

Lehment, Harmen

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## Fiscal implications of the ECB's public sector purchase programme (PSPP)

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# KIEL WORKING PAPER

**Fiscal implications of  
the ECB's Public  
Sector Purchase  
Programme (PSPP)**



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*Harmen Lehment*

# ABSTRACT

## **FISCAL IMPLICATIONS OF THE ECB'S PUBLIC SECTOR PURCHASE PROGRAMME (PSPP)**

*Harmen Lehment*

The large Public Sector Purchase Programme (PSPP) which the ECB started in 2015 on the basis of monetary policy purposes, had major side-effects on fiscal policy. One concerns the programme's uncommon seigniorage effects. We find that the PSPP not only led to partly negative seigniorage gains, but also produced super-seigniorage gains resulting from negative interest rates on the excess reserves which have been created by the programme. Another effect of the PSPP is its interference with fiscal debt management, thereby making fiscal budgets more vulnerable to changes in short-term interest rates. We also find that the experience with the PSPP suggests that fiscal policy should prepare for a greater role in fighting future recessions.

**Keywords:** Central bank asset purchases, seigniorage gains, debt management, monetary-fiscal cooperation

**JEL classification:** E5;E6;H6

### **Harmen Lehment**

Kiel Institute for the World Economy

Kiellinie 66

D-24105 Kiel, Germany

*E-mail:*

*harmen.lehment@ifw-kiel.de*

*[www.ifw-kiel.de](http://www.ifw-kiel.de)*

# FISCAL IMPLICATIONS OF THE ECB'S PUBLIC SECTOR PURCHASE PROGRAMME (PSPP)

*Harmen Lehment*

## 1 Introduction

The PSPP has led to a massive change in the ownership of public sector bonds. By the end of 2017, bonds in the order of 1,900 bill € have moved from the private sector into the hands of the ECB and the national central banks. In this paper we look at several fiscal implications that result from these purchases.

In part 2 we give an overview of the PSPP and the relative size of the purchases of public sector bonds by national central banks in the euro area. In part 3 we analyse the seigniorage gains that have resulted from the PSPP so far. In part 4 we discuss the effects of a normalization of monetary policy on seigniorage gains. In part 5 we analyse the fiscal risks that result from the accumulation of high excess liquidity due to the PSPP. In part 6 we address the question whether the PSPP has reached its limits. In part 7 we discuss whether the experience with the PSPP suggests a closer cooperation of monetary and fiscal policy in the future. In part 8 we summarize the main results.

## 2 The PSPP – an overview

In the face of weaker than expected inflation dynamics and signs of reduction in inflation expectations even at relatively long maturities, the ECB Governing Council decided on 22 January 2015 for the adoption of an Public Sector Purchase Programme (PSPP) to increase the size and change the composition of the Eurosystem's balance sheet (Andrade et al. 2016). The PSPP is part of a larger Expanded Asset Purchase Programme (APP) which also includes the Asset-backed Securities Purchase Programme (ABSPP), the Covered Bonds Purchase Programme 3 (CBPP3), and the Corporate Sector Purchase Programme (CSPP). Monthly purchases under the APP which started in March 2015 amounted to 60 bill € from March 2015 to March 2016, 80 bill € from April 2016 to March 2017, 60 bill € from April 2017 to December 2017, and 30 bill € from January 2018 to September 2018. With about 80 percent of the purchases the PSPP is by far the largest purchase programme of the APP.

The spectrum of securities covered by the PSPP includes securities with a residual maturity ranging from 1 to 30 years<sup>1</sup>. In terms of overall breakdown, the intended allocation of the total purchases under the PSPP is 90% to government bonds and recognized agencies, and 10% to securities issued by international organisations and multilateral development banks<sup>2</sup>. Purchases are to be split across eligible euro area jurisdictions according to the ECB's capital key, and conducted with the aim of maintaining market neutrality. To preserve normal secondary market

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<sup>1</sup> Initially the range was 2-30 years.

<sup>2</sup> Until April 2016 the ratios were 88% and 12% respectively.

functioning, purchases were initially subject to a security-specific issue-share limit of 25% and an issuer-specific limit of 33% in terms of nominal value. In September 2015, the Governing Council decided to increase the security-specific limit also to 33%, subject to a case-by-case verification that it would not create a situation whereby the Eurosystem would have a blocking minority for the purposes of collective action clauses in which case the issue share limit would remain at 25%. The security-specific limit for international organisations and multilateral development banks was raised to 50% in April 2016.

In line with the Eurosystem's regular monetary policy operations, the PSPP is coordinated centrally by the ECB, but implemented in a decentralised fashion. To this end, the ECB buys directly 10% of the total amount, the remaining 90% are purchased by national central banks<sup>3</sup>. Each national central bank (NCB) restricts its activity to domestic bonds issued by the central governments and recognised agencies of their jurisdictions. Since the recalibration of the programme in December 2015, NCBs also purchase euro-denominated marketable debt instruments issued by regional and local governments located within their jurisdiction. Purchases are allocated across issuers from the various euro area countries on the basis of the ECB's capital key. In case the envisaged amounts to be purchased in a jurisdiction cannot be attained, national central banks will conduct substitute purchases in bonds issued by international organisations and multilateral development banks located in the euro area. These purchases will be subsumed under the 10% allocation to international organisations and multilateral development banks, which will be purchased by some national central banks and be subject to profit and loss sharing. Purchases of domestic bonds by national central banks are not subject to profit and loss sharing.

By the end of 2017, cumulated asset purchases under the PSPP amounted to 1,900 bill euro, of which about 1,700 bill euro were purchases of national public debt securities and about 200 bill euro purchases of supranationals' debt securities.

Table 1 (at the end of the paper) lists the cumulative purchases of national public debt securities under the PSPP for the ten largest EMU member countries in absolute terms as well as in relation to the respective country's GDP and its public debt. As can be seen from column 2, the size of purchases relative to GDP has varied among the listed countries. There are two main reasons for this. First, the size of the purchases is intended to follow the capital key of the Eurosystem which depends not only on a country's GDP but also on the size of its population. Countries with a low per-capita income benefit from this arrangement, as their share in the Eurosystem's profits and also their ability to purchase public sector bonds under the PSPP is higher than it would be with a capital key that depended only on GDP (Heinemann 2017). This explains why in particular Italy and Spain were able to purchase a larger amount relative to GDP than countries with higher per-capita income such as Germany and the Netherlands. The second reason for the difference results from constraints concerning the permissible scope of purchases under the PSPP, in particular the share limits that have been set. In particular the relatively low purchases of Irish asset under the PSPP relatively to GDP can be explained by this factor. With official holdings of Irish bonds already bloated by previous interventions between 2010 and 2014 in the context of the banking crisis, this meant that the ECB was obliged to taper the amount it was spending on Irish bonds much earlier than was required for other sovereign bond markets (Irish Times, 2017).

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<sup>3</sup> Until April 2016 the ratios were 8% and 92% respectively.

The relation of public sector purchases to public debt is shown in column 3. For countries with a debt/GDP ratio above 1 (Italy, Portugal, and Belgium), the figure is below that of column 2. For the other countries with a debt/GDP ratio below 1, it is accordingly above the figure in column 2. As can be seen, the ratio of cumulated purchases to public debt is highest for the Netherlands (where it reached almost 25 percent), Germany and Finland. For countries with a high debt/GDP the ratio of cumulated purchases to public debt is in the range of 12-15 percent.

### 3 Seigniorage gains from the PSPP

The purchase of public bonds by national central banks leads to an additional interest income. When this income is transferred to the government via the distribution of central bank profits, the public budget benefits from a resulting seigniorage gain.

Table 2 shows the interest income on public sector securities which have been acquired under the PSPP for the national central banks of four countries (Germany, Ireland, Italy and Spain) which publish the respective figures in their annual reports<sup>4</sup>.

The interest rates on public sector securities vary substantially among the member countries of the euro area. Accordingly one can expect that NCBs of countries with relatively high interest rates experienced particularly high seigniorage gains. This is confirmed by table 2. The NCBs of Spain and Italy received a positive interest income on their PSPP securities in the period 2015-2017. The interest income for the Irish NCB was positive as well. In contrast, the German Bundesbank recorded a negative income on its PSPP portfolio in each year. The reason is that the interest rates on German public securities were not only the lowest in the euro area, but were negative even for bonds with longer maturities. As the interest income from the PSPP does not fall under the profit and loss sharing agreement of the Eurozone, the seigniorage gains and losses from the purchase of PSPP securities remain fully with the national central banks, and subsequently increase or reduce the scope for a transfer of central bank profits to the national government<sup>5</sup>.

To get a full picture of the seigniorage effect of the PSPP, one should also consider its effect on the monetary base. The purchases of public bonds, together with other measures of the Expanded Asset Purchase Programme (APP), led to large excess liquidity (Baldo et al. 2017). As excess liquidity has been subject to negative interest rates (- 0.1% from June 2014; -0.2 % from Sept. 2014; -0.3% from Dec. 2015; - 0.4% from March 2016) the increase in excess liquidity led to an additional interest income for the NCBs. This means that currently there is a “super seigniorage effect”: the Eurosystem not only receives revenues from the assets it has purchased (the normal seigniorage) but also an additional interest income on its liabilities.

As interest income on excess liquidity is subject to profit and loss sharing of the Eurosystem, the seigniorage gain of an NCB depends on the total excess liquidity of the Eurosystem. While the Eurosystem does not publish interest income on excess liquidity, the NCBs’ seigniorage gain

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<sup>4</sup> Most of the national central banks in the Eurozone only provide information on aggregate interest income, and do not specify interest income from the PSPP as a separate item. The table does not include the seigniorage income of the ECB which is distributed to the NCBs.

<sup>5</sup> It should be noted that an NCB’s purchase of bonds with negative maturities does not necessarily imply a worsening of a country’s fiscal position. To the extent that the PSPP leads to lower interest rates for public sector bonds, the resulting benefit of lower interest payments for the remaining public debt may offset the loss from the NCB’s negative seigniorage gain.

can be roughly estimated using information on the total excess liquidity, the negative interest rate and the country's capital key.

Excess liquidity of the Eurosystem increased by about 1,500 bill euro in the period 2015-2017<sup>6</sup>. Taking average figures rather than end of year figures for 2017, the increase would be approximately 1.250 bill euro. With a negative interest rate of 0.4 this means that the expansion of the excess liquidity during this period would yield an additional interest income to the Eurosystem in the order of 5 bill euro in 2017. According to the capital key this implies an additional interest income of 1.3 bill euro for the Bundesbank, 0.9 bill euro for the Banca d'Italia, 0.6 bill euro for the Banco de Espana and 0.1 bill euro for the Central Bank of Ireland.

To which extend can the increase in excess liquidity and the resulting interest income be attributed to the PSPP? As about 92 per cent of the extension of the Eurosystems balance sheet can be attributed to the APP (the balance sheet expanded by about 2,250 bill euro from end of 2014 to end of 2017, with assets for monetary purposes rising by about 2,070 bill euro), and as the share of the PSPP in the APP was about 82 percent, it is plausible to attribute 75 per cent of the additional interest income from excess liquidity to the PSPP, i.e. 3,750 bill euro. According to the capital key of the Eurosystem, this implies for 2017 an additional interest income of 960 mill euro for the Bundesbank (which more than compensates the losses from the negative yield of the PSPP portfolio), 660 mill euro for the Banca d'Italia, 470 mill euro for the Banco de Espana, and 60 mill euro for the Central Bank of Ireland.

An additional point to be considered is the Eurosystem's interest income on euro-liabilities against non-euro area residents. These liabilities increased massively from 48 bill euro at the end of 2014 to 355 bill euro at the end of 2017, and are – similar to holdings of excess liquidity (Baldo et al. 2017) – heavily concentrated in financial center countries. As can be seen from Table 3 the bulk of these liabilities is held with the NCBs of three countries: Germany, France, and the Netherlands. As the Eurosystem's claims against non-residents have not increased in this period, this suggests that the expansion of the liabilities against non-residents is a result of the APP. According to Baldo et al. (2017) more than 50 % of APP purchases occurred with counterparties belonging to banking groups whose head institution was situated outside the euro area. To the extent that the returns from the asset sales are not placed with banks in the Eurozone but end up at NCBs of the Eurozone, as may e.g. be the case for bond sales by foreign monetary authorities, this is shown by a respective increase of liabilities against non-euro area residents.

Taking a closer look at the Bundesbank which accounts for more than 50 per cent of the liabilities against non-euro area residents, we find that interest income from negative interest rates on this item amounted to 963 mill euro in 2017 (Deutsche Bundesbank 2018). This income remains fully with the Bundesbank, as it is not subject to the profit and loss sharing of the Eurosystem<sup>7</sup>. Again the question then is to which extent the increase of the liabilities against non-euro area residents can be attributed to the PSPP. Considering that 90-95 per cent of the liabilities against non-residents in 2017 are due to increases since the beginning of 2015, and that the Bundesbank's claims against non-residents did not increase in this period, it is plausible to

<sup>6</sup> The current account (including minimum reserve holdings) and the deposit facility together rose from 367 bill euro at the end of 2014 to 1,882 bill euro at the end of 2017. Subtracting the minimum reserve holdings (106 bill euro at the end of 2014 and 123 bill euro at the end of 2017) one obtains an increase in excess liquidity by 1,498 bill euro. Source: Eurosystem.

<sup>7</sup> Profit and loss sharing with respect to items on the liabilities side of an NCB's balance sheet is restricted to interest income on central bank money (currency and deposit liabilities to euro-area credit institutions).

attribute 90-95 per cent of the resulting interest income to the APP. With a PSPP share of about 81 per cent of the Bundesbank' APP purchases, approximately 75 per cent of the interest income on liabilities against non-euro area residents in 2017, i.e. 720 mill euro, could then be attributed to the PSPP<sup>8</sup>.

#### **4 The effect of a normalisation of monetary policy on seigniorage gains**

The observation of substantial seigniorage gains raises the question whether these effects are permanent or just a transitory. A main consideration is that the seigniorage gains which resulted from the PSPP were a by-product rather than a target of the ECB's policy, the latter being guided by the aim of a medium-run inflation rate of below but close to 2 per cent in the euro area. This means that future seigniorage gains will very much depend on the course of the ECB's policy in the coming years.

There is currently an intensive discussion on the normalization of the ECB's policy. Will normalization mean returning to monetary policy as it was prior to the financial crisis, or will there be a "new normal" that would entail different monetary policies (Claeys and Demertzis 2017)? The most likely approach for the ECB seems to be to follow the procedure of the FED. It consists of the following steps: (1) terminate the asset purchases, (2) gradually raise short-term interest rates, and (3) gradually reduce holdings of public bonds by not reinvesting the principle on securities that are maturing.

Concerning the termination of the PSPP, the ECB has already decided to terminate purchases by the end of 2018. During this period the cumulated purchases of public sector securities and the resulting seigniorage gains will still increase.

With respect to a rise in interest rates, the ECB has announced that it will keep its rates at the present level for some time after the expiration of the APP. It is to be expected that the initial increases of interest rates will concern the deposit rate. Raising the deposit rate from its current level of -0.4% to 0% would remove the present positive interest income on the Eurosystem's deposits. The fiscal benefit of the PSPP will then be limited to the return on the public sector securities which have been acquired in the context of the programme. NCBs with a negative return on their PSPP portfolio, such as the Bundesbank, would face a loss from the PSPP at this stage. A subsequent increase of the deposit rate into positive numbers would lead to further negative seigniorage effects. As interest rates on the securities purchased under the PSPP are fixed for a prolonged period of time, the payment of positive interest rates on the NCB's deposits would reduce the net interest income from the PSPP – which thereby may turn negative also for NCBs which bought securities with positive rates of return.

A rise of the deposit rate will in particular affect the interest income of NCBs in financial center countries. As shown above, these NCBs currently benefit from the negative interest rates on liabilities against non-euro area residents which are not subject to profit and loss sharing within the Eurosystem. This in particular concerns the Bundesbank whose liabilities against non-

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<sup>8</sup> The loss of 258 mill euro on the Bundesbank's PSPP portfolio in 2017 would thus be more than compensated by the PSPP-induced interest earnings on excess reserves and on euro liabilities against non-euro area residents, which according to our estimates sum up to about 1680 mill euro, resulting in a net surplus of around 1420 mill euro.

euro area residents reached an amount of about 200 bill euro by the end of 2017. A swing from negative to positive deposits rate would accordingly lead to a substantial negative swing in the in the Bundesbank's income account which would have to be fully borne by the Bundesbank.

With the existing large excess liquidity an increase of the deposit rate cannot be avoided if the ECB wants to raise money market rates. Raising just the main refinancing rate (MRFR) will not lead to higher money market rates, since high excess liquidity has made refinancing of minimum reserve requirements largely obsolete. Since the start of the APP, money market rates have followed the deposit rate rather than the MRFR. The deposit rate, therefore, has become the core interest rate instrument of the ECB, and this likely to stay so as long as substantial excess liquidity prevails<sup>9</sup>

Removing the current excess liquidity through an unwinding of the PSPP will take considerable time. A remarkable feature of asset purchase programs such as the PSPP is that they are not symmetrical in respect to accumulating and reducing assets. It is relatively easy for central banks to buy public sector securities, even in high quantities, but there are major reservations when it comes to selling them. The main concern is that selling bonds in large amounts could evoke a new financial crisis. Another concern is that a sale of bonds before maturity would result in negative income effects for the central banks if bonds were sold with a loss. In light of these concerns, an unwinding of the PSPP is likely to occur mainly by not reinvesting the principle on maturing assets. Since the PSPP portfolio includes mainly assets with a long duration, the unwinding of the PSPP would then be a lengthy process (the PSPP portfolio can include bonds with duration of up to 30 years). In addition, it is yet open when such an unwinding will start. The Fed only began unwinding its quantitative easing program in autumn 2017 – 3 years after the end of the last purchase program.

Removing the current excess liquidity through a rise in the minimum reserve ratio does not seem to be likely either. The Eurosystem's minimum reserve ratio was at 2 per cent until January 2012. Since then, this ratio has been lowered to 1 per cent. The total minimum reserve requirements for euro area banks amounted to 123 bill euro at the end of 2017. Raising the minimum reserve ratio to the earlier level of 2 percent would, thus, only remove a small fraction of the Eurosystem's excess liquidity which amounted to 1882 bill euro at the end of 2017.

## **5 High excess liquidity: fiscal risks for the euro area**

The PSPP has increased the fiscal exposure to interest rate risks in the member countries of the Euro area. Governments usually finance themselves by issuing both securities with short duration and securities with long duration. Purchases of long-term government bonds through the PSPP alter the profile of the interest rate exposure: the PSPP turns a long-term obligation of the state (government bonds) into a short-term obligation (central bank liabilities paying interest at the deposit rate). This increases government exposure to short-run interest rate changes. Basically, the case is similar to the case in which the government itself replaces long-term borrowing by short-term borrowing (Williamson 2017). In the latter case, an increase in short-run

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<sup>9</sup> In the United States which has large excess reserves from its previous Quantitative Easing programmes, the last one ending in October 2014, interest rates on required reserves (IORR) and the interest rates on excess reserves (IOER) have been set at the same level. Since December 2015 they gradually rose from 0.25% to 2% in June 2018.

rates affects public budgets directly through higher interest payments on short-term securities, in the former case indirectly through lower profit transfers from the NCB<sup>10</sup>.

From a fiscal perspective, borrowing short-term via a liability of the country's NBC has advantages over short-term borrowing via the issue of government securities if the deposit rate is below the interest rate on short-term securities. Two effects have to be considered here. The first is that short-term government securities, such as treasury bills, have an advantage over excess liquidity, since the latter can only be held by a restricted set of financial institutions, while treasury bills are more widely held and are useful as collateral in financial transactions (e.g. repurchase agreements) in ways that reserves are not (Williamson, 2017). The second effect concerns country risk. While interest rates on short-term government securities differ in the euro area due to country risk, the deposit rate is the same for all countries. Thus the higher the country risk, the higher is the probability that borrowing at the common deposit rate is cheaper for the government than borrowing via the issue of short term securities.

Comparing April 2018 market rates of government securities with a residual maturity of 3 months in the euro area (World Government Bonds 2018) we find relatively high negative rates for Germany (-0.68%), Netherlands (-0.63%) and France (-0.51%) and relatively low negative rates for Italy (-0.47%) and Portugal (-0.41%). While these figures reflect country risk, they are still below the deposit rate of -0.40% also for the countries with relatively high country risk, so that borrowing at the deposit rate does not provide a fiscal advantage. Nevertheless, being able to borrow at the deposit rate may turn into an advantage, if country risk should increase in the future. Short-term borrowing through the NCB in the context of the PSPP thereby creates a backstop against increasing country risk.

The risk of rising interest rates on excess liquidity and other NBC liabilities resulting from the APP has led to an increase in central bank risk provisions<sup>11</sup>. From a fiscal perspective this reduced central bank profits so that seigniorage gains from the APP in the years 2015-2017 were only partly passed on to governments. Yet, in case of an acceleration of inflation pressure in the euro area which would necessitate a substantial increase in the deposit rate, current risk provisions may not be sufficient.

The strong increase of excess liquidity that resulted from the PSPP and other programmes of the APP also affects fiscal risks that are associated with TARGET imbalances. The increase in excess liquidity is not distributed uniformly over the Euro area but is heavily concentrated in financial center countries, such as Germany, France, and the Netherlands (Baldo et al. 2017)<sup>12</sup>. The preference for financial center countries resulted in rising TARGET claims of their NCBs against NCBs in other countries, such as Italy, Spain, and Portugal (Eisenschmidt et al., 2017).

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<sup>10</sup> Governments could react to the increased exposure to short-run interest rate changes which results from the PSPP by an opposite operation, i.e. reduce their own short-term borrowing and increase long-term borrowing instead. This would work in the direction of steepening the yield curve, thus weakening the impact of the PSPP. Greenwood and al. (2014) find that this happened in the context of the Fed's quantitative easing programmes.

Andrade et al. (2016, p. 46-49) obtain a similar result for the euro area in 2015. For Italy, the Ministry of Economics and Finance reports an increase of the average life to maturity of total public debt from 76.62 months in January 2015 to 82.95 months in March 2018 (MEF 2018).

<sup>11</sup> The Bundesbank (2017 p. 76) explicitly mentions the risk of interest changes resulting from the APP as a reason to increase its risk provisions.

<sup>12</sup> Baldo et al. (2017) show that more than 50% of the purchases under the APP occurred with counterparties from outside the euro area. Those non-euro area investors tend to manage their euro holdings in financial centers of the euro area. But also euro area residents from non-financial center countries such as Italy are reported to have invested the returns from their bond sales in financial center countries (Banca d' Italia 2017, p 14).

Rising TARGET imbalances imply an increasing fiscal burden for TARGET surplus countries in the case that a country with a TARGET deficit would leave the Eurosystem and not honour its obligations. But this per se would not necessarily constitute an argument against the PSPP. To the extent that the programme stimulates economic activity, it tends to reduce the probability of a crisis that would force member countries to leave the Eurosystem. Moreover, by shifting public bonds from the hands of the private sector to national central banks it may reduce the probability of speculative, self-fulfilling attacks on member countries with high public debt.

## 6 Limits to the PSPP

The large size of the PSPP has led to a discussion of the limits of the programme. As shown by Claes and Leandro (2016), constraints are provided by the guidelines which the ECB has set itself. The guidelines concern the eligibility of securities, and the maximum share of a security issue that can be bought by the Eurosystem. The maximum share was imposed to preserve market neutrality and to prevent the ECB from having a blocking minority in a debt restructuring involving collective action clauses, as the ECB did not wish to be in a position in which it had the power to block a potential vote on the restructuring of ECB-held debt of a Euro-area country (Claes and Leandro, 2016, p. 5-6). Share constraints have been relevant for countries with low debt/ GDP ratios such as Germany, where the Bundesbank had to purchase short-term securities with negative rates, as its share in long-run bonds with positive interest rates had already reached the limit.

To overcome present constraints to the PSPP, one option would be to change the ECB's guidelines with respect to the eligibility of securities, and the permissible maximum shares. In fact, the ECB has changed the original guidelines at various occasions to increase the permissible volume of purchases:

- It expanded the list of national agencies which are eligible for purchases under the PSPP
- It increased the duration of eligible securities from 2-30 year to 1-30 years
- It removed the requirement that eligible securities must have a return above the deposit rate
- It raised the issue share limit which was originally at 25 percent to 33 percent for debt securities not containing collective action clauses; for debt securities by supranational issuers the share was even raised to 50 percent.

A further change of the guidelines, however, would give rise to the question what is the worth of the ECB's self-imposed limits if they are changed whenever they are reached. This suggests that the present PSPP has largely exhausted the ECB's potential for conducting such a policy. It is hardly conceivable that in case of renewed weak demand the ECB would be in the position to launch a second PSPP of a similar size as the current programme.

Apart from the limits that the ECB has set itself, there are also limits to the effectiveness of a monetary policy that seeks to stimulate demand via a reduction of long-term interest rates. The explicit task of the PSPP was to lower long-term rates through a reduction of the term premium <sup>13</sup>

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<sup>13</sup> Long-run rates can be decomposed two components: the expectation of future short-term rates and the term premium, which reflects duration risk. While the ECB before embarking on the APP focused on lowering medium and long-term interest rates through providing information on its intended future path of short-term interest

The announcement of the PSPP on January 22, 2015 and the initial purchases under the program starting in March 2015 had the desired effect: the yield of euro area 10-year AAA bonds fell from about 0.6 % at the beginning of January to about 0.2% in April 2015 ( ECB 2018)<sup>14</sup>. This reduction was, however, not maintained. By April 2018, the yields had again increased to around 0.6% - the same level as before the announcement of the PSPP. As short term interest rates declined in this period<sup>15</sup>, the spread between long-term and short-term interest rates has not been reduced, despite the extremely large purchase programmes, but even increased. Iskrev (2018) decomposes observed 10-year euro area yields into expectations components and term premia. He finds that the expectations component is relatively flat, and that changes in long-term rates track closely the movements of the term premium. His estimates show that while the term premium declined in the first months of 2015 it went up at a later stage, and that in October 2017 the term premium stood at the same level as before the announcement of the PSPP<sup>16</sup>. This suggests that the effect of the PSPP on long-term interest rates was a transitory rather than a sustained one. Doubts on the efficiency of the PSPP are also supported by Elbourne et al. (2018) who find that the effects of unconventional monetary policy on inflation at the aggregate euro area level are economically insignificant.

## 7 Does the Euro- Area need a closer cooperation of monetary and fiscal policy?

The established macroeconomic policy paradigm, building on the assumption that central banks can and should control medium-term aggregate demand and inflation through interest-rate policies, is subject to increasing doubts : " ... after all, look what we have done for the seven last years. We have done the most extreme monetary policies we could imagine. We've had interest rates at zero. We've used forward guidance to try to convince people that they are going to stay at zero. We've used quantitative easing to try to bring down the long end of the yield curve as well as the short end. And seven years into this, inflation is below target in all the major economies of the world. So you can't call this a success. The sheer amount of monetary policy and the small effect it produced is really extraordinary."(Turner 2016).

The question then arises what could be done to make monetary policy more efficient in situations that call for an expansion of aggregate demand in order reach the inflation target. Rather than trying to push interest rates further into negative territory, a preferable way may then be to stimulate aggregate demand by raising income. In fact it has been discussed in the context of the introduction of the PSPP whether the ECB could pursue an income-based monetary policy in the form of direct transfers to citizens (BIS 2015). The main reason for not doing so is that direct transfers to citizens are usually considered to belong to the realm of fiscal policy. An income-based monetary policy would, therefore, require coordination with fiscal authorities. This would be in line with standard business cycle models which show that monetary

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*rates (forward guidance), the massive purchase of long-term securities in the market had the aim to reduce the term premium.*

<sup>14</sup> Andrade et al. (2016, p. 15) consider the full spectrum of securities purchased under the PSPP and find that the announcement and the initial implementation of the programme lowered 10-year yields by 45 basis points.

<sup>15</sup> The yield of 1-year AAA bonds fell from -.10 in early January 2015 to -0.66 in mid-April 2018 (ECB 2018).

<sup>16</sup> A similar result has been found by Chadha and Hantzsche ( 2018).

and fiscal policy together – not only monetary policy – may be necessary for macroeconomic stabilization in the wake of a large adverse disturbance such as the global financial crisis of 2008 (Corsetti et al. 2016).

Following this consideration, one could ask why fiscal policy in recent years has not done more to support the ECB in its attempt to raise aggregate demand and inflation rates in the Euro area. Rather than pushing deposit rates (and money market rates) into negative territory and embarking on an asset purchase program totaling around 2500 bill €, why not instead agree on a much smaller expansion of the ECB's balance sheet combined with, say, tax cuts to raise euro-area aggregate demand in line with the inflation target?

One reason is the fragmentation of fiscal policy in the Euro area. In contrast to monetary policy which is centralized in the euro area, fiscal policy decisions are made at the national level which generally complicates a coordination of monetary and fiscal policy: "The problem is that there is no common European fiscal policy, which is also not foreseen in the Treaty. The overall fiscal stance is not discussed and there is no substantive effort to co-ordinate independent national fiscal policies. Many economists have pointed out that this constitutes a significant shortcoming of our monetary union design. Economic governance of the monetary union depends only on monetary policy without any concept of a macroeconomic policy mix" (Constancio, 2015).

A main factor in this respect is that economic conditions, including business cycles, may differ substantially between EMU member countries. So at the end of 2014 – before the decision on the PSPP - the German economy did relatively well, with no output gap, unemployment rates already below the pre-2008 crisis level and prospects for a continued upswing in 2015/2016 (Boysen-Hogrefe et al. 2014). The German government, therefore, saw no need for providing an additional fiscal stimulus. It also did not share the concern of the ECB about the low inflation rate and resulting deflation risks. On the other hand, countries in the south of Europe with high unemployment, sizable output gaps and low –in some cases even negative – inflation rates would have basically been in favour of a fiscal expansion, but were constrained by high levels of debt and the resulting consolidation pressure<sup>17</sup>.

While it appears to be appropriate to use the current upswing in the euro area for fiscal consolidation rather than fiscal expansion, the question of a coordination of monetary and fiscal policies in the euro area may come up again in the next recession (Feldstein 2017). In the following we discuss several aspects that will have to be considered in such a case.

The standard textbook case of monetary-fiscal coordination is the one in which government increases spending or lowers taxes, and in which the central bank provides the money that is needed to finance the resulting deficit. The assumption of the textbook case is that the central bank does not pay interest on the monetary base. While fiscal policy financed by the issue of bonds may fail to be an effective instrument to stimulate demand, as it creates a debt burden on future budgets which dampens spending (Ricardian equivalence), the financing through the issue of central bank money does not create a debt burden as money has not to be repaid and does not involve the payment of interest by the state. The latter assumption, however, does not apply in the euro area. The ECB, like many other central banks, pays interest on reserves

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<sup>17</sup> In this respect there is a difference to the situation the 2008/09 when euro area countries were in a common deep recession and embarked on fiscal stimulation programs even in the absence of coordination.

holdings. As shown above, with high excess liquidity the deposit rate is closely linked to money market rates. Excess liquidity at the ECB has the property of short-term debt certificates with variable interest rates<sup>18</sup>. When short-term interest rates, including the deposit rate, become positive, the payment of interest will become a fiscal burden, similar to the burden of short-term government securities.

In such circumstances monetary financing of a fiscal impulse does not bring an advantage over financing the impulse by short-term government borrowing. Both create a similar debt burden for citizens. As shown above, the deposit rate has in various cases been above the short-term interest rates which governments in the Eurozone had to pay. This means that financing of government expenditures via excess reserves may result in a higher debt burden for the state than a financing through issuing short-term government securities.

From the monetary side a requirement for an effective coordination of monetary and fiscal policy, therefore, is to restrict the payment of positive interest on reserves. In fact, for long periods central banks did not pay interest on reserves. The reason to introduce them were mainly two: lowering the opportunity cost of holding money (Friedman 1969) and reducing the disadvantage of bank financing versus non-bank financing such as the issue of securities. From a fiscal perspective the payment of interest on reserves brought a respective seigniorage loss. This loss was considered to be acceptable in times when monetary policy could steer the economy with its traditional instruments. But in situations that call for a policy of monetary-fiscal coordination, seigniorage gains tend to be crucial for the success of such a policy.

To create a sustained seigniorage from a future monetary-fiscal purchase program, the Eurosystem would have to raise minimum reserve requirements sufficiently to absorb the increase in central bank money that has been created through the open market purchase of government bonds. The increase in minimum reserves has to be sustained and interest rates on minimum reserves have to be set at zero permanently<sup>19</sup>.

The fiscal side of a monetary-fiscal programme poses particular problems in the euro area, as it requires a coordination of fiscal policy among the various member countries. All 19 euro area member countries would have to agree on a fiscal package. A monetary-fiscal program is not possible for just a subgroup of countries, as asset purchases for monetary purposes under such a programme would have to be symmetrical to the Eurosystem's country keys. Even if only a single country does not agree, the programme cannot become effective.

Even if all countries agree on the need for fiscal support to attain the ECB's inflation target, it still has to be decided which form the fiscal policy support should take: tax cuts, increases in spending, and if so which ones? This may turn out to be a complicated and lengthy procedure, and a delayed decision in one country will prevent the whole programme from getting started.

One suggestion to overcome these problems is to form a fiscal union among the euro area countries, with an own budget and the right to impose taxes and issue securities. Such a suggestion, however, is subject to multiple objections and it is not likely that a fiscal union will be created in the foreseeable future. If a fiscal union is still far away and if an explicit monetary-fiscal programme specifying the fiscal obligations of each euro area member country is also difficult to put into practice, what is left to fight the next major recession?

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<sup>18</sup> The Bank of Sweden (2018) explicitly uses the term "debt certificates" in its balance sheet.

<sup>19</sup> The MRRF applying to central bank lending would remain variable as would be the deposit rate.

Fiscal support would then basically have to come in the form of voluntary contributions of euro area member countries. Experience from the financial crisis shows that in a major recession there is widespread political support for a fiscal expansion. The important point to take care of is that a fiscal expansion is not prevented by concerns that this would further increase a country's debt burden. To remove these concerns, the central bank could announce its own contribution to stabilize aggregate demand. For example the ECB could announce a public sector purchase program in the order of 2 % of euro area GDP to prevent negative effects of the recession on the inflation rate. This would, then, be a guideline for governments of the member countries, signaling that they can take expansionary measures in the order of about 2 % of GDP without raising the debt burden<sup>20</sup>. Considering the positive effect of the fiscal expansion on output and employment, and hence tax receipts, the debt burden would even be reduced. This would create a strong incentive for governments to provide fiscal support for fighting the recession.<sup>21</sup>

## 8 Summary

1. The public sector purchase programme (PSPP) led to super-seigniorage gains for the national central banks (NCBs) of the euro area: there was not only additional interest income from the acquired public sector securities, but also interest income stemming from negative interest rates on excess reserves and other central bank liabilities that have resulted from the PSPP.
2. Interest income on the PSPP portfolio in the first three years of the programme was particularly large for NCBs in countries with high interest rates such as Italy and Spain, whereas it was negative for the Bundesbank which had to purchase public sector securities with negative interest rates.
3. NCBs in financial central countries such as Germany benefited from negative interest rates on their euro liabilities against non-euro area residents which increased substantially in the context of the purchase programmes, and which are not subject to profit and loss sharing within the Eurosystem.
4. To which extent the initial seigniorage gains will persist, depends on the future course of the ECB's monetary policy. Raising the current negative deposit rate in the course of normalizing the ECB's monetary policy will reduce the seigniorage gains from excess liquidity and other central bank liabilities. Positive deposit rates will transform seigniorage gains on these items into losses, which could result in an overall negative

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<sup>20</sup> As the ECB country key is based not only on GDP but also on population size, the Eurosystem's purchases would be somewhat above 2 % for countries with low per capita income, and accordingly the room for expansionary measures will be somewhat above 2 % for these countries. For countries with high per capita income, the room for expansionary measures will be somewhat below 2 %.

<sup>21</sup> As mentioned above, an important requirement is that the Eurosystem raises its (non-interest bearing) minimum reserves by the same amount as the purchase program, i.e. in this case by 2 % of GDP. With a euro-area GDP of around 11 trillion euro in 2017, this would imply an increase of minimum reserves by about 220 bill euro, or a rise of the minimum reserve ratio from its current level of 1 % to 2.75 %. The new level would be not far above the ratio of 2 % that the Eurosystem applied until 2012 and would not provide a major constraint on banks' credit policy, in particular in a period of large excess reserves. In a situation of excess liquidity and negative deposit rates, a rise of the minimum reserve ratio would even strengthen the financial position of credit institutes, as it would transform excess liquidity with a negative interest rate into minimum reserves with a zero interest rate.

interest income from the PSPP, in particular for NCBs which have acquired public sector securities with low or negative yields.

5. The PSPP has increased the fiscal exposure to interest rate risk in the member countries of the euro area as the programme has turned long-run obligations of the state (such as government bonds) into a short-term obligation (central bank liabilities paying variable deposit rates).
6. Comparing April 2018 interest rates in the euro area, short-term borrowing via a country's NCB had no advantages over short-term borrowing via government securities, as the interest rates of short-term government securities were below the deposit rate. This even holds for states with relatively high country risk. For these states the ability to borrow at the deposit rate may, however, turn into an advantage, if country risk should increase. Borrowing at the deposit rate – which is the same for all NCBs – then provides a backstop against increasing country risk.
7. While the PSPP and other programmes of the APP initially had the desired effect of lowering the term premium of long-term securities and thereby reducing long-term interest rates, this effect was not sustained. As shown by Iskrev (2018), in October 2017 the term-premium was again at the level which it had attained before the announcement of the PSPP. Comparing interest rates of 10-year AAA-bonds, we find that interest rates in April 2018 are about the same as at the beginning of January 2015, before the announcement of the programme. The finding that three years of enormous asset purchases of the Eurosystem had no sustained effect on the term premium and the level of long-term interest rates sheds substantial doubts on the effectiveness of the PSPP.
8. As central bank interest rates in the euro area are already very low (the deposit rate being even negative) and as limits to the effectiveness the ECB's quantitative easing policies are showing up as well, it can be doubted that the ECB will be able to fight the next recession on its own, without support from fiscal policy. Organizing fiscal support in the euro area is, however, an extremely difficult undertaking. A fiscal union does not exist, and a formal monetary-fiscal support program that would require consent by all members of the euro area will be very hard to achieve.
9. What may be viable is a less stringent form of monetary-fiscal cooperation in which the ECB creates a strong incentive for voluntary fiscal contributions to fight the recession. So the ECB could announce a purchase program of, say 2 % of euro-area GDP (much smaller than the current PSPP), and make sure that the purchase is leading to a persistent seigniorage gain (by raising minimum reserves in line with the amount of the purchase and by keeping interest rates on minimum reserves permanently at zero). This would signal governments in the euro area that they can take expansionary measures in the order of about 2% of GDP without raising the debt burden (as the interest payments will be balanced by the NCB's seigniorage gain).

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## Tables

**Table 1: Cumulative NCB purchases of securities under the PSPP for the ten largest Euro area countries (Dec. 31, 2017)**

	Amount in bill euro	relative to GDP (%)	relative to public debt (%)
Germany	459.3	14.1	21.9
France	375.7	16.4	16.9
Italy	326.7	19.0	14.3
Spain	230.3	19.8	20.3
Netherlands	102.8	14.1	24.9
Belgium	65.5	15.0	14.1
Austria	52.0	14.1	17.7
Portugal	31.1	16.1	12.5
Finland	29.2	13.0	21.7
Ireland	25.3	9.2	12.0

Public debt figures refer to the 3<sup>rd</sup> quarter 2017.

**Source:** ECB; Statista.

**Table 2: NCB's interest income on PSPP portfolio, mill euro**

	2015	2016	2017
Germany	-11	-78	-258
Ireland	20	84	128
Italy	358	1427	2845
Spain	371	1514	2470

**Source:** Central bank annual reports and annual accounts, various issues.

**Table 3: Central bank liabilities to non-euro area residents in euro ( end of year), bill euro**

	2014	2015	2016	2017
Austria	0	1	1	1
Belgium	1	1	2	8
Finland	0	1	2	3
France	28	15	36	53
Germany	12	27	117	200
Netherlands	1	4	21	37
Ireland	0	0	0	1
Italy	0	0	3	2
Portugal	0	0	0	0
Spain	0	0	2	3

**Source:** Central bank annual reports and annual accounts, various issues.