



## Eurosystem asset purchases and portfolio rebalancing in the euro area

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*Who holds and sells the assets purchased by the Eurosystem? And how do these counterparties rebalance their portfolio? This Rue de la Banque shows that the major end-counterparty of the Eurosystem's purchases is the non-resident sector, followed by banks and mutual funds from euro area countries as a whole. Purchases by the Eurosystem have enabled the majority of investors to reduce their exposure to duration risk and sovereign risk.*

*This Rue de la Banque presents the findings of research carried out at the Banque de France. The views expressed in this post are those of the authors and do not necessarily reflect the position of the Banque de France. Any errors or omissions are the responsibility of the authors.*

### How do asset purchases work?

Asset purchase programmes are one of the most important non-standard monetary policy instruments available to central banks.<sup>1</sup> By the end of December 2017, the Eurosystem had purchased approximately 25% of the sovereign debt of euro area countries (see Box 1).

However, the underlying mechanisms of asset purchase transmission are still debated in the literature, and have rarely been quantified – including, for example, the oft-mentioned “portfolio rebalancing” channel. Through this channel, central bank purchases exert upward pressure on the price of purchased assets. By rebalancing their portfolios towards other securities, investors bid up the price of assets that were not directly purchased by the central bank. Asset rebalancing should therefore play an important role in transmitting this type of non-standard measure.

This *Rue de la Banque* presents the key findings of recently updated works by Koijen, Koulischer, Nguyen

and Yogo (2016 [revised, 2018], 2017), which quantify the reallocation in European investors' portfolios in response to the Eurosystem's asset purchase programmes. We use new portfolio data collected by the Eurosystem since 2013, which for the first time enable us to document the composition and risk exposure of European investors' portfolios and to monitor them as the purchase programmes evolve.

The literature asserts that the impact of asset purchases varies depending on the counterparties and the rebalancing of their portfolios (Krishnamurthy and Vissing-Jorgensen, 2011). Brunnermeier and Sannikov (2016) state that the effect of asset purchases differs depending on the counterparties' financial constraints. In particular, purchases from institutions experiencing financial difficulties would have the effect of loosening their credit constraints.

<sup>1</sup> For the euro area, see Marx, Nguyen and Sahuc (2016).

Our analysis shows that the main net seller of assets purchased under the Asset Purchase Programme (APP, see Box 1) is the non (euro area) resident sector, followed by euro area credit institutions. Other sectors, such as insurance corporations and pension funds, continued to buy the same assets as the Eurosystem.

## Box 1

### Eurosystem asset purchase programmes

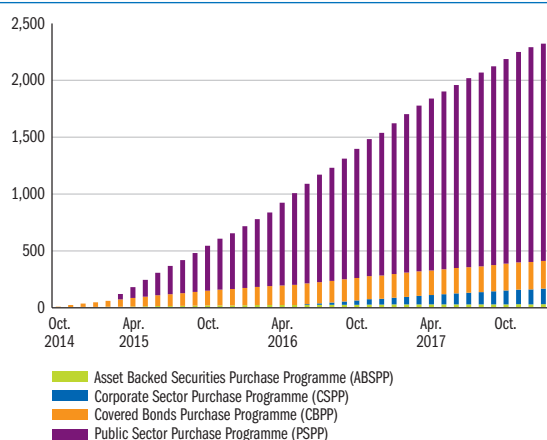
The Asset Purchase Programme (APP) groups together the various asset purchase programmes that have been implemented since 2014:

- the ABSPP and the CBPP3 programmes for asset backed securities (ABS) and covered bonds, respectively, have been in operation since September 2014;
- the Public Sector Purchase Programme (PSPP) that concerns sovereign bonds and bonds issued by some public and supranational agencies was implemented in March 2015 and is by far the most important programme in terms of amounts purchased;
- the Corporate Sector Purchase Programme (CSPP) was put in place in June 2016 to purchase corporate bonds.

Together, these programmes were responsible for net monthly purchases of EUR 60 billion between March 2015 and March 2016, EUR 80 billion between March 2016 and March 2017, and EUR 60 billion from April to December 2017. In January 2018, the pace of monthly purchases was reduced to EUR 30 billion, which will remain unchanged at least until the end of September 2018, when the Governing Council may then extend the programme if it deems it necessary.

### Breakdown of total APP purchases

(EUR billions)



Source: European Central Bank.

## Data and methodology

We use the Eurosystem Securities Holdings Statistics (SHS) database,<sup>2</sup> available since fourth-quarter 2013, which provides the quarterly security-level holdings data of six institutional investor sectors for each of the 19 euro area countries, based on country of domicile. These sectors are: (i) households; (ii) monetary financial institutions (MFIs); (iii) insurance corporations and pension funds (ICPFs); (iv) other financial institutions (OFIs, such as money market funds); (v) general government; and (vi) non-financial corporations. To avoid double counting, we only consider the direct holdings of each sector and exclude indirect holdings (on behalf of third parties).

We create two additional “sectors”: the non-resident sector and the Eurosystem. For the Eurosystem, we have access to data on holdings of sovereign and corporates bonds purchased under the APP (and past purchase programmes).

Non-resident sector holdings for each security are calculated as the difference between total holdings and the sum of the holdings reported by the European investor sectors and the Eurosystem.

## Eligible asset allocation prior to the Asset Purchase Programme (APP)

In our article, we provide a detailed picture of the allocation of seven categories of assets: (i) PSPP-eligible sovereign bonds (in accordance with the criteria in force at the beginning of the purchase programme – see inset); (ii) ineligible sovereign bonds; (iii) investment grade corporate bonds; (iv) speculative grade corporate bonds; (v) asset backed securities (ABS) and covered bonds; (vi) equity; and (vii) securities issued by the non-resident sector. We differentiate between “vulnerable” and “non-vulnerable” countries, applying the distinction devised by Altavilla et al. (2017). The group of “non-vulnerable” countries includes Austria, Belgium, Estonia, Finland, France, Germany, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Slovakia, and Slovenia. The group of “vulnerable” countries includes Cyprus, Greece, Ireland, Italy, Portugal, and Spain.

This section focuses on PSPP-eligible holdings only. Until 2015 the majority of PSPP-eligible sovereign bonds

<sup>2</sup> We would like to thank Emmanuel Gervais, Aurélie Hodeau and the Securities Division of the Banque de France Directorate General Statistics.

were held by non-resident investors, insurance companies and banks in “non-vulnerable” countries, followed by banks in “vulnerable” countries (see Table 1). 38% and 52% of the portfolios of insurance companies in “non-vulnerable” and “vulnerable” countries, respectively, were invested in eligible sovereign bonds.

Our analysis also demonstrates significant heterogeneity in government debt holdings between euro area countries. The home bias (Table 1, third column), which had already been noted in the context of European banks, is also extremely pronounced for the other sectors. This is particularly the case, for example, with insurance companies in “vulnerable” countries: 86% of their holdings of eligible bonds were issued in their home country.

## Investors’ portfolio rebalancing in response to the APP

We examine how the investor sectors have rebalanced their portfolios since first-quarter 2015 and the first PSPP

purchases. Our measurement involves calculating – for each security and each investor sector – the change in holdings in nominal terms (at face value for bonds) between quarters Q-1 and Q, and then applying the price of the security in Q. Thus, the measurement of portfolio rebalancing is not distorted by changes related solely to valuation effects.

Table 2 shows the changes observed from first-quarter 2015 to fourth-quarter 2016 in the three asset categories purchased by the Eurosystem (sovereign bonds, corporate bonds, and ABS and covered bonds).

The major end-counterparty of the PSPP is clearly the non-resident sector, followed by banks and mutual funds from euro area countries as a whole. Insurance companies continued to be net purchasers of European sovereign bonds. As for corporate bonds and ABS and covered bonds (the two other categories of assets purchased by the Eurosystem), the amounts sold by euro area banks as a whole, particularly banks in “vulnerable” countries, are similar to the amounts sold by the non-resident sector.

## T1 Holdings of sovereign bonds eligible for the Public Sector Purchase Programme (PSPP), and home bias

(amounts in EUR billions – Q4 2013-Q4 2014 average, preceding PSPP –, shares as a %)

		Eligible sovereign bond holdings <sup>a)</sup>	Eligible holdings as a % of the overall portfolio	% of eligible bonds portfolio held in own country
“Non-vulnerable” countries	Insurance companies <sup>b)</sup>	948	38	51
	Banks	838	25	55
	Mutual funds	585	12	19
	Households	20	2	65
	Other	126	11	71
“Vulnerable” countries	Insurance companies	362	52	86
	Banks	533	24	84
	Mutual funds	160	12	64
	Households	176	20	95
	Other	123	24	95
Non-resident		2.273	–	–
Eurosystem <sup>c)</sup>		114	64	–

Source: Eurosystem, Securities Holdings Statistics; author’s calculation.

Note: Each value is an average of the five quarters (Q4 2013 to Q4 2014) preceding the PSPP.

a) The eligibility criteria that are applied for the purposes of this table are those in force in March 2015 at the beginning of the purchase programme: (i) issued by a euro area government or eligible national agency; (ii) a minimum residual maturity of between 2 and 30 years; and (iii) a yield above the deposit facility rate. The criteria have since been eased, notably since March 2016, see <https://www.ecb.europa.eu/mopo/implement/omt/html/pspp.en.html>

b) We use the term “insurance companies” to refer to insurance corporations and pension funds (ICPFs), “mutual funds” to refer to other financial institutions (OFIs), and “other” to refer to both general government and non-financial corporations.

c) The EUR 114 billion already held by the Eurosystem corresponds to purchases made under the Securities Market Programme (SMP) between 2010 and 2012.

## T2 Portfolio rebalancing following the implementation of the Asset Purchase Programme (APP), from Q2 2015 to Q4 2016

(EUR billions)

		Sovereign bonds	Corporate bonds	Asset backed securities (ABS) and covered bonds
“Non-vulnerable” countries	Insurance companies	20	20	-20
	Banks	-153	-88	-105
	Mutual funds	-70	18	-34
	Households	-12	-41	-3
	Other	13	-5	-7
“Vulnerable” countries	Insurance companies	148	46	-4
	Banks	-114	-10	-52
	Mutual funds	-33	13	-8
	Households	-66	-97	-2
	Other	-26	-5	-1
Non-resident		-687	-111	-108
Eurosystem <sup>(c)</sup>		1.198	50	138

Source: Eurosystem, Securities Holdings Statistics; author's calculation.

Note: by market clearing, the sum of purchases and sales in each category must be equal to the value of new issues.

The reported change  $B_{i,n,t}$  is calculated for each investor  $i$  and each security  $n$  as the change in holding  $Q$  in nominal terms between  $t-1$  and  $t$ , valued at market price at Q2 2015.

### Redistribution of market risk in the euro area

In the same way that we are able to quantify the rebalancing of asset holdings, we can also quantify the redistribution of exposure to various market risks. This allows us, for example, to assess whether purchase programmes are associated with a search for yield or a concentration of risk-taking in certain sectors.

In particular, in Koijen et al. (2016 – revised, 2018) that we recently updated, we consider the redistribution of duration risk and sovereign credit risk. In the charts in Box 2, we show the share of these two risks borne by each broad investor category, normalised on the basis of total risk present in the market in fourth-quarter 2014, in order to take into account developments in market risk created, for example, by new issues.

Over the eight-quarter period since Q1 2015, the Eurosystem absorbed approximately 17% of the overall duration risk of the euro area sovereign debt market.

The non-resident sector most reduced its exposure to duration risk, as, to a lesser extent, did the other sectors, with the exception of insurance companies in “vulnerable” countries, whose exposure to euro area duration risk rose from 6% prior to the APP to 8%.

Equally, all sectors reduced their exposure to sovereign risk, except for insurance companies in “vulnerable” and “non-vulnerable” countries. Insurance companies in “vulnerable” countries, for example, were exposed to around 13% of sovereign risk in fourth-quarter 2016, compared with 8% prior to the APP.

With the exception of these limited cases, ringfenced to certain types of investors, we do not find a clear concentration pattern of market risk in any particular sectors. This suggests that the risk-taking channel (rebalancing towards riskier assets) probably had little influence in the euro area, and that the consequences in terms of financial stability appear limited, during the period and for the type of risk under review.

## Box 2

### Redistribution of market risk

Duration is a standard measure of interest rate risk – the sensitivity of bond portfolio valuations to interest rate changes. We calculate the exposure to duration risk of each investor sector, which we normalise on the basis of aggregate market duration risk in fourth-quarter 2014, immediately prior to the APP.

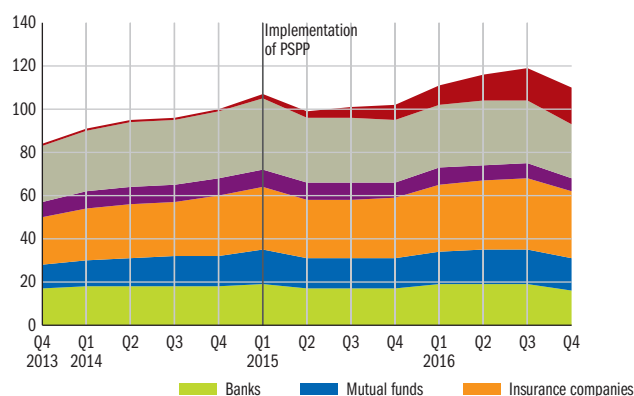
We apply the same approach to sovereign credit risk: for each portfolio security, we take the credit rating allocated by the Eurosystem or, failing that, a credit rating agency such as Standard & Poor's, Fitch, Moody's or DBRS, and convert it into a five-year cumulative default probability.

The evolutions seen in the total reflect the changes in aggregate risk, e.g. related to new debt issues. In each chart, the series total 100 in fourth-quarter 2014.

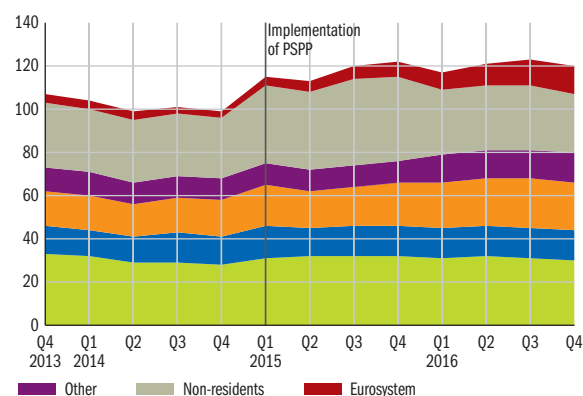
### Distribution of duration and sovereign credit risk

(en %)

a) Distribution of duration risk



b) Distribution of sovereign credit risk



Source: Eurosystem, Securities Holdings Statistics; author's calculation.

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