

# WHO HOLDS WHAT? NEW INFORMATION ON SECURITIES HOLDINGS

*The financial crisis of 2008-09 highlighted the need for granular information on holdings of individual securities. This article introduces new statistics – securities holdings statistics – which have been collected by the European System of Central Banks since the beginning of 2014 and significantly help to close the information gap on securities holdings both within the euro area and between the euro area and the rest of the world. In particular, since the data are collected on a security-by-security basis, they provide a vast range of new breakdowns. This article describes the scope, content and coverage of the new statistics. In addition, it illustrates the value added of these new data on the basis of a few specific examples and outlines the future potential uses of the data.*

## I INTRODUCTION

**When Lehman Brothers collapsed in September 2008, policy-makers, including central banks, had very limited information about who was exposed to the securities at stake.** In particular, most of the then available official statistics only provided aggregated information, thereby making it difficult to identify exposures of market participants or sectors to a particular issuer or to capture the extent of contagion that such an event could trigger.<sup>1</sup>

**This and similar experiences, where a lack of detailed data hindered swift policy action, pointed to the need for highly granular information on securities holdings** and accelerated the preparatory work of the European System of Central Banks (ESCB) on the development of new statistics to help fill this information gap.<sup>2</sup> This work resulted in two legal texts<sup>3</sup> that provide a sound legal basis for the collection of a comprehensive dataset on securities holdings for the euro area. The actual data collection of the new securities holdings statistics (SHS) started in early 2014, with the first data referring to holdings at the end of December 2013.

**The rest of this article is organised as follows.** Section 2 introduces SHS data collection, including scope, content and coverage. Section 3 illustrates the possible use of SHS data by means of examples. Finally, Section 4 concludes.

## 2 THE MAIN FEATURES OF SECURITIES HOLDINGS STATISTICS

**SHS data have been collected quarterly since the fourth quarter of 2013 and cover the two main types of security: debt securities and equity securities** (including investment fund shares). The main feature of these data is that holding information is collected on the level of each individual security, i.e. security by security.

1 See Harford, T., “Let’s have some real-time economics”, *Financial Times*, 7 March 2014.

2 See Sola, P. and Strobbe F., “Addressing data gaps revealed by the financial crisis: European Central Bank statistics on holdings of securities”, Irving Fisher Committee on Central Bank Statistics, *IFC Bulletin*, No. 34: Proceedings of the IFC Conference on “Initiatives to address data gaps revealed by the financial crisis”, Bank for International Settlements, Basel, August 2010.

3 Regulation of the European Central Bank of 17 October 2012 concerning statistics on holdings of securities (ECB/2012/24) and Guideline of the European Central Bank of 22 March 2013 concerning statistics on holdings of securities (ECB/2013/7).

## 2.1 DATA COLLECTION

**The collection of data on securities holdings on a security-by-security basis has gained considerable ground in recent years given its advantages.**<sup>4</sup> Before the introduction of security-by-security data collection, reporting agents were required to aggregate data according to breakdowns defined by the statistical authority before reporting them (the “aggregate method”). This method requires, on the one hand, reporting agents to understand statistical codes and to use them to aggregate the data. On the other hand, statistical compilers have to ensure that each reporting agent implements the aggregation and applies the statistical standards in the same (harmonised) way. Additionally, whenever changes are necessary, all reporting agents have to adapt their systems accordingly.

**In security-by-security data collection, the aggregation step is eliminated on the side of the reporting agents.** The agents only have to report a few essential items, such as the International Securities Identification Number (ISIN), which is widely used in the financial markets, and the corresponding monetary amounts (positions and/or transactions). The statistical compiler then uses the ISIN and reference data on securities to calculate the necessary aggregates centrally. This in turn ensures a harmonised treatment of the data of each reporting agent and thus allows the compiler to manage data quality accurately. Moreover, the availability of highly granular data enables the calculation of a wide range of breakdowns even retrospectively (whenever necessary), without placing an additional burden on reporting institutions. While the costs borne by reporting agents are reduced, the costs to the statistical authority increase due to the granular data collection, extensive data manipulation and reference data maintenance. Nevertheless, the numerous benefits more than outweigh the costs. In particular, recent advances in IT solutions, infrastructure and related communication channels have made such wide-scale data collection considerably easier.

## 2.2 SCOPE

**The SHS project contains two data modules (the SHS Sector and the SHS Group), which differ on account of the granularity of the information on the holder’s side** (see Chart 1). The SHS Sector module provides aggregate information on the holdings of institutional sectors resident in individual countries, while the SHS Group module currently contains information on the individual holdings of the 25 largest banking groups with head offices in the euro area (i.e. holder-by-holder information).

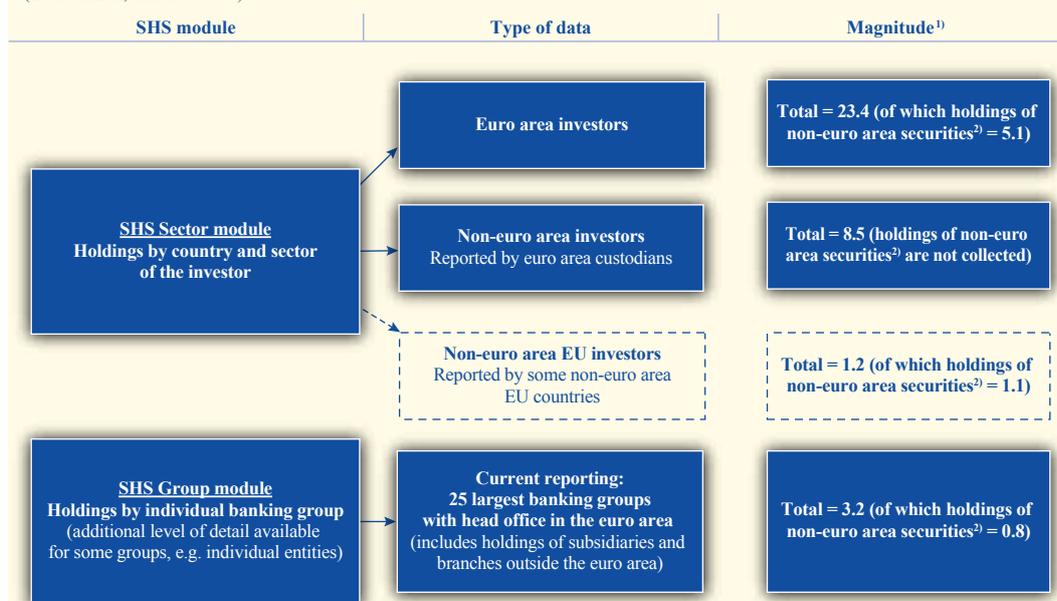
**Furthermore, the SHS Sector module encompasses two main distinct sets of data:** (i) holdings of securities by investors resident in the euro area, such as households in Germany or monetary financial institutions (MFIs)<sup>5</sup> in France, and (ii) non-resident investors’ holdings of euro area securities that are deposited with a euro area custodian, such as US investors’ holdings

<sup>4</sup> In the United States, for instance, the collection of Treasury International Capital (TIC) data on foreign holdings of US securities and US holdings of foreign securities relies on this method. For more information on the TIC data set, see <http://www.treasury.gov/resource-center/data-chart-center/tic/Pages/index.aspx>. Several other statistical series published by the ECB, such as balance of payments or investment fund statistics, also rely on this method. The SHS database is, however, the only example of an integrated international database covering security-by-security data on holdings of securities (i.e. covering data collected from many countries).

<sup>5</sup> For the purposes of this article, the MFI sector comprises deposit-taking corporations and money market funds, excluding central banks, unless indicated otherwise.

Chart I Overview of the two SHS modules

(EUR trillion, market values)



Sources: ECB (SHS Sector and SHS Group) and ECB calculations.

1) SHS Sector third-party holdings by non-financial investors and holdings of securities without ISINs are excluded.

2) Non-euro area securities refer to securities issued by non-euro area residents.

of German securities deposited in Luxembourg. In addition, most non-euro area EU countries (namely Bulgaria, the Czech Republic, Denmark, Hungary, Poland and Romania) also collect SHS Sector data.

**The magnitudes of the collected holdings are rather substantial, particularly of those in the SHS Sector module.** Total holdings by euro area investors amounted to some €23.4 trillion at the end of June 2014,<sup>6</sup> covering holdings of both securities issued by euro area residents (around €18.3 trillion) and those issued by non-euro area residents (around €5.1 trillion). The holdings by non-euro area investors reported by euro area custodians are of a significantly smaller magnitude – around €8.5 trillion – and only refer to holdings of securities issued by euro area residents. Data reported by non-euro area EU countries cover holdings of around €1.2 trillion; the rest of this article, however, focuses on the data from euro area countries.<sup>7</sup>

**The SHS Group module includes significantly smaller amounts.** It covers holdings of around €3.2 trillion reported by a limited sample of large banking groups with their head offices in the euro area (the 25 largest banking groups at the end of the second quarter of 2014). The SHS Group module comprises the holdings of securities by the whole group, including by the group's subsidiaries and branches resident outside the euro area. Holdings of securities issued

6 The figures presented in this article refer to the end of June 2014, unless stated otherwise.

7 There is a certain overlap between both types of data. The part of the holdings of the euro area securities reported by EU countries not belonging to the euro area can also be found in the data collected from the euro area custodians, although with a limited sector breakdown in the latter.

by both euro area residents (€2.4 trillion) and non-euro area residents (€0.8 trillion) are covered in this module.

**It is worth noting that, in many cases, SHS data help to fill long-standing statistical gaps** – even on an aggregated basis – with information not previously available from any other data source. For instance, the SHS Sector module also contains data that refer to holdings by non-financial sectors in other euro area countries reported by euro area custodians (e.g. holdings by German households deposited with, and thus also reported by, custodians in Luxembourg). These holdings amount to some €0.4 trillion.

### 2.3 CONTENT

**The collection of holdings data on a highly granular, security-by-security level provides the possibility to link SHS data with other databases**, notably those with reference data on individual securities, typically using an ISIN as the matching element. In the case of SHS data, an integral part of the data compilation is the link to information from the Centralised Securities Database (CSDB)<sup>8</sup>, jointly operated by the ESCB, which is a multi-purpose platform currently containing reference information (such as price, issuer name and outstanding amount) on over six million outstanding debt securities, equities and investment fund shares.

**As a result, SHS data enriched by CSDB information contain a high number of attributes**, which can be freely combined to derive various breakdowns and/or aggregations on both the issuer and holder sides (see Table 1 for some of the main attributes). For instance, the SHS Sector module can be used to obtain information on the market value of holdings by the French MFI sector of debt securities maturing in three years and issued by a specific non-financial institution.

Table 1 Selected attributes from the SHS dataset enriched by CSDB information

SHS data collection		CSDB reference data	
Holder data Who is the holder?	Holding value How much is it worth?	Security data What is held?	Issuer data Who is the issuer?
SHS Sector module <sup>1)</sup>	Market value	Security identifier (ISIN)	Issuer name/code
– Sector	Nominal value	Instrument type	Issuer sector
– Country	Notional flows <sup>3)</sup>	Price	Issuer country
	Accrued income	Maturity date	NACE classification
		Market capitalisation	
SHS Group module <sup>2)</sup>		Outstanding amount	
– Individual banking groups		Currency	
		Eligibility for Eurosystem operations	

1) Information about holders is only available on an aggregate (by institutional sector and/or country) level, i.e. not by individual holder. The main holding sectors available are (i) deposit-taking corporations, (ii) money market funds, (iii) investment funds, (iv) financial vehicle corporations, (v) insurance corporations, (vi) pension funds, (vii) other financial corporations, (viii) general government, (ix) non-financial corporations, (x) households and (xi) non-profit institutions serving households. For holdings by non-euro area investors, the sector breakdown is restricted to (i) general government and central banks and (ii) other investors.

2) Information available by individual (group) holder.

3) Notional flows refer to estimated values of transactions (i.e. they reflect changes in positions adjusted for price and exchange rate variation, as well as for other changes in volume due to reclassifications, adjustments, etc.).

8 For more information, see the publication entitled “The Centralised Securities Database in brief” on the ECB’s website.

## 2.4 COVERAGE

**SHS data are regularly checked against comparable data sources in order to ensure sufficient quality and coverage.** In particular, they are compared with other ECB statistics, such as the integrated euro area financial and non-financial accounts (EAA), MFI balance sheet statistics, insurance corporation and pension fund statistics, investment fund statistics and securities issues statistics, as well as with consolidated banking data. Such comparison exercises and subsequent investigations provide valuable insights into the reasons for possible discrepancies, including possible conceptual and measurement differences.

**Box 1 describes in detail the various aspects that can be the source of differences between SHS data and other available statistics on securities holdings.** In particular, it highlights that the SHS Sector data on holdings by euro area investors are of a higher quality and coverage (as well as being more detailed) than those on holdings by non-euro area investors reported by euro area custodians. The main reason for this is that the former are often collected through direct reporting by the actual holders, whereas the latter only rely on indirect reporting by euro area custodians, presumably covering only part of the total holdings by non-euro area residents.

### Box 1

#### DIFFERENCES BETWEEN SHS DATA AND OTHER SECURITIES STATISTICS

**A number of features of SHS data have to be taken into account when reconciling the main aggregates derived from these data with other available (aggregate) statistics on securities holdings.** SHS data collection focuses on securities about which detailed information can be provided in a highly standardised manner, i.e. debt securities, investment fund shares and listed shares (unlisted shares are not covered). Furthermore, holdings of securities without ISINs are only collected in some countries and have not, at the time of writing, been incorporated in the regular SHS aggregates (reported data amount to almost €1 trillion, mainly issued by investment funds).

**More importantly, one of the main aspects that influence the coverage and quality of SHS data is the collection method,** i.e. whether the data are collected through direct reporting by the actual investors or indirectly through custodians that hold (for safekeeping) the securities on behalf of the actual investors. The indirect, custodian method allows the collection of data from a relatively low number of specialised reporting agents. The main disadvantage is that securities held by a custodian that is not subject to SHS reporting<sup>1</sup> are not covered. Moreover, a custodian may not know the final investor and thus the data are likely to suffer from “custodial bias” (especially if the custodian’s customers are institutions transacting on behalf of a third party/customer), affecting the geographical and sector breakdown on the investor side.

**The custodian method is typically used if the investor is located outside the respective jurisdiction or if the costs to collect the data directly from the investors are too high** (e.g. for holdings by households or by small non-financial corporations). In the case of SHS,

<sup>1</sup> Custodians not resident in the euro area, for instance, given that the ECB’s regulations can only be applied to residents of the euro area.

custodial reporting is used to collect information on holdings by non-euro area investors of euro area securities (e.g. US holdings of euro area government debt) and on holdings by non-financial sectors in the euro area (e.g. holdings by German households).

**Another conceptual difference is caused by the treatment of derogations.** While the least relevant reporting agents are subject to derogations in almost all official statistics, the final aggregates usually account for the effect of the derogations by estimating them. However, this is currently not the case for SHS data as, owing to the focus on security-by-security data, all SHS aggregates are built in such a way that they can be disaggregated up to the individual holding.

**Other differences may exist, including valuation and measurement differences, depending on the selected benchmark data.** For instance, while the SHS holdings are available in both market and nominal values, the other data sources may rely on a combination of different valuation methods applied to different sub-sets of the overall holdings.

**The SHS Sector module covers around 83% of the total outstanding amount of securities issued by euro area residents** (see Table 2). Put differently, the holding sector and country are known for around €27 trillion of the amount outstanding of €32 trillion obtained from the ECB's EAA data, which measure both the holdings and outstanding issuance by all euro area sectors at an aggregated level and thus provide a comprehensive benchmark for the SHS Sector data (see also Box 2). The coverage of debt securities (92%) is found to be higher than that of shares (73%).

**A more detailed comparison can be carried out with the EAA data on holdings by each sector in the euro area** (see Table 3). Overall, the SHS Sector data cover around 83% of the aggregates in the EAA data, but there are differences across the holding sectors. For instance, SHS coverage tends to reach nearly 90% for the MFI sector and for other financial intermediaries and auxiliaries, which in most cases are subject to direct reporting. By contrast, coverage lies below 80% for euro area non-financial investors, which are generally not subject to direct reporting.

**SHS coverage of holdings by non-euro area investors reported by euro area custodians is also relatively high**, around 81%, compared with liabilities from the EAA data, which amount to some €10.6 trillion. Coverage is high for debt securities and quoted shares but rather low for investment funds shares. In addition to the caveats of indirect reporting by custodians (see Box 1 for more details), the quality of SHS data on holdings by non-euro area investors is still improving, given that the collection of these data has only recently started in the euro area.<sup>9</sup>

**Table 2 SHS Sector holdings of securities issued by euro area residents at the end of the second quarter of 2014**

(EUR trillion, market values)

	Debt securities	Shares	Total
Amount outstanding of securities issued in the euro area (EAA)	17.7 (100%)	14.5 (100%)	32.2 (100%)
Of which covered by SHS Sector holdings	16.2 (92%)	10.7 (73%)	26.9 (83%)
<i>Held by euro area investors</i>	10.6	7.7	18.3
<i>Held by non-euro area investors</i>	5.6	2.9	8.5

Sources: ECB (SHS Sector and EAA) and ECB calculations.

<sup>9</sup> SHS Sector holdings by domestic investors have been collected by the ESCB on a voluntary and “best-effort” basis since early 2009. Moreover, even prior to 2009, some euro area countries had national collection systems for securities holdings by domestic investors in place.

**Table 3 Securities holdings by euro area sectors at the end of the second quarter of 2014**

(EUR billion, market values)

	SHS Sector	EAA	SHS coverage (in percentages)
<b>Euro area financial sectors</b>	<b>18,316</b>	<b>21,700</b>	<b>84</b>
Monetary financial institutions	6,152	6,914	89
Other financial intermediaries and auxiliaries	7,488	8,705	86
Insurance corporations and pension funds	4,676	6,081	77
<b>Euro area non-financial sectors</b>	<b>5,036</b>	<b>6,408</b>	<b>79</b>
Non-financial corporations	1,434	1,955	73
General government	746	982	76
Households	2,856	3,471	82
<b>Total</b>	<b>23,352</b>	<b>28,108</b>	<b>83</b>

Sources: ECB (SHS Sector and EAA) and ECB calculations.

### 3 SOME EXAMPLES OF HOW SECURITIES HOLDINGS STATISTICS DATA CAN BE USED

Given the richness of SHS data, it is not feasible to present a comprehensive overview of their possible uses. Nevertheless, the following case studies at least attempt to give a flavour of potential uses, such as for monetary policy, financial stability and financial integration. Box 2 also explains the benefit that the new SHS data may bring to other statistics, using the example of the future use of the SHS Sector data to enhance the EAA.

#### 3.1 CASE STUDY 1: ANALYSES OF INVESTMENT PATTERNS BY EURO AREA SECTOR

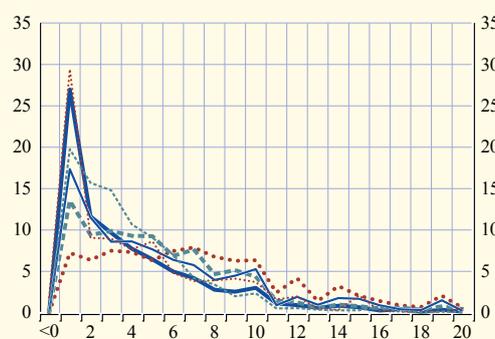
SHS data can be used to investigate the differences in investment patterns by euro area sector by analysing, for example, the residual maturity profile of sectors' holdings of debt securities (see Chart 2). The data highlight the greater share of holdings of short-term securities in the portfolios of non-financial sectors (i.e. households, non-financial corporations and general government). Conversely, holdings by insurance corporations and pension funds include the lowest share of securities with a short maturity. The profile of holdings by MFIs may reflect the different functions of that sector (e.g. investment in short-term money market funds and commercial paper on the one hand, and, on the other, market-making with a need for holdings of a broad maturity spectrum and the underwriting of securities issuances as a part of investment banking, which can lead to the warehousing of long-term debt).

**Chart 2 Maturity profile of holdings of debt securities by euro area sector**

(percentage of total holdings at the end of the second quarter of 2014)

x-axis: residual maturity in years

- monetary financial institutions
- insurance corporations and pension funds
- - - other financial institutions
- general government
- non-financial corporations
- - - households and NPISH



Sources: ECB (SHS Sector) and ECB calculations.

Notes: Negative residual maturity represents holdings of securities past their scheduled maturity date following the bankruptcy of the issuer. NPISH stands for non-profit institutions serving households.

Knowing the exact maturity profile of securities holdings can prove useful when, *inter alia*, analysing the balance sheet channel of the monetary transmission mechanism, monitoring vulnerabilities related to the liquidity positions on the side of the issuers and measuring mismatches in the maturity of assets and liabilities. Moreover, changes in the holdings of various sectors are relevant in the context of assessing non-standard monetary policy measures like securities purchasing programmes. In particular, such information helps to assess the respective announcement and balance sheet effects and to gauge potential crowding-out effects. If needed, more granular data are also available, both on the investor side (a country-sector breakdown) and on the issuer side (up to the level of the individual issuer/security).

### 3.2 CASE STUDY 2: INTERCONNECTEDNESS OF THE MAIN EURO AREA SECTORS

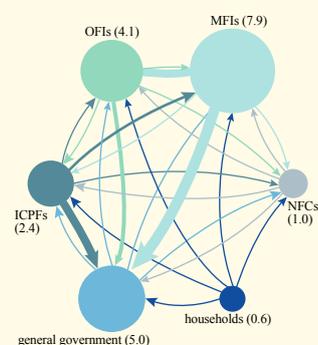
One of the benefits of SHS data is that they provide information on securities holdings by main euro area sector, with the same sector on the issuer side. As this information was not previously available from other data sources for all euro area sectors, SHS data can be especially useful from the perspective of financial system stability in the euro area. In particular, the new information allows a better assessment of the interconnectedness of sectors, the level of systemic risk and the strength of possible contagion channels (both direct and indirect) in the system.

Direct exposures owing to securities issued by one euro area sector being held by another sector differ significantly, according to the type of security. The notable feature of the euro area debt market (see Chart 3, panel a) is that all three financial sectors are significantly exposed to a sovereign credit risk, with the largest chunk of government debt securities held by the MFI sector. By contrast, the euro area market for investment fund shares is dominated by the investment of households and insurance corporations, as well as pension funds, in shares issued by other financial institutions (see Chart 3, panel c). In turn, other financial institutions tend to invest heavily in listed shares issued by non-financial corporations (see Chart 3, panel b). However, it is also the case that

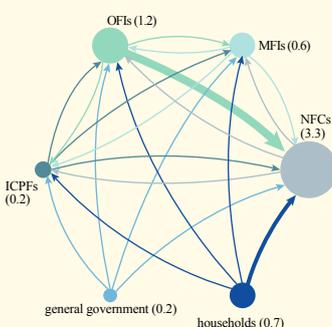
Chart 3 Interconnectedness of euro area sectors at the end of the second quarter of 2014

(EUR trillion)

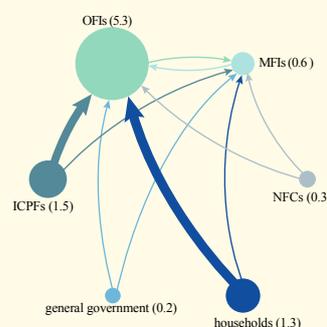
#### a) Debt securities



#### b) Listed shares



#### c) Investment fund shares



Sources: ECB (SHS Sector) and ECB calculations.

Notes: Each node represents one euro area sector (NFCs = non-financial corporations, MFIs = monetary financial institutions, OFIs = other financial institutions, ICPFs = insurance corporations and pension funds, and households = households and non-profit institutions serving households). The arrows show the holdings by the corresponding sector of securities issued by another euro area sector, their thickness being proportional to the value of these holdings. The size of the nodes is proportional to the sum of (i) the market value of holdings by the respective sector of securities issued by euro area residents and (ii) the value of securities issued by the respective sector and held by euro area investors. This sum is also reported in brackets (EUR trillion).

other financial institutions partially channel the initial investment in investment fund shares from other sectors (e.g. from households) to government debt securities. In fact, the share of government debt holdings in total holdings by investment funds is around 47%.

### 3.3 CASE STUDY 3: CROSS-BORDER SECURITIES HOLDINGS BY EURO AREA AND NON-EURO AREA INVESTORS

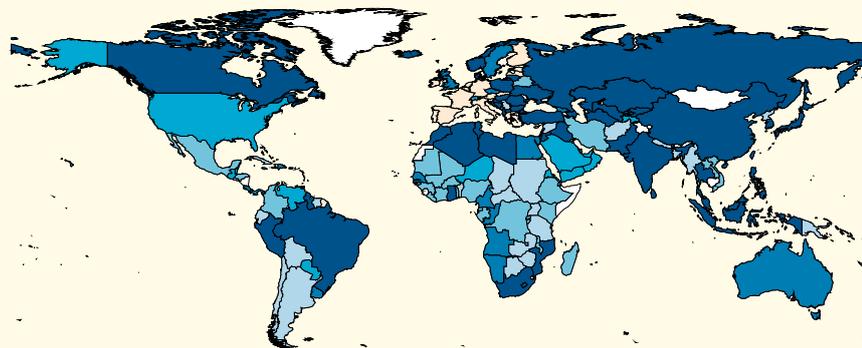
Besides the detailed information on intra-euro area holdings, SHS data contain useful information on securities holdings between the euro area and the rest of the world. In this way, they contribute to a better understanding of the degree and nature of financial integration worldwide.<sup>10</sup>

**Chart 4 Share of debt securities in total securities holdings by each country/region at the end of the second quarter of 2014**

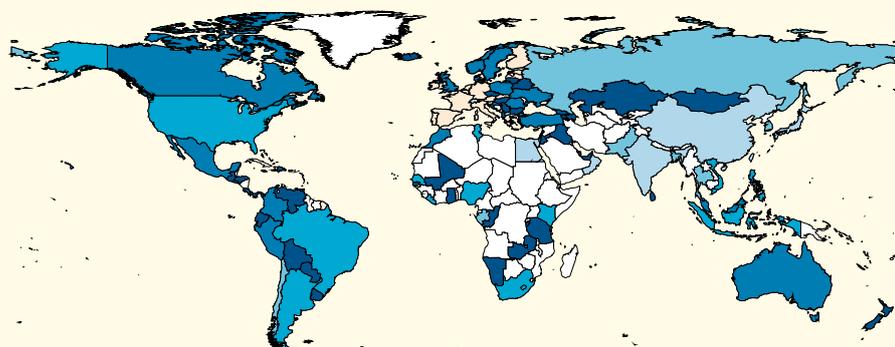
(percentages)



**a) holdings of euro area securities by non-euro area investors**



**b) holdings of non-euro area securities by euro area investors**



Sources: ECB (SHS Sector) and ECB calculations.

Notes: Owing to confidentiality restrictions, the data of a few countries are not shown (selected countries with holdings of less than €1 billion or countries with a very small geographical area) and some countries were aggregated into regions. In panel a), the six aggregated regions comprise the following countries: (i) China, Macau and Japan; (ii) Albania, Croatia and Macedonia; (iii) Turkmenistan, Kazakhstan and Uzbekistan; (iv) Saudi Arabia, Oman, Qatar, the United Arab Emirates and Yemen; (v) Libya, Tunisia and Algeria; and (vi) Angola, Namibia and Congo. In panel b), the only aggregated region consists of Costa Rica, Ecuador, Panama and Venezuela.

<sup>10</sup> The use of SHS data for the development of financial integration indicators is also illustrated in Fache Rousová, L. and Rodríguez Caloca, A., “The use of Securities Holdings Statistics (SHS) for designing new euro area financial integration indicators”, *Irving Fisher Committee on Central-Bank Statistics: Proceedings of the Seventh IFC Conference*, Basel, September 2014.

Chart 4 shows the difference between holdings of euro area securities by non-euro area investors (see Chart 4, panel a) and holdings of non-euro area securities by euro area investors (see Chart 4, panel b). First of all, when only distinguishing between countries shown in white (i.e. no holdings) and those shown in varying shades of blue (positive holdings), the chart shows that investment in the euro area is a worldwide phenomenon, as nearly every country in the world holds some euro area securities (see Chart 4, panel a). This is not the case for euro area investment in securities issued by the rest of the world (see Chart 4, panel b). In particular, some African countries do not seem to receive any securities investment from the euro area.

Second, the chart highlights that non-euro area investors from most countries, particularly the Asian ones, invest substantially more in euro area debt securities than in euro area shares (the shade of blue reflects the ratio of debt securities in total investment, i.e. the darker the colour, the more investment in debt securities as opposed to equities). A similar pattern is not found for euro area investment abroad, since the ratio of debt securities in total investment is much more balanced.

### 3.4 CASE STUDY 4: HOLDINGS OF DEBT SECURITIES ISSUED BY EURO AREA GOVERNMENTS

The granularity of SHS data may be used to analyse data on holdings of selected classes of security, such as those issued by a specific sector. In particular, the monitoring of holdings of debt securities issued by euro area governments serves a number of purposes, including financial stability analysis and the assessment of access to markets by sovereigns.

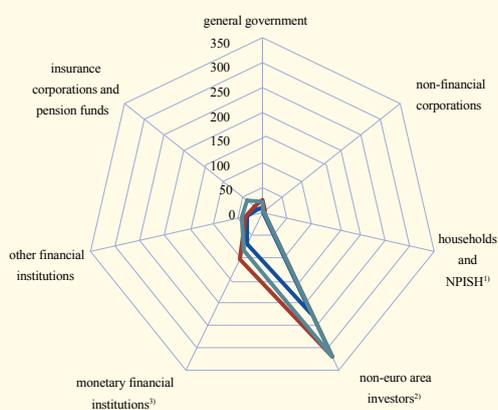
Chart 5 shows the differences in the profile of investors in government debt due in two years, issued by two groups of euro area countries: (i) those that did not experience market tensions during the euro area sovereign debt crisis and (ii) those that experienced tensions or even lost market

Chart 5 Preferences of investor sectors regarding holdings of euro area government debt securities due in two years, by residual maturity

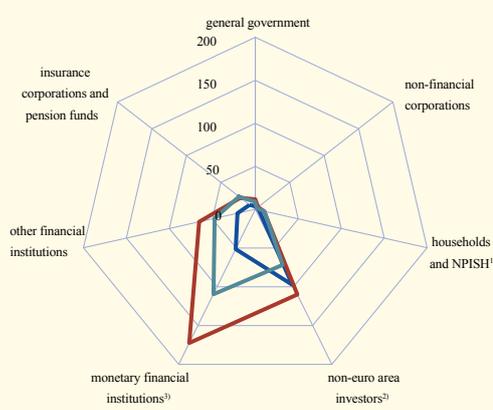
(holdings in EUR billions, market value at the end of the second quarter of 2014)

- up to three months
- over three months and up to one year
- over one and up to two years

a) issuer countries: AT, BE, DE, FI, FR, LU, NL



b) issuer countries: ES, GR, IE, IT, PT



Source: ECB calculations.

1) NPISH stands for non-profit institutions serving households.

2) Holdings by non-euro area investors are calculated as a residual (difference between amount outstanding and holdings by euro area sectors).

3) The MFI sector comprises deposit-taking corporations and money market funds and excludes central banks.

access. The share of holdings by non-euro area investors is significantly larger for securities issued by the former group of countries, while the latter group relies much more on funds from the euro area MFI sector. This is particularly striking for debt securities with maturities of over three months.

**SHS Sector data also indicate that a disproportionately large share of government debt issued by the countries that experienced market tensions is held by the domestic MFI sector.<sup>11</sup>**

For instance, in the case of government debt due in two years, the domestic MFI sector holds around 48% of the total amount outstanding, compared with around 34% thereof in the other group of countries. This highlights the strong interdependence between these sovereigns and their domestic banking sectors.

### 3.5 CASE STUDY 5: THE EFFECT OF INTEREST RATE CHANGES ON THE MARKET VALUE OF GOVERNMENT DEBT HOLDINGS

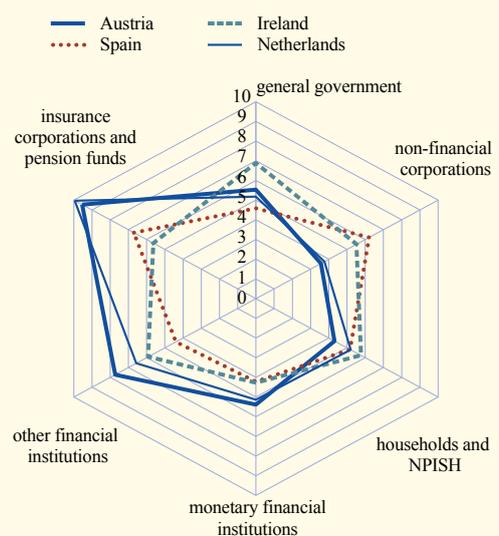
The aim of this case study is to calculate the (accounting) effect of interest rate changes on the market value of the portfolio of actual bond holdings. Quantifying this effect is relevant both from the monetary policy standpoint, particularly as an element of the balance sheet channel of the monetary transmission mechanism (see, for instance, Bernanke and Gertler, 1995, and Constâncio, 2014),<sup>12</sup> and from the financial stability perspective, as a measure of the vulnerability of the market value of holdings to interest rate risk.

To calculate the effect, information on the modified duration of each security is needed.<sup>13</sup> As it is not directly available in SHS data, it has to be taken from another source, such as the iBoxx database. Subsequently, this information is matched to the SHS holdings using ISINs as identifiers. Given the scarcity of the data on modified duration, this study

focuses on a portfolio of government debt securities issued by selected euro area countries (Spain, Ireland, Austria and the Netherlands) and held by euro area sectors.

**Chart 6 Percentage change in market value of selected euro area government debt securities after a 100-basis point decline in the reference interest rate, by euro area holder sector**

(percentages, second quarter of 2014)



Sources: iBoxx and ECB calculations.

Notes: NPISH stands for non-profit institutions serving households. The chart reflects the weighted modified duration of the portfolio of specific government debt securities held by different euro area institutional sectors.

<sup>11</sup> See Fache Rousová, L. and Rodríguez Caloca, A., op. cit.

<sup>12</sup> See, for instance, Bernanke, B. and Gertler, M., "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, American Economic Association, Vol. 9(4), pp. 27-48, Fall, 1995 and Constâncio, V., "A new phase of the ECB's monetary policy", *ECB workshop on non-standard monetary policy measures*, Frankfurt am Main, October 2014.

<sup>13</sup> Modified duration measures the percentage change in the bond price in response to a 100-basis point change in the reference interest rate (i.e. the semi-elasticity of a bond price to the interest rate). In particular, it allows a comparison of the properties of bonds with different maturities and with or without coupons.

The calculations imply that, for holdings by euro area financial investors, the weighted modified duration of securities issued by Spain and Ireland (both affected by the sovereign debt crisis) is lower than for securities issued by Austria and the Netherlands. More precisely, the results presented in Chart 6 mean that, following a decrease of 1 percentage point (100 basis points) in the reference interest rate,<sup>14</sup> the market value of the holdings of Irish government debt by euro area other financial institutions would increase by approximately 6%. By the same token, the corresponding increase in the market value of holdings of Austrian government debt would be somewhat higher, at around 8%.

14 More precisely, given that the holdings cover securities with different maturities, the scenario considered is a parallel shift in the yield curve.

## Box 2

### USE OF SHS FOR THE ENHANCEMENT OF THE INTEGRATED EURO AREA FINANCIAL AND NON-FINANCIAL ACCOUNTS BY INSTITUTIONAL SECTOR

The integrated euro area financial and non-financial accounts (EAA), published quarterly by the ECB since June 2007<sup>1</sup>, provide a comprehensive overview of the economic and financial transactions by all institutional sectors in the euro area. Sectoral balance sheets, including aggregate information on the holdings of securities and the total amounts outstanding of securities issued, are also available from the accounts. When available with sufficient counterparty detail, the financial accounts provide the links between the holders of financial assets and the issuers of those assets. Thus, the new statistical data on the holdings of securities are a valuable source of information that will be used to enhance the EAA.

In the financial accounts, “who-to-whom” data refer to financial transactions and/or positions for which both the creditor and debtor sectors can be simultaneously identified and presented in a fully consistent manner, i.e. without double-counting or gaps. A schematic overview of a who-to-whom presentation can be found in the table below. The table shows the financial claims that the sectors in the rows have against the sectors in the columns. Thus, for loans, the cell corresponding to the third row and the second column (marked with an “X”) would show lending in the form of loans from the financial sector to the non-financial corporations sector. Who-to-whom data serve a multiplicity of purposes, such as risk analysis from a macro-prudential

#### A who-to-whom presentation of the financial accounts for a financial instrument

		Households	Debtor sector			Rest of the world
			Non-financial corporations	Financial corporations	Government	
Creditor sector	Households					
	Non-financial corporations					
	Financial corporations		X			
	Government					
	Rest of the world					

1 For the EAA publication, see, for example, the Report section of the ECB’s Statistical Data Warehouse, which also includes who-to-whom tables for deposits and loans (<http://sdw.ecb.europa.eu/reports.do?node=1000002340>).

perspective, a more refined analysis of the monetary transmission mechanism (e.g. by focusing on the sources of funding for a specific sector) and the estimation of interest flows between sectors.

**The compilation of the financial accounts on a who-to-whom basis requires primary sources containing information on the institutional sector of the counterparty**, which are often difficult to obtain for all sectors of the economy. A full who-to-whom presentation of the EAA has been compiled and published since October 2010 for loans and deposits, as their limited tradability makes it easier to obtain counterparty information from primary data sources.

**An extension of the who-to-whom coverage to all marketable instruments, namely debt securities, quoted shares and investment fund shares, will now be possible thanks to the detailed information contained in the SHS.**<sup>2</sup> As a result, a much larger proportion of all assets and liabilities of the main sectors in the EAA will become available on a who-to-whom basis. In turn, this extension of the EAA will also help users of the SHS who wish to interpret aggregate figures within a comprehensive framework, by encompassing all forms of indebtedness together with the underlying financial and non-financial flows. These enhancements represent a significant improvement in the availability of statistics for monetary policy purposes. It is envisaged that the **first publication of the EAA with extended who-to-whom coverage will take place in early 2016.**

2 See also Lavrador, I., Peronaci, R. and Silva, N., “Security-by-security data on holdings of securities: the importance for national and euro area accounts”, Irving Fisher Committee on Central Bank Statistics, *IFC Bulletin*, No. 36: Proceedings of the Sixth IFC Conference on “Statistical issues and activities in a changing environment”, Bank for International Settlements, Basel, August 2012.

#### 4 CONCLUSIONS

**This article has introduced the new quarterly security-by-security data on securities holdings.** This new data collection significantly helps to close previously existing data gaps on holdings of securities and thus substantially improves the information available for policy decision-making in the euro area.

**The granularity and comprehensiveness of the data mean they can be used for a wide range of purposes**, including in the monetary policy and financial stability areas, as well as in market and financial integration analyses. Both the regular monitoring of market conditions and ad hoc studies on various topics are expected to benefit from the availability of these data from now on.

**Selected aggregates derived from the SHS data will also be made available for public use** in the ECB’s Statistical Data Warehouse.<sup>15</sup> They will include holdings by euro area investors of securities issued by EU countries and other main issuing countries.

**Although the new SHS data are already a significant improvement on the information available on securities holdings, further enhancements are envisaged.** For instance, the implementation of the recent ECB regulation on insurance statistics (ECB/2014/50) will lead to improvements in SHS data quality regarding holdings by the insurance corporations sector, as more data will be reported by the insurance corporations themselves rather than collected through custodians. Furthermore, given the new supervisory function assumed by the ECB, further extensions of SHS are under consideration.

15 The Statistical Data Warehouse can be accessed at <http://sdw.ecb.europa.eu>