further monetary policy action is unlikely to carry strong benefits.

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## EXECUTIVE SUMMARY

- Central banks resort to quantitative easing when the normal monetary policy tool of lowering the short-term interest rate is constrained. This constraint typically arises from the zero-lower bound, i.e. the reluctance to cut nominal rates below zero. This can result in a real interest rate that, while negative, is still too high for an economy to quickly find its way back to full employment and equilibrium. Many indicators such as the low inflation rate, high unemployment rates, the current account surplus and high savings compared to weak investment suggest that the euro area is in such a situation.
- Quantitative easing attempts to address this situation through three different channels: lowering long-term interest rates - improving investment conditions and dis-incentivising savings - (interest rate channel), purchasing relatively safe long-term assets thereby driving investors into riskier investments (portfolio re-balancing channel), and weakening the exchange rate (exchange rate channel) .
- The main criticisms of the European Central Bank's sovereign QE programme are that it is (i) unlawful in a monetary union without a joint treasury; (ii) ineffective and/or unnecessary; and (iii) associated with negative side effects in terms of financial stability and inequality. The design of the programme has dealt with the first criticism. This briefing focuses on the second criticism.
- We argue that the ECB's QE programme is necessary given the general macroeconomic situation and the continuing weak inflation dynamics in the euro area. But the continuously weak inflation dynamics have raised doubts about its effectiveness.
- Assessing the effectiveness of QE is difficult without a counter-factual, but we show that QE had a strong effect on the exchange rate channel, weakening the euro-dollar exchange rate substantially. We also show that long-term interest rates fell substantially in anticipation of the programme. In relation to portfolio rebalancing, we show that banks have not shed sovereign debt from their balance sheets at a significant scale so the purchases have been from different parties. We show that investment has picked up slightly, housing markets in some countries have gained strength but credit creation is only slightly increasing. Finally, we show that the expansion of the ECB's Public Sector Purchase Programme in March 2016 has had no visible effect on any variable.
- We document that QE has reduced the profitability of banks by narrowing their margins. The recent corporate QE, while lowering corporate yields, is further reducing margins for banks.
- We argue that further monetary policy measures are unlikely to bring strong benefits. One sensible avenue for monetary policy could be to enact the sovereign bond purchases from banks in order to reduce the exposure of banks to sovereign debt. More important, however, is government action. In particular, reducing the debt overhang, tackling banking fragilities and introducing reforms to create new business opportunities and fiscal measures in countries with fiscal space would help speed the recovery and increase inflation.

# 1. INTRODUCTION

The decision to start quantitative easing in the euro area has been highly controversial. After a long period of deliberation, the European Central Bank decided in January 2015 on a sovereign QE programme that was implemented from March 2015 with monthly purchases of €44 billion. The amount purchased was increased in March 2016.

The controversy over QE now is less about whether the ECB is empowered to use a monetary policy instrument that most central banks in advanced economies have used. It is rather about whether QE is effective as a tool to increase inflation to the target. In addition, there is increasing concern that QE and other non-conventional monetary policy measures produce unintended consequences in terms of financial instability or in terms of wealth inequality.

Central banks resort to QE when the nominal short-term interest rate falls to zero. The so-called zero lower bound (ZLB) prevents central banks from reducing the nominal interest rate below zero. Central banks cannot lower the rate much below zero because households and corporations would shift their savings to cash, which would generate a return above the rate set by the central bank.

When the short-term nominal interest rate reaches zero, the real interest rate of the economy is set by the inflation rate. If inflation is low, this real rate may be well above the level at which the economy returns to equilibrium, unemployment is significantly reduced and output reaches its potential. A low inflation environment with the nominal rate at zero therefore risks creating an economy with high and sustained unemployment.

Quantitative easing attempts to address this problem by lowering the nominal long-term interest rate and by pushing investors into riskier asset classes. The lower long-term interest rate should encourage savers to save less and shift towards consumption, and investors to take advantage of the lower long-term funding cost to fund investment (which is in term more profitable). Moreover, by purchasing sovereign bonds, the central bank forces investors to buy other, riskier assets, which in turn should stimulate activity. The increased liquidity should weaken the exchange rate thereby supporting the recovery. Finally, more targeted QE can remove weak assets from balance sheets, contributing to deleveraging (Woodford, 2012).

But the effectiveness of monetary policy depends on economic circumstances. While arguably inflation is a monetary phenomenon in the long run, the effectiveness of monetary measures in the short to medium run depends on broader macroeconomic circumstances.

The euro area suffered from a number of shocks and a weak starting position that led to particularly strong disinflationary pressures. In principle, the process of disinflation – itself the result of poor aggregate demand conditions – that the euro area is experiencing is the result of the following factors:

- Deleveraging: most countries have at least one sector in their economy that built up levels of excessive debt prior to 2008. Reducing the debt overhang weakens demand and as a consequence there is downward pressure on prices. Debt deleveraging in the euro area has been undertaken comparatively slowly (Ahearne and Wolff, 2012; Ruscher and Wolff, 2012).
- A fragile banking system is a further factor hampering the effective transmission of monetary policy to the euro area. Mody and Wolff (2015) show the significant weaknesses of the euro area's banks and in particular the still high non-performing exposures. The currently ongoing resolution of banking problems in Italy illustrates the slow clean-up of the banks. Schoenmaker and Véron (2016) argue

that the new European banking supervisor is tough and addresses the weaknesses, but that problems have not yet been fully resolved.

- Risks and uncertainty: a variety of economic, regulatory and geopolitical risks have emerged across the euro area and beyond. Banks are reluctant to invest in new activities, and corporates and households are reining in consumption and investment. The risk of the break-up of the euro area had one of the biggest negative effects on confidence and investment. The current uncertainty on Brexit could be a further factor dampening confidence
- Negative feedback between low growth/inflation and debt: The process of deleveraging itself becomes increasingly difficult as it progresses. The decline in output and prices that deleveraging causes reduces the scope for further deleveraging. It is exactly for this reason that those countries with the greatest deleveraging needs find it the hardest to reduce their debts.
- Finally, fiscal and structural policies play a central role in supporting growth and thereby helping the ECB to achieve its inflation target. In the euro area, fiscal policies have often dampened demand or have turned slightly expansionary only this year. In turn, progress with structural reforms that could provide incentives for new investment has been slow in the euro area's biggest three economies. Arguably, monetary policy has been insufficiently supported by other policies (Fratzscher *et al*, 2016).

The euro area was in need of a quantitative easing programme. Growth was low, inflation dynamics were weak with repeated downward revisions, savings were high and investment was meagre, falling well below pre-crisis investment trends. Overall, the signs of demand weakness were overwhelming pointing to a need for more stimulating monetary policies. But how effective has the ECB's QE programme been in stimulating demand and increasing inflation? Would increasing QE support the euro area or is the marginal benefit of QE limited? Has QE introduced new risks to the economy? We tackle these questions by reviewing the decisions behind QE, by discussing the macroeconomic implications of QE, and the channels through which it is transmitted, and by assessing the potential risks arising from aggressive monetary policy.

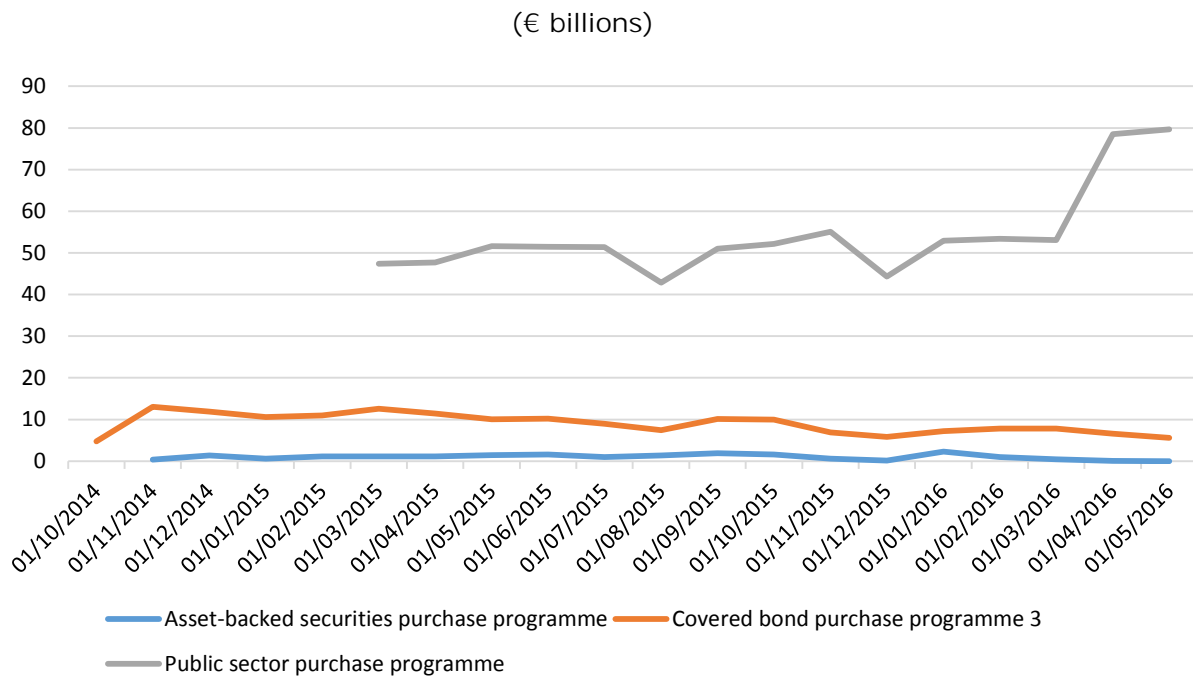
## 2. THE ECB'S UNCONVENTIONAL MONETARY POLICY: WHAT IS IT AND WHAT DOES IT DO?

On 22 January 2015 the European Central Bank (ECB) announced the Public Sector Purchase Programme (PSPP), an expansion of the Asset Purchase Programme (APP). Under the PSPP, the Eurosystem started in March 2015 to purchase sovereign bonds from euro-area governments and debt securities from European institutions and national agencies. This new programme supplemented two other asset-purchase programmes already in place within the APP: the Asset-Backed Securities Purchase Programme (ABSPP, which started in November 2014) and the third Covered Bond Purchase Programme (CBPP3, which started in October 2014).

On 3 December 2015, ECB president Mario Draghi announced an extension of the PSPP. While it was initially planned to last until at least September 2016, it was extended until at least March 2017. President Draghi said that the asset purchase programme would continue *“until we see a sustained convergence towards our objective of a rate of inflation which is below but close to 2 percent”*. Additionally, regional and local government bonds were added to the list of eligible assets for purchase.

Finally, on 10 March 2016 the ECB announced a further expansion of the APP: the combined monthly amount purchased was increased from €60 billion to €80 billion, and the new Corporate Sector Purchase Programme (CSPP), which involves the purchase of investment-grade euro-denominated bonds issued by non-bank corporations established in the euro area, was added. Details of the amount of corporate bonds to be purchased every month were not given, but the ECB indicated that the CSPP would not lead to a higher amount of monthly purchases under the APP as a whole, thereby indicating that corporate bond purchases will be made at the expense of one or more of the three other programmes already in place. Figure 1 plots the monthly volumes of assets purchased so far under the three existing programmes: the ECB has purchased about €1 billion per month under the ABSPP, almost €10 billion under CBPP3, and €50 billion under the PSPP (before this was raised to about €79 billion in April 2016).

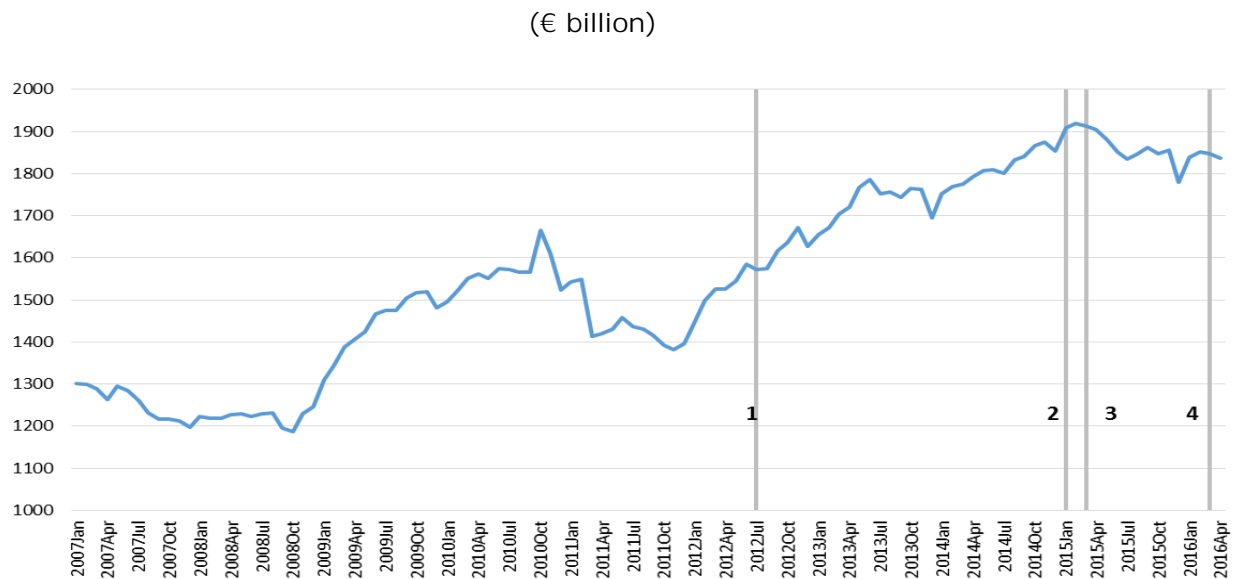
**Figure 1: Monthly purchases under the three APP of the ECB**



**Source:** European Central Bank

Interestingly, Hüttl and Merler (2016) have shown that the increase in the Eurosystem's holdings of euro-area government bonds has not been matched by a corresponding reduction in the amounts of these bonds on euro-area banks' balance sheets. This is corroborated by ECB data on bank balance sheets, which shows that bank government bond holdings have gone down by €82 billion since the start of the PSPP, compared to the €726 billion currently being held by the Eurosystem (see Figure 2). This suggests that government bonds purchased under the PSPP have mostly been purchased from non-bank entities and foreign banks.

**Figure 2: Government bond holdings of euro area monetary and financial institutions**

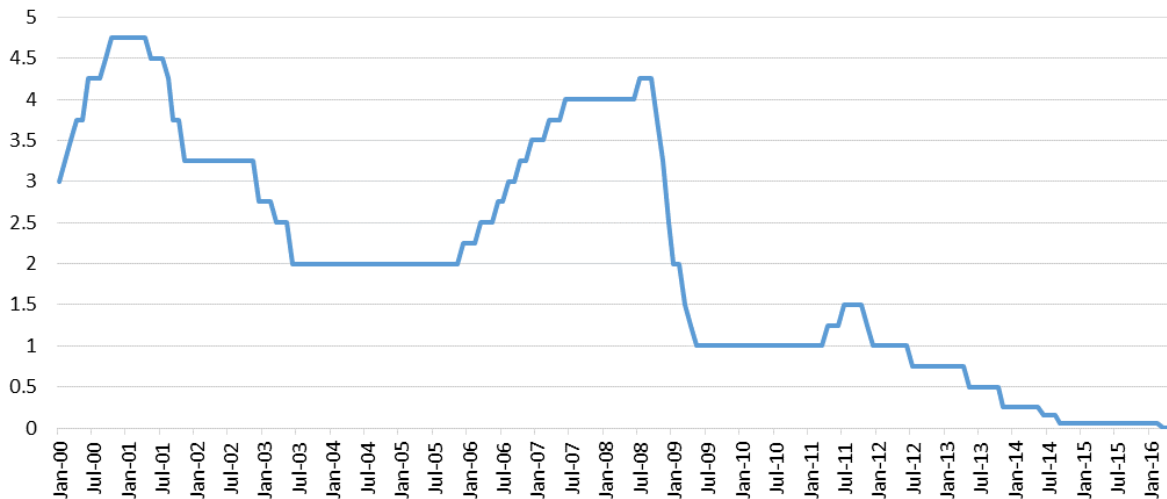


**Source:** European Central Bank

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

Figure 3 shows that the ECB's main refinancing operations rate was gradually lowered in response to the Great Recession, until it reached zero in March 2016.

**Figure 3: The European Central Bank Main Refinancing Operations Rate (%)**



**Source:** European Central Bank

However, QE can become less effective as the purchase programme continues. It can also increase inequality (Claeys, Darvas and Leandro, 2015) and undermine financial stability (Claeys and Darvas, 2015), especially as the policy continues to be implemented over a longer period. Additionally, the untested nature of such unconventional monetary policies makes it much harder to calibrate them in order to obtain the desired increase in aggregate demand, especially if they go on for a long period.



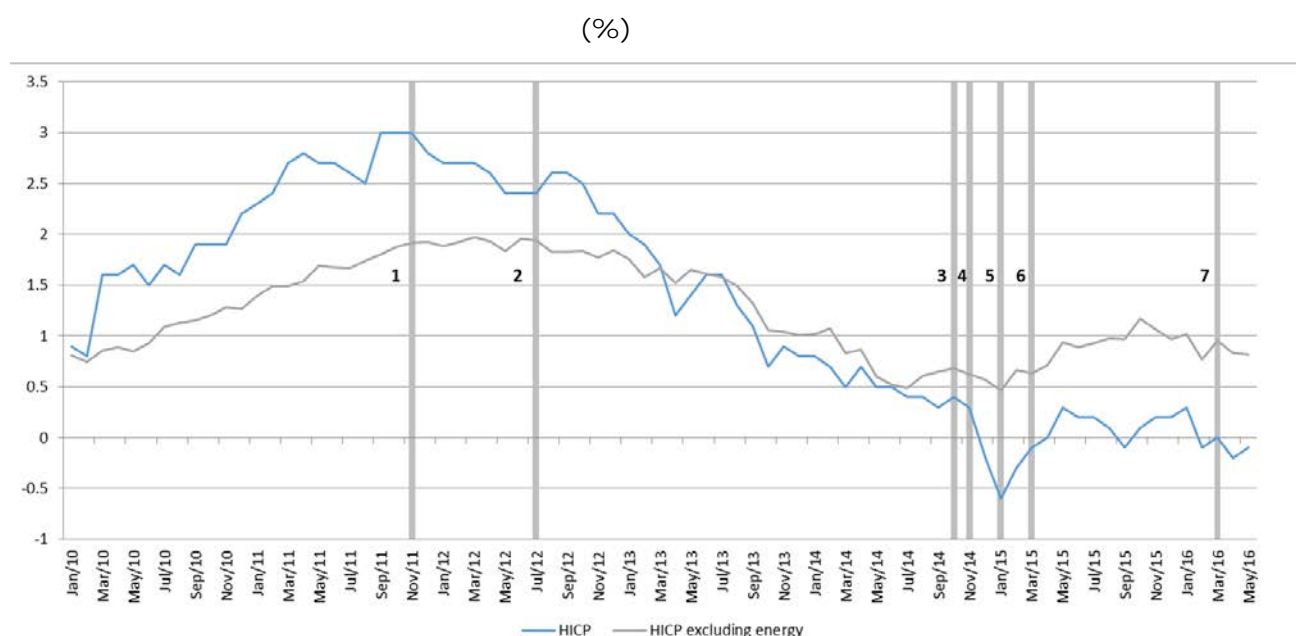
### 3. THE EFFECTS OF QUANTITATIVE EASING

Analysing the effects of QE is a difficult task. Its effectiveness can only be assessed against a benchmark that is unknown, the so-called counterfactual. What would have the developments in inflation, employment and GDP been if the ECB had not embarked on QE? In this section, we show simple charts documenting developments in key macroeconomic and financial variables around the dates of major decisions by the ECB on both QE and the Outright Monetary Transactions (OMT) programme.

#### 3.1 Inflation and inflation expectations

January 2015, the month of the announcement of the PSPP, was the month with the lowest rate of inflation in the euro area ever, -0.6 percent (Figure 4). Thereafter, year-on-year inflation reached a peak of 0.3 percent in May 2015, the third month of government bond purchases. Since then, monthly inflation has drifted between -0.1 percent and 0.3 percent, falling to -0.2 percent in April 2016, and -0.1 percent in May. This is still far from the ECB's target of close to but below 2 percent, and data for recent months points to a deteriorating trend. Core inflation is currently higher than overall inflation because energy prices are falling, but it is still below 1 percent, though the start of the PSPP does seem to have had a short-lived positive effect.

**Figure 4: Euro area overall HICP annual growth rate**



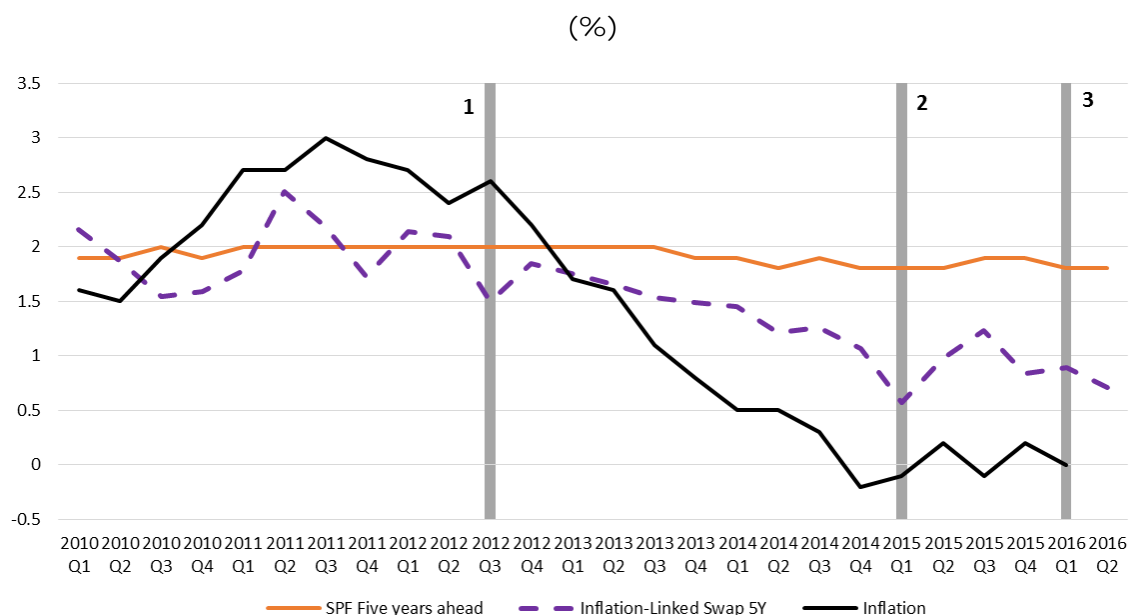
**Source:** European Central Bank

**Note:** 1) CBPP2 2) "Whatever it takes" 3) CBPP3 4) ABSPP 5) PSPP Announcement 6) Start of PSPP 7) CSPP and expansion of PSPP

In terms of perceptions, the information that expectations convey is mixed. Figure 5 shows long-term expectations (at the 5-year horizon) from two different sources: a survey of professional forecasters and market (swap rates). The survey figures show that expectations have been and remain both very stable as well as at the level of the ECB's inflation objective, below but close to 2 per cent. This indicates that professional forecasters believe that given enough time, inflation will return to the definition of price stability. However, market expectations, at the same horizon, show something different. The 5-year inflation-linked swap rate shows a clear declining trend (Figure 5). We interpret this difference to mean two things: first, as these two series diverge, this signals that confidence is starting to wane. Second, the existence of this persistent wedge, visible also recently in the US, might be a reflection of increased uncertainty.

Market expectations are quicker to follow actual inflation (even at longer horizons) because they attempt to also capture perceptions about risk and therefore hedge against them. Survey expectations on the other hand, reflect an opinion about inflation reaching its target in the relevant horizon and are therefore arguably more a measure of policymakers' ability to deliver.

**Figure 5: Inflation expectations: Survey of Professional Forecasters and 5-year Inflation Linked Swap rates**



**Source:** European Central Bank and Thomson Reuters Datastream

**Note:** 1) "Whatever it takes" 2) Announcement and start of PSPP 3) CSPP and expansion of PSPP

A formal measure of credibility<sup>1</sup> shows that both the Federal Reserve and the ECB have been able to remain credible during the financial crisis that started in 2008. However, while the Fed has only seen a temporary decrease in credibility that was recovered almost in full subsequently, the ECB has not been able to regain the credibility it has lost. Arguably since inflation in the two areas has been very similar in the last eight years, the difference in the way the credibility of the Fed and ECB has changed is arguably the result of the different macroeconomic policy mixes applied. Therefore, also factors largely outside the control of the ECB have affected its credibility.

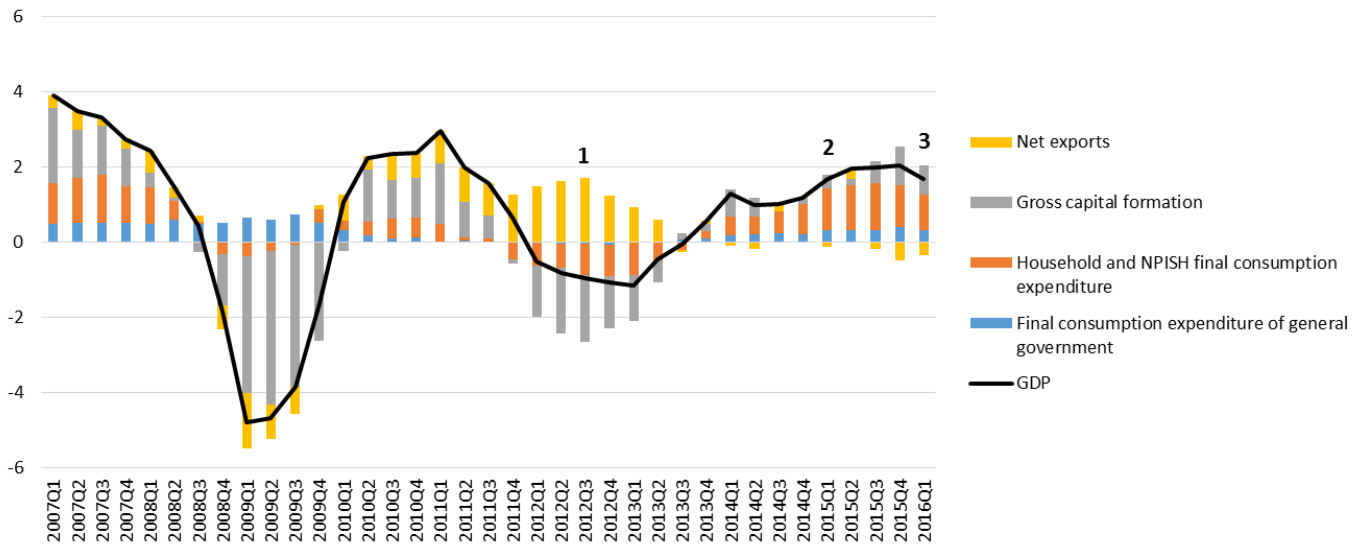
### 3.2 The real effects of QE: GDP, investment and unemployment

Euro-area real GDP fell for seven consecutive quarters starting in 2012: the second dip of the euro area's double-dip recession (Figure 6). Since then, GDP has grown moderately, reaching a peak of around 2 percent following the start of the ECB's PSPP. The latest data shows a drop in GDP growth to 1.7 percent during 2016 Q1. Household consumption, investment and to a lesser extent fiscal expenditure have been the main drivers of growth in the last quarters.

<sup>1</sup> Demertzis and Viegli, (2016), Are Central Bank(er)s still credible? Bruegel Blog, June 2016.

**Figure 6: Contributions to real Gross Domestic Product growth**

(growth contribution, percentage points)



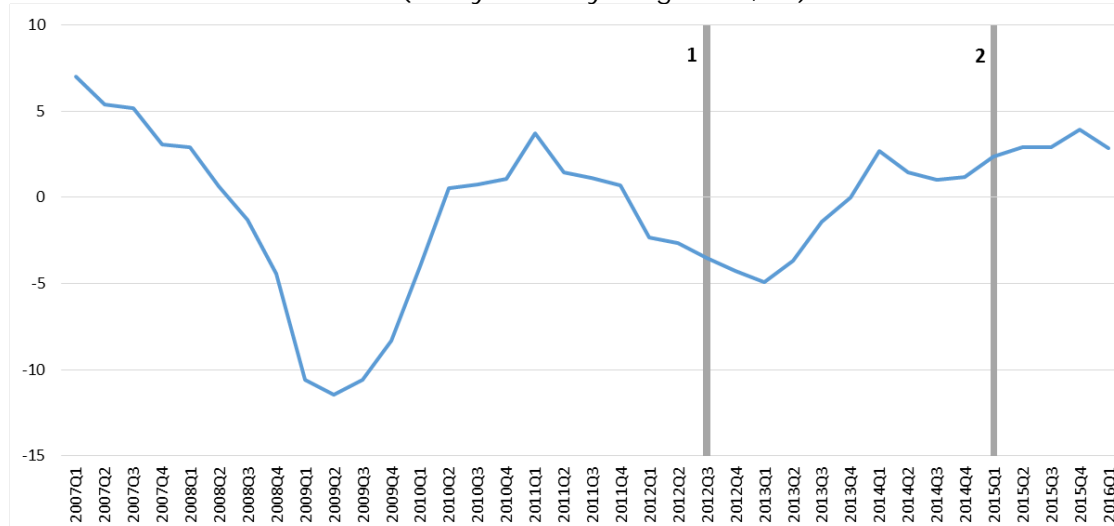
**Source:** Eurostat

**Note:** 1) "Whatever it takes" 2) Announcement and start of PSPP 3) CSPP and expansion of PSPP

For the recovery to be stronger, a bigger increase in investment would be desirable. Gross capital formation has picked up slightly after a period of continuous decline throughout 2012 and 2013 (Figure 7). Annual investment growth has been positive since 2014 Q1, reaching a peak of 3.9 percent in 2015 Q4, the penultimate quarter of available data. It is unclear whether the start of the PSPP had any impact.

**Figure 7: Euro area Gross Fixed Capital Formation**

(real year-on-year growth, %)

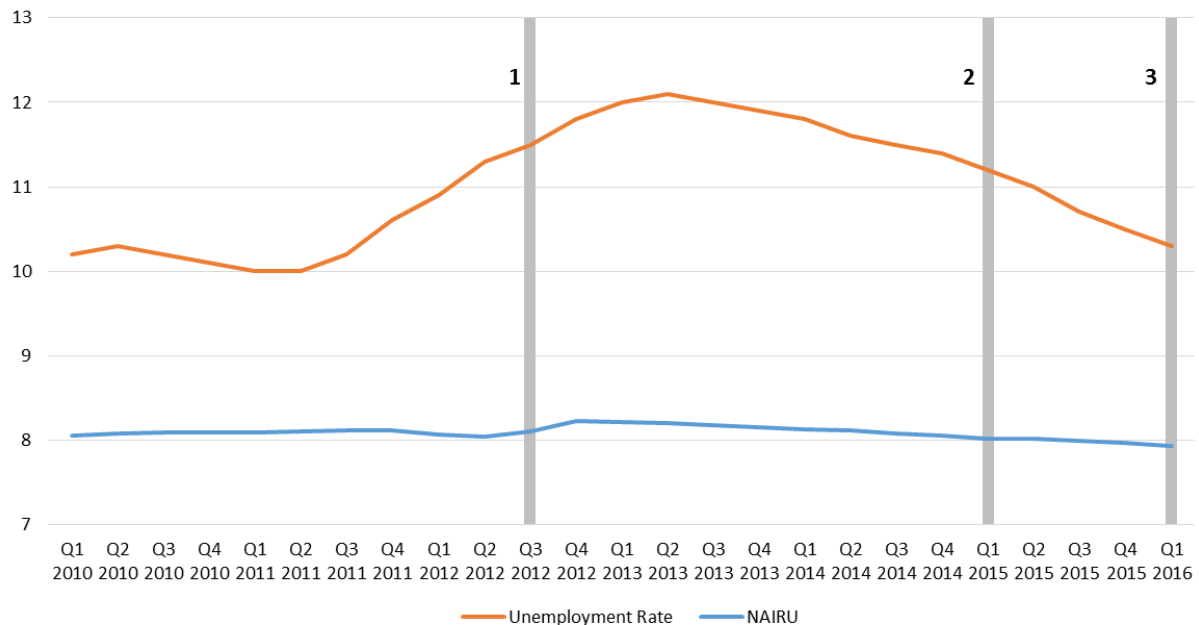


**Source:** Eurostat

**Note:** 1) "Whatever it takes" 2) Announcement and start of PSPP

One possible explanation of why expansionary monetary policy has had little visible effect on inflation is the significant slack in the economy. Euro-area unemployment has steadily but slowly decreased from its peak of 12.1 percent in the second quarter of 2013, reaching 10.3 percent in Q1 2016 (Figure 8). Following the announcement and start of the PSPP, the unemployment rate continued its gradual decrease but there does not seem to have been a significant effect from QE on the pace of unemployment reduction. The unemployment rate is still very high compared to the non-accelerating inflation rate of unemployment (NAIRU), the theoretical level of unemployment below which inflation would start accelerating.

**Figure 8: Euro area Unemployment**  
(%)



**Source:** Eurostat and Oxford Economics

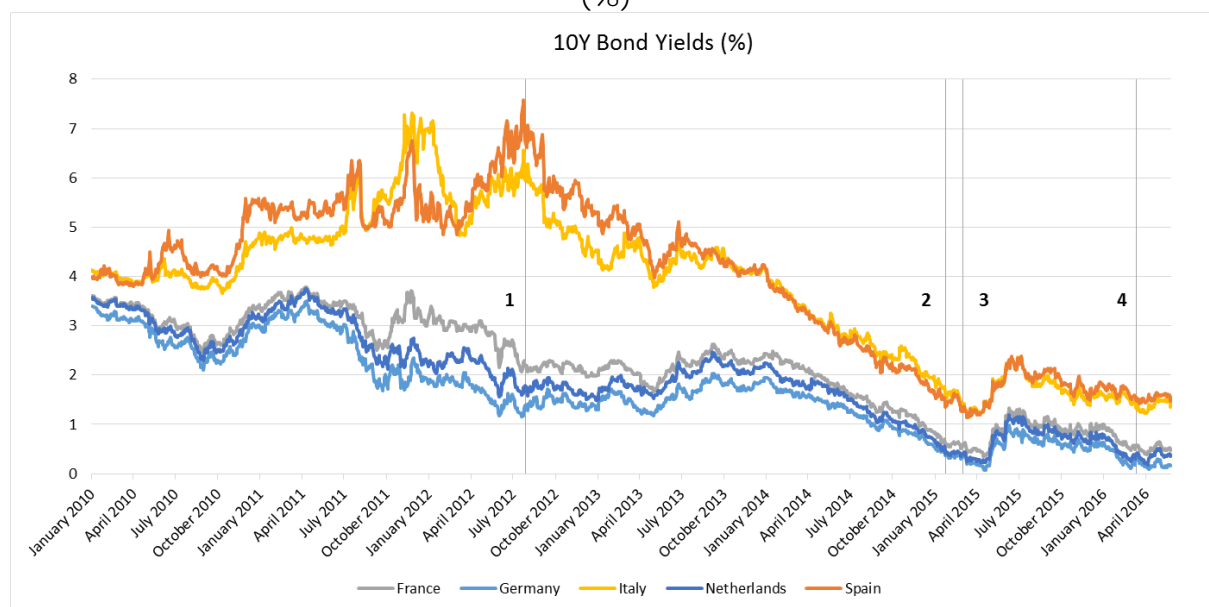
**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

## 4. THE CHANNELS

### 4.1 Bond yields

Euro-area government bond yields shot up during the sovereign debt crisis of 2011, especially in the periphery countries (in Spain and Italy, 10-year bond yields reached 7.6 percent and 6.5 percent respectively; Figure 9). The highest values were attained in summer 2012, until President Draghi's famous "whatever it takes" speech. Since then bond yields have steadily reduced except for a temporary increase in the summer of 2015 during the Greek crisis. In fact, this increase in bond yields coincided with the first few months of the PSPP's operation. There has since been a gradual reduction in yields.

**Figure 9: 10-year government bond yields**  
(%)

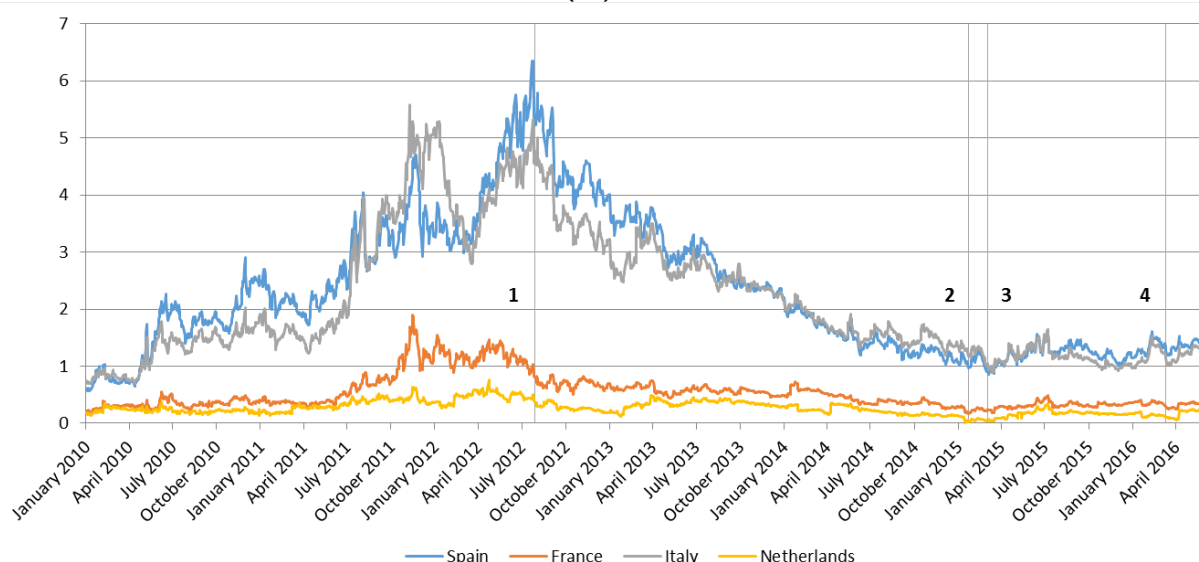


**Source:** Thomson Reuters

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

While bond yields declined both in the core and periphery countries, periphery bond yields fell faster after Draghi's July 2012 "whatever it takes" speech, thus compressing the spreads against German bonds (Figure 10). However, the announcement and start of the PSPP did not seem to have a very strong effect on these spreads.

**Figure 10: 10-year government bond spreads against Germany (%)**



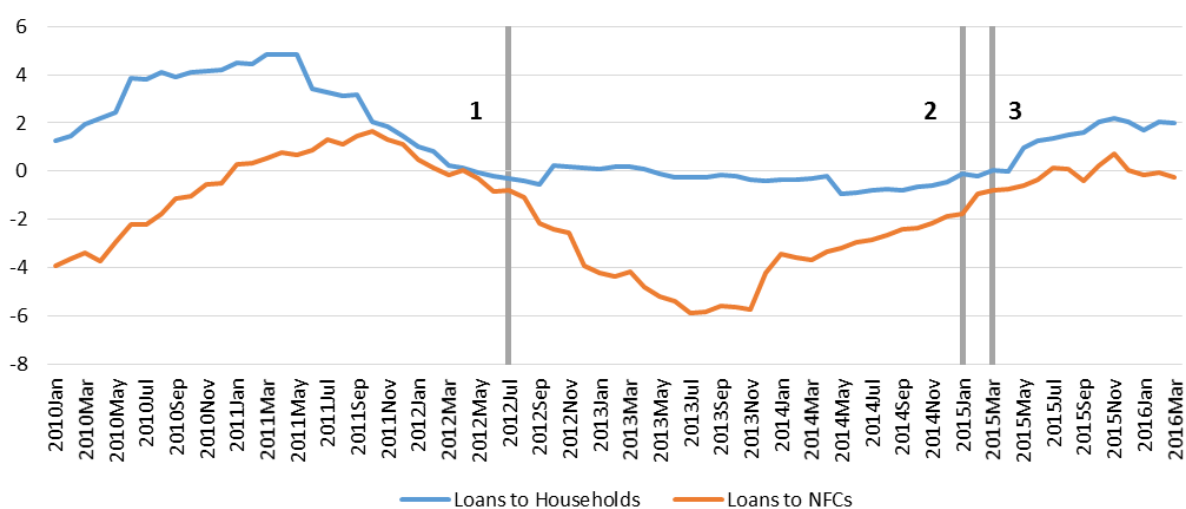
**Source:** Thomson Reuters

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

## 4.2 Lending

We observed earlier that consumption and investment are picking up and are the two main contributors to GDP growth. The link to monetary policy comes through credit creation. Figure 11 shows that lending to non-financial corporations fell steadily since 2012, before it stabilised in the second half of 2015 following the start of the PSPP. Lending to households has held up more robustly, increasing since the announcement of the PSPP from stagnation to a yearly growth rate of about 2 percent. This credit was mostly in the form of mortgages, which was helped by the stabilisation of, or even the increase in, house prices. Credit, therefore, has been important in reversing and sustaining the contributions of consumption and investment to growth.

**Figure 11: Loans to households and non-financial corporations (year-on-year growth, %)**



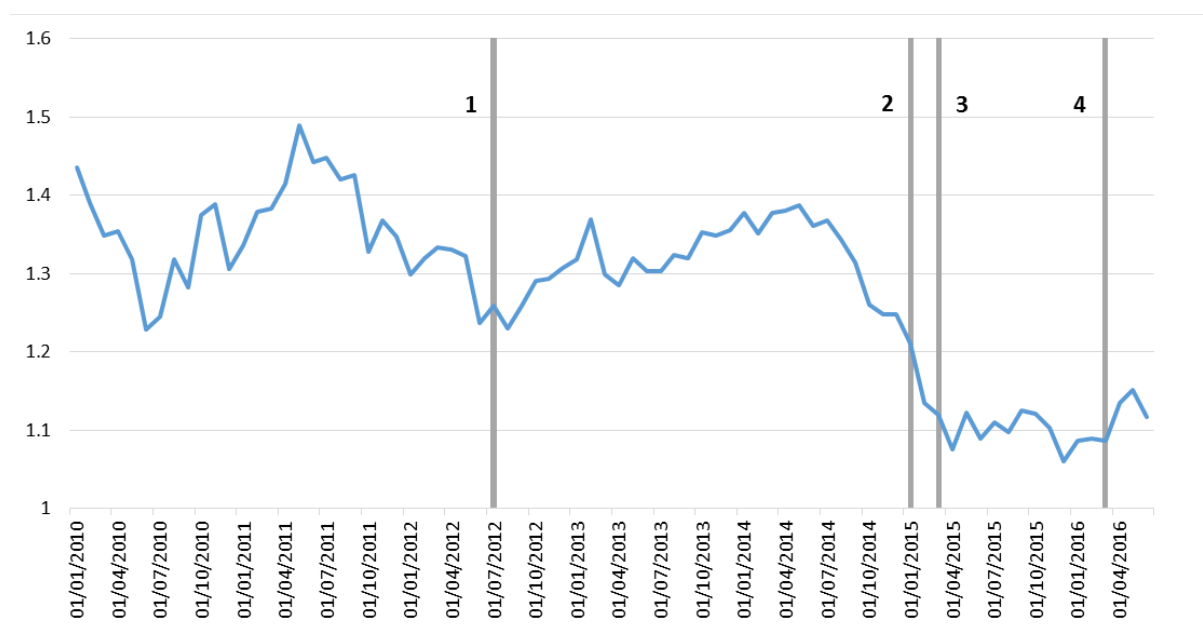
**Source:** European Central Bank

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP

### 4.3 Exchange Rate

QE has likely had a significant effect on the exchange rate. The USD/EUR exchange rate is now significantly weaker (Figure 12). Compared to the peak in 2014, the exchange rate is now down from almost 1.4 to 1.12. Most of the decline happened prior to the official announcement of the PSPP, but in line with discussions about when and how the ECB would start the PSPP. One factor that has significantly affected the exchange rate during the last year is monetary policy normalisation in the United States. The divergence in monetary policy across the Atlantic leads to capital flows which put downwards pressure on the euro area's effective exchange rate. A weaker exchange rate facilitates exports and contributes to GDP by making domestic goods relatively cheaper than foreign goods.

**Figure 12: USD/EUR exchange rate**



**Source:** Thomson Reuters Datastream

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

### 4.4 Portfolio rebalancing

Portfolio rebalancing is perhaps the hardest QE transmission channel to document. In principle, one would want to observe that sellers of government bonds to the ECB are then forced to allocate cash to riskier assets. In the euro area, it is important to note that the ECB's purchases of government bonds from the balance sheets of banks have been limited (Figure 12 and Table 1). Table 1 shows that only Spanish banks have sold government bonds significantly. This is much less the case for France, Italy and Germany, where other residents or even non-residents have sold government bonds.

**Table 1: Sovereign debt holdings between end-2014 and end- 2015 by institutional sector** (changes in percentage points)

	Resident Banks	Central Bank	Other Public Institutions	Other Residents	Non-Residents
Spain	-6.1%	4.6%	-0.1%	-2.1%	3.7%
France	-0.7%	6.4%	0.0%	-3.3%	-2.4%
Italy	-1.2%	3.4%	0.0%	-2.8%	0.6%
Germany*	-0.3%	1.6%	0.0%	2.0%	-3.3%

**Source:** Hüttl and Merler (2016), Bruegel sovereign bond holdings dataset; \*Germany does not provide all the data up to Q4 2015, so we calculate the % point change between Q4 2014 and Q2 2015 instead.

This suggests that portfolio rebalancing should come primarily from non-banks. Unfortunately, we do not have good data readily available on these non-banks.



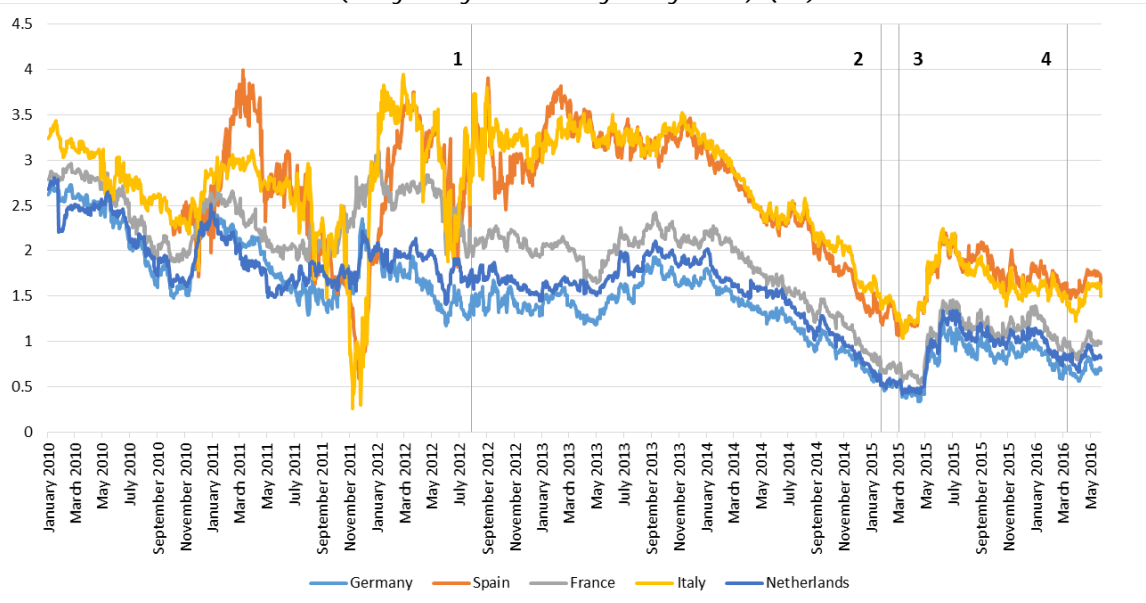
## 5. THE RISKS OF CURRENT MONETARY POLICY

Monetary policy, in its conventional form, affects bank balance sheets through two channels. First, are low interest rates leading banks to search for yield? This implies that they might take bigger risks by lending to riskier projects. Arguably, this is unlikely to happen while the levels of private debts remain high. The demand for new credit is unlikely to pick up before the levels of private debt reduce to lower and more sustainable levels. At the same time, banks are still in the process of repairing their balance sheets and are seeking to conform to new regulatory requirements.

The second channel is banks' profits. Banks want to pass falling interest rates through to deposit rates. This means that their cost of funding reduces, which, all things being equal, increases their profits. As banks see their profits increase they are less likely to invest in risky projects because they have more to lose. However, the situation is different when deposits rates are close to zero. In reality banks are very reluctant to reduce these rates to negative numbers, effectively charging depositors, because that would encourage them to withdraw their money. As interest rates reduce, banks instead see a squeeze on their profits, which further restricts bank business. In turn this undermines the creation of new credit and the funding of new investments.

Unconventional monetary policy, in the form of QE, aims directly at reducing the long-term yield of assets. The term spread, or the spread between long- and short-term bond yields for a given country, should thus have declined following the start of the PSPP. As Figure 13 shows, the term spread fell from very high levels in the periphery countries during 2013 and 2014, but increased after the announcement and start of QE. The explanation might be the uncertainty over negotiations with Greece in summer 2015. As this subsided, the term spread also fell. The term spread appears to have increased a little since the ECB announcement of the expansion of the PSPP in March 2016, under which monthly purchases were increased and corporate bonds were included.

**Figure 13: Government bond term spreads**  
(10 year yields – 1 year yields) (%)



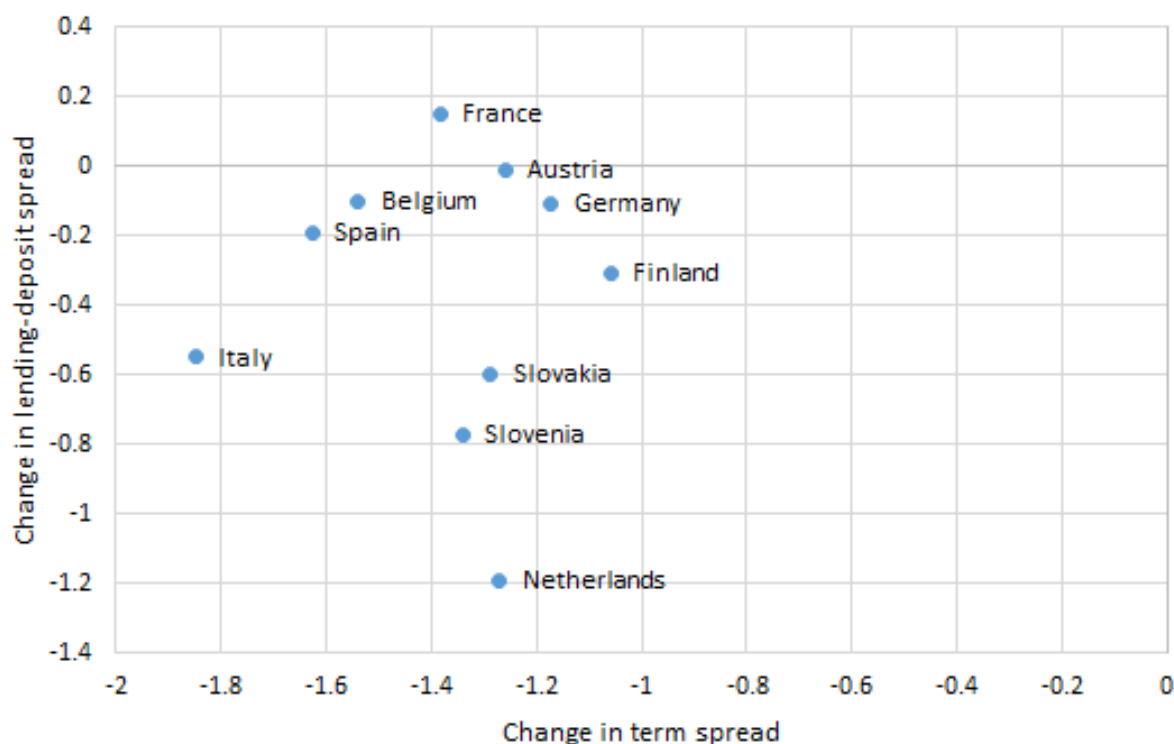
**Source:** Thomson Reuters

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

Overall, a fall in the term premium affects banks' profitability to the extent that banks transform short-term deposits into long-term loans. Figure 14 shows the positive

correlation between term spreads and bank lending spreads, suggesting that QE does influence profitability.

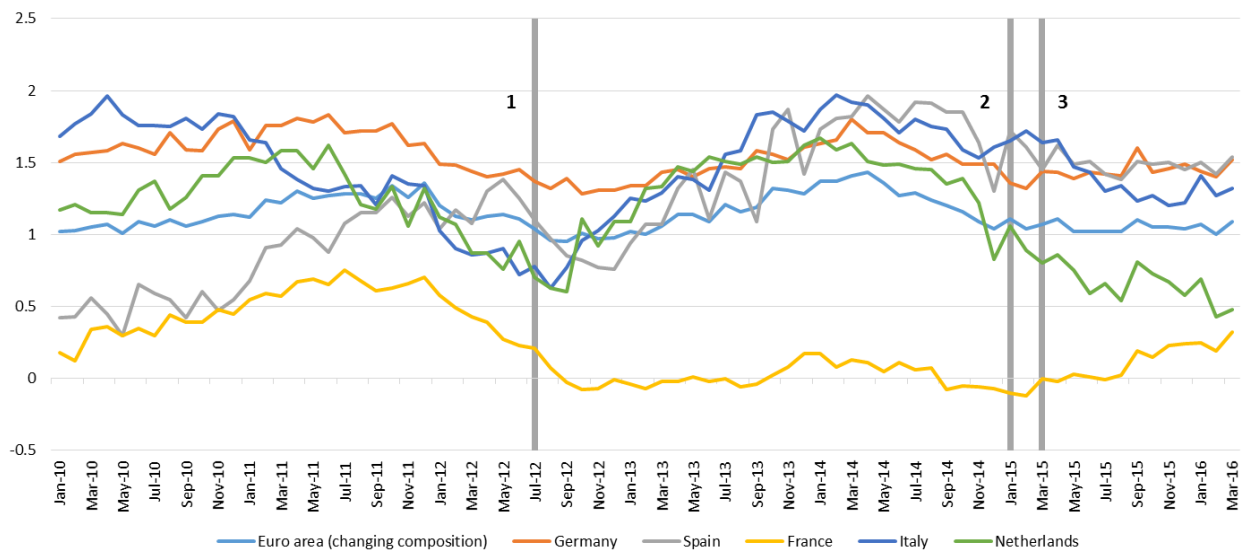
**Figure 14: Changes in the term spread and the lending-deposit spread between January 2014 and April 2016 (%)**



**Source:** Papadia and Wolff (2016) (updated), European Central Bank and Thomson Reuters Datastream

Furthermore, Figure 15 shows that the spread between lending and deposit rates in the euro area as a whole has been reducing since the beginning of 2014. While these developments reflect lower lending rates which are helpful in an economy with little lending, they also indicate declining bank profitability. This can be a problem if these conditions remain for a long period. In fact, the lending-deposit spread of France's banks has been very low for four years now, and below zero at times.

**Figure 15: Lending-deposit rate spread**  
(%)

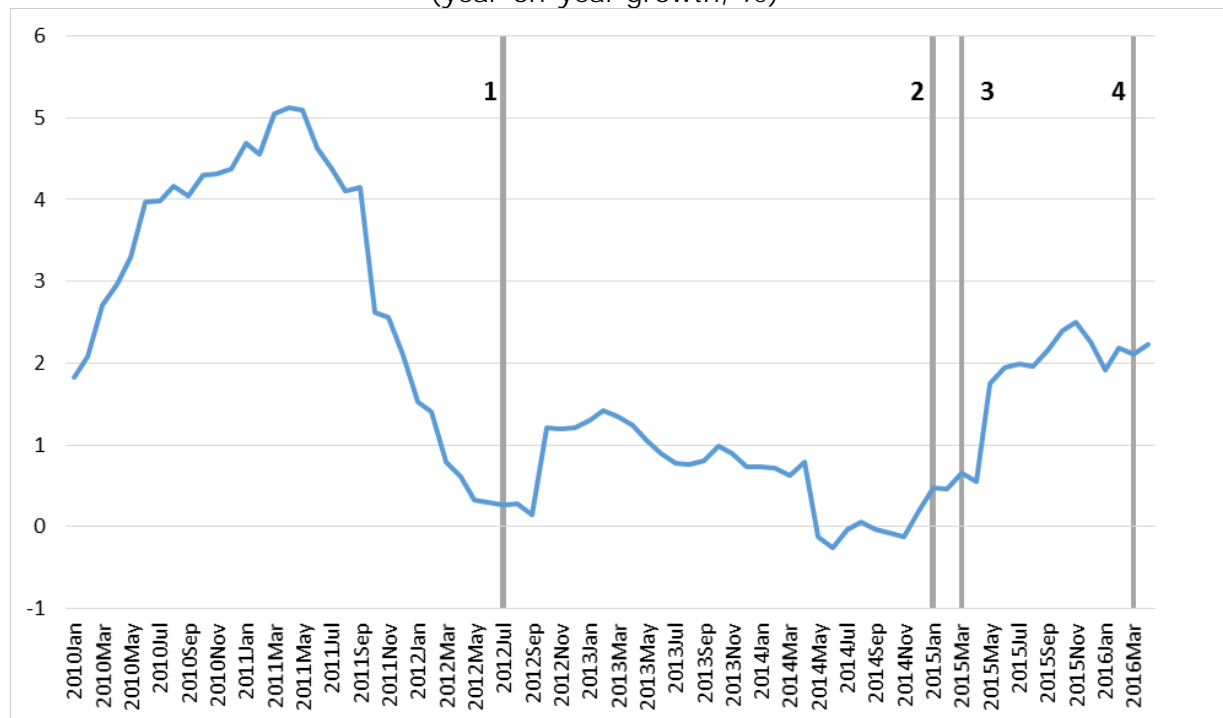


**Source:** European Central Bank

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP

Housing markets could be another area in which financial risks could emerge. Figure 16 shows the evolution of mortgage loans in the euro area. These were growing at a rate of 5 percent annually at their peak in April 2016, after which growth rates fell to negative values in 2014 until they picked up around the time of the announcement and start of the PSPP.

**Figure 16: Euro area Monetary and Financial Institutions (excluding ESCB) lending for house purchase**  
(year-on-year growth, %)

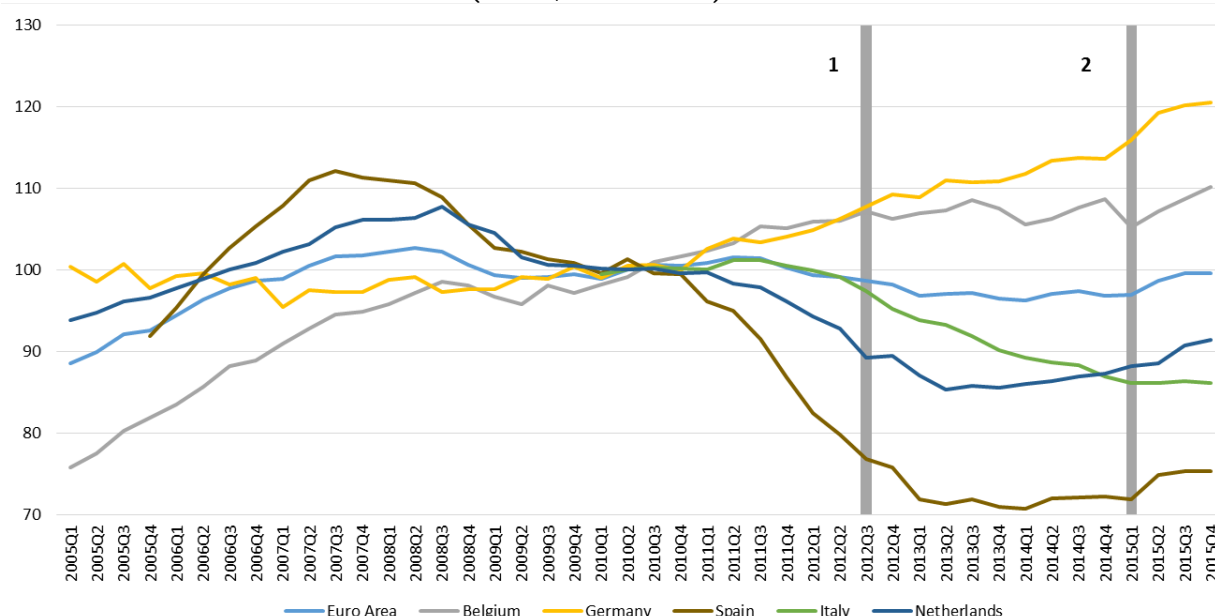


**Source:** European Central Bank

**Note:** 1) "Whatever it takes" 2) PSPP Announcement 3) Start of PSPP 4) CSPP and expansion of PSPP

House price developments have however been very different across the euro area (Figure 17). As a whole, the euro area's house price index is now at roughly the same level as in 2010, and seems to have picked up following the announcement and start of the PSPP. Different countries, however, have seen very different developments in their housing markets. In Spain, which experienced a large housing bubble before the crisis, house prices continuously fell between 2007 and 2013, and have stayed fairly constant since then. Italy and the Netherlands have also seen corrections to their housing markets, but these have been less severe than in Spain. House prices in Germany and Belgium have been growing steadily and do not seem to have been overly affected by the crisis. Finally, it seems that house prices have been growing in all countries shown except Italy since the start of the PSPP.

**Figure 17: House Price Index**  
(index, 2010=100)



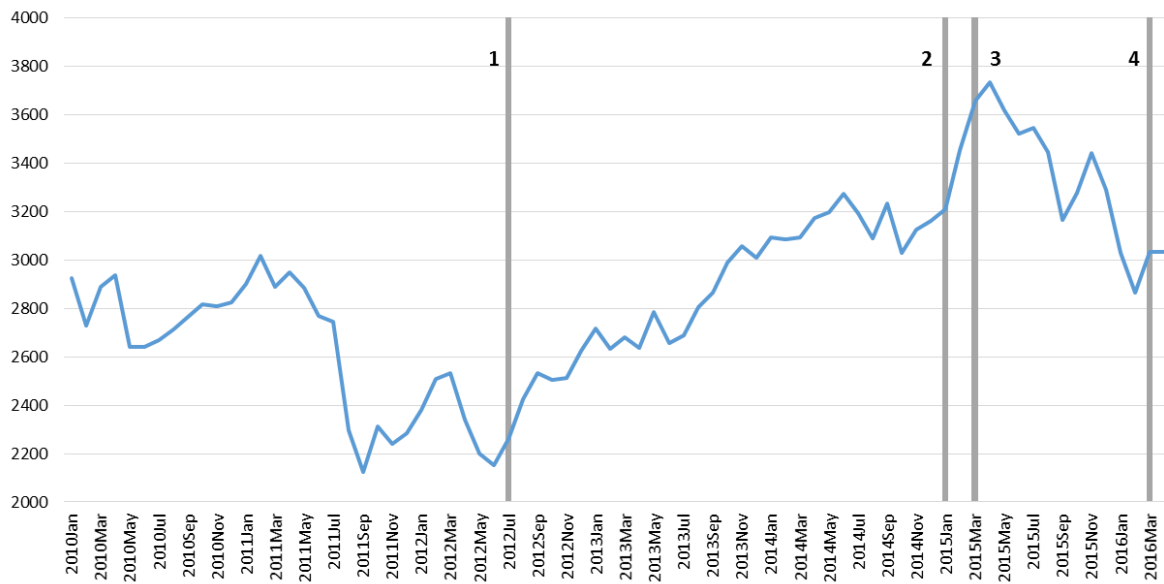
**Source:** Eurostat

**Note:** 1) "Whatever it takes" 2) Announcement and start of PSPP

There has therefore been some effect in terms of generating new lending primarily for households, consistent with a general recovery in housing markets. On the corporate side however, there is still close to no new lending. The European Commission estimates that most euro-area countries have at least one sector that requires a reduction in debt of at least 10 percent (Bricongne *et al*, 2016). This inevitably reduces the demand for new credit, despite ample supply. We expect therefore that the low interest rate environment and the availability of liquidity in the system will not pose financial risks as long as the process of deleveraging continues.

Finally, between Draghi's "whatever it takes" speech and right after the start of QE, stock markets values have increased (Figure 18). After that, however they have been declining. This reflects, among other things, increased uncertainty on world markets and, in 2016, uncertainty coming from China.

**Figure 18: Stock Market Price Index**  
(Dow Jones Euro Stoxx 50 Price Index)



**Source:** European Central Bank

## 6. MORE QE: THE EXPANDED PUBLIC SECTOR PURCHASE PROGRAMME (PSPP) AND THE CORPORATE SECTOR PURCHASE PROGRAMME (CSPP)

It is a little too early to judge the effects of the ECB's decision to expand government bond purchases in March 2016. Inflation is still hovering around zero and the government bond term spread has increased a little and stabilised.

In its latest action of purchasing corporate bonds, which started on 8 June, the ECB's intervention is much more targeted. **The Corporate Sector Purchase Programme (CSPP)** involves outright purchase of investment grade euro-denominated bonds issued by non-bank corporations in the euro-area, and carried out by central banks in Belgium, Germany, Spain, France, Italy and Finland. Purchases are conducted both in primary and secondary markets; primary market purchases will not involve any purchases by public undertakings.

Figure 11 shows that credit to NFCs, having been negative since 2012, only recently has stabilized broadly around zero. This implies that banks have not increased the amount of total loans to firms in four years<sup>2</sup>. And since banks are still very much in the process of building up capital to satisfy the new regulatory requirements, it is unlikely that they will issue significant new credit. The ECB is therefore aiming to reach the corporate sector directly by bypassing the banks.

Bypassing the banks at the current juncture might be useful but it is not sufficient. For this measure to be successful, the corporate sector needs to funnel the money it borrows to the real economy. If the money borrowed from the ECB is used for deleveraging, there will not be a beneficial effect on the economy in the short run (although there will eventually, as corporates become stronger). The ECB's is to take on the risk that banks are currently unable or unwilling to take.

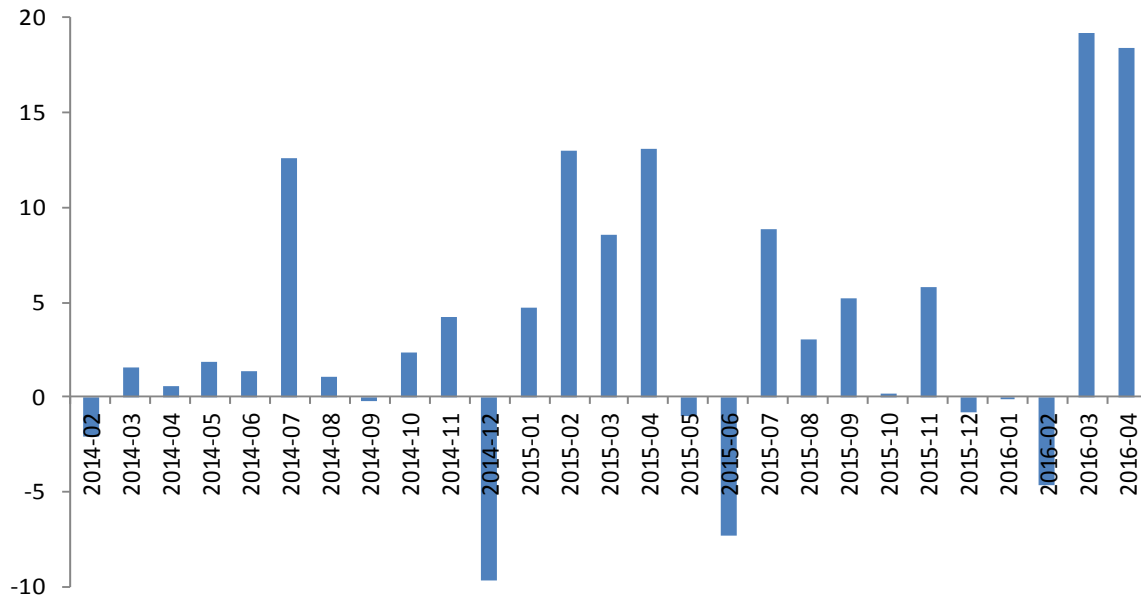
There is some evidence that corporates have sought to take advantage of the ECB decision by issuing a greater amount of securities following the March 2016 announcement (Figure 19).

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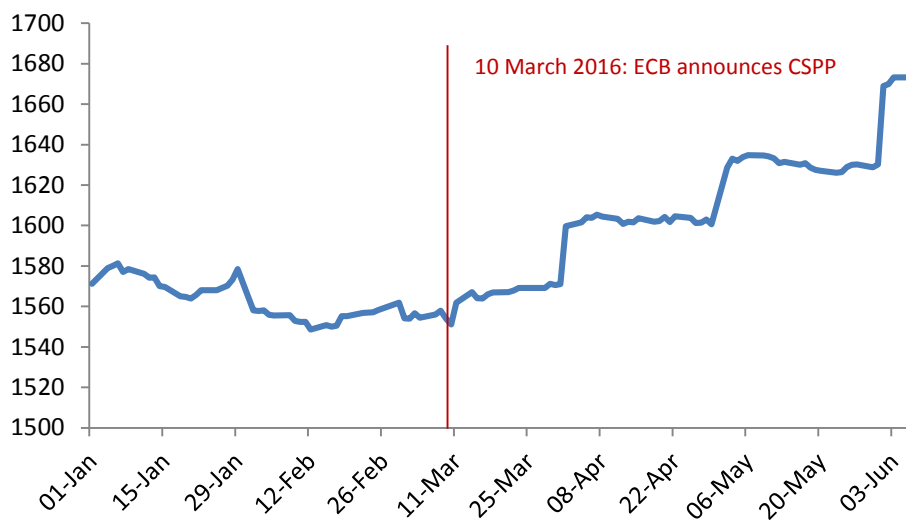
<sup>2</sup> There are significant differences between countries. In Germany, Finland and France new credit was issued to non-financial corporations during the course of 2015. But credit in Italy and particularly Spain remains in negative territory.

**Figure 19: Net issues (flows) of securities other than shares, excluding financial derivatives**

(Nominal value, Non-financial corporations, € billions)

**Source:** European Central Bank

The total market value of the corporate investment grade bonds has increased substantially since then, in particular for high-rated bonds (Figure 20).

**Figure 20: IBoxx total market value of the corporate investment grade bonds**  
(€ billions)**Source:** Thomson Reuters Datastream

At the same time, bank profitability has once again been put under pressure because corporate yields have been depressed. Irrespective of the outcome of this intervention by the ECB, the role of the central bank as a 'financial intermediary' needs to be both an exception and short-lived. Lending to firms needs to be the outcome of a market mechanism. The ECB's intervention is therefore a significant market distortion. It is necessary given the current conditions, but a distortion nonetheless.

## CONCLUSIONS

Since the end of 2014, inflation has been at or very close to zero. With very little ability to move the actual interest rate further into negative territory, the ECB has resorted to unconventional measures. The latest of these includes a programme to purchase corporate bonds, which started on 8 June 2016.

Monetary policy so far has helped extend new credit to the euro-area economy and has positively contributed to growth. These effects are visible but small in relation to the size and type of monetary policy interventions. There are no inflationary risks while slack continues to exist in the euro area. At the same time, we do not see any immediate financial risks arising from excessive debt as long as there is a need to reduce existing levels of debt to lower and more productive levels.

Quantitative easing can pose risks to the profitability of banks, a factor that could hamper the creation of new credit. This risk would increase if banks do not divert to other business models, a reason why the European banking supervision<sup>3</sup> has called for revisions to business models. While a correction of bank margins was probably inevitable, the longer this pressure exists, the greater the threat to financial intermediation.

Draghi's "whatever it takes" speech was a critical turning point for the euro area. This was sufficiently convincing to remove risks to the system's financial stability. The QE that followed has helped to sustain progress made since then. Investment, employment and growth continue to move in a positive direction. At the same time, QE has made an important contribution to lowering the exchange rate (aided also by US monetary policy). Given the underlying uncertainties about the global economy, it is difficult to imagine how this result would have been attained without such aggressive intervention.

Also, confidence appears to have stabilised with bond yields and spread volatility substantially lower and more stable. Markets still have faith that the ECB is able to manage inflation, given enough time. However, this confidence is beginning to wane given the scale and unconventional nature of the measures taken and the absence of inflation. It is unlikely that confidence will be sustained for long in the absence of a visible increase in aggregate demand and inflation. Given also that the marginal benefits of more central bank action are disputable, more of the required stimulus would have to come from elsewhere. This includes better use of fiscal space where it is available and more effective resolution of unproductive debt.

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<sup>3</sup> Nouy (2016) available on line at .  
<https://www.bankingsupervision.europa.eu/press/speeches/date/2016/html/se160223.en.html>



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## NOTES

# Assessing ECB Quantitative Easing One Year On

Eddie GERBA, Corrado MACCHIARELLI

## IN-DEPTH ANALYSIS

### Abstract

The ECB's expanded asset purchase programme (EAPP) adds the purchase programme for public sector securities to the existing private sector asset purchase programmes to address the risks of a too prolonged period of low inflation. It now consists of a covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP) and public sector purchase programme (PSPP).

However, as the transmission mechanisms of monetary policy remains characterized by long, variable and uncertain time lags, the impact of asset purchases on the real economy continues to be a matter of discussion as confirmed by the slow recovery in bank lending. Some economists even argue that the most effective transmission channel of unconventional monetary policy is the exchange rate. Against this backdrop, the note assesses the effectiveness of the ECB programme of asset purchases one year after its first implementation.

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## EXECUTIVE SUMMARY

Albeit estimating the macroeconomic effects of ECB's quantitative easing (QE) is clearly challenging given that only one year has passed since its first implementation, policies to reduce pressure on government bond yields have generally been effective. However, the liquidity in the credit markets has so far not returned evenly, forcing the ECB to flood the financial system with fresh liquidity in order to sustain the yet fragile euro area recovery.

With these limitations in mind, this note attempts to assess the effectiveness of the ECB programme of asset purchases one year after its first implementation. We find that:

- (Preliminary) empirical evidence is supportive of the latest ECB's expanded asset purchase programme (EAPP) in that it succeeded in lowering bond yields and pushing the investors out from the sovereign debt market.
- Talking about the EAPP extension in the direction of buying investment-grade euro-denominated bonds issued by non-bank corporates, previous private asset purchases have generally shown positive results, though mostly in the US. This, however, happened in an environment when the spread over US Treasuries was unusually high. While Portugal's and Greece's 2 and 10 year spreads are on the rise, it is not the case for the whole euro area at the moment.
- All in all, and based on the previous (non-euro area) evidence available, the medium to long-term effects of European QE may depend on the quality of market signalling by the ECB and the extent to which markets will react to it going forward. The immediate market reaction to the extension of assets purchases has been a lot more liquidity into the fixed income segment. However, it is not clear whether this rapid influx of liquidity is improving the market functioning, or it is simply used to engage in speculative short-term gains.
- Inflation is still subdued. Only the 5-year ahead inflation expectation comes somewhere close to (even if still significantly under) the 2 percent target. What is not clear is whether those expectations have priced in a possibility of the ECB continuing the EAPP 5 years ahead. If so, should the ECB decide to tamper off sooner, there might be further downward pressure for medium-term expectation. Evidence on inflation expectations may be difficult to evaluate, given the counteracting effects of oil prices and weak demand from emerging market economies at the same time. Consistent with the ECB's inflation forecasts' figures, however, the Survey of Professional Forecasters last reported that the risks to the baseline inflation outlook are perceived as relatively on the downside for 2017 and 2018, with these downside risks stemming indeed primarily from external factors.
- The EUR-USD has been depreciating and has - since then - remained stable, fluctuating at around 1.1 since March last year. The ECB clearly wishes for the euro exchange rate to continue to weaken as it continues with the EAPP, in the hope of spurring growth via external demand. However, its success will crucially depend on several factors, including trade. While the EUR has weakened with respect to several other currencies, since ECB engaged in EAPP, the EUR has consistently appreciated with respect to the basket of its trade-weighted currencies. The index is currently at the same point as it was in early 2015, just before the QE.

- The euro area economy expanded 0.5 percent on quarter-to-quarter in the first three months of 2016, lower than a preliminary estimate of 0.6 percent. This still represents the fastest growth rate in a year as large economies such as Germany, France and Italy accelerated while Greece and Latvia contracted.
- While bank lending is picking up in the euro area, ECB's programme seems to have had so far limited impact on the lending-decisions. If anything, it is having an impact on the terms and conditions of loans, not the quantity of credit. However, significant regional disparities have been observed in lending. In particular, mainly banks from the core seem to be (re)gaining confidence about national (sovereign and credit) conditions.
- Even if the supply shortage is not an imminent problem for the ECB, it might become a problem at a later date when the ECB will try to execute further purchases and the universe of 'acceptable' bonds will shrink, particularly in the core. At the same time, on the demand side, more than 53 percent of total foreseen purchases of bonds under the EAPP have been executed, but there is at least one year to go. Hence the logistics of accessing bonds for ECB may become a supply, as well as a demand problem, if the characteristics of the Program do not change.

## 1. INTRODUCTION

The ECB's expanded asset purchase programme (EAPP) adds the purchase programme for public sector securities to the existing private sector asset purchase programmes to address the risks of a too prolonged period of low inflation. It now consists of a covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP) and public sector purchase programme (PSPP). According to the latest ECB's Governing Council release, monthly purchases in public and private sector securities will amount to €80 billion (updating the previous figure of €60 billion from March 2015 until March 2016). They are intended to be carried out until the end of March 2017 and in any case until the Governing Council sees a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below, but close to, 2% over the medium term.

Large asset purchases have a more direct impact on bank's balance sheet and the availability of credit for firms and households. The ultimate goal is the same, namely to stimulate spending, but quantitative measures changing the size/composition of the balance sheet remain the only effective tools to achieve further monetary policy accommodation, when the lower bound for policy interest rates is reached.

Nevertheless, impact of asset purchases on the real economy continues to be a matter of discussion as confirmed by the mixed macroeconomic results and the slow recovery in bank lending. Some economists even argue that the most effective transmission channel of unconventional monetary policy is the exchange rate, i.e. via the depreciation of the euro. Against this backdrop, we assess the (macroeconomic and financial) impacts of ECB's QE one year since it was first implemented. In particular, we assess the continuing impact it has on inflation (expectations), exchange rate, bank lending, corporate credit, bond yields, and ultimately, the growth prospects for the euro area.

## 2. QE AT WORK

Albeit estimating the macroeconomic effects of European quantitative easing is clearly challenging given that only one year has passed since its first implementation, policies to reduce pressure on government bond yields have generally been effective. However, the liquidity in the credit markets has so far not returned, forcing the ECB to flood the financial system with fresh liquidity in order to sustain the yet fragile euro area recovery.

The aim of the QE is, as expressed by ECB President Mario Draghi, to do “whatever it takes” to bring the core consumer-price-index (CPI) back to the 2%-target. However, by November 2015, it became clear that the core CPI was still far below the ECB’s threshold. In fact, since the start of QE inflation has had hard time to even cross 1% (see Macchiarelli and Gerba, 2016). In light of this, and following the ECB’s Governing Council meeting of 3 December 2015, it was announced that the EAPP would be first extended in scope, time, and possibly even size: in particular, the list of eligible collateral would be extended to include securities issued by regional and local governments, and the programme would be extended by at least 6 months until March 2017. At the same time, the deposit rate was cut by 10 b.p., down to -0.30%. A second extension in scope (but not in duration) came with the last ECB’s Governing Council Decision of 10 March 2016, one year since the start of the Program, with the decision to cut the interest rate on the deposit facility at a historical low, by 10 basis points, down to -0.40%, and to extend the monthly purchases under the asset purchase programme to €80 billion starting in April, with corporate bonds being the latest assets to be added to a growing list of securities the ECB will be open to buy.

This latest extension is primarily targeted at investment-grade type of corporate bonds. While the exact details of these purchases are still unclear, the start date of their purchases has been set to Wednesday 8 July 2016. Moreover, it is highly probable that most of the bonds will come from the primary market (Suter, 2016), i.e. where the highest liquidity is concentrated. Nevertheless, until a significant amount of corporate bond purchases have been executed, it will be difficult to know their exact origin and status.

This additional extension is intended to last until the end of March 2017 and in any case until the Governing Council sees a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below, but close to, 2% over the medium term. As demonstrated by this further extension, the ECB is hoping that the program does not become obsolete, at least in the near term, and that further liquidity injection will help market conditions normalize.

In conjunction with an extension of the Program, a new series of four targeted longer-term refinancing operations (TLTRO II), each with a maturity of four years, has been launched, with the start date set in June 2016. As highlighted previously, another targeted long-term funding operation for banks was to be indeed expected (Gerba and Macchiarelli, 2016).

Looking at the history of the long term refinancing operations, in the euro area, the previous three-year full-allotment LTROs avoided massive bank deleveraging and an ensuing contraction in credits, following frozen interbank markets (Ciccarelli *et al.*, 2013; Paries *et al.*, 2013). They also increased carry-trade opportunities for banks to get cheap liquidity and invest into government bonds over the same maturity, resulting into further buy-back of sovereign bonds. Banks either deposited the cheap central bank funding at the ECB, or purchased higher yielding government bonds. Thereby, the LTROs in effect supported liquidity, ensured stable medium to long-term financing of banks, and temporarily supported further distressed government bond markets (Claeys, 2014).



**Figure 1: The ECB's deposit facility rate since the start of the EAPP**

**Source:** ECB data

With the EAPP, however, the story is completely different (see Gerba and Macchiarelli, 2016). Cutting the ECB deposit rate below -0.2 (-0.4 as of April 2016 – Cf. Figure 1) indeed makes banks want to reduce their exposure to the ECB to the minimum. Hence, instead of increasing their lending to households and businesses, banks would likely respond by moving money to non-euro zone central banks (Gerba and Macchiarelli, 2016). To avoid such scenario and get banks to lend more, the ECB will therefore need to wave “a lending carrot” (e.g. TLTRO) discouraging banks from simply putting their money into safe assets like overseas sovereign bonds. In addition, the indirect stimulus to government bond markets coming from carry trade is very limited at the moment, given that by mid-November 2015 already, about a third of the debt issues by euro area governments had negative yields. For ‘safe’ countries, almost the entire maturity spectrum of bonds trades at negative yields. If we take the shorter-end spectrum of debt (for instance 2-years), already by November 2015, almost all European debt was trading at negative yields (this will be discussed in greater detail in Section 3).

## 2.1. Direct evidence on the effects of bond purchases

A recent ECB paper by Altavilla, Carboni and Motto (2015), evaluating the impact of the most recent EAPP on asset prices, reports the impact of the latter to be “sizeable”, despite an environment of relatively low financial distress (indeed, the program came at a time when the pressure on sovereign bond yields was plummeting). The authors attribute the result to the interplay of the EAPP with the asset composition of the programme, via “portfolio rebalancing” (*scarcity* and *duration*; see also Gerba and Macchiarelli, 2015) as well credit channel effects, whereby changes in the maturity composition of nominal government debt affected other – non-targeted – asset prices.

This complements the empirical evidence for the other purchasing programs previously implemented by the ECB, and having different scope. Under the SMP, initiated in May 2010, the ECB bought 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 entirely sterilised; hence “not-inflationary”. 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. Ghysels *et al.* (2012) have tried to assess the impact of SMP and conclude that it had a positive but short-lived effect on market functioning by reducing

liquidity *premia* and reducing the level as well as the volatility of government bond yields. Likewise, while no transaction materialized, the announcement of OMT (outright monetary transactions) significantly decreased bond yields in euro area countries under market stress (see Altavilla, Giannone and Lenza, 2014), thus strengthening bank balance sheets and (to some extent) limiting potential sovereign-bank linkages.

**The (preliminary) empirical evidence is thus supportive of the latest EAPP in that it succeeded in lowering bond yields and pushing the investors out from the sovereign debt market.** This evidence is consistent with other studies, including Gagnon *et al.* (2011), D'Amico *et al.* (2012), and McLeay, Radia and Thomas (2014) looking at other central banks' Asset Purchases programmes. Gagnon *et al.* (2011), for instance, studied the Fed's 2008-09 QE and found that large-scale asset purchase (LSAP) announcements reduced U.S. long-term yields. Similarly, Joyce *et al.* (2011) found that the BoE's QE program had bond yield effects quantitatively similar to those reported by Gagnon *et al.* (2011) for the U.S.

**As a part of this extended package, the ECB will buy investment-grade euro-denominated bonds issued by non-bank corporates. This is very novel since ECB is now entering the private sector financing market. Previous private asset purchases have generally shown positive results, though mostly in the US.** In the first phase of LSAP 1, the Fed purchased mortgage-backed securities and Agency bonds. LSAP 1 appears to have decreased MBS yields by 150 bps (Krishnamurthy and Vissing-Jorgensen, 2010), and mortgage rates by nearly 50 bps (Hancock and Passmore, 2011). **This, however, happened in an environment when the spread over US Treasuries was unusually high. While Portugal's and Greece's 2 and 10 year spreads are on the rise (see Section 3.3), it is not the case for the whole euro area at the moment.**

With the latest extension EAPP the ECB has increased the monthly asset purchases to €80 billion. This recent move can be viewed in two ways. On one hand, ECB is signalling its solid commitment to fulfil its price stability mandate, and a greater tolerance for risk. On the other hand, however, the recent extension may also unveil concerns that the ECB is having a hard time in managing a stubbornly low inflation and growth, as well as facing shortage of supply in the bond markets (this will be discussed in greater details in the next section).

## 2.2. The signalling transmission channel

The previous empirical evidence on asset purchase programmes points to the prevalence of the signalling channel, though the scarcity and duration channels occasionally played important roles. In the case of the euro area, the latter two have been particularly strong (Altavilla, Carboni and Motto, 2015). Overall, however, IMF staff estimates based on the US, UK and Japanese experiences, suggests that the **signalling channel seems to have had the largest macroeconomic effects**. On average, IMF (2013) found that a decrease in long-term yields coming through the signalling channel has an effect on GDP growth approximately twice as large as the same shock coming through the portfolio rebalancing channels. This result is consistent with theory, whereby shocks to long-term rates due to "portfolio rebalancing" are expected to be more provisional and reversible, in part due to the volatile market conditions on which this channel relies.<sup>1</sup>

In this respect, Draghi made clear that the ECB would be unwinding "unconventional" measures in the (near) future. He also said that they do not anticipate "it will be necessary to reduce rates further", signalling that the -0.4 deposit rate could be the ECB's very floor, hence avoiding sending the signal that rates can go into negative territory indefinitely.

<sup>1</sup> Stein (2012) provides another explanation: lower premia on riskier long-term bonds induced by portfolio rebalancing might lead firms to buy back shorter-term debt with longer-term issuance.

Hence, yet again, despite the ECB's EAPP further extension, the ECB's action in non-standard mode was based on a principle of separation between the interest rate policy and recourse to exceptional measures (see Gerba and Macchiarelli, 2016).

This latest extension of the EAPP has, nevertheless, attracted criticism, particularly as the ECB was not prompt enough to distil the type of non-banks which are eligible for purchases, or the composition of the additional €20bn bond purchases. Going forward, as purchases will increase over time, monetary-fiscal policy interactions will be very relevant, as we underlined in a previous note (Gerba and Macchiarelli, 2016), and echoing the current debate. More recently, Draghi opened the possibility of "helicopter money" calling it "a very interesting concept" (even if recognizing that it involves accounting and legal "complexities, on the other hand"). **All in all, the medium to long-term effects of European QE may depend on the quality of market signalling by the ECB and the extent to which markets will react to it going forward.** The initial market reaction to the extension of assets purchases has been a lot more liquidity flowing into the fixed income segment. Data from Morningstar show that European investors returned to fixed income funds from March, following a nine-month period of constant outflow. Data for March show that around EUR 3 (11.6) billion flew in into the corporate bond (fixed income) market (Suter, 2016). At the same time and following announcement that investment-grade European corporate bonds would be purchased, the issuance of this category of bonds increased by EUR 30.6 billion in the same month.<sup>2</sup> However, not all bond issuers were equally successful in drawing funds. While Shroders and Pioneer's saw liquidity pouring in into their high-yield funds, BlackRock and US-Dollar denominated funds lost EUR 1.8 billion and EUR 4.3 billion respectively only in 2016 (Suter, 2016). Also the equity markets have gone up for two months since March, after having fallen for most of last year (Melin, 2016). However, it is not clear whether this rapid influx of liquidity to those markets is improving the market functioning, or it is simply used to engage in speculative short-term gains. Only more data and a structured financial stability analysis will be able to disentangle the two and answer this concern.

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<sup>2</sup> This influx has been the largest since the QE programme started in March 2015.

### 3. ASSESSING QUANTITATIVE EASING

#### 3.1. Inflation and expectations

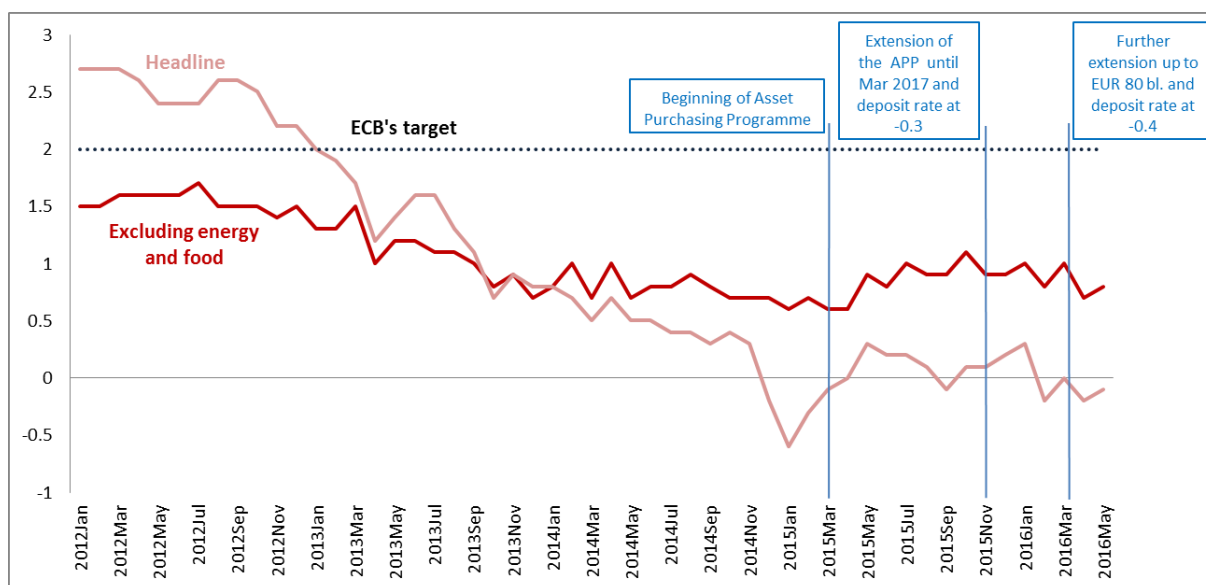
As underlined in a previous note (Gerba and Macchiarelli, 2016), the ECB does not have a mandate to support employment or growth, as, e.g. the Fed. Its primary objective is to keep inflation below, but close to, 2 percent — a goal the ECB has missed since the start of the EAPP. If we were to use inflation as “yardstick” for the EAPP’s success, the Program felt short of its objectives: inflation has been running well below the ECB’s target for the past three years (Cf. Figure 2, core inflation increased to 0.80 percent in May 2016 over the same month in the previous year), although some of the slump reflects the fall in energy costs.

The latest inflation expectations monitor from Allianz Global show that the slight increase in expected inflation during the past month (May 2016) has mainly come from a recovery in crude oil prices (Petersen, 2016). While this is good news for euro area, it brings into question the successfulness of ECB QE in driving up prices.

Inflation expectations are indeed relevant going ahead since they give projections on the future path of inflation. According to the ECB’s forecast, the central bank expects no inflation this year (0.1 percent). But it expects the EAPP can help raise inflation to 1.3 percent next year and to 1.6 percent in 2018. These last figures revise down the ECB’s previous more optimistic figure of bringing inflation at 1.8 percent already by 2017. Those calculations depend, however, on future (further) rises in crude prices.

**Figure 2: Euro area CPI headline and CPI core developments**

(Annual % change)

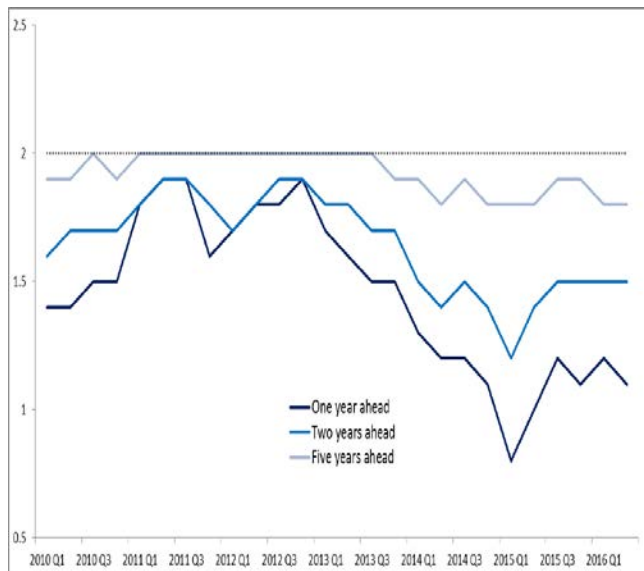


**Source:** ECB Data Statistical Warehouse

Survey of Professional Forecasters’ expectations have remained flat, or even decreased at a 5 year horizon (Figure 3) and the aggregate uncertainty surrounding longer-term inflation expectations, as measured by the standard deviation of the aggregated probability, has overall increased (Figure 4). At the same time the probability of inflation at or above 2%

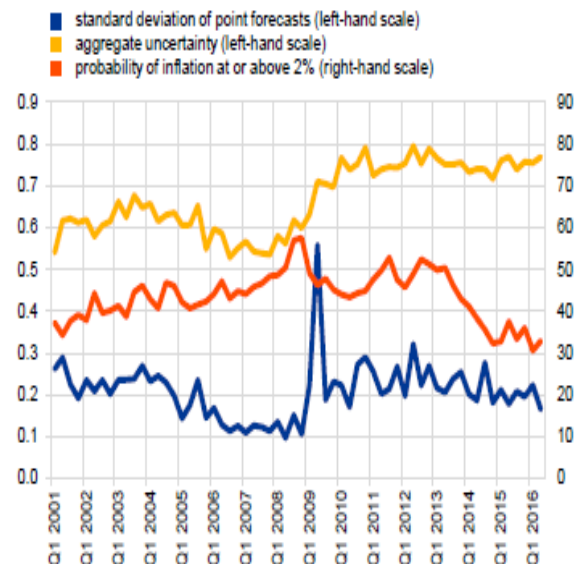
has been trending downwards since 2013Q1, with the Asset Purchasing Program not being able to invert this trend. From Figure 4 it is clear that only the 5-year ahead inflation expectation comes somewhere close to (even if still significantly under) the 2 percent target. What is not clear is whether those expectations have priced in a possibility of the ECB continuing the EAPP 5 years ahead. If so, should the ECB decide to tamper off sooner, there might be further downward pressure for medium-term expectation.

**Figure 3: Survey of Professional Forecasters expectations**



**Source:** ECB Data. Last observation 2016Q2

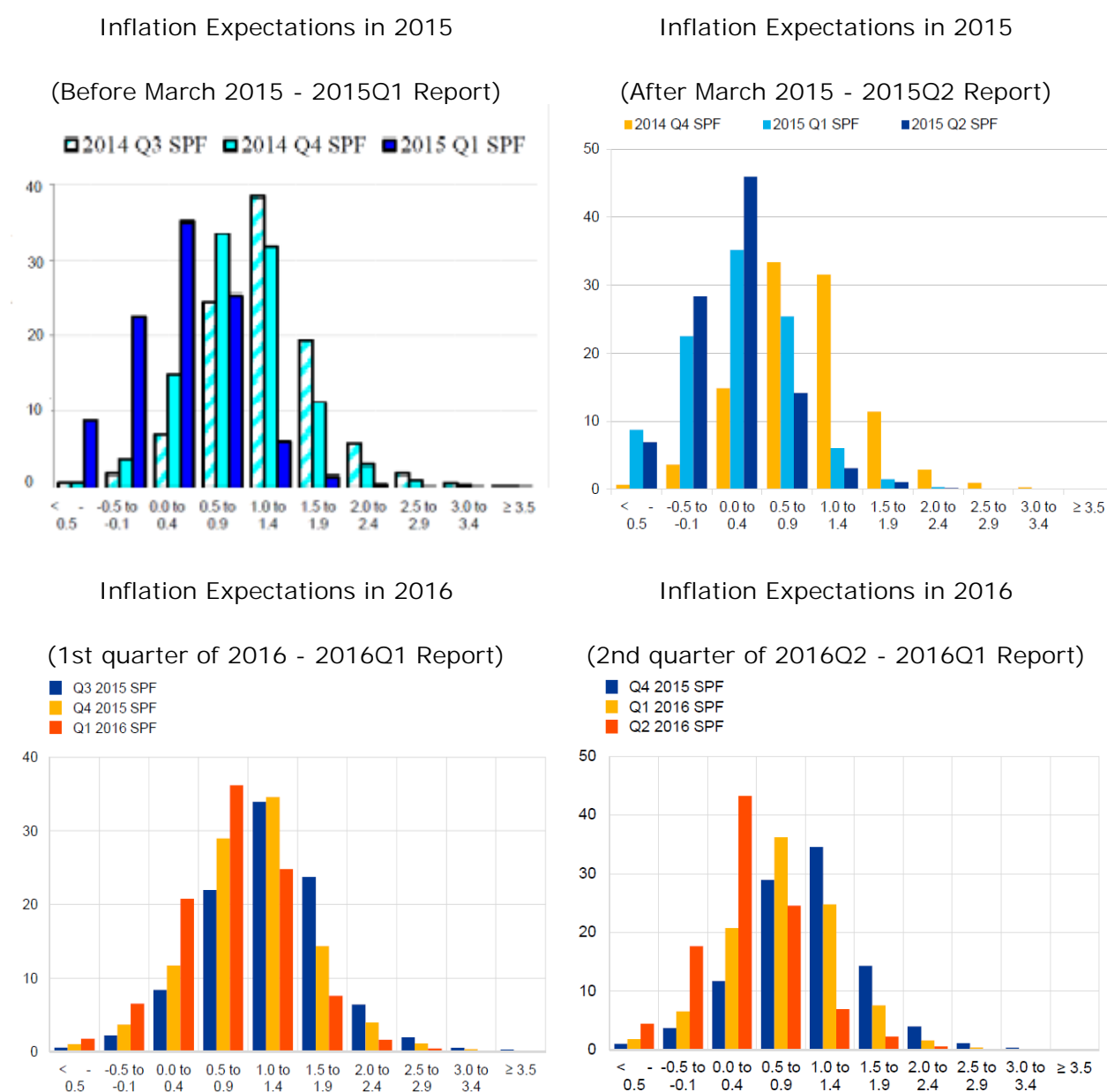
**Figure 4: Disagreement and uncertainty regarding longer-term inflation expectations**



**Source:** ECB SPF 2016Q2 Report

According to SPF respondents, the main factor behind the strong downward revision and low inflation forecast in 2015 was the sharp drop in oil prices observed since mid-2014. This survey was taken shortly before European QE took place (Figure 5, top left panel). During the first year of QE in 2015, the most likely outcome has shifted down one bin to the 0.0 - 0.4% range, from the 0.5 - 0.9% range (see Figure 5, top-right panel). As reported by the ECB Survey of Professional Forecasters Report for 2016Q2, for the current year, although the most likely outcome remained in the same bin (i.e. 1.0 - 1.4%), the probability associated with lower outcomes has generally increased.

After Europe QE was implemented (see Figure 5, top-right panel), survey expectations considered that the slack remaining in the euro area economy would have been removed only gradually, with the ongoing adjustments in some euro area countries being reported as some of the factors behind the very low inflationary pressure. The main factor cited as being behind the downward revisions for the 2015 post-QE outlook compared with the previous survey round (pre-QE) was the lower oil prices observed at the beginning of the year. On the other hand, exchange rate developments and the expected effects of the EAPP were cited as counteracting factors in the revisions. These factors, however, did not seem to counteract the aggregate probability distribution for expected inflation in 2015 to further towards lower outcomes. For the last two quarters of 2015 (Figure 5, bottom panels), there was a relatively high probability of inflation remaining below 1.0% in 2016 (38-48% in between the two quarters' forecasts). Said that, the probability of negative inflation remained moderate.

**Figure 5: Aggregated probability distribution of inflation expectations**

**Source:** ECB Survey of Professional Forecasters

In this respect, the empirical evidence would suggest that inflation tail risk are normally reduced (the inflation skewness based on surveyed expectations decreases) as per the effect of central bank purchases – if purchases are announced (see IMF, 2013).<sup>3</sup> **Evidence for the ECB's purchases on inflation expectations may be difficult to evaluate, given the counteracting effects of oil prices and weak demand from emerging market economies at the same time.** Consistent with the ECB's inflation forecasts' figures, the Survey of Professional Forecasters last reported that the risks to the baseline inflation outlook are perceived as relatively on the downside for 2017 and 2018 (not reported here), with these downside risks stemming indeed primarily from external factors.

<sup>3</sup> Of course, with the mitigating factor that surveys are not necessarily perfect measures of agents' beliefs.



### 3.2. A weaker euro

The start of the European QE came just days following the announcement of a better-than-expected round of US employment figures prompting rumours that the US Federal Reserve was to raise interest rates shortly after. The expected diverging paths of the ECB and the Fed have contributed keeping the euro weak against the dollar throughout 2015-16. In light of the unexpectedly weak US job growth figures over the past few months, the Fed has postponed the idea of raising interest rates, possibly to its next July or September meetings. This has prevented the euro to depreciate further, and reach parity with the dollar, with the exchange rate now standing at 1.14 (Figure 6).

**Figure 6: EUR-USD Exchange rate developments**



Source: ECB Data Statistical Warehouse

**Figure 7: Trade-weighted euro index (NEER)**



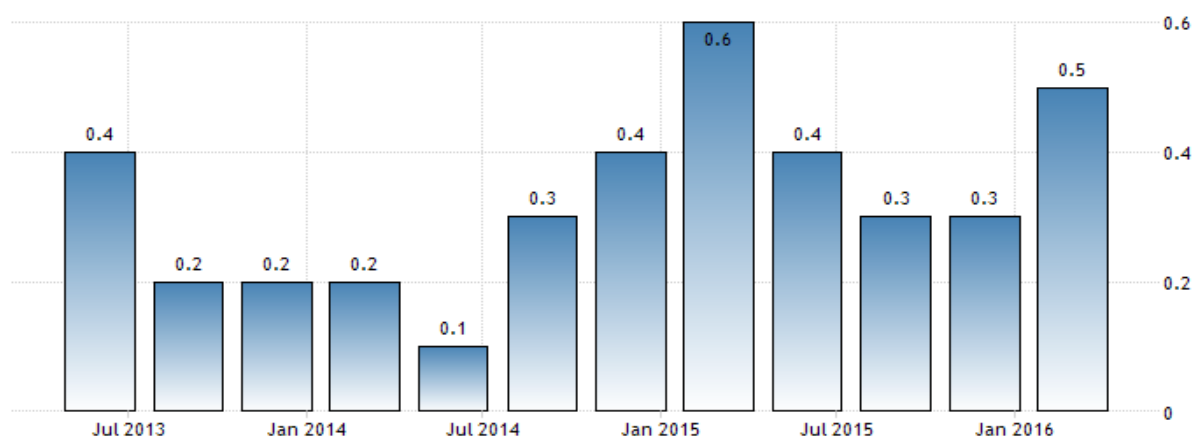
Source: Petersen (2016)

The extent to which parity will be achieved will largely depend on Fed's moves during the coming months. The ECB clearly wishes for the euro to continue to weaken as it continues with the EAPP, in the hope of spurring growth via external demand. However, its success will crucially depend on several factors, including trade. **While the EUR has weakened even with respect to other currencies, since ECB engaged in EAPP, the EUR has consistently appreciated with respect to the basket of its trade-weighted currencies**, as shown in Figure 7. The index is currently at the same point as it was in early 2015, just before the QE. Hence, its success will crucially depend on whether it manages to turn the trend on the NEER trade-weighted rate towards depreciation.

### 3.2. Growth

The euro area economy expanded 0.5 percent on quarter-to-quarter in the first three months of 2016, lower than a preliminary estimate of 0.6 percent (Figure 8). This still represents the fastest growth rate in a year (Trading Economics) as large economies such as Germany, France and Italy accelerated while Greece and Latvia contracted.

As underlined previously (Gerba and Macchiarelli, 2016) QE will not work alone, as the eurozone's recovery will depend on much more than the ECB's EAPP. Confidence is likely to play a significant role. Contributing to a lower outlook may be the still high unemployment figures and geo-political threats (e.g., Brexit). The ECB has recently revised down its growth forecasts to 1.4% this year, 1.7 percent in 2016, and 1.8 percent in 2017. In addition, the combination with fiscal stimulus (Gerba and Macchiarelli, 2016) is crucial as monetary-fiscal interactions become more important over time.

**Figure 8: Euro area GDP growth rate**

**Source:** Trading Economics based on Eurostat data

### 3.3. Lending

As discussed previously, the EAPP is supposed to push banks to sell their holdings of government debt and take on more risk, either by focusing on other asset classes or lending more to households and firms (the latter, under the additional stimulus of the TLTRO).

There are signs that credit conditions are easing for the businesses and households in the euro zone. In the euro area, loans to household increased 1.5 percent year-on-year in April 2016, slowing from a 1.6 percent rise in the previous couple of months, whereas credit to non-financial corporations grew 1.2 percent, higher than a 1.1 percent rise in March. Total annual credit growth in the euro area including governments accelerated to 3.3 percent from 3.1 percent in the previous month: credit to governments went up to 10.4 percent, 0.3 percent higher than 10.1 percent in March and private sector credit growth also increased at a faster rate of 1.2 percent from 1.1 percent (Cf. Figure 9; Trading Economics).

However, a further look into the disaggregated figures from the ECB lending survey shows a much more diverse picture. QE is not the main driver of the expansion in credit. Most banks surveyed say that the extra liquidity they receive has basically no impact on their decisions to grant (or not) loans. For firm loans, fewer banks now claim QE liquidity is helping their lending than in the previous survey in October last year. Moreover, banks are complaining that the EAPP is eroding their profits (see the discussion in our previous note, Gerba and Macchiarelli, 2016). Taken together, it is safe to conclude that the *net easing impact* of bond purchases appears to be improving **terms** and **conditions** of loan granting rather than **credit standards** themselves (see also Bloomberg, 2016).



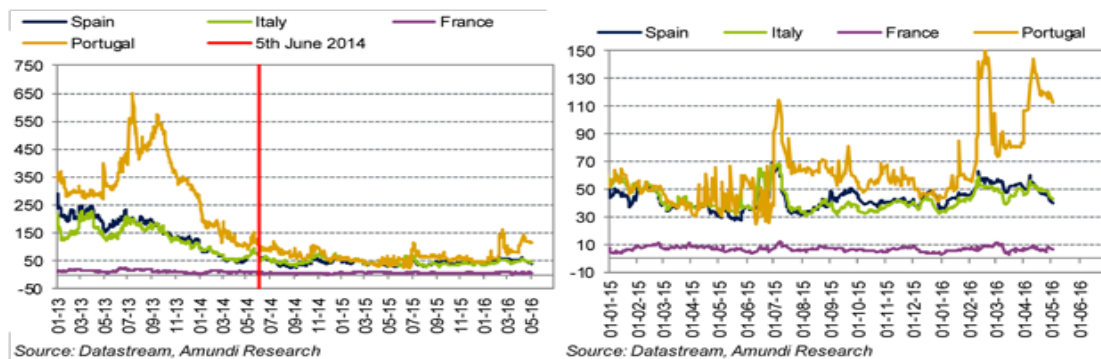
**Figure 9: Loans to private sector (% change)**

**Source:** Trading economics based on Eurostat data

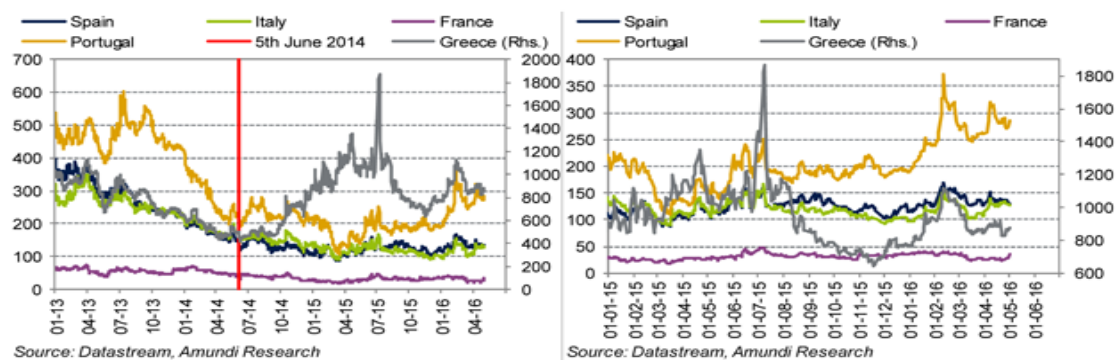
**Figure 10: Sovereign spreads**

### Spreads channel

#### > 2Yr sovereign spreads



#### > 10Yr sovereign spreads



**Source:** Amundi Research

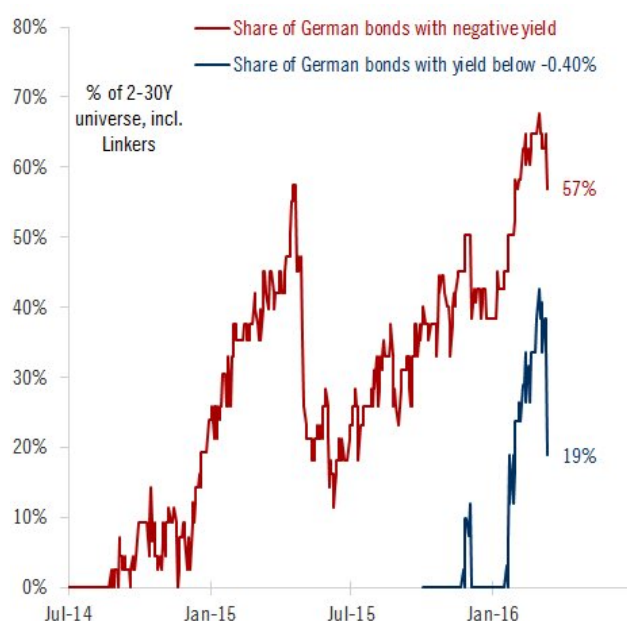
In addition, there is a regional disparity in the lending figures. While banks in the core countries are buying bonds from their own governments, the banks in the periphery (such as Spain, Italy, Portugal) are engaging in carry-trade opportunities by buying bonds from the core. Capital Economics noted that periphery banks have used some of the proceedings allocated to them to buy sovereign bonds from core countries, thus reflecting a lack of confidence in the performance of their own economies, and clearly reducing lending opportunities for the local economy. The consequences from this can also be seen in peripheral bond spreads in Figure 10. Both the 2-year and 10-year spreads have started to rise again, particularly for Portugal and Greece, since March this year. Also the stock markets of the core countries have seen a much sharper rise than in the peripheral countries, shedding further doubt on the economic prospects of the periphery (Melin, 2016).

Thus, **while bank lending is picking up in the euro area, ECB's EAPP seems to have limited impact on the lending-decisions. If anything, it is having an impact on the terms and conditions of loans, not the quantity of credit. However, significant regional disparities have been observed in lending. In particular, mainly banks from the core seem to be (re)gaining confidence about national (sovereign and credit) conditions.**

### 3.4. Yields and the yield curve

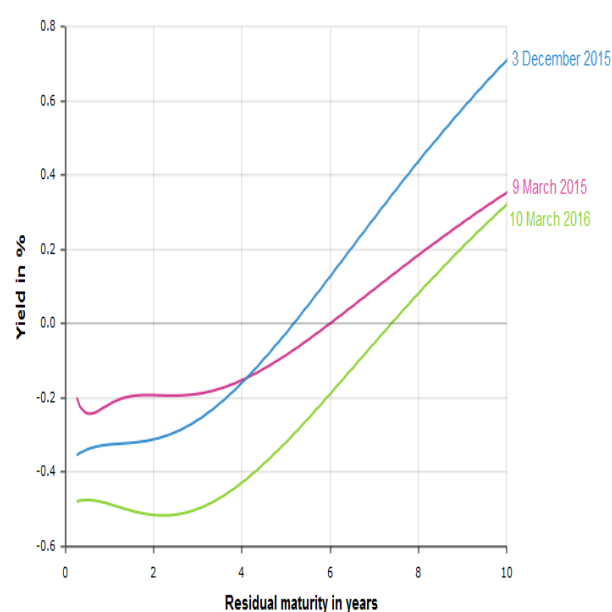
One of the intended impacts of QE is to push down longer-term interest rates. As discussed in Section 2.1 this is consistent with recent evidence of the EAPP. For instance, 80% of German debt is trading at negative yields, with 19% below the new ECB's threshold, and borrowing costs for many euro area countries are already at their lowest.

**Figure 11: Share of German bonds with negative yields**



Source: Frederik Ducrozet

**Figure 12: Euro area yield curve with key ECB dates**



Source: ECB Statistics

However, not only the German bonds are trading at negative yields, but many of the other northern European and Swiss bonds (Figure 13). For most of the core countries, all bonds up to 7 years are trading negatively.

From Figure 14, it is clear that while core countries have around 50 percent of their total outstanding debt (all maturities) traded in the negative territory (or even with yields lower than -0.4 percent), for periphery, most or all of the debt trades at positive yields. Hence there is still a high spectrum for bringing those yields down. Yet, ECB's purchases may be constrained by capital keys.

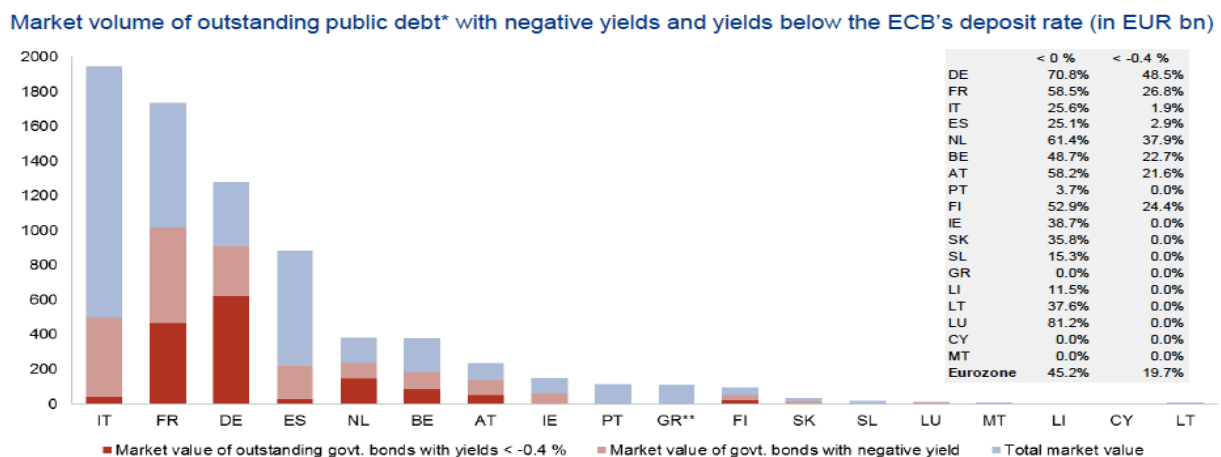
**Figure 13: Sovereign bonds trading at negative yields (in red)**

	3M	1Y	2Y	3Y	4Y	5Y	6Y	7Y	8Y	9Y	10Y	15Y	20Y	30Y
Germany	-0,58	-0,51	-0,51	-0,52	-0,47	-0,37	-0,32	-0,23	-0,13	0,01	0,15	0,31	0,57	0,86
France	-0,52	-0,49	-0,43	-0,38	-0,30	-0,17	-0,10	0,03	0,16	0,34	0,49	0,97	1,26	1,46
Netherlands	-0,53		-0,50	-0,46	-0,45	-0,39	-0,15	-0,04	0,09	0,24	0,37			0,99
Belgium	-0,54	-0,51	-0,48	-0,46	-0,39	-0,32	-0,20	-0,08	0,21	0,39	0,54	1,01	1,13	1,60
Austria		-0,48	-0,47	-0,40	-0,38	-0,34	-0,15	-0,11	0,01	0,17	0,35	0,46		1,36
Finland		-0,49	-0,46	-0,43	-0,29	-0,23	-0,08	-0,01	0,12	0,25	0,42	0,82		1,03
Non-EMU countries														
Switzerland		-0,80	-0,85	-0,87	-0,82	-0,75	-0,66	-0,57	-0,46	-0,37	-0,31	-0,05	0,07	0,21
Sweden		-0,62	-0,50	-0,60	-0,44	-0,19		0,13			0,51			
Denmark		0,08	-0,55	-0,36	-0,15	-0,08	0,31				0,43			0,94
UK		0,52	0,39	0,40	0,57	0,73	1,01	1,16	1,29		1,39	1,95	2,13	2,27
US		0,28	0,57	0,84	0,99	1,31		1,58			1,78			2,60
Japan		-0,27	-0,30	-0,24	-0,22	-0,21	-0,22	-0,20	-0,18	-0,14	-0,09	0,05	0,28	0,37

**Source:** Allianz Global

Despite this picture, most analysts believe that this *per se* does not represent a problem in terms of supply shortage even under the new extended purchase limits. The willingness to issue new bonds at those negative yields is still high. The complication rather lies within the existing bond holders, or 'captive investors'. Concerns remain that they will not be willing to sell their share of bond holdings to the ECB despite the negative yields (Petersen, 2016). Even if the supply shortage is not an imminent problem for the ECB, it might become a problem at a later date when the ECB's universe of 'acceptable' bonds will shrink. At the same time, on the demand side, more than 53 percent of total foreseen purchases of bonds under the EAPP have been executed, but there is at least one year to go. **Hence the logistics of accessing bonds for ECB may become a supply, as well as a demand problem, if the characteristics of it do not change.** Nevertheless, this risk remains limited since the ECB President has, on multiple occasions, showed his readiness to amend the QE programme to fit the changing market environment.

**Figure 14: Bond yields trading in negative territory out of the universe of all bonds**



**Source:** Allianz Global

## CONCLUSIONS

The recent move to expand ECB's asset purchase programme (EAPP) adds the purchase programme for public sector securities to the existing private sector asset purchase programmes to address the risks of a too prolonged period of low inflation. It now consists of a covered bond purchase programme (CBPP3), asset-backed securities purchase programme (ABSPP) and public sector purchase programme (PSPP). According to the latest monetary policy decision, monthly purchases in public and private sector securities will amount to €80 billion (updating the previous figure of €60 billion from March 2015 until March 2016). They are intended to be carried out until the end of March 2017 and in any case until the Governing Council sees a sustained adjustment in the path of inflation that is consistent with its aim of achieving inflation rates below, but close to, 2% over the medium term.

A new extension of the QE programme requires a new evaluation of its successfulness in achieving its objectives. While we recognise that it is still too early to grant a full objective evaluation of the ECB's policies, we do provide some insights into the EAPP's impact on the different segments of the financial market and the real economy. The results are quite mixed. While inflation expectations rose during the last month, they are still well below the 2 percent target. Moreover, most of the rise can be attributed to the recovery in crude oil prices rather than the QE policy itself, and the Professional Forecasters' outlook for the next years is on the downside. Also bank lending has increased, including lending to SME's. However, following the bank lending survey executed by ECB, the direct effects of QE on their bank-lending decisions has been estimated to be very limited. The impact on the exchange rate and growth has been more clear and visible. More needs to be done if the trend is not to revert. To conclude, there should be pressure for further fiscal stimulus in the euro area, the ECB should monitor the markets for any potential shortage of supply risk (particular in the core), and most importantly, push banks in the periphery to engage in their local lending markets and buy their own country's bonds instead of those from the core - all in all - to ensure the ECB's expected boost to the economy to be more even.

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DIRECTORATE GENERAL FOR INTERNAL POLICIES  
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POLICY

# QE effectiveness

Daniel GROS

## IN-DEPTH ANALYSIS

### Abstract

The massive sovereign bond-buying programme(s) that started in early 2015 should now be bearing fruit, but there is little sign of any improvement in inflation, despite a recovery in oil prices. Assessing the effectiveness of Quantitative Easing (QE) in the euro area in terms of financial market indicators, such as interest rates or inflation expectations, yields mixed results. Interest rates began falling even before the announcement of the sovereign bond-buying, which is widely attributed to investors anticipating QE. But inflation expectations also fell during this same period. Should one conclude that the anticipation of QE led to lower expectations of inflation? Financial market indicators do not exhibit any sustained change or trend since the bond-buying started. The movements up and down in interest rates, and inflation expectations, can be interpreted in many ways. Our preferred interpretation is that QE in the euro area was a reaction to a global deflationary trend, but that the bond purchases did not affect inflation in the euro area in a sustained way. It bears repeating that QE in the euro area is not a centralised policy. The ECB executes only a small fraction of the programme.

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## EXECUTIVE SUMMARY

- Given the long and variable lags with which monetary operates, it is too early to arrive at a firm judgement of the effectiveness of the massive bond-buying programme(s) first announced by the European Central Bank (ECB) in early 2015.
- However, first signs of an impact should be visible by now, given also that it is often argued that investors anticipated the start of quantitative easing (QE) already in late 2014, over 18 months ago.
- Neither actual inflation, nor inflation expectations have improved since the start of sovereign bond-buying by central banks in the euro area.
- The available assessments on the effectiveness of QE in the euro area (EA) are usually based on faster-moving variables, such as interest rates and expectations.
- But these variables exhibit a high variability and there has been no clear trend in any direction since the bond purchases started. It is difficult to find any strong evidence of a sustained impact of QE (only the impact on the day of the announcement seems uncontroversial, but it was very small).
- An important consideration of the ECB in decisions on bond-purchase programmes has been the fear that inflation expectations could become 'unanchored'. The ECB has used various measures of inflation, seeming often to prefer 'five years, five years forward' expectations based on financial market indicators. These indicators have not improved, but rather have deteriorated during the time period when QE could have been anticipated and have not improved since the purchases started.
- One needs to be careful in using inflation expectations from market indicators: the purpose of QE is to affect (lower) interest rates. The ECB is buying both indexed and non-indexed bonds, thereby affecting presumably the yields on both types of securities. There is thus an inherent contradiction between the idea that inflation expectations embedded in the yield differential are unbiased, market-based predictions, and the underlying assumption of QE that central bank purchases affect market prices, i.e. that markets are not efficient.
- The decision to extend the bond purchases taken some months ago arose from the disappointing reaction of inflation, not only actual, but also expected, thus suggesting that QE had been ineffective so far. But an extension makes sense only if QE is effective. The ECB itself must thus walk a fine line between acknowledging the limited impact of the bond purchases so far, and the need to justify its intention to extend a programme with limited impact.
- Praet (2016) has rightly warned against judging policy by "looking out the window". But the absence of any increase in inflation (expectations) can only be explained if some deflationary shocks hit the euro-area economy in the meantime. But it is difficult to find these shocks in reality.

- Oil prices can no longer be used as an excuse for the persistence of near deflation, since they are now back to the level of early 2015, when QE started in the euro area.
- Fiscal policy has also been roughly neutral in the euro area as whole.
- It is not surprising that even record-low (long-term) interest rates have failed to have a measurable impact on inflation or output. At low rates, investment does not react much to small further changes. Moreover, low interest rates increase the income of debtors, but reduce those of the creditors. The net impact on the economy of going from low to very low, and sometimes even negative rates, should in any event have been expected to be small.

## INTRODUCTION

With inflation and inflation expectations remaining below its target (of “close to but below 2%”), the ECB announced in December of 2015 that it will expand the duration of its purchase programme of sovereign bonds and that it will also buy corporate bonds.

As the background provided by the European Parliament’s service rightly notes: the “transmission mechanisms of monetary policy remains characterized by long, variable and uncertain time lags”.

It might thus be still too early to expect the full impact of the massive bond buying on the real economy and inflation. However, one could also expect to see a beginning of an impact now – especially given that it is usually argued, that the eventual decision by the ECB to embark on sovereign bond buying had been anticipated months beforehand.

There is little sign of any significant change with respect to about 18 months ago. But this is not definite proof that QE has not worked, since many other variables affecting the economy have changed in the meantime.

These simple considerations provide a first illustration of the difficulties involved in judging monetary policy by just looking at the evolution of macroeconomic variables.

Praet (2016) has rightly warned against judging policy by “looking out the window”. However, the absence of any visible increase in inflation (expectations) can only be explained if the euro-area economy was hit by some negative shocks. But it is difficult to find these shocks in reality. Oil prices can no longer be used as an excuse for the persistence of near deflation since they are now back to the level of early 2015, when QE started in the euro area. Fiscal policy has also been roughly neutral. It is thus difficult to maintain that without the ECB’s actions the euro-area economy would have been much weaker and inflation much lower.

Another way to judge the success of QE in the EA would be to look at faster-moving variables, such as interest rates and inflation expectations. The latter in particular should provide a key indicator since one of the justifications for embarking on large-scale purchases of government bonds that there was a risk that inflation expectations would become unanchored unless the ECB acted.

It is next to impossible, however, to determine the impact of QE on financial market variables since markets tend to anticipate policy. This problem is particularly acute for QE since its purpose is to influence longer-term interest rates. The market price of a 10-year bond increases by approximately 5% if the long-term interest rate increases by 50 basis points (ECB representatives have claimed that the impact of QE might have been of this order of magnitude). This implies that traders have a strong incentive to try to anticipate QE, and that most of the impact should be when the bond-buying is anticipated or announced, not when it is implemented.

If the (sovereign) bond purchase programme had come as a total surprise, one would have thus expected to find a jump in (long-term) interest rates and asset prices the day it was announced (22 January 2015). But this did not happen.

Some of the so-called event studies, which try to measure the impact of QE in a very narrow time window (day, or even intra-day), have tried to overcome this difficulty by looking at the reaction of markets over all the days when one could identify signals from the ECB that QE was becoming more likely. This type of study has provided the key evidence for the thesis that QE has been successful.

The approach used by standard studies is simple: first one estimates the impact of the anticipation of bond purchases on interest rates. The estimated impact of QE on interest rates is then fed into a standard macroeconomic model, which usually yields a substantial increase in demand and inflation.

The present paper does not follow this approach. Instead, the present paper raises some fundamental issues: it discusses first whether a consumer price index provides the

appropriate measure of deflation. It then takes a different tack in analysing the effectiveness of QE in the euro area. Rather than looking at interest rates, it asks whether the bond-buying by the Eurosystem has been effective in increasing inflation.

Throughout this paper we use the somewhat complicated term “bond purchases in the euro area” because the so-called QE in the euro area is not being implemented exclusively by the ECB itself, but rather to a large extent by the national central banks (NCBs) in the euro area. Moreover, the NCBs buy the bonds of their own government, at their own risk, and each NCB buys slightly different maturities. It is thus not correct to speak of the “ECB buying bonds”.

## 1. HOW TO MEASURE PRICE STABILITY?

The ECB has defined its measure of price stability in terms of the harmonised consumer price index (HICP). This seemed natural when it was done at the start of EMU. At the time there was great concern that the introduction of the euro would increase to higher prices for consumers and popular confidence in the new currency was a key political priority.

However, consumer prices measure just one part of the economy, and they are heavily influenced by taxes and commodity prices, especially the price of oil.

There are two key reasons to prefer a broader price index, such as the GDP deflator to the HICP, to measure price stability.

The first reason is short- to medium term: large swings in oil prices have had a strong impact on consumer prices over the last year. The core inflation rate is only partially immune to this problem. Core inflation does not contain the goods that are directly affected by oil prices (like petrol), but this does not totally strip out these volatile components, because oil is an input into many other goods and services (like travel). The GDP deflator, by contrast, measures the difference between nominal and real GDP and, unlike the CPI, captures changes in prices related to production and income developments. Crucially, the GDP deflator is not affected by taxes and input price developments. This aspect is important in a context of volatile commodity prices and changes in tax policies.

The second reason for preferring the GDP deflator is that the key issue for monetary policy today, and for the foreseeable future, is the debt overhang left by the credit boom of the early 2000s. The main reason to be concerned about price stability today is thus 'debt deflation', i.e. a situation in which debtors have difficulties servicing their debt because their revenues fall. Nominal GDP is the best indicator for revenue growth for the two most important debtors (governments and the corporate sector). It follows that the best measure of whether debt deflation is a problem is the GDP deflator (see Alcidi, Busse and Gros, 2016).

The current values of the GDP deflator give a much less 'deflationary' picture (See Table 1) of the euro-area economy than consumer prices.

Table 1. Euro-area inflation, alternative measures

	2015 (actual)	2016 (predicted)
HICP	0.0	0.5
HICP core	0.8	1.0
GDP deflator	1.2	1.2

Source: European Economic Forecast, Winter 2016

Inflation measured by the GDP deflator has been essentially flat, not only before, but also after the start of the ECB's and National Central Bank's bond-buying in the euro area. Using this measure of inflation would thus not change the results found in this paper.

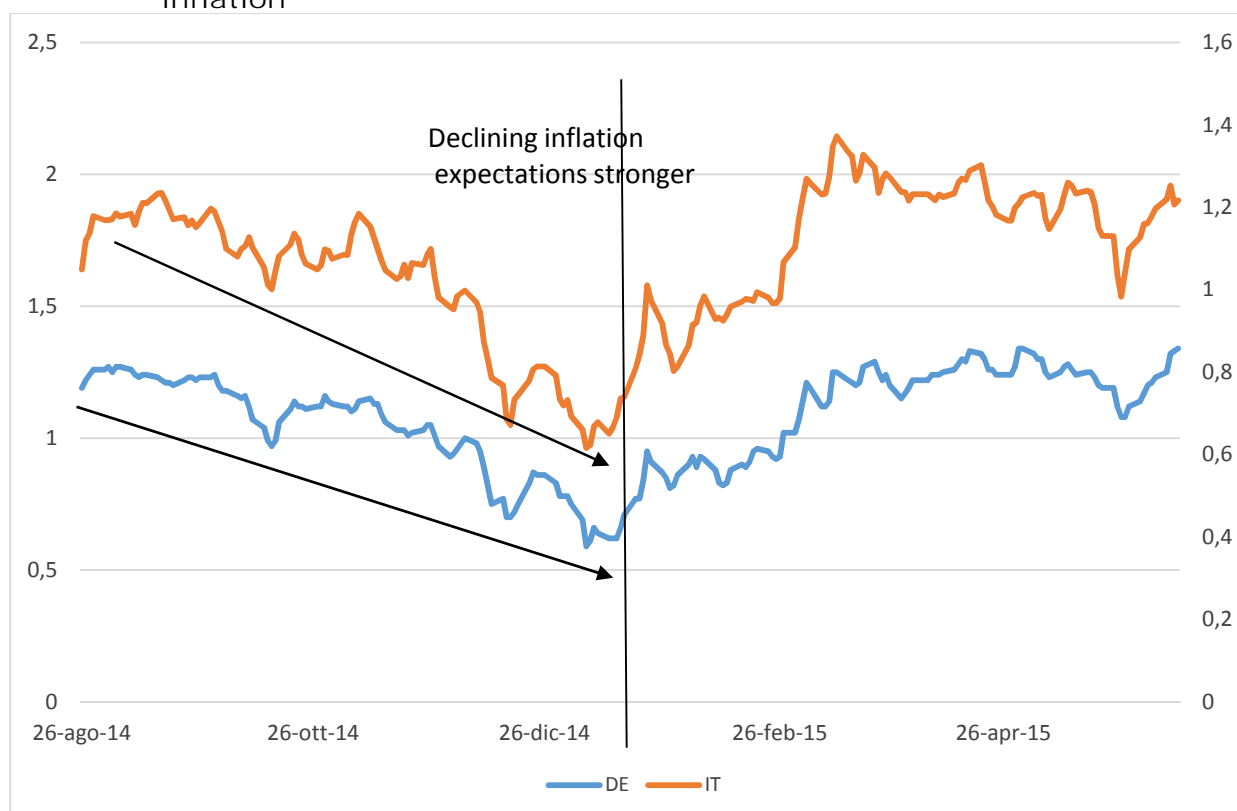
## 2. INTEREST RATES AND INFLATION EXPECTATIONS BEFORE AND AFTER

Given the long and variable lags with which monetary policy operates, the ECB has based its decisions more on future inflation than on the present rate of price increases. Over the last few years the ECB has tended to emphasise market-based measures of expected inflation. The most widely used measure of expected inflation is based on derivatives called “inflation swaps” whose pay-off depends only on realised inflation.

These inflation swaps give a similar, but not identical measure of expected inflation to what is called “break-even inflation” which is calculated as the difference in the yield of normal, un-indexed bonds and bonds whose interest rate is linked to some price index (normally a national consumer price index). So-called ‘linkers’, i.e. bonds whose return is linked to inflation exist only in selected euro-area countries (DE, IT, FR, ES). Most of them are linked to the national inflation rate and their liquidity varies. This implies that measures based on break-even inflation can show substantial differences across euro-area member countries (sometimes up to 50 basis points) and variations over time might be affected by changes in their liquidity. This is why the ECB prefers to measure inflation by inflation swaps.

To illustrate the differences between the (national) breakeven inflation rates, Figure 1 below shows the break-even inflation calculated from 10-year bonds for both Germany and Italy. It is apparent that under this measure inflation is expected to remain somewhat higher in Italy (although the country needs to regain competitiveness) and that this measure of inflation expectations declined more during the period during which the anticipation of QE became stronger and stronger. There were thus considerable cross-country differences in the way in which the anticipation of QE affected expectations.

Figure 1. QE and inflation expectations, Germany and Italy, 10 year break even inflation



Source: Datastream

As mentioned above, it is difficult to measure the impact of euro-area QE on interest rates because financial markets tend to anticipate monetary policy measure. This applies in particular to long-term interest rates since bond prices move in the opposite direction of interest rates, and potentially by much more than 1:1 with respect to interest rates. A 10-year bond should, approximately, lose 10% of its value if interest rates increase by one percentage point. Holders of these bonds try, naturally, to anticipate monetary policy measures, especially those which are supposed to have a particularly strong impact on long-term interest rates like central banks buying massive amounts of longer-term government bonds (QE).

This is why most studies of the effectiveness of QE use the so-called event study technique: i.e. they measure to what extent interest rates moved around announcements, not the actual implementation of the bond purchases. Moreover, QE in the euro area did not come out of the blue. Its start had been carefully orchestrated by a number of speeches and studies by the ECB, which had made it clear that the ECB would implement this type of policy if inflation were to remain low, and in particular if expected inflation were to show a loss of confidence that the ECB is able to reach its target of close to 2% inflation at least over the long run.

Altavilla et al. (2015), which is often cited by ECB board members, put it this way:

Because the January 2015 ECB's announcement was expected by financial markets, this leads us to consider a broad set of events comprising ECB's official announcements that, starting from September 2014, could have affected market expectations about the programme.

Most studies of the effectiveness of QE thus start with an estimation of the impact of the (announcement or anticipation) of QE on (long-term) interest rates. The result (usually a few dozen basis points) is then fed into a standard macroeconomic model to calculate the impact on inflation and output.

This approach is in principle correct. But it has two drawbacks:

First, this approach cannot discriminate between the hypothesis that observed falls in interest rates were due to the anticipation of QE and the hypothesis that QE became more likely as inflation fell for exogenous reasons (for example, a global deflationary trend).

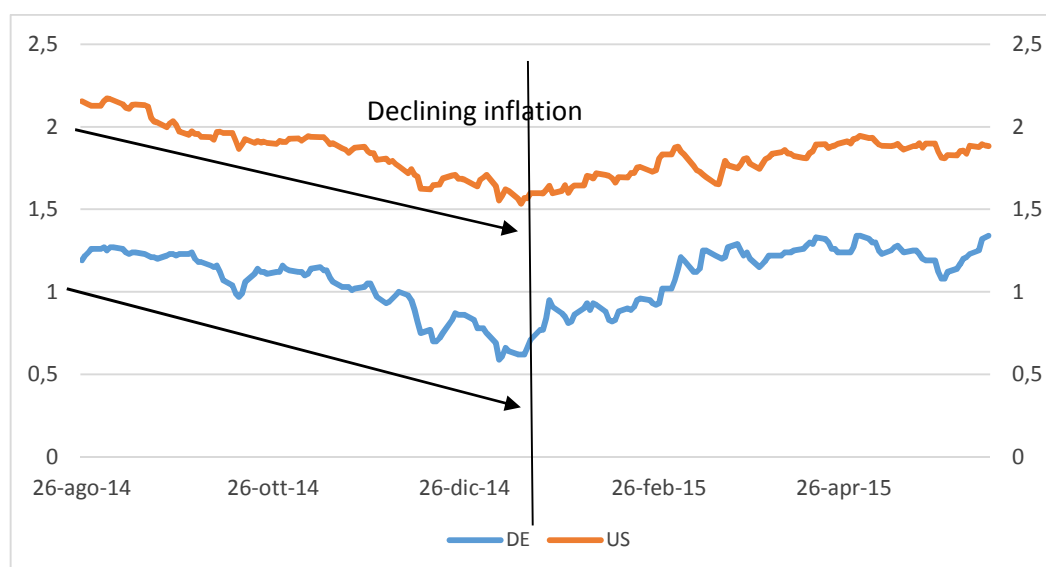
Secondly, the results of this approach imply in general that in the absence of QE, output and inflation would have been even lower. But it is difficult to see what negative shocks would have diverted the euro-area economy away from its slow, but steady recovery which had already started in 2013. Lower oil prices might of course have affected measured inflation (CPI, but not GDP, as mentioned above), but the impact of lower oil prices should have worn off by now.

The first objection is especially important given that the President of the ECB had already laid out the strategy in early 2014, which included sovereign bond purchases as the last resort, inflation were to stay low and expectations became unanchored. The latter happened, gradually, during the latter half of 2014. The ECB was thus reacting to this development.

But as the figure below shows clearly: inflation expectations, measured here by break evens, declined not only in the euro area, but also in the US. The decline in inflation expectations was thus a general, indeed global, phenomenon.

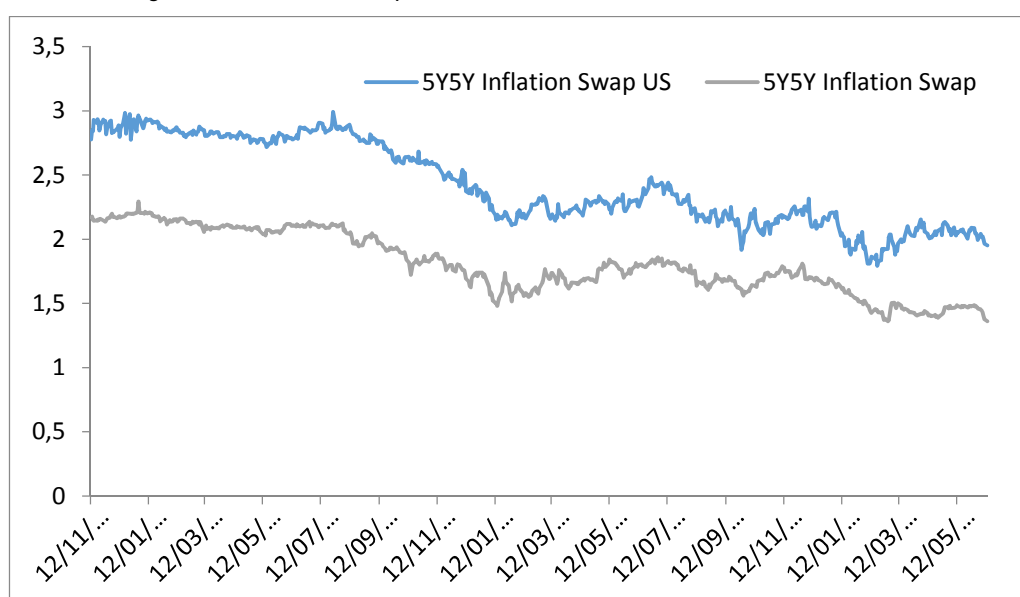
In this figure, one cannot find a specific impact on euro-area bond buying, neither during the anticipation, nor during the implementation phase. During the first few months of implementation, the ECB did tout the observed increase in inflation expectations as proof that the policy worked. But this increase was short-lived and was, again, a global pattern as the following figure shows.

Figure 2. QE and inflation expectations US and Germany 10-year break-even inflation



Source: Datastream

Figure 3. 5-year inflation expectations



Source: Datastream



Altavilla et al. (2015) represent one of the few studies to apply the event study methodology to inflation expectations, proxied by inflation swap rates. They find that inflation expectations increased at almost all maturities on the same dates of announcements that made QE more likely, but the overall impact is generally rather small (less than 0.15%) with the usual methodology. But even with their preferred methodology, the impact is at most 0.33%, but somewhat counter-intuitively this is for inflation only one year ahead (see Table 2 below).

The table also show that they find in general that longer term inflation expectations have increased less than short term ones. In particular their results also imply that the ECB's preferred measure (expectations 5 year out for the next five years.) forward have in general declined with QE announcements – which is the opposite of what QE was supposed to achieve.

Table 2. Inflation expectations

	Euro-USD exchange rate (%)	Dow Jones Euro Stoxx (%)	Inflation swap rates (in basis points)			
			1- year	2- year	5- year	1 0 - y e a r
Controlled event study						
1-day change	-5	2	14	8	15	6
2-day change	-12	1	33	25	24	4
Standard event study						
1-day change	-5	3	9	7	15	6
2-day change	-12	5	5	7	14	- 3

Source: Altavilla et al. (2015).

### 3. EXPECTATIONS: CONFRONTING MARKET-BASED, OFFICIAL AND SURVEYS

The use of market-based measures of expected inflation leads to a logical conundrum: the purpose of QE is to affect (lower) interest rates. The ECB is buying both indexed and non-indexed bonds, thus affecting presumably the yields on both types of securities. There is thus an inherent contradiction between the idea that inflation expectations embedded in yield differentials are unbiased, market-based predictions, and the underlying assumption of QE, namely that central bank purchases affect market prices, i.e. that markets are not efficient.

Given these inherent difficulties in interpreting market-based measures of inflation expectations, it is important to find alternatives. Another way to measure shifts in expectations of inflation is to use surveys, or the forecasts of the official institutions themselves.

Official forecasts are in all likelihood biased, but the question to be asked here is whether professional/official forecasts have changed since the start of central bank bond-buying in the euro area. If the bias has not changed over time, the change in official forecasts provides a good idea of the extent to which QE has affected the outlook for inflation (at least in the mind of the forecasters).

We use one private (survey of professional forecasters) and two official sources, the (twice) annual forecasts of the European Commission and the projections contained in the World Economic Outlook of the IMF. (There is no point in using the staff forecasts of the ECB itself, as the ECB staff is clearly in a conflict of interest situation.)

We start with the projections from the IMF. The table below shows that the IMF actually became more pessimistic on the outlook for inflation after the announcement and implementation of QE in the euro area.

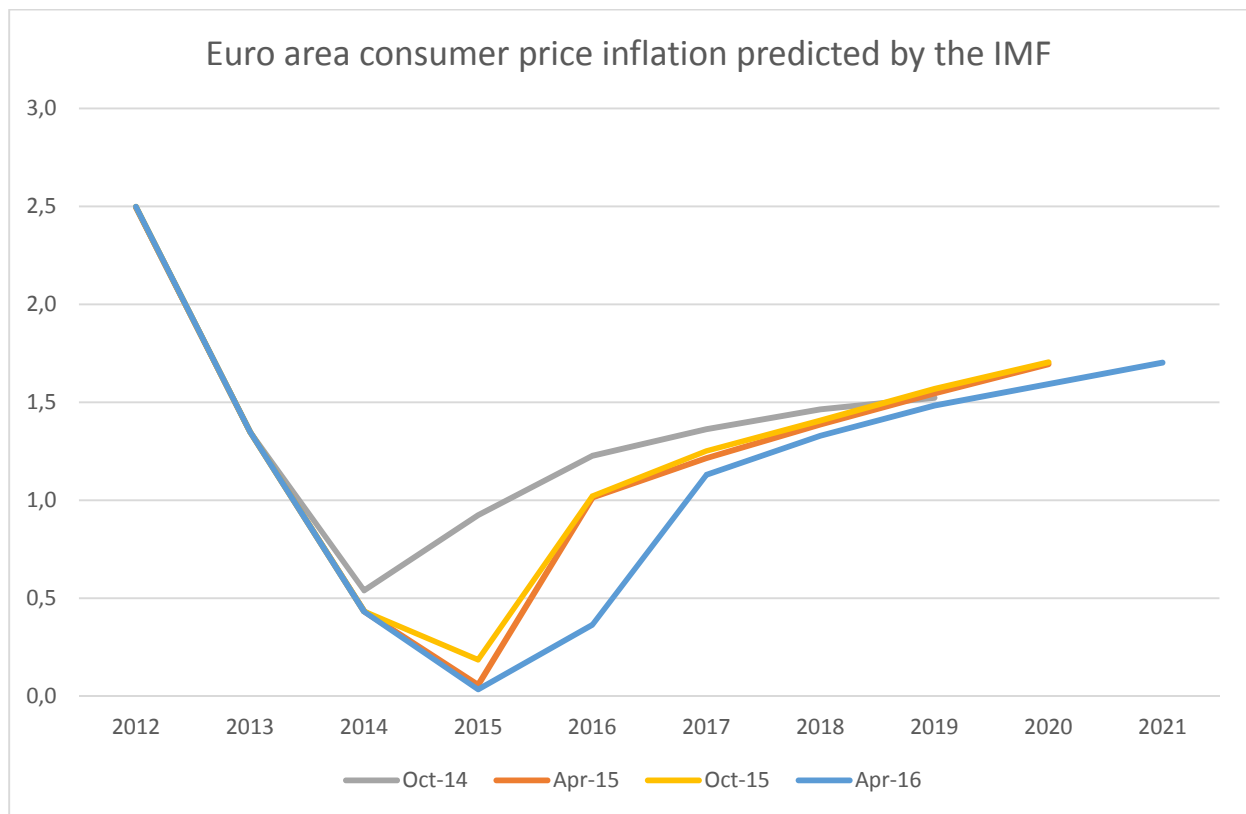
Table 3. Euro-area inflation forecasts by the IMF for the year 2017, before and after QE

	End 2014 (before QE announcement)	April 2016 (after announcement of extension of QE)	Delta = impact of QE (?)
HICP	1.4	1.1	-0.3
GDP deflator	1.4	1.1	-0.3

Source: IMF.

Figure 5 below shows the entire paths for HICP inflation for the euro area as projected by the IMF. The newest projections are generally below the ones when QE started. As mentioned above, oil prices are currently back to the level of early 2015. The low values in the latest projection can thus no longer be attributed to low oil prices.

Figure 4. Euro Area CPI, IMF prediction



Data source: IMF.

The ECB Survey of Professional Forecasters (SPF) shows a similar pattern. As shown in the table below, inflation in the euro area is much weaker than anticipated before the bond-buying started.

Table 4. Euro area inflation forecasts by the ECB Survey of Professional Forecasters (SPF) for the year 2016, before and after QE

	Q4 2014 (before QE announcement)	Q2 2016 (after announcement of extension of QE)	Delta = impact of QE?
HICP	1.4	0.3	-1.1
Real growth	1.5	1.5	0.0

Data source: IMF.

One could of course argue that other factors have depressed inflation that in the absence of QE and that inflation would have been even lower without massive bond-buying. However, it is difficult to point precisely to any factors that could have negatively affected the euro-area economy in general, or inflation more narrowly. The temporary dip in oil prices of late 2015/early 2016 can no longer serve as an explanation of the continuing weakness of inflation, as oil prices are now back to the level they were when QE started. Fiscal policy has been slightly expansionary (notwithstanding the continuing talk about austerity) and the euro is now lower than at the start of QE. Real growth in 2016 should be in line with expectations. This overall picture is difficult to square with the view that QE had a strong impact (and that inflation would have been much lower in the absence of QE).

## 4. QE = NATIONAL POLICY

One of the key decisions accompanying the launch of the PSPP (public sector purchase programme) was that 80% of the bond purchases under this programme should be undertaken by the national central banks in the Eurosystem. Moreover, NCBs are buying the bonds of their own government, and any profits or losses on these purchases remain at the national level. Furthermore, experience has shown that there are important differences in the maturity composition of the bonds bought by different national central banks.

Gros (2016) shows that this type of 'national QE' is equivalent to national bond market management and that different NCBs bought quite different maturities. Viewing QE in this perspective suggests immediately that the government purchasing programme of the ECB should not have a strong impact on the economy and that the impact might well vary strongly from country to country.

## 5. CONCLUSIONS

In early 2015, the ECB embarked on the secondary markets public sector asset purchase programme. The aim was to achieve a “sustained adjustment in the path of inflation” towards the target of below, but close to 2%. Almost one year and a half into the programme, there is little sign that this goal will be achieved any time soon.

In December of 2015, the ECB increased the size of the programme and promised to extend it until the target of inflation of (close to, but below) 2% is in sight. This promise might be difficult to keep. The experience of Japan has shown that even massive bond-buying programmes have little sustained impact on (consumer price) inflation in economies characterised by large excess savings.

Interest rates fell throughout 2014, i.e. prior to the implementation of the bond purchase programme and there is some evidence that part of this was due to the anticipation of the ECB’s eventual decision of January 2015. However, long-term expectations of inflation also fell prior to the start of the bond purchases (and have not recovered since). Logically, one should ascribe this result to the anticipation effects. But this would imply that the (anticipation of) the bond purchase programme has had the opposite of the intended effect.

The defence of the ECB’s policy is usually based on the assertion that inflation would have been even lower without the ECB acting. But this argument has become rather weak as oil prices have recovered to the level of early 2015 whilst inflation has remained stubbornly weak.

All in all, it appears that the bond purchases of the ECB have helped to reduce interest rates somewhat, especially for the countries facing high risk premia, and this might have sustained demand in these countries. But bond purchases have not been effective in achieving the official goal of the ECB, namely bringing area-wide inflation closer to 2%.

How can one explain the muted impact of QE on inflation expectations? Gros (2014) argued almost two years ago that that this was to be expected. It is well known that the reaction of investment to lower interest rates is always difficult to predict. One should thus expect that investment does not react much in a low-rate environment to additional small changes. Moreover, low interest rates increase the income of debtors, but reduce those of the creditors. The net impact on the economy of going from low to very low, and sometimes even negative rates should in any event have been expected to be small. Most evaluations of QE assume this problem by using standard models that imply, by construction, that lower rates stimulate the economy and increase output and inflation.

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## NOTES





DIRECTORATE GENERAL FOR INTERNAL POLICIES  
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# Effectiveness of the ECB programme of asset purchases: where do we stand?

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## IN-DEPTH ANALYSIS

### Abstract

Large-scale asset purchase programmes are a form of monetary policy in which market interest rates are reduced by different amounts at different maturities – in particular lowering them at the long rates that affect investment and consumption decisions. They are intended to stimulate spending by increasing liquidity, raising asset prices, creating wealth effects, lowering borrowing costs and increasing investment spending.

The ECB's expanded asset purchasing programme is too young to allow a final assessment of its impact or effectiveness. But the results so far are similar to those elsewhere, perhaps a little weaker.

The impact may be weaker because the programme is proportionately smaller than the US and UK programmes. It contains public sector asset purchases at its core, with two essential compliments (covered bond purchases, and asset-backed securities) that spread the effects to private sector behaviour to stabilise financial conditions, to provide higher quality collateral for loans, and reduce risk premia by region or sector. It is argued that these qualitative benefits are going to be more important than the quantitative results.

Nevertheless, damaged transmissions (from increased credit to new loans and spending) and debt deleveraging are the major impediments that remain. Various extensions of the ECB's programme are possible: negative interest rates, "funds for lending", fiscal coordination and helicopter money. They offer some scope, but have disadvantages. The most promising is the exchange rate channel. But this is a longer term proposition and requires structural reform to be self-sustaining.

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## EXECUTIVE SUMMARY

- Large-scale asset purchase programmes by Central Banks are a form of monetary policy in which market interest rates are reduced differentially at different maturities – principally lowering them at the longer rates which affect investment and household consumption decisions. They are designed to stimulate spending by increasing broad money holdings, pushing up asset prices, producing wealth effects, lowering borrowing costs and stimulating aggregate demand.
- The experience of those who have tried asset purchase programme (the US Federal Reserve, Bank of England, Bank of Japan) is fairly uniform: small but significant increases in GDP of ¼%-½% each year; and 10-year interest rates lower by ¼%-½%. But the impact on prices and inflation has been negligible (<0.1%) in each case.
- The ECB's asset purchase programme is too young to allow a final assessment of its impact and effectiveness. But the results so far in the Euro area are broadly the same as elsewhere, perhaps a little weaker: output growth around 0.3% on average and inflation -0.05%, from January 2015 to early 2016.

Other measures of effectiveness:

- PSPP (Public Sector Purchase Programme): Large-scale asset purchases inject liquidity into the financial markets, reducing financial stress, lowering uncertainty, stabilising financial institutions and easing portfolio rebalancing away from risk. This reduces the risk of financial disruption.
- Lower interest rates and additional liquidity will benefit investors, banks, firms, mortgage holders more than savers, employees, or pensioners. But compared to a world without PSPP, most people will be better off: unemployment would have been higher, more firms would have closed and growth would be lower.
- ABSPP (Asset-Backed Securities Purchase Programme): Rising asset prices will boost dividends, wealth inequality, but reduce defaults and bankruptcies. This is consistent with PSPP in increasing the potential for spending from wealth and providing smoother financial conditions for a private sector recovery; but it is also necessary since PSPP alone may take too many assets off the market for banks/firms to offer as high quality collateral for loans.
- CBPP (Covered Bond Purchase Programme): Also a necessary complement to facilitate credit easing either directly or through the banking system. Evidence suggests that reducing risk premia, by region or sector, can have the biggest effect in terms of impact on the economy, in limiting inequalities and a build up in non-performing loans.
- Investors, specifically insurance or pension companies, enter riskier investments to secure higher returns to offset lower yields on safe investments. CBPP and prudential regulation can counter this tendency.

The main difficulty faced by asset purchase programmes is a breakdown in transmission between liquidity and low cost credit, actual loans, investment and spending. Debt deleveraging makes it worse. Hence policy implications: i) Actively repair transmission mechanisms and offset private deleveraging; ii) Expand asset purchasing beyond the banks and retain/extend ABSPP and CBPP; iii) Use credit easing; iv) Focus on reducing risk premia by region or sector; v) Coordinate to exploit the extra fiscal space created by quantitative easing, and extend it by targeting long term bonds; and vi) For greater impact, reinforce the exchange rate channel using currency interventions, coupled with creating space for self-sustaining structural reforms.

## 1. LARGE-SCALE ASSET PURCHASE POLICIES: A RESTATEMENT

The impact of monetary action on the economy depends on the level of long-term interest rates, being the rates that determine household consumption and business investment decisions. Conventional expansionary monetary policies stimulate the economy by buying short-term government bonds in order to lower short-term interest rates, or by changing overnight lending rates in the interbank market. Arbitrage then provides the transmission from short-term to long-term rates via the yield curve, which balances rates of return vs. those on other assets of similar maturity and the risk of inflation at that maturity. But when policy rates hit the zero lower bound, or get close to it, variations in conventional monetary policy become disabled and inoperative on the expansionary side.

Unconventional monetary policy actions are based on the idea that the central bank can still stimulate the economy when conventional monetary policy has become ineffective by intervening to change long-term market rates. Monetary policy may try to lower market rates directly by undertaking large-scale asset purchases at longer maturities (quantitative easing (QE)); or by purchasing corporate bonds; or by making loans to businesses and firms to lower their cost of borrowing (credit easing).

QE is designed to stimulate spending by increasing broad money holdings, pushing up asset prices, producing wealth effects, lowering borrowing costs and stimulating expenditure. This portfolio rebalancing process lowers the spread of long-term interest rates over short-term policy rates and the return on risky assets over risk-free assets.

This portfolio balance channel is the main policy transmission mechanism of concern to QE. There are others: the signalling channel (a commitment to keep future policy rates low); the liquidity-credit channel, the translation of greater liquidity into actual credit and loans; and the exchange rate channel (a depreciation of the exchange rate to increase exports). Since these additional channels operate in parallel to the portfolio rebalancing effects, they produce different cocktails of impacts to the main thrust of QE – which is to reduce the cost and increase the availability of credit at maturities that affect investment and household spending decisions when conventional monetary policies cannot.

## 2. WHAT DO WE KNOW? HOW EFFECTIVE HAVE PROGRAMMES OF ASSET PURCHASES BY CENTRAL BANKS BEEN?

There have been several asset purchase programmes in recent years, principally in the US (to 2014), UK (to 2014), Japan (continuing), and now in the Euro area. Any assessment of how effective or successful these programmes have been must include an analysis of their impact on the designated targets of economic policy. Since the ECB's programme has only been in operation since 2015, the impacts are not yet very clear. But general lessons, and a fuller picture of the likely impacts, can be derived from the experience elsewhere.

### 2.1. PSPP: Quantitative Easing by Large-scale Asset Purchases

The basis of unconventional monetary policies is that financial markets are neither perfect nor complete. Therefore arbitrage tends to work imperfectly, depending on expected future interest rates as well as on the preference for short-term over long-term assets.

In such circumstances, monetary authorities can purchase significant quantities of Treasury securities of long maturity, or mortgage-backed securities, or corporate bonds, altering their relative supply vs. demand. This raises bond prices and lowers interest rates at that maturity. These effects then extend to other longer-term assets as investors who just sold securities to the central bank move to invest in substitutes that are closer to the asset sold than cash, thereby adding to the downward pressure on longer-term interest rates further along the yield curve or in neighbouring markets. Using this portfolio balance or "ripple" effect, the central bank is able to affect both the spread of long-term interest rates over policy rates (term premium) and the necessary return on risky assets over risk-free assets (risk premium). Monetary authorities are then able to manipulate the interest rates relevant to consumption and investment spending.

### 2.2. Impacts in the US and UK

The policy process described above is an example of the QE implemented by the U.S. and others after the financial crisis. Available data confirm the impact of this policy channel. In the U.S., before QE, there was an average excess term premium of almost 200 basis points for securities with a 10 year over a 9 year term. This excess premium then dropped by 75 basis points as a consequence of QE (Fawley and Juvenal 2012). In the UK, QE reduced the spread of corporate bonds over gilts by between 2000 (for high yield bonds) and 200 basis points (for investment-grade, non-financial bonds) after 2009, and the yield on 10-year gilts from 5% to 2% (Miles, 2012). The ripple effect to neighbouring markets, other maturities, and in particular to reducing risk premia, was quite strong. How much did those changes translate into gains in output and employment, or losses in inflation?

The answer is again fairly consistent. A range of estimates for the US, reported in Williams (2011), suggest that these QE policies reduced interest rates by between 0.15% and 0.3% points in this period – which corresponds to having increased GDP by similar amounts each year. That is a valuable contribution, but not large. There was no perceptible impact on inflation, or inflation expectations, before the programme ended.

In the UK, QE is estimated to have added 3% to the level of GDP over the 6 years since 2009 compared to what would have happened otherwise, with negligible effects on inflation [0.1% or less in the US, UK, Japan]<sup>1</sup>.

<sup>1</sup> Kapetanios et al (2012); Joyce et al (2012); Bank of England (2012).

Thus, real output is higher by ½% on average each year, equivalent to an extra 0.4% on the growth rate. However, unemployment typically follows output with a one to two year delay. Hence, QE operations may take a year or more to achieve their full effect on the economy.<sup>2</sup>

## 2.3. Details on the Lessons Learned from the US Experience

The Federal Reserve Bank in the US has conducted three rounds of QE. The first ("QE1") lasted from 2008 to 2010 and involved asset purchases of \$2.1tn; the second ("QE2", from 2010-12) added a further \$2.05tn assets initially at the rate of \$30bn a month; and the third ("QE3" from 2012-14) bought in assets at \$85bn a month before being tapered down to \$65bn, then \$50bn a month, and was terminated in late 2014.

In total, the three QE programmes amounted to \$4.5tn or 25% of GDP. This is considerably larger, in absolute value, than the QE operations undertaken elsewhere. But in proportion to the size of the economy, it is about the same as in the UK; but larger than that proposed for the Euro area set at €80bn per month in 2016. That amounts to 16% of Euro area GDP.

### 2.3.1. Financial Impacts

In the early stages, the emphasis was on how far QE had been able to reduce long-term market interest rates. Early estimates suggested rates had fallen by between 30 and 100 basis points depending on the type of security (Gagnon et al, 2011). Subsequent studies of QE1 and QE2 found similar results (Williams 2011), as did the corresponding studies undertaken for the UK. Later studies from the QE2-QE3 era (Chen et al, 2012, for example) reduced these estimated interest rate reductions to around 30-40 basis points, or 4-9 basis points per \$100bn of asset purchases.

There can be many explanations for this weakening (apart from over-estimates in the event studies used in the early papers, which were unable to separate out the QE effects from other factors). First, there may have been "QE fatigue" after a while – when the supply and quality of assets available for purchase began to fall. Second, repeated applications of QE inevitably create expectations of inflation, which undermine the downward pressure on interest rates further along the yield curve. Third, adherence to the zero lower bound means that interest rate reductions, per unit of QE, will be smaller the lower are market interest rates at the start of the exercise (less important in an era of negative interest rates). Any one of these factors would lead to declining impacts as QE operations continue.

A second point is that QE may have an impact on a number of other variables – the most important being on risk premia, as opposed to term premia. To the extent that QE reduces the risk premia in corporate bonds, or in bank borrowing, or on bank loans, it will have an impact on the cost of borrowing and the progress of the economy – over and above what may have been achieved in the underlying market interest rates.

This point obviously reflects the liquidity provision aspect of QE, and QE's ability to stabilise fragile or dysfunctional financial markets. But it also raises a difficult question for the Euro area: which assets should the ECB buy in its operations? Evidently it should buy beyond government bonds and include corporate bonds and those of the distressed governments if it wishes to have the maximum effect in lowering commercial borrowing costs, in particular real interest rates where risk premia or deflation are strongest. But it

<sup>2</sup> The results for output (but not inflation) were less favourable in Japan where circumstances were different. QE has also been effective in other countries by stabilising the financial sector, making credit conditions and the flow of funds offered for investment more reliable.

should focus on a spread of bonds if the priority is to revive a deflating Euro area economy.

A third point is that, by reducing market interest rates, QE will cause an economy's exchange rate to depreciate. On one hand, this is useful as it will boost net exports (so long as other economies do not use QE too). That adds to the recovery. On the other hand, it is unhelpful because it may induce a capital outflow which will lower asset prices and raise interest rates again. These two effects will tend to offset each other.

### 2.3.2. Macroeconomic Effects

Early estimates of the output and price effects of QE operations in the US economy were optimistic: the drop in long-term interest rates of  $\frac{1}{2}\%$  point in QE1 was thought to raise GDP by 3% in the short run, and prices by 1% all else equal. Later estimates, from the QE2 period, reduced those figures to a rise in GDP of 0.4%-0.5% a year over 5 years with a minimal upward effect on prices (Chen et al 2012), driven by a smaller fall in interest rates, about 0.2% points, spread over a longer period. This under-lines the importance of maintaining continuity and credibility in QE.

These results are in line with those found in other OECD economies. In fact, longer periods of commitment to low interest rates appears to increase the gains in GDP sharply; but at the cost of extra inflation. That introduces a difficult trade-off and the need for a careful choice of timing. Signalling policy intent appears to be a crucial aspect of a successful QE.

There is additional evidence that around half the interest rate reductions come from lower risk premia that follow from QE operations. The reduction in risk premia, when separated out, then allows a modest but persistent increase in output due to a small but lasting fall in real interest rates where they matter most – the suggestion being that risk premia reductions are necessary to achieve an enduring fall in real, as well as nominal interest rates.

### 2.3.3. Need for an Exit Strategy

From early on, the Fed argued that an exit strategy was a necessary step to counter expectations of future inflation from expanding the Fed's balance sheet; to assure the markets that the Fed would indeed exit QE in good time, and that asset purchases would not continue to generate inflationary pressures in the future.

At the time, the Fed's announcement had to be corrected to signal that the current QE programme would not be abandoned until the Fed's targets (for unemployment, growth or inflation) were achieved – and reinforced with public explanations of why an exit strategy was necessary, how it would work and tests to show its feasibility. A gradual tapering of the QE operations then enabled a smooth exit to take place. By contrast, the ECB's PSPP programme lacks any mention of an exit strategy or how it would operate.

## 2.4 Experiences in the Euro area: Early Results

Do the results seen in the Euro area so far match those in the US and UK? The ECB's asset purchasing programme appears to have had a limited impact on the Euro area economy so far, with output growth averaging at 0.3% and inflation -0.05% from late 2014 through 2015. This may have been because the programme is proportionately smaller, just <sup>rds</sup> of the US and UK programmes; or because long run interest rates fell by less ( $\frac{1}{2}\%$  on average), having started from a lower level. Hence, the logical extension to negative interest rates in 2015.

That said, a few comments can be made on why the QE programme has had such a limited impact on the real economy. The first is that monetary policy has had to act alone; it has



not been able to take advantage of fiscal expansions at the same time, or exploit lower borrowing costs either directly or by refinancing past debt. Only Italy seems have done that systematically, to be rewarded with small gains in relative performance. This suggests QE programmes may be more effective when conducted in conjunction with other policies (hence the focus on helicopter money and fiscal coordination, sections 5.3 and 5.4).

Second, low levels of private sector lending seem to have been a problem everywhere: in surveys, 85% of the banks report QE programmes have had no effect on lending. That suggests problems with the transmission mechanism between liquidity provision and credit uptake: Investment spending is still below its 2008 peak; real interest rates are still high; and many small businesses or consumers still prefer to pay down debt.

Third non-performing loans have increased, and now run at above 9% of GDP which makes the banks reluctant to lend. Each of these factors reduces the effectiveness of the ECB's asset purchases programme.

## 2.5 CBPP3: Credit Easing vs. Quantitative Easing

According to former Fed Chairman Bernanke, we can classify unconventional policies into quantitative easing and credit easing. The former refers to money injections from the Fed through commercial banks; the latter where central banks provide liquidity to the economy bypassing financial intermediaries, by buying private-sector assets such as corporate bonds or residential mortgage backed securities. Included in this definition of credit easing are subsidised loans, cheap loans, funds for lending, or direct liquidity provision to firms. This credit easing channel is particularly important where there are liquidity restraints in the banking system which would prevent any money injections from being transformed into loans to households and firms; or when banks are thought more likely to use the extra liquidity provided by QE to pay off past debts, or raise their capital or liquidity ratios as they are required to do under the new financial regulation arrangements associated with Basel III, Dodd-Frank or the EU's banking union.

## 2.6 Redistributive Effects: Inequality and Costs

No monetary policy, conventional or unconventional, is a neutral policy action. Lower long-term yields benefit borrowers over savers, portfolio rebalancing favours equities over bondholders. Both create wealth effects. Lower interest rates benefit investors, owners of capital over labour, home owners over renters, consumers over pensioners, exporters over importers, irrespective of the instrument chosen to conduct the policy. Large corporations are one of the main beneficiaries since they can borrow more cheaply, buy back their own stock or retire past debt. In another example, rising asset prices benefit current over future pensioners who face lower returns on their contributions to the pension fund – a matter of some importance and concern in an era of ageing (and often declining) populations. At the same time, reducing the funding costs of public debt will benefit taxpayers over non-taxpayers; also higher taxpayers over lower taxpayers in a progressive tax system.

Large-scale asset purchases and unconventional policies more widely are not a free lunch; they have potential costs. Apart from the effects on financial stability and redistribution, extended balance sheets expose central banks to potential losses and imply greater risks to the economy (Carpenter et al., 2013), although this is unlikely to affect tax payers much (de Grauwe and Ji, 2015). Portfolio rebalancing can increase vulnerabilities in the financial system too, and thereby undermine financial stability in the long run. In fact, it could lead to excessive risk taking in insurance companies and pension funds, which need to hold long-term assets in their portfolios in order to match their investment returns to their long-term liabilities – difficult in an era when yields are being pushed down.



The extent of the costs associated with QE depends on the exit strategy designed to reverse QE's effects; on the form of financial regulation that replaces unconventional policies in normal times; and on how this process is communicated and understood by the public. Moral hazard can also arise as a consequence of unconventional policies.

For example, commercial banks and financial intermediaries may increase liquidity risk by relying on central bank intervention. And the success of QE may delay or postpone structural and regulatory reform, thus reducing the effectiveness of future monetary policies. Similarly, large-scale asset purchases may undermine central bank credibility, independence and hence inflation control, to the extent that they are thought to be a form of permanent government financing designed to sustain large structural deficits.

Given small economic impacts, the indirect effects of extra liquidity, stability in the financial markets, less uncertainty/volatility and an easier rebalancing of balance sheets away from risk and insolvency are likely to be the most important benefits of QE. In particular, a judicious choice of assets to be bought can be used to reduce risk premia on the debt of distressed governments or on corporate bonds in distressed sectors (given that market imperfections, inefficiencies or frictions must have caused the risk premia in the first place). This offers a way to reduce borrowing and refinancing costs for governments or businesses in depressed areas. The central bank therefore has to decide whether its first priority is to promote a general recovery; or to design policies to relieve depression in poorly performing areas.

### 3. EFFECTS IN THE FINANCIAL SECTOR

#### 3.1 Increased Financial Stability (ABSPP)

To the extent that QE reduces the risk premia on corporate bonds, or on bank loans, or on loans to regional or national governments, it will have an important impact on the cost of borrowing and growth prospects in the economy. Some (Gagnon et al 2011) have argued that this is the more important part of a QE programme in practice. Obviously, this has to do with liquidity provision, and QE's ability to stabilise fragile or dysfunctional financial markets. As in section 2.3.1, it raises the question for the Euro area: which assets should the ECB buy in its QE operations? Evidently it should go beyond core government bonds to include corporate bonds and those of distressed governments if it is to balance commercial borrowing costs and regional inequalities. But it should focus on a spread of bonds if the first priority is to revive a deflating Euro area economy. I stress the former approach to counteract natural tendency of the ECB's asset purchases to boost and redistribute activity to more prosperous regions, while gains in Euro-wide performance would come (in the first instance) from support to the depressed regions.

At the same time, ECB asset purchases mitigate the risk of an asset price collapse, and the financial disruption that would follow. Put differently, QE has a big (but hard to measure) effect in stabilising financial markets, while providing new liquidity, resolving dysfunctional financial markets and reducing uncertainty. In difficult or potentially deflationary times, this is a considerable advantage even if the direct impacts on GDP and prices are not large<sup>3</sup> – provided that the QE horizon is long enough, and the ECB's commitment to seeing the QE programme through is credible enough. Given that, QE will have important effects in terms of reducing risk premia for borrowers and those who would refinance their debts, be they in the public or in the corporate/private sector.

The logic of this comment is that portfolio rebalancing effects may be the important side-effect of QE. If so, QE would be best implemented by buying assets, not from banks who would use the funds to deleverage their own debt position (in which case nothing will come from the easing); but from corporations or non-bank financial institutions more likely to buy corporate bonds or invest in assets which yield a return. Thus QE is typically most effective when markets are dysfunctional and not working efficiently, meaning that assets have become hard to substitute due to rigidities or credit/liquidity constraints. QE then has its effect through reducing bid-ask spreads, risk premia, trading costs, pricing "errors", rather than through lowering baseline market interest rates per se.

#### 3.2 Negative Financial Side-Effects

- a) A reduced default rate among firms means less creative destruction as QE eases the depression, leaving a tail of unreformed "zombie" firms in the recovery. Similarly, structural reforms generally might be postponed. This is true; but for those reforms to take place at all we need liquidity/credit and fiscal space. This is what the ECB's asset purchases provide.
- b) Mortgage and other lending decline because the central bank takes so many bonds out of the market that firms cannot acquire enough high quality bonds to act as collateral for their loans. It is important to get round this difficulty (ABSPP, CBPP).
- c) Investors, and specifically insurance or pension companies, enter into riskier investments in search of higher returns, QE having lowered the yields on safe investments. Likewise, speculation on higher asset prices creates a serious risk of an

<sup>3</sup> Some of the impact of asset purchases will be undone by the requirement that liquidity ratios now need to rise.

asset bubble (especially in housing<sup>4</sup>). Prudential regulation and higher capital ratios are needed to counter that effect.

- d) The risk of default on an asset held by the central bank creates a possible loss on the ECB's balance sheet, instead of on the balance sheet of an already indebted government. Two points here: i) The changes to income flows wash out as the interest payments made to the ECB would cease, but the extra profits paid to national governments by the ECB will also cease; ii) The write down of the ECB's assets will have no implications for taxpayers since central banks do not need to maintain capital/asset ratios to function. Even if the ECB felt the need to repair its capital base, it would ask its shareholder governments for extra capital which they could supply in the form of bonds – in effect replacing QE assets with new interest payments and income refunds. No implications for taxpayers. The real danger here is rather different. If the defaulted bond is not replaced, there will be no bond to sell back into the market in the exit strategy. Realising this, private agents will expect a residual degree of inflation from the QE process.

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<sup>4</sup> Feldstein, 2016.

## 4. CHANGES TO THE DISTRIBUTION OF INCOME AND WEALTH

Section 2.6 above implies that QE can be expected to make significant changes to the distribution of income and wealth – generally but not always in the direction of the owners of capital, houses and financial assets, but away from employees, savers and possibly pensioners. That could represent a significant rise in inequality.

To an extent, the spending from the wealth effects of this change can mitigate the implied deterioration in the distribution of income. In other words it matters what the recipients do with their gains. But it is important to be careful of the comparisons being made. Compared to history, low interest rates and abundant liquidity will benefit investors, banks, firms, mortgage holders more than savers, employees, or pensioners. But compared to what could have happened without QE, most people would be better off: unemployment would have been higher, more firms would have closed and growth would be lower. That would have damaged employees, savers and pensioners even more.

That said, income from savings is more tied to the central bank policy rate (not part of QE) and available estimates show that asset purchases have pushed the prices of equities and similar assets up by as much as bond prices. This implies the ripple effect is strong and that most of the impact of QE on consumption and saving will come through wealth effects.

### 4.1 Wealth Inequality: Savings and Consumption Effects

The two biggest influences on savings and consumption spending in this context will be the loss of jobs (or reduced earnings) and expectations of inflation. In practice, QE has limited both – meaning that (savings) deposits are healthier and more secure than they would have been otherwise. Beyond that, lower interest rates reduce interest income and interest payments on mortgages or personal and small business loans. Since most savings deposits are at short-term rates, but QE operates at long rates, the net effect is that income gains from saving under QE are small but positive, meaning households gain a little in income. This is confirmed by Bank of England (2012, Table 1). There may be other factors: rising asset prices mean those with assets gain more than those without. If the exchange rate depreciates prices will rise damaging everyone, but owners of net foreign wealth gain.

More important are the direct effects. Rising asset prices (falling interest payments) will boost dividend payments and reduce defaults/bankruptcies. So the larger is the share of assets in household or corporate portfolios, the greater the gains from QE and the greater the boost to the economy from increased consumption or investment. However in individual cases it depends if the individual is a net asset holder (those later in the life cycle) or a net liability holder (those early in the life cycle). So even if QE brings gains for the economy as a whole, there will be rising intergenerational transfers/inequality behind the scenes.

To give an idea of scale here, the Bank of England assessed the gains in net wealth in the UK was 16% by mid-2012, or £10000 per head. If the top 5% have 40% of the assets, this means gains of around £80000 per person in the top 5% of the wealth distribution, but £6300 per head in the bottom 95%. That means the rich gained by 13 times more than the poor. And since (from the same source) the over 45s hold 80% of the non-pension assets, the older generation gained roughly 26 times as much as the younger generation.

## 4.2 Intergenerational Inequality and Pension Funds

The analysis of the effect of the ECB asset purchase programme on wealth is comparatively straightforward, at least conceptually (measurement may be more intricate). But the analysis of the effects on pensions or the incidence of taxation is technically difficult. This sub-section and the next provide a summary taken from Hughes Hallett (2015), using evidence from Miles (2012) and Bank of England (2012) for pensions and Steeley (2015) for tax.

There are two types of funded pension schemes: defined benefit (the payout is defined by final salary and length of service) and defined contributions (the payout is defined by the market value of the contributions made during employment). Both may place a lump sum in a fund on retirement whose value is not much affected by QE since higher asset prices at the moment of buying in imply a bigger fund but a lower net present value of the yields per asset. These effects net out.

Defined benefit pensions: Consider a scheme that is fully funded. When QE starts, the value of the fund's assets will increase. But so will the net present value of the liabilities needed to pay future pensions since yields on those assets will have gone down. Since the fund holds assets that remain not bought by QE (paying historical pre-QE yields), while arbitrage means asset prices will rise for all asset classes, the value of the assets will rise more than the fund's liabilities. The fund will move into a temporary surplus; once the historical assets mature, the fund returns to balance. In the long term QE has no effect, but in the short term there is a potential redistribution of wealth to current pensioners at the expense of future pensioners. Or, pension firms may buy riskier assets to increase their yields which shifts risk onto future pensioners.

Defined contribution pensions: Here the story is the same on the asset side. But there is no obligation to pay specific sums out, the future payouts being the market value of the fund at that point. If asset values rise with QE, then the market value of the fund goes up, but the yield on existing investments goes down. Those two factors net out in efficient markets. Since QE increases the efficiency of the bond markets (Steeley (2015)), the value of the fund will be unaffected.

Weakening demographics: One concern here is that, if a declining birth rate is the origin of a declining or aging population, intergenerational transfers not only put an extra burden on the younger generation, but it will become an increasing burden as time goes on.

## 4.3 Inequality or Redistribution between Taxpayers?

We can get an idea of the impacts of QE on taxpayers and investors, and on the costs of operating government, from a study of the UK bond markets by Steeley (2015). Steeley finds that initially there is evidence of asset mispricing, thus excess profits and transfers to investors. That implies an increased burden on taxpayers who have to foot the bill. But, over time, these pricing inefficiencies were competed away and the potential excess profits fall below the cost of trading and vanish. Trading costs were also reduced as a side-effect of the increased competition in this larger market for asset trades. Consequently, whereas initially there was a transfer to investors from taxpayers as a result of QE, later on, as bond markets became more efficient, there was a transfer back again from investors to taxpayers, because the opportunities for excess profits were removed and because more efficient pricing leads to lower trading costs. This implies a net contribution, if small, to the budget and a lower burden on taxpayers overall.

The bottom line is that, by expanding the size of the market for asset trades, QE increases competitive pressure in the asset markets, lowers trading costs, reduces mispricing, and lowers the cost of government (in addition to reducing debt servicing costs).

In a second round effect, spreads with respect to other types of assets reduced also. A key component in this shrinking of bid-ask spreads appears to be the size of the market owned by the central bank. The higher is that ownership, the more liquid the market and the less risk in holding assets – a reduction in uncertainty that would again lower the tax burden.

## 5. EXTENSIONS: REPAIRING THE TRANSMISSION MECHANISM

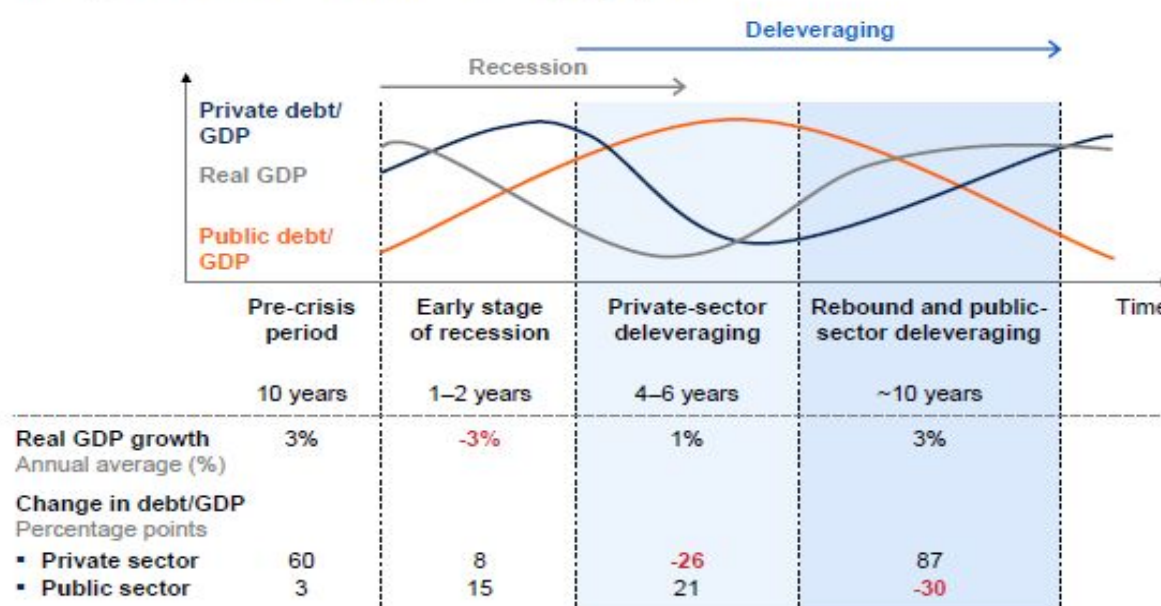
Asset purchases may not be sufficient to spark a recovery in output or prices in bad times. Lower interest rates at the maturities that would normally persuade businesses to invest, or consumers to buy durable goods, does not guarantee they will necessarily do either. Faced with declining incomes and high levels of debt, they may well prefer, and have in practice preferred, to save and pay off past debts as protection against future recessions. The pass-through (transmission) from cheap credit to actual borrowing and new spending is held back by this reluctance. This is to be expected. Why would a business invest if the prospect of being able to profit from rising incomes or a recovery appears remote? Similarly, consumers will prefer to save than spend if they think that incomes may fall or jobs will be lost because the economy fails to recover – the more so, the more they are indebted.

In fact, the experience in recent asset purchase programmes, not least in the Euro area, has been that businesses and consumers alike have been very reluctant to invest or spend on a scale needed to trigger a firm recovery, despite the extra liquidity – partly because of the risks of continued stagnation and soft prices, partly because banks fear holding increasing non-performing loans in an extended recession, especially if bank credit is tightly regulated<sup>5</sup>; but mainly because businesses, consumers and banks have been deleveraging (paying off) past debt at a time when there have been no other stimulus measures to counteract the deleveraging, but there is extra liquidity through QE available to do it. In fact, deleveraging typically happens in the private sector long before it takes place in the public sector (as Figure 1 demonstrates from a similar episode in the 1990s).

Figure 1: Deleveraging in the Swedish/Finnish Debt Crisis of the 1990s

### Deleveraging typically begins in the private sector, even as government debt continues to grow

Average of Swedish and Finnish deleveraging episodes



<sup>5</sup> Feldstein (2016)



In addition, the ECB has faced a “double whammy” of austerity policies imposed on top of this deleveraging process. That has naturally made the asset purchases programme less effective than it would otherwise have been, and the need for extensions or additional components specifically to counteract these effects even more pressing. This section now looks at four popular possibilities.

## 5.1 Negative Interest Rates

Negative interest rates are not a necessary part of asset purchase programmes, but they are a logical extension – especially when the need to repair ineffective transmission mechanisms becomes an important issue (section 2.4).

Negative interest rates usually come into play for one of two reasons: i) To deter capital inflows, exchange rate appreciations or a loss of competitiveness; or ii) To extend an expansionary monetary policy to generate a recovery or to avoid deflation. We are not concerned with the first case here, but the second leads to problems for both banks and depositors.

Drawbacks for the banks:

- a) It reduces the banks' profits (if the clients are not charged interest on deposits at the same time). This is now thought to be a serious threat.
- b) It induces contractions if the interest payments reduce the reserves held below the required ratio. That would shrink the loan portfolio; the very opposite of what we need to generate a recovery. It may also discourage holding adequate reserves in the first place.
- c) Falling profits may lead to inadequate capital ratios, a safety issue.
- d) It is often unclear if negative interest rates are intended as an extension of QE, or follow from market fundamentals.

Drawbacks for the depositors (firms, investors, consumers):

- a) Negative interest rates discourage savings/deposits (so credit expansion is smaller)
- b) They encourage banks to make loans, but imply higher risks for the banks that do so.
- c) They raise the costs for firms if they too must pay interest on their deposits, implying falling profits and a tendency not to use the banking system (leading to reduced credit).
- d) They lead to reduced spending by consumers (and firms) who have to divert greater funds to pension saving in order to maintain expected or contractual pension levels.

These drawbacks have led to a new strategy by investors. In the first stage, investors have bought US dollars in the reasonable expectation that the dollar will rise vis-à-vis the euro because yields/interest rates will be higher in the US, but not in the Euro area. At the same time they have also bought riskier investments (equities, corporate bonds, household debt) elsewhere, in their search for higher yields. This is particularly marked for large institutional investors (pension funds, insurance companies) with future liabilities to meet.

In a second stage, it will become unclear if this was a wise strategy with bank profitability under threat. But that seems to be of no concern to the central banks who have pushed their negative interest rate strategies forward regardless. The lesson drawn by markets is that central banks appear to have abandoned their traditional responsibility to supply liquidity to the financial system as needed. This increases the risks to the stage 1 strategy. In addition, with the world economy slowing down, the perception is that further rises in US interest rates are becoming less likely. The result: many investors have sold off their riskier investments again to go into safer, if lower yield government bonds. This has led investors to purchase safe bonds in cheaper jurisdictions (Euro/Germany, UK, Japan,



Canada, Switzerland) and to rises in their exchange rates. The paradox is that negative interest rates have led to lower interest rates, but to rising exchange rates in a flight to safety or where risk premia still persist (by sector or region) within a currency area.

This has wiped out many of the helpful exchange rate channel effects (section 6) just where they are needed most in the ECB's programme.

## 5.2 Lessons from the ABSPP Programme: Cheap Loans from the ECB

Cheap loans from the ECB via its Long Term Refinancing Operations (LTRO) programme, or liquidity support to the banking sector through the Target2 payments system, in which national central banks are empowered to provide credit support to domestic banks under pressure if they are short of funds, would appear to do the same as the Bank of England's "funds for lending". They both create extra liquidity at home and increase the value of the stock of home assets. That in turn reduces the net "foreign" liability position and leads to lower interest rates (Hughes Hallett and Martinez Oliva, 2015). Cash injections from the ESM or asset purchases by the ECB would reinforce this effect.

Thus, on the face of it, all these programs appear to work in the same way as a "funds for lending" approach would. Nevertheless, there are two crucial differences:

i) Although the loans under the LTRO program were intended for domestic banks to be lent on to private firms, in practice they were mostly lent on to distressed governments (to lower their borrowing costs, and to reduce the level of risk to the home banking system should there be a liquidity or solvency crisis). Because the loan contracts were not written with an explicit penalty clause, there was no mechanism to prevent this kind of behaviour. The upshot was that a bank's extra liquidity was not lent on for investment or consumption spending. Instead the funds were used to ease or retire debt. As a result, the main impact of this policy has been via the side effects of improved liquidity and increased financial stability – and from there to lower borrowing costs, lower risk premia, less risk, and hence a gradual improvement in output and employment. The results were clear to see in the 2012-13 era, when the spreads of 10-year borrowing rates over German rates fell dramatically in the distressed economies. Not all those improvements can be ascribed to the LTRO program of course, because the loans were short term and comparatively modest and because they came just before the Outright Monetary Transactions (OMT) initiative which had a larger effect. But the point is nevertheless made. This kind of approach is also to some extent self-limiting in that distressed banks have limited supplies of collateral, or collateral of progressively diminishing quality<sup>6</sup>.

ii) Because any loans to, or implicit borrowing by home banks were made from European institutions, those loans are in effect foreign liabilities. If you are not in control of your own money supply and prices, the net foreign liability position matters. That means the capacity to earn additional "foreign" revenues to pay off the loans and interest plays a central role, which implies that either relative growth or the current account balance has to improve to make that happen. If that fails, repeated loans and/or liquidity injections will be necessary to keep interest rates down until the real exchange rate has to be forced down by enough to raise growth relative to others or to improve the trade balance. That is relatively easy when you operate your own currency; the nominal exchange rate can be forced down by printing money or buying foreign currencies. But in the Euro area this has to be done by structural reforms which depress domestic prices relative to Euro prices. This typically takes 6 to 10 years of recession to achieve, which condemns the economy to

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<sup>6</sup> Valiante (2015)

seek repeated loans and foreign liabilities until the process is complete. Understandably therefore, this approach has had little success.

### 5.3 Coordinated Fiscal Stimuli

At the start of section 5, I pointed to the need for coordination with other expansionary policies to offset the effects of deleveraging, austerity policies, tighter bank regulation that could be undermining the effectiveness of the ECB's asset purchase programme. Structural reform, which is a long term proposition (and designed to make the recovery self-sustaining rather than trigger a recovery in the first place) aside, the natural partner is expansionary fiscal policy. Indeed Fazi (2015), for example, argues that the inability to take advantage of a coordinated package of fiscal and asset purchases is a big reason why the ECB's QE asset purchase programme has been relatively ineffective so far. It is the combination of the two which is important in this context – implicit recognition that asset purchases, and monetary policy more generally, may not be sufficient on their own to resolve a major recession. Of course there are many reasons why fiscal policy has not been used, the extended deficits and sovereign debt crisis being principle among them. But these constraints do not affect all countries. It should be possible to create a coordinated package of fiscal policies to support the asset purchase programme, with inter-country loans from stronger economies to direct the spending to where it is needed most (recognising that these loans will have to be made anyway if the distressed economies were to fail to recover). Even countries with large fiscal imbalances could contribute to a supporting fiscal expansion by exploiting the fall in borrowing costs that QE has made possible. Refinancing debt would enable the average Euro area country increase its fiscal spending/reduce taxes by 0.45% of GDP as a result of the ½% interest rate fall in QE, without any increase to its debt or deficit ratio. For France the contribution might be 0.5% of her GDP; for Germany 0.4% and so on. The contribution from the high debt countries could be higher, depending on how much QE has brought local risk premia down. For Italy, the contribution could be 0.7% and upwards. Only Italy has taken advantage of this option; whereas, reversing the argument, half of the improvement in Germany's deficit ratio since 2014 represents fiscal stimulus withdrawn.

### 5.4 Helicopter Money

Helicopter money is defined as money created by the central bank, but distributed (as cash or liquidity) to banks, firms or households directly without going through the asset markets, or as a loan, or in payment of some service – as if scattered from a helicopter on high. This money can be distributed in two ways. Newly created cash could be placed in the reserves of the commercial banks, ready for lending out. As such, no asset purchases are involved (which makes the central bank's balance sheet look worse since there is no possibility of an exit strategy to redeem the new assets to reduce the bank's swollen balance sheet). In other words, this approach is an extreme form of "funds for lending", but is otherwise likely to have an impact similar to QE. However, it is also likely to suffer the same drawbacks as QE: there is no certainty that firms/household will want to borrow to invest or spend, or that the banks will risk making loans (though it would now be more profitable if they did). This approach does not get round the transmission problem.

The second way to distribute the money is to make ex-gratia payments to the population, as a tax rebate, or a rebate for some misselling or competition infringement, or as "cash for clunkers". The idea here is that, in the hands of consumers or firms, the money is more likely to be spent and create a boost for aggregate demand in the economy. However, even if it did, the revenues from that increased demand are most likely to be deposited

back in the banks with no guarantee that they would be lent out again. So, while helicopter money in this form may partially repair the transmission problem, it will only do so to a limited degree in those cases where serious repair is necessary.

There are other reasons why helicopter money could be ineffective in practice. We need to get exactly the right quantity of money created – enough to create an effective stimulus, but not so much as to trigger escalating inflation expectations. With no exit strategy, this is a difficult exercise. Moreover, the quantity of money created needs to be determined and distributed by the central bank (even if through the agency of others) in order to ensure that favoured special interests are not favoured. If, in the second form of helicopter money, the distribution is made through government accounts, financial markets may fear swollen long-term fiscal deficits and debt. That would raise long-term interest rates, potentially offsetting the entire asset purchase programme – in the same way that rising inflation expectations would impose risk premia on long rates. However, the biggest potential drawback is the simplest: there is still no guarantee that the new helicopter money would be spent. If consumers fear for the sustainability of the welfare system in the downturn, or if, in the absence of growth, firms prefer to pay down debt, the new money will be saved instead of spent. There is plenty of evidence that this is likely to happen. Japan has supplemented her QE programme with helicopter fiscal expansions on several occasions (not least in the Abe-nomics regime), but to no perceptible effect. Consumers have preferred to save the extra cash, and firms have invested abroad rather than at home. In the UK, compensation for insurance misselling amounted to 2% of GDP without visible expansionary effect. The risk therefore is that helicopter money also fails to repair the transmission mechanisms to any material extent.

## 6. THE EXCHANGE RATE CHANNEL

Given that the impact of asset purchasing programmes has been rather small, but tempts pension and insurance funds to invest in more risky assets while eroding the profit margins of banks (with the potential for destabilising the financial markets and increasing the number of nonperforming loans), it is not surprising that many economists have concluded that the exchange rate channel is the most effective route by which QE can benefit the home economy. Support for this conclusion is provided by the fact that the transmission mechanism between asset purchases and higher investment or spending easily becomes damaged or ineffective and is hard to repair (section 5).

The exchange rate channel operates as follows: lower asset yields in the QE economy will prompt capital outflows and hence a depreciation of the domestic currency and hence extra exports, but lost imports from the trade partners who face an appreciating currency in one of their export markets. This is clear to see in the Euro area. Since QE was announced in late 2014 the euro has depreciated significantly, aided by a secular appreciation of the US dollar. This may have been an important factor in the tentative upturn in the prospects for growth in the Euro area. As such, this is a potentially important aspect of asset purchase programmes (good for the Euro-area economies, damaging to the trading partners) and should be taken into account when assessing the effectiveness of those programmes.

Most of the literature has been concerned with the damage to outsiders. But there are two reasons why that damage may be less than one thinks. First, if QE is successful in rescuing the domestic economy from recession, lowering the cost of capital in the process, then domestic demand will not fall as far as it might have done and the demand for imports will be sustained allowing the outsiders to continue exporting. Damage from the exchange rate channel will be neutralised to a large degree. The consensus view in the literature is that reviving import demand, an income effect, will outweigh the loss of exports through the price effect. If so, the net effect is positive – the QE countries mostly being larger than their trading partners (Lavigne et al (2014)). However, this conclusion is dependent on the relevant elasticities. If the advanced economies are commodity or component importers, then the assumption that the income elasticities are larger will be justified.

Second, if falling yields at home trigger a capital outflow, the associated asset sales will depress their price and increase interest rates – partially offsetting the effectiveness of the ECB's asset purchases. As a result, as noted by Lavigne et al (2014), the damage is more likely to arise at home from financial disruption caused by abrupt capital withdrawals from smaller economies with less financial depth when QE comes to an end. We have already seen such behaviour in Eastern Europe and the BRICS. It suggests an exit strategy needs to be carefully calibrated and communicated in and beyond Euro-area markets.

Allied to that, investors, seeing falling yields in the QE economies, will typically look for higher yield and hence more risky investments elsewhere, transferring risk taking to other economies and easing monetary conditions in those economies. Prudential regulation would limit this effect of course. But, like the issues in the paragraph above, it is a consequence of monetary easing, conventional or unconventional, not specifically a problem with QE. This supplies the conclusion for this section: Fic (2013) has shown that the impacts of QE have been 70% through reduced term premia, and only 30% through lower risk premia and the incentives to pursue riskier types of investment. The QE part of this increased risk taking behaviour may therefore be less severe in practice.

Conclusions from this section: a) At conventional export price elasticities and income import elasticities, the exchange rate channel will typically have the largest numerical impact of the QE effects. But b), because of a series of conflicting factors, these effects are likely to be somewhat smaller (both in the Euro area and on outsiders) than much of the literature has suggested. And c), although these benefits might appear more important in the smaller economies, they will in fact principally accrue to the most competitive in the Euro area. This suggests successful asset programmes should be carried out in combination with structural reform measures for distributional purposes, which converts the programme into a longer term operation and one where the full benefits will be slow to arrive.

## 7. CONCLUSION

The ECB's asset purchases programme has only been in operation since March 2015. It is therefore too early to give a definitive judgment on its effectiveness. But the results so far are in line with those in other economies where QE has been used: a small reduction in long run interest rates, increased output growth of around 0.3%, no inflation.

To get a wider perspective on the effectiveness of the ECB's programme, comparisons with QE programmes elsewhere are useful. These comparisons suggest that a major gain is the stabilisation of the financial markets and the consequent lowering of risk premia. The main difficulty seems to be damage to the transmission mechanism and from debt deleveraging. This suggests that asset purchases should be extended to financial institutions, corporate bonds, other asset backed securities beyond the banks; that the effects of deleveraging needs to be offset; and that a range of other mechanisms be considered to combat the loss of transmission (pass-through) to investment and spending. Several are reviewed here.

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