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International financial flows and the Eurosystem’s asset purchase programme: evidence from b.o.p and security by security data ¹

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¹ This paper was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

International financial flows and the Eurosystem's asset purchase programme: evidence from b.o.p and security-by-security data

Katharina Bergant, Martin Schmitz¹

Abstract

The growing complexity and interconnectedness of the international financial system as well as heterogeneity across sectors provide a strong case for incorporating micro data into policy analysis. In this paper, we use security-by-security data from the ESCB's securities holding statistics by sector (SHSS), which offers a comprehensive and granular dataset of the security holdings and transactions by euro area residents. With this information, we provide a detailed account of portfolio rebalancing in response to the Eurosystem's asset purchase programme (APP). The granular nature of the dataset enables us to complement the information available from b.o.p. statistics with security-specific information, such as the currency of denomination, yield and maturity of financial assets. This allows for instance to track euro area residents' investment behaviour in sovereign debt securities that are eligible to be bought by the Eurosystem under the APP, as well as in their closest substitutes, i.e. sovereign debt securities with the same characteristics issued by non-euro area advanced economies.

Keywords: Balance of payments, security-by-security data, portfolio rebalancing, capital flows, quantitative easing, micro data

JEL classification: F21, F34, E52, G15

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1. Introduction

Large scale asset purchase programmes (LSAPs) by central banks have become a popular tool of unconventional monetary policy since the global financial crisis to stimulate economic growth and fulfil inflation objectives in a zero lower bound environment. A major transmission channel of these policies to the real economy is portfolio rebalancing, induced by a decrease in long-term bond yields resulting from a scarcity of securities in the secondary market triggered by the central bank's purchases. Thereby, lower yields should lead investors to rebalance their portfolio towards higher yielding assets, both domestic and foreign.

The ECB's unconventional monetary policy measures, covering the large scale asset purchase programme (APP), a negative deposit rate, and targeted longer-term refinancing operations (TLTROs) reduced euro area long-term risk-free rates by around 80 basis points since June 2014 (ECB, 2017a). The resulting yield differentials between euro area and foreign government bonds have played an important role for euro area capital flows since then (ECB, 2017b). Evidence from the euro area balance of payments shows that the introduction of the main component of the APP in the first quarter of 2015 – namely the Public Sector Purchase Programme (PSPP) – was followed by significant net capital outflows in portfolio investment (Figure 1).²

This macro-based evidence confirms that LSAPs can trigger substantial cross-border capital flows by way of the portfolio rebalancing channel. In an integrated international financial system, monetary policy impacts both domestic investment patterns and international capital flows. The growing complexity and interconnectedness of the international financial system as well as sector heterogeneity provide a strong case for incorporating micro data for policy analysis (Lane, 2015). Limitations of macroeconomic statistics pertain for instance to the limited extent of sectoral information on holders and issuers of assets, both in a domestic and cross-border context. Data on country-level capital *flows* usually only offer a limited geographic breakdown, while bilateral data merely cover investment positions, are available at low frequencies, and do not include the holdings of domestic securities (e.g. the IMF's Coordinated Portfolio Investment Survey, CPIS).

Security-by-security data allow identifying important asset specific characteristics, such as the issuing entity, the yield of a debt security, market prices, as well as the currency denomination, maturity and rating. Such granular information – if consistent with macroeconomic statistics – enables data users and statisticians to drill down to specific dimensions of financial positions and transactions, both on an ad-hoc basis and to construct aggregate statistical indicators. Another benefit of security-by-security data relates to the possibility to analyse financial position and transactions on a who-to-whom basis at various layers of detail.

In this paper, security-by-security data from the European System of Central Banks (ESCB) securities holding statistics by sector (SHSS) is used, which offers a comprehensive, fully integrated, granular dataset of the security holdings and transactions of euro area residents. As such one is able to integrate the analysis of domestic and international sectoral portfolios. This dataset allows for providing a

² The PSPP accounts for approximately 80% of the entire asset purchase programme.

detailed account of euro area portfolio rebalancing – both at the aggregate and sector level, incorporating domestic, euro area and global capital financial transactions of euro area residents – in the period since the launch of the PSPP (2015Q1 to 2017Q4).

The remainder of this paper is organised as follows: Section 2 provides evidence on euro area cross-border portfolio rebalancing since the launch of the PSPP based on ECB balance of payments data. Section 3 presents the key features of the SHSS dataset which is subsequently used in Section 4 to present additional insights on euro area portfolio rebalancing. Section 5 concludes.

2. Evidence based on b.o.p. data

Figure 1: Breakdown of euro area net portfolio investment flows

(EUR bn)

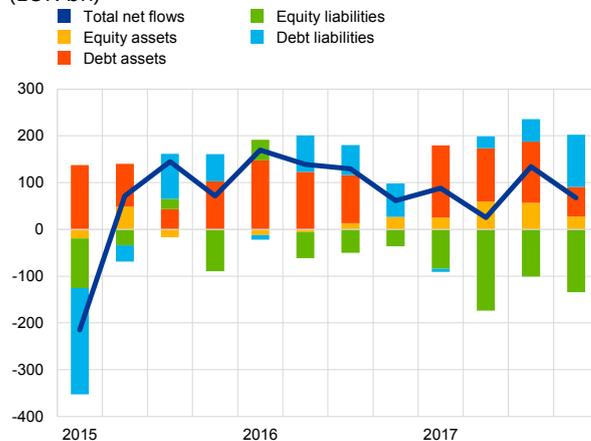
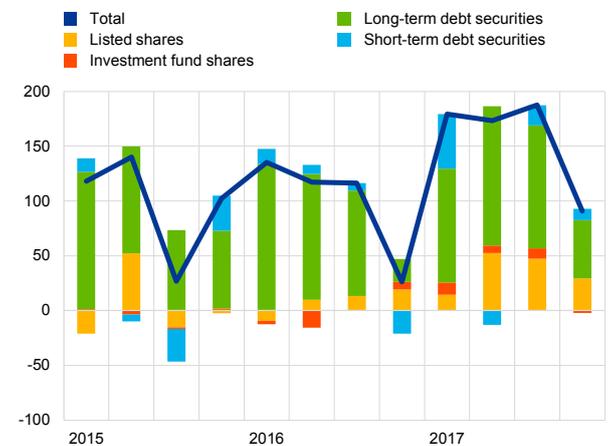


Figure 2: Euro area portfolio investment asset flows

(EUR bn)



Source: ECB.

Notes: For assets, a positive (negative) number indicates net purchases (sales) of non-euro area securities by euro area investors. For liabilities, a positive (negative) number indicates net sales (purchases) of euro area securities by non-euro area investors. For net flows, a positive (negative) number indicates net outflows (inflows) from (into) the euro area. Equity includes investment fund shares. The latest observation is for 2017Q4.

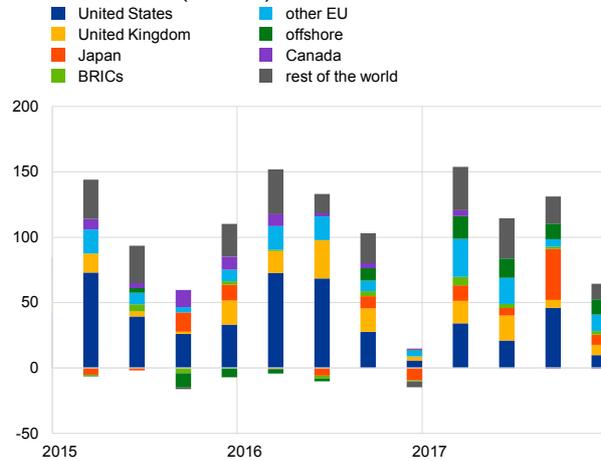
This section provides evidence from the ECB's b.o.p. statistics on developments in euro area portfolio investment since the announcement and launch of the PSPP in early 2015. Since then, the euro area has recorded net outflows (i.e. the net purchases of foreign asset by euro area residents exceeded the net purchases of euro area asset by foreign residents) in portfolio investment, owing to rebalancing towards non-euro area debt securities on the part of both euro area and non-euro area investors (Figure 1). While non-euro area residents account for a sizable share of bond sales to the Eurosystem as part of the PSPP, they have been large net buyers of euro area equity.³ Euro area investors on the other hand were a major driving force behind the observed net outflows (Figure 2). Since the start of the

³ According to Cœuré (2017) the selling of euro area government bonds by non-residents in the PSPP is to some extent a mechanical feature of the programme due to the relatively large share of euro area government bonds held by non-residents. Moreover, the inflows to euro area equity by foreign investors partly reflected a confidence effect as the ECB's policy measures boosted investor confidence in the euro area's growth prospects.

PSPP, net purchases of foreign securities by euro area investors have largely consisted of debt securities – in particular long-term bonds – suggesting that domestic investors partly rebalanced their portfolios towards the closest substitute to PSPP eligible assets outside the euro area.

Zooming in on euro area investors’ portfolio debt investment outside the euro area, one observes that since early 2015 net purchases were largely concentrated on securities issued by advanced economies outside the euro area (Figure 3). Almost two-thirds of cumulated net debt purchases went into securities issued by residents in the United States (37%), the United Kingdom (13%), Japan (6%), and Canada (5%). By contrast, there was only limited investment into the BRICs – Brazil, Russia, India and China (around 2%).

Figure 3: Geographical breakdown of euro area investors’ net transactions of non-euro area portfolio debt securities (EUR bn)



Source: ECB.

Notes: “BRICs” comprises Brazil, Russia, India and China; “other EU” comprises EU Member States outside the euro area, excluding the United Kingdom. The latest observation is for 2017Q4.

3. The securities holdings statistics by sector (SHSS) dataset

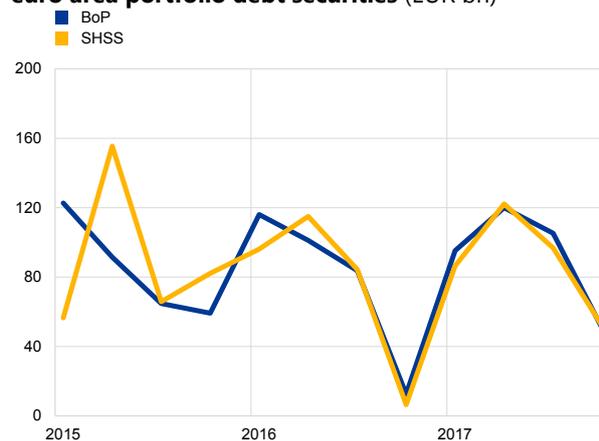
We use data on security-level portfolio transactions of all 19 euro area countries from the European System of Central Banks (ESCB) Sectoral Securities Holding Statistics (SSHS).⁴ The data are collected by national central banks from (i) financial investors and (ii) custodians. The dataset covers short-term and long-term debt securities, listed shares as well as investment fund shares which are in most cases identified with a unique International Securities Identification Number (ISIN). The data are collected on a quarterly basis since 2013Q4; data released until 2017Q4 (reference quarter) have been used in this analysis. The SHSS data consist of *directly* and *indirectly* reported securities. A financial institution resident in the euro area is

⁴ This dataset is collected according to Regulation ECB/2012/24, see http://www.ecb.europa.eu/ecb/legal/pdf/l_30520121101en00060024.pdf

obliged to report securities that it holds as its own investment (“direct reporting”) as well as securities that it holds in custody (“indirect reporting”). Moreover, in some countries non-financial investors have direct reporting requirements. In the other countries, assets held in custody are included for non-financial investors in the SHSS.⁵ Investors in the dataset are defined by their country of domicile and sector. We follow the European System of Accounts (2010) and aggregate the data to six sectors: monetary and financial institutions (MFI) excluding monetary authorities, insurance companies and pension funds (ICPF), other financial institutions (OFI),⁶ non-financial corporations (NFCs), general government (GOV), and households (HH).

Using the ISIN for every security, SHSS data are merged with individual asset characteristics obtained from the ESCB’s Centralised Securities Database (CSDB) which contains information on more than six million debt and equity securities issued globally (see ECB (2015) and Fache Rousová and Rodríguez Caloca (2018) for further details). Therefore, one can use information at the security-level, such as the instrument type, issuer country and institutional sector, currency of denomination, yield and maturity.

Figure 4: Euro area investors’ net purchases of non-euro area portfolio debt securities (EUR bn)



Source: ECB.

Notes: The latest observation is for 2017Q4.

A priori b.o.p./i.i.p. and SHSS statistics are expected to provide rather consistent results, since the national portfolio investment assets of euro area residents should rely on SHSS (or data collected for SHSS purposes) as the primary data source. In particular, the ECB Guideline on external statistics defines that cross-border portfolio investment collection systems of euro area countries shall rely, as much as possible, on security-by-security information. Specifically, the Guideline defines that stocks of securities reported to national compiler on an aggregate basis, i.e. without

⁵ This approach prevents a double-counting of holdings which would happen if there are several intermediate financial institutions between the final non-financial investor and the financial institution holding assets in custody.

⁶ These include important intermediaries such as mutual funds which represent the largest subgroup of this sector.

standard (ISIN or similar) codes, should not exceed 15% of the total portfolio investment stocks of assets or liabilities.

The consistency between euro area b.o.p./i.i.p. statistics and SHSS has improved in recent years, especially for long-term debt securities (Figure 4). Over the period 2016Q1 to 2017Q4 the average ratio of SHSS to b.o.p./i.i.p. data on euro area holdings of securities issued by non-euro area residents (b.o.p./i.i.p. assets, i.e. not considering intra-euro area holdings) was very high for long-term debt securities (97%) and listed shares (90%) and somewhat lower for short-term debt securities (76%) and investment fund shares (72%). This high coverage of SHSS data makes it an appealing data source to construct complementary micro-based statistical indicators.

4. Evidence based on security-by-security data

In this section we analyse the ‘active’ portfolio rebalancing (i.e. in terms of net purchases/sales) of euro area investors since the launch of the PSPP by using additional statistics from the SHSS dataset. Hence, we are able to provide additional insights compared to those based on more aggregate statistics, such as the balance of payments presented in Figures 1 to 3. Furthermore, the dataset allows us to integrate euro area investors’ financial transactions in securities issued globally (i.e. domestically, in the rest of the euro area and outside the euro area).

Figure 5: Euro area investors’ net transactions of debt securities

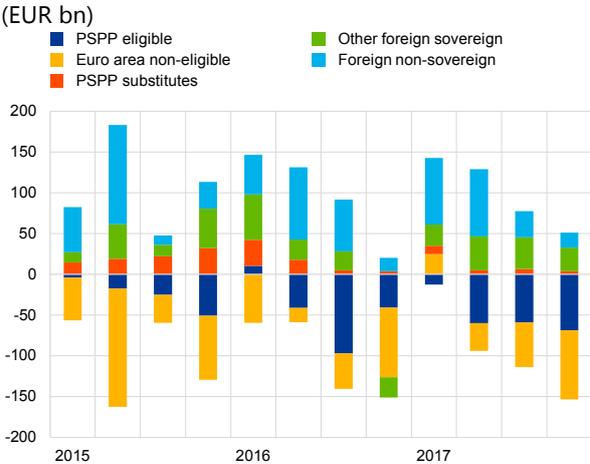
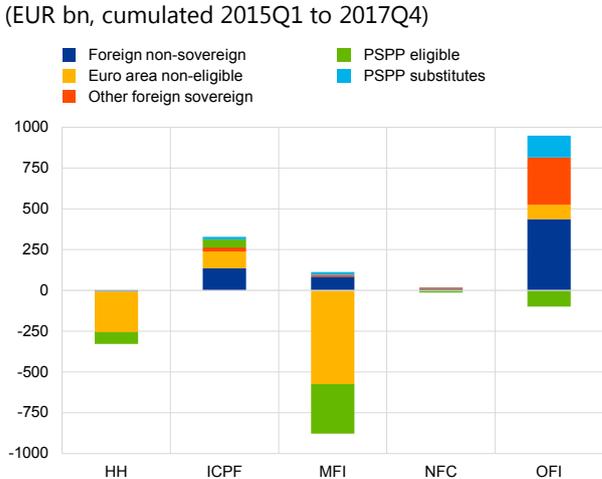


Figure 6: Euro area sectors’ net transactions of debt securities



Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. PSPP eligible assets are securities eligible to be bought by the Eurosystem under PSPP. PSPP substitutes are sovereign debt securities from advanced countries outside the euro area which would otherwise fulfil the eligibility criteria of the PSPP programme. The latest observation is for 2017Q4.

Starting with transactions in debt securities, Figure 5 shows that euro area investors were net sellers of securities eligible to be bought by the Eurosystem under the PSPP in the period 2015Q1 to 2017Q4.⁷ The SHSS dataset enables us to identify transactions in these eligible securities at the security level and use those in aggregated form in descriptive analysis.

Net sales of PSPP eligible securities by euro area residents amounted to more than EUR 470 bn in the period 2015Q1 to 2017Q4. At the same time, even larger net sales of around EUR 670 bn were recorded for other debt securities issued in the euro area, of which the most important component consisted of those issued by euro area MFIs. These net sales can be attributed to spillovers from the PSPP programme to other euro area debt instruments as well as negative net issuance of bonds by the banking sector in light of deleveraging pressures. These net sales of euro area debt instruments were mirrored in sizeable net purchases of foreign debt securities by euro area residents. More than half of these net purchases consisted of foreign debt securities issued by the foreign private sector, thereby closely matching in size the net sales of non-eligible euro area debt securities. Moreover, we also observe significant net purchases (of around EUR 500 bn) of foreign sovereign debt securities, of which around 35% qualify as close substitutes for PSPP eligible assets.⁸ Figure 6 shows which sectors drove these overall patterns: MFIs and households accounted for the largest net sales of euro area debt securities (both PSPP eligible and other debt securities), while ICPFs were net buyers of both types of euro area debt securities. OFIs – mainly consisting of mutual funds – bought the largest amounts of PSPP substitutes as well as foreign debt securities in general, followed by ICPFs and MFIs.⁹

In Figure 7 the analysis is broadened to include equity securities, i.e. investment fund shares and listed shares, in order to investigate the transmission of quantitative easing in the euro area from targeted securities towards other instruments. In contrast to the b.o.p. based analysis in Figure 2, also securities issued by euro area residents are considered, i.e. including securities issued in the country of residence of a euro area investor. The evidence shows that euro area investors rebalanced their portfolios towards euro area investment fund shares, debt securities issued outside the euro area, and to a lesser extent to (euro area and foreign) listed shares. The rebalancing towards investment fund shares was particularly pronounced for euro area households.

Figure 8 provides additional detail on euro area flows into investment fund shares. Based on additional security characteristics from the ESCB's CSDB, we differentiate investment funds at the ISIN level according to their main investment purpose/mandate. The largest net purchases by euro area residents of investment

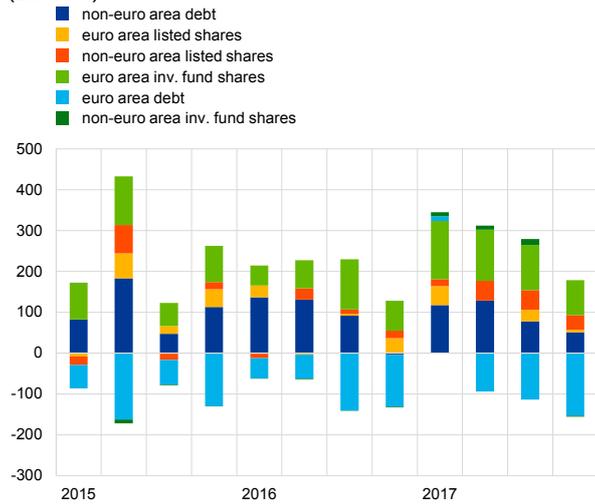
⁷ Securities eligible to be bought under the PSPP are those (i) issued by euro area governments or (ii) by certain international/supranational institutions. In addition, they need fulfil specific requirements, e.g. a maturity between 2 and 30 years, ratings above credit quality step 3 in the Eurosystem's harmonised rating scale (i.e. at least a rating BBB- from Standard & Poor's or Fitch, BBBL from DBRS, or Baa3 from Moody's), a yield to maturity above the Eurosystem's deposit facility rate, which was equal to -20bp at the time of the announcements of the programme in January 2015.

⁸ We define PSPP substitute as sovereign debt securities of foreign advanced countries which otherwise fulfil the requirements of the PSPP, e.g. a 10-year US treasury bond.

⁹ For a formal regression-based analysis of sectoral portfolio rebalancing in response to the PSPP, please see Bergant, Fidora and Schmitz (2018).

funds shares targeted 'mixed' investment funds, followed by those funds with explicit mandates to invest in bonds, equity and real estate. Combining the evidence contained in Figures 6 and 8 suggest that at the end of the investment chain, euro area investment funds channelled large funds towards the acquisition of non-euro area debt securities.

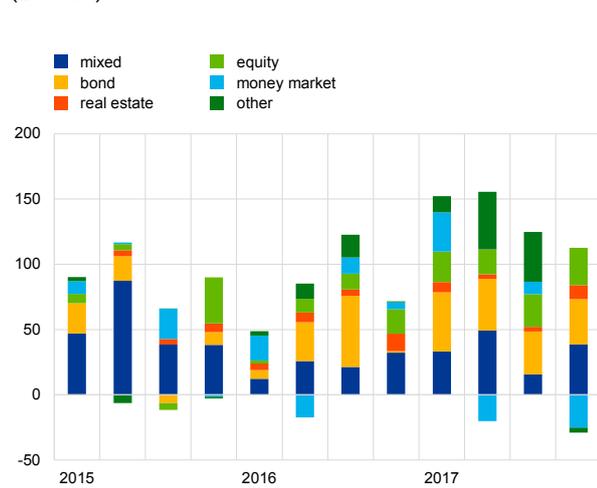
Figure 7: Euro area investors' net transactions of euro area and non-euro area securities (EUR bn)
(EUR bn)



Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. Euro area securities include domestic securities. The latest observation is for 2017Q4.

Figure 8: Euro area investors' net transactions of investment fund shares split by main mandate
(EUR bn)



Source: ECB.

Data on the mandate of the respective investment funds are from an extract of the CSDB on 31/01/2018. Other includes unallocated. The latest observation is for 2017Q4.

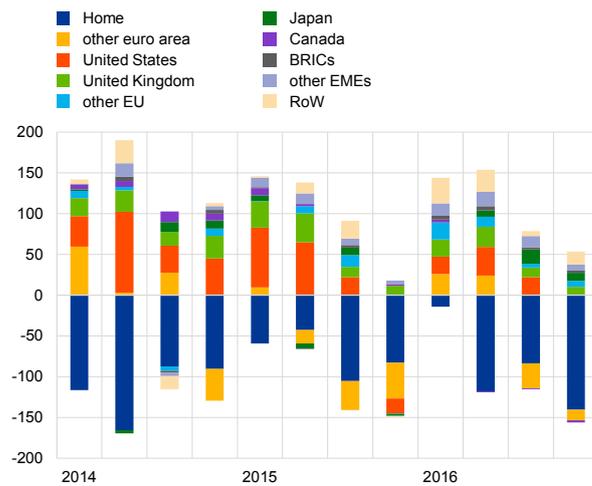
As regards the geographical decomposition of euro area residents' net purchases of debt securities we go beyond the b.o.p. evidence by also including transactions in debt securities issued in the investor's country of residence ("Home") and those issued in "other euro area countries" (Figure 9). The security-level data also allows for constructing geographical counterparts on an ad-hoc basis. In this instance, we construct an aggregate of "other emerging market economies (EMEs)" which we include alongside the BRICs aggregate.¹⁰ Figure 9 shows that euro area residents' net sales of debt securities were largely concentrated on those issued in their home countries, which points to a decline in the home bias of debt securities. Apart from the patterns already observed in the b.o.p. analysis – most strikingly the large amount of net purchases of debt securities issued by the United States of around EUR 450 bn since 2015Q1 – the relatively large volume of net purchases of debt securities issued by other EMEs of around EUR 110 bn stands out.

The importance of the US as euro area residents' preferred issuers of debt securities since the launch of the PSPP warrants a closer analysis. Indeed, the two

¹⁰ Our definition of other EMEs which is broadly consistent with the IMF's definition includes Argentina, Bangladesh, Chile, Columbia, Indonesia, Malaysia, Mexico, Pakistan, Peru, Philippines, Thailand, Turkey, South Africa, Uruguay and Venezuela.

single issuing sectors receiving the largest net debt securities purchases by euro area residents' were US non-financial corporations and the US government sector. Figure 10 also reveals important time dynamics: from 2015 up to mid-2016 large euro area net purchases of debt securities issued by the US government were recorded, while these turned negative afterwards. Net purchases of debt securities issued by US NFCs on the other hand were recorded persistently in all quarters since 2015Q1.

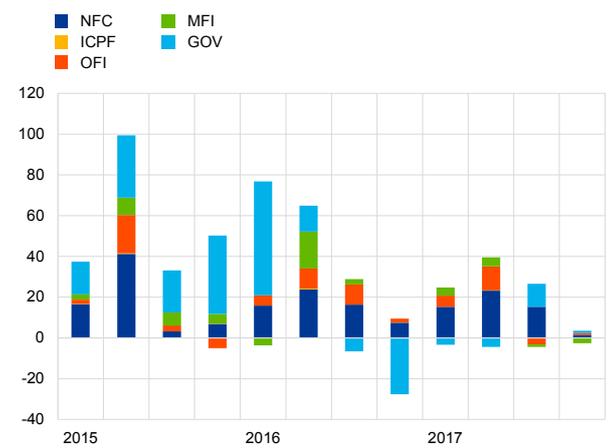
Figure 9: Geographical breakdown of euro area investors' net transactions of debt securities (EUR bn)



Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. The latest observation is for 2017Q4.

Figure 10: Euro area investors' net transactions of debt securities issued by US residents, by issuing sector (EUR bn)



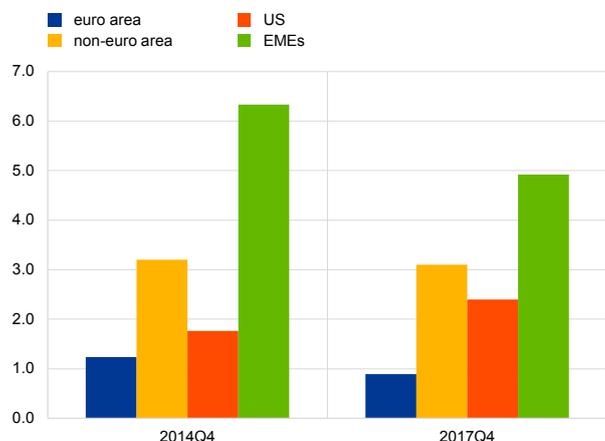
Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. The latest observation is for 2017Q4.

Large net purchases of US debt securities are in line with euro investors eyeing the closest substitutes to PSPP eligible securities and can also be explained by the substantial yield differentials between the euro area and the US in recent years. In fact, as our security-level dataset also contains information on the yield to maturity of debt securities, we are able to calculate the average yields euro area investors are obtaining on their debt security holdings, broken down by issuing counterparty. Figure 11 focuses on sovereign debt securities: since the launch of the PSPP, a key development has been the growing interest rate differential between euro area and non-euro area (in particular US) sovereign debt securities. Moreover, the yield on government debt securities issued by EMEs has remained substantially higher than the yield on euro area government debt.

A further dimension of euro area residents' transaction in debt securities concerns the currency of denomination. Starting from the security-level, we find that the five most relevant currencies in euro area residents debt securities' portfolios are the euro, US dollar, British pound, Japanese Yen and the Swiss Franc. The geographical decomposition of euro area residents' net purchases of debt securities is mirrored in the currency of denomination of the underlying assets: Figure 12 shows large net purchases of debt securities denominated in US dollar and to a lesser extent in British pound, as well as net sales of euro-denominated debt securities.

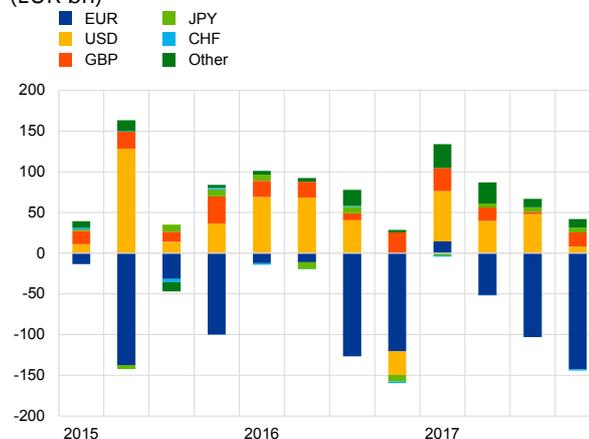
Figure 11: Yield on euro area investors' government debt security holdings, by issuer (percentages)



Source: ECB.

Notes: Average yield to maturity on aggregate euro area investors' portfolio as contained in SHSS dataset. EMEs include the BRICs and "other EMEs" as outlined above.

Figure 12: Currency breakdown of euro area investors' net transactions of debt securities (EUR bn)

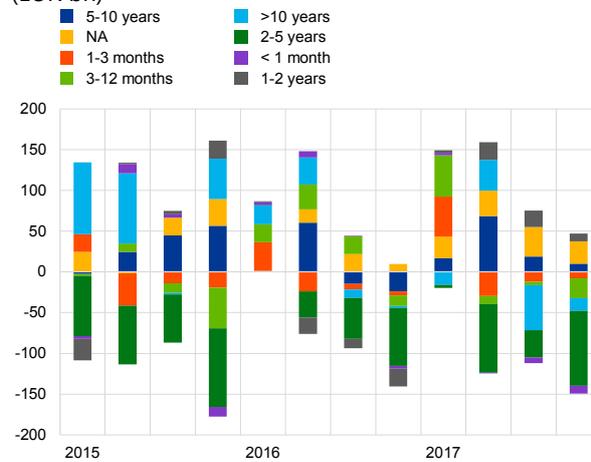


Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. The latest observation is for 2017Q4.

As our dataset contains very detailed information on the original and residual maturity of a security (in number of days), we are able to construct various maturity intervals and report net purchases of debt securities belonging to each of these intervals. This is particularly relevant for the PSPP period, because the euro area yield curve shifted downwards, which might have induced euro area investor to increase the average maturity of their debt security holdings in order to achieve a certain nominal yield. Figure 13 points to evidence in the direction of a shift towards longer term maturities as the vast majority of net sales over the PSPP period consisted of assets with an original maturity between 2 and 5 years. Net purchases of debt securities on the other hand largely fell within the maturity intervals of 5 to 10 years and more than 10 years. Further evidence at the sector level shows that the large net purchases of assets with a minimum original maturity of 10 years is driven by ICPFs and OFIs. In particular for the latter, the switch to longer-term maturities may be driven by "search for yield" considerations, while for ICPFs these net purchases are likely driven by the inherent need to match long-term liabilities with long-term assets. The large net sales of 2-5 year original maturity securities were mainly driven by MFIs and households.

Figure 13: Maturity breakdown of euro area investors' net transactions of debt securities
(EUR bn)



Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. Maturity refers to original maturity of debt securities at issuance. The latest observation is for 2017Q4.

5. Conclusions

In this paper, we use security-by-security data from the ESCB's SHSS to provide detailed account of portfolio rebalancing in response to the Eurosystem's asset purchase programme (APP). The granular nature of the dataset enables us to complement the information available from b.o.p. statistics.

Our analysis reveals for instance that euro area investors rebalanced away from euro area debt securities (including PSPP eligible securities) towards foreign debt securities (including the "closest substitutes" to securities targeted under the PSPP). While the aggregate patterns for the euro area are in line with "textbook portfolio rebalancing", we find sector heterogeneity as ICPFs were net buyers of PSPP eligible assets and other euro area debt securities since the launch of the PSPP.

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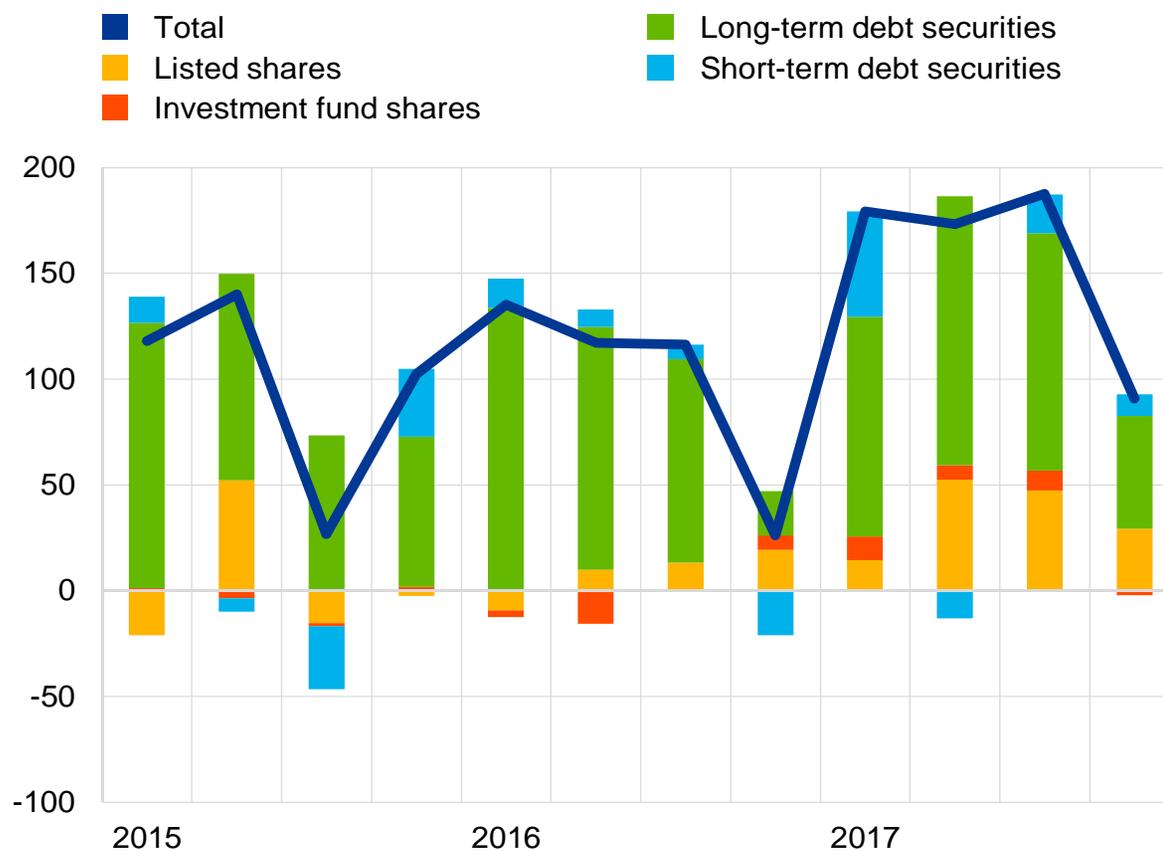
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B.o.p. evidence: euro area residents rebalanced towards foreign debt securities

Euro area portfolio investment asset flows

(EUR bn)



Source: ECB.

Notes: For assets, a positive (negative) number indicates net purchases (sales) of non-euro area securities by euro area investors. The latest observation is for 2017Q4

- Incorporating micro data for policy analysis due to **complexity of international financial system and sector heterogeneity** (Lane 2015; Shin 2016)
- Limitations of **macroeconomic statistics**
 - Sectoral information on holders/buyers and issuers of securities
 - Integrated information on domestic and foreign securities
 - Data on country-level capital flows offer limited geographic breakdown
- **Security-by-security** data
 - Enable data users and statisticians to drill down to security-specific dimensions of financial positions and transactions
 - In this paper: ESCB's security holdings statistics by sector (SHSS)

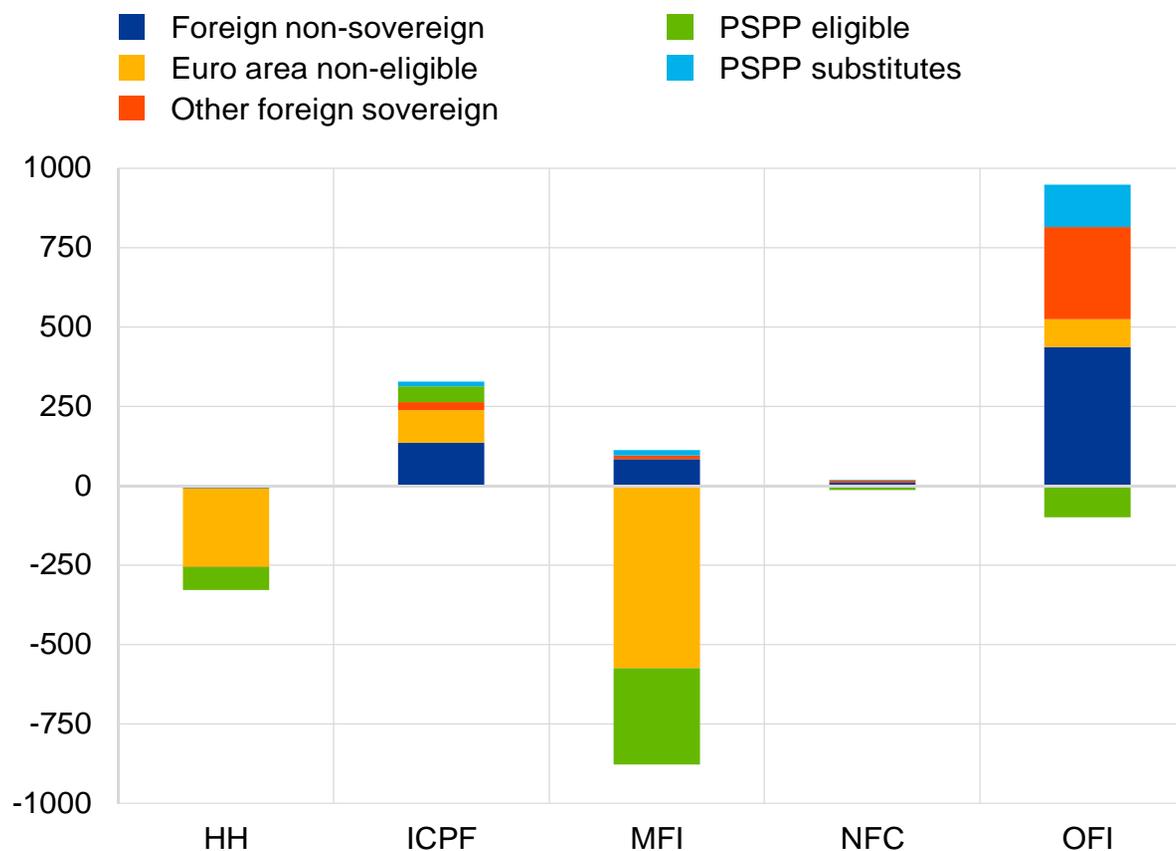
Security holdings statistics by sector (SHSS)

- Sectoral **security-level portfolio holdings** and transactions of all 19 euro area countries
- **All securities** (domestic and foreign) held by euro area investors
 - Debt securities (short-and long-term) and equities (listed shares and investment fund shares)
- ISIN allows for obtaining **individual asset characteristics** from the ESCB's Centralised Securities Database (CSDB)
 - issuer country and institutional sector, currency denomination, yield, maturity...
- **High consistency** with euro area b.o.p./i.i.p. statistics
 - makes SHSS appealing source to construct complementary micro-based statistical indicators

Euro area rebalancing away from PSPP eligible assets towards PSPP substitutes

Euro area sectors' net purchases of debt securities

(EUR bn; cumulated 2015Q1 to 2017Q4)



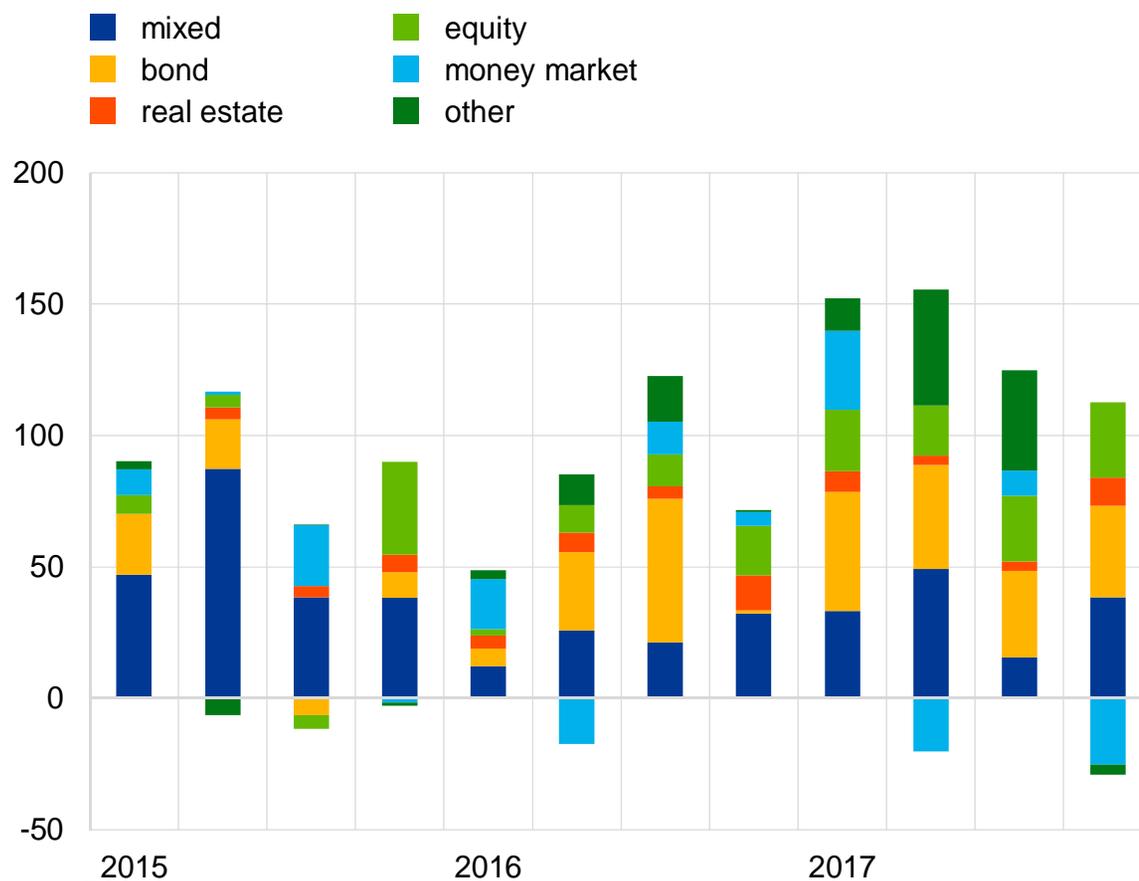
Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. PSPP eligible assets are securities eligible to be bought by the Eurosystem under PSPP. PSPP substitutes are sovereign debt securities from advanced countries outside the euro area which would otherwise fulfil the eligibility criteria of the PSPP programme. The latest observation is for 2017Q4.

Rebalancing into “mixed” and bond investment funds

Euro area investors' net purchases of investment fund shares split by main mandate

(EUR bn)

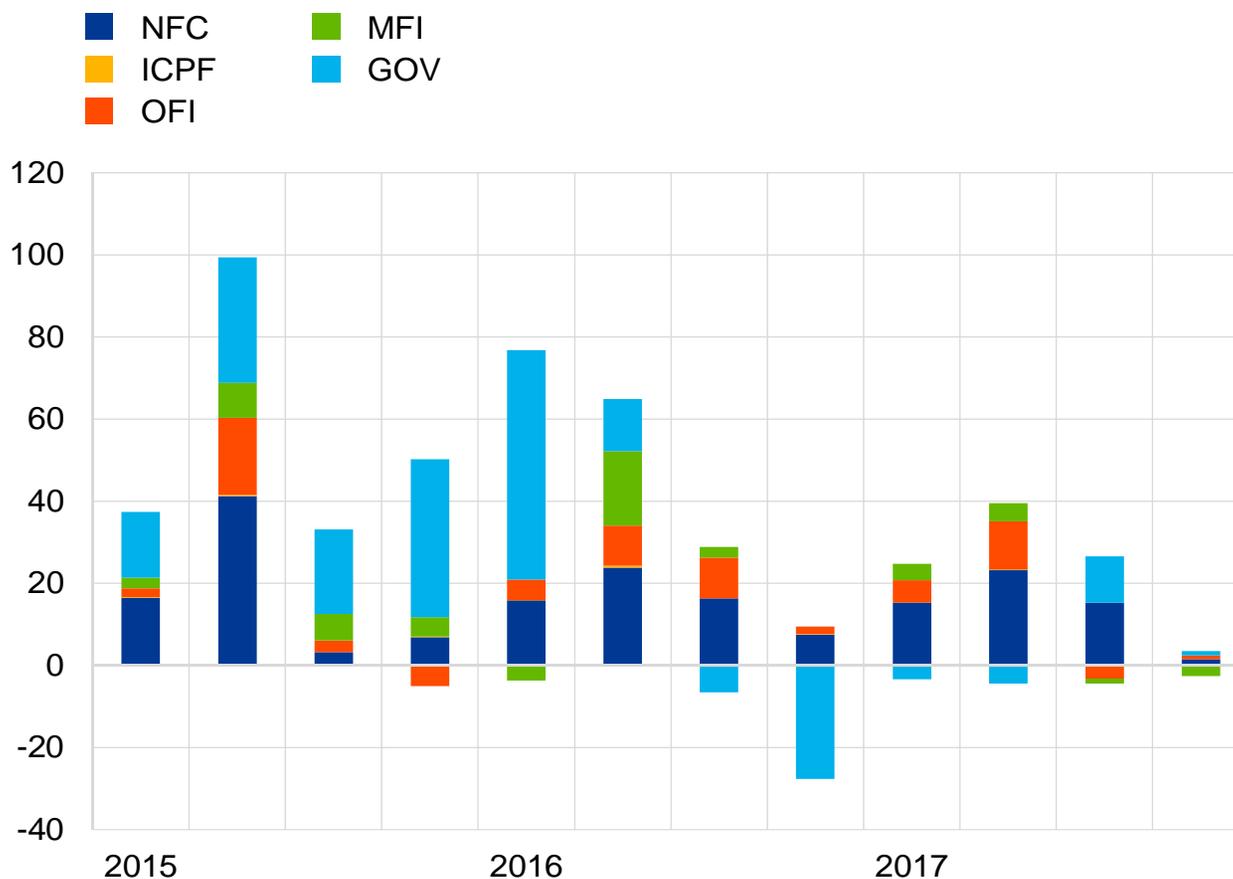


Source: ECB.

Notes: A positive (negative) number indicates net purchases (sales) of securities by euro area investors. Data on the mandate of the respective investment funds are from an extract of the CSDB on 31/01/2018. Other includes unallocated. The latest observation is for 2017Q4.

US has been the euro area's preferred issuers of debt securities since launch of PSPP

Euro area investors' net purchases of debt securities issued by US residents, by issuing sector (EUR bn)

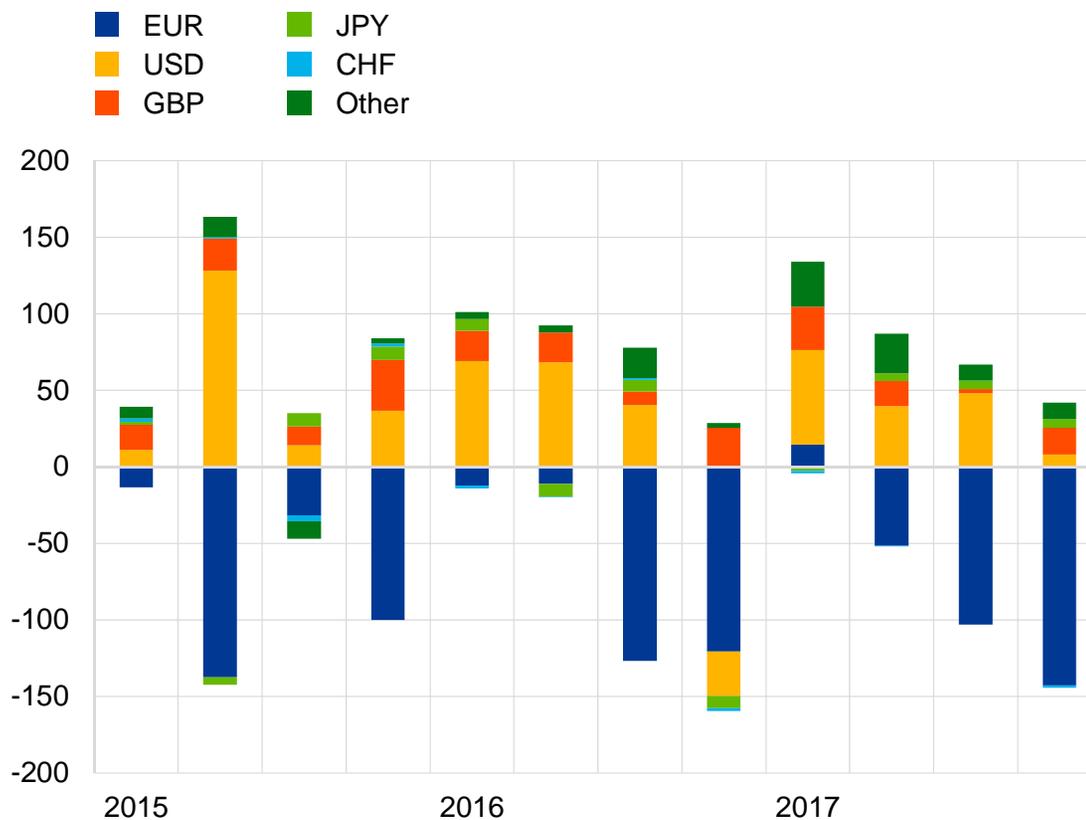


Source: ECB.

A positive (negative) number indicates net purchases (sales) of securities by euro area investors. The latest observation is for 2017Q4.

Rebalancing into foreign-currency denominated debt (especially US dollar)

Currency breakdown of euro area investors' net purchases of debt securities (EUR bn)

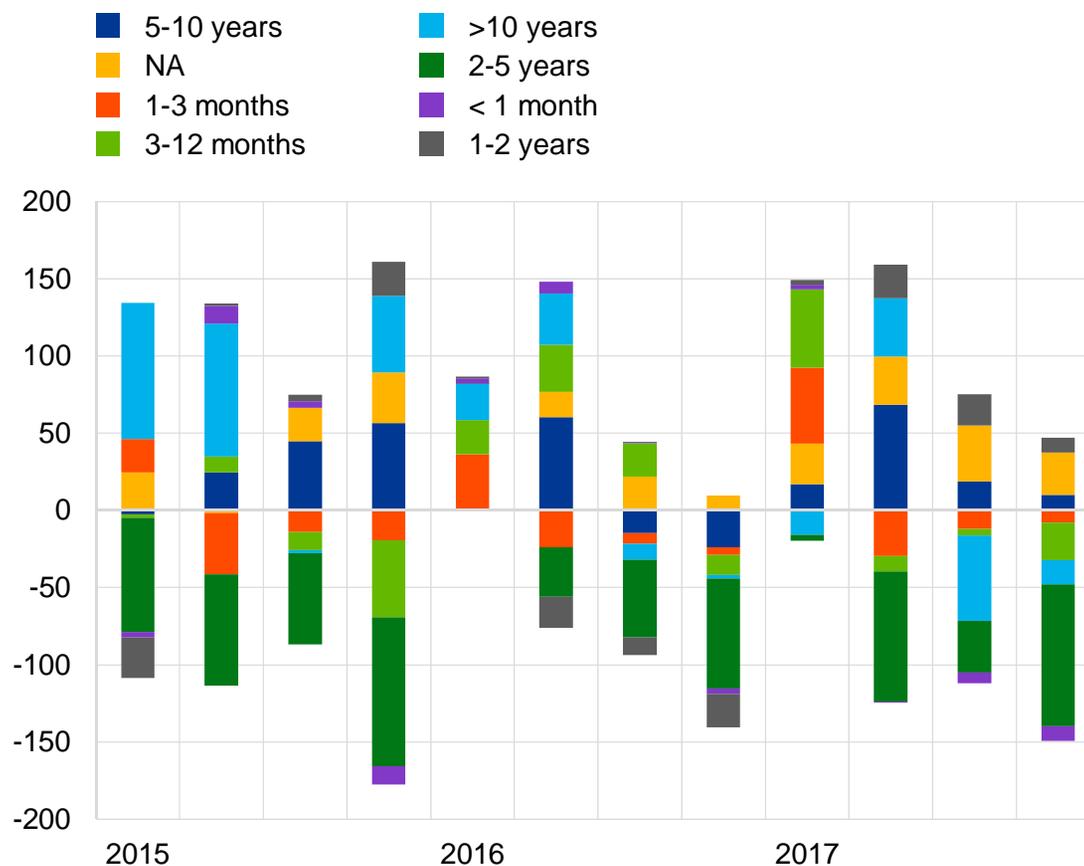


Source: ECB.

A positive (negative) number indicates net purchases (sales) of securities by euro area investors. The latest observation is for 2017Q4.

Rebalancing into securities with original maturity exceeding five years

Maturity breakdown of euro area investors' net purchases of debt securities (EUR bn)



Source: ECB.

A positive (negative) number indicates net purchases (sales) of securities by euro area investors. Maturity refers to original maturity of debt securities at issuance. The latest observation is for 2017Q4.

Thank you for your attention!

