

# Addressing data gaps revealed by the financial crisis: European Central Bank statistics on holdings of securities

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## Introduction

As a follow-up to the recent financial crisis, a number of studies have been launched to identify the main causes of the adverse developments that took place in this period, as well as the information that would have been required to identify in advance the corresponding build-up of risks. Statisticians have launched various initiatives to reduce the identified gaps: from an international perspective, several of these initiatives have been endorsed by the G20 and will give rise to a coordinated implementation in the countries involved.

The present paper aims to provide an overview of a further ESCB initiative which has been taken regarding holdings of securities – to develop a new statistical dataset, to be collected in the form of micro statistics, i.e. on a security-by-security basis.

The paper is organised as follows: Section 1 provides an overview of data needs highlighted by the recent financial developments; Section 2 focuses on the steps to develop securities holdings statistics (SHS) both in terms of data inputs and in terms of potential outputs; Section 3 summarises the way forward with reference to initiatives under way and further challenges.

## 1. Data needs highlighted by the recent financial developments

### a. General limitations in the information available on holdings of securities

Securities markets have always been relatively opaque with respect to the identification of the lender, as issuers and most market participants do not generally know who is holding the securities issued by a certain borrower. They have therefore triggered requests from policymakers – related to, e.g. monetary policy or financial stability – for information on the links between holders and issuers of securities.

Such limitations in the transparency of securities markets and the need for more detailed information (especially regarding holdings of securities) had been flagged even before the financial developments since 2007 by data users and market analysts. The information currently available refers mainly to highly aggregated data. For example, while financial accounts statistics provide data on overall holdings of securities of each resident sector in most countries, they do not allow identification of the institutional sector of the resident *issuers* of these securities. Such a detailed breakdown of securities holdings data (also called “from-whom-to-whom” tables) has been deemed desirable by ESCB users for a long time for the purpose of monetary analysis.

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Limitations in data availability are even more salient regarding cross-border holdings, given that statistics and other data compilers have limited power to collect information on non-resident holders of securities. The International Monetary Fund (IMF) Coordinated Portfolio Investment Survey, launched in 1997, and which aimed to identify holders of securities from an international perspective, has closed some information gaps regarding these cross-border holdings of securities. However, it includes only limited information on issuers, with only the country of residence, and in some cases the institutional sector. The coverage is also not complete, as some important investing countries (e.g. China or Saudi Arabia) do not currently take part in this survey.

The international banking statistics collected by the Bank for International Settlements (BIS), and similar data in a number of countries, also provide useful indications of cross-border exposures by country for the banking sector of many industrialised countries. This covers all securities, and takes into account risk transfers related to, e.g. collateral, financial derivatives or guarantees. This information is nevertheless only available from cross-border assets by banks, and cannot be disaggregated into specific credit or market rate exposures.

#### **b. Further statistical needs identified in the context of the recent crisis**

Based on the limitations described above, policymakers, supervisors and other analysts have had extensive discussions on how to reduce the risk of systemic crises in the future, including issues that have a bearing on the collection and compilation of statistics.

As mentioned in the report by the Financial Stability Board (FSB) Secretariat and IMF staff to the G20 finance ministers and central bank governors on “The Financial Crisis and Information Gaps” of October 2009, data gaps are an inevitable consequence of the ongoing development of markets and institutions, and good data are fundamental for effective surveillance and policy responses at both the national and international levels<sup>2</sup>.

However, as highlighted in the recommendations formulated by the Issing Committee (2009) on the New Financial Order, greater transparency does not mean just collecting more and more data, as this might lead to confusion rather than improving *transparency*. On the contrary, data have to be collected more systematically and with a clear orientation to the purpose for which they are needed.

More precisely, the report by the FSB Secretariat and IMF staff of October 2009 identifies among the main data gaps the need for information aimed at better capturing the build-up of risk in the financial sector (e.g. by strengthening the international reporting of indicators of current financial health and soundness of financial institutions; developing measures of aggregate leverage and maturity mismatches in the financial system; and improving coverage of risk transfer instruments, including data on the credit default swap markets) as well the need to improve data on international financial network connections (e.g. by enhancing information on the financial linkages of systemically important global financial institutions and strengthening data-gathering initiatives on cross-border banking flows, investment positions, and exposures, in particular to identify activities of non-bank financial institutions)<sup>3</sup>.

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<sup>2</sup> Further elaboration on these principles can be found in the Progress Report on Action Plans and Timetables published by the FSB in May 2010.

<sup>3</sup> This report includes one recommendation directly related to securities, i.e. recommendation 7, which encourages central banks and statistical offices to participate in the BIS data collection on (issues of securities and to contribute to the further development of the BIS/ECB/IMF Handbook on Securities Statistics.

These general principles have the following implications regarding statistics on holdings of securities:

First, there is a need for a better identification of the risks taken by regulated and non-regulated institutions, and therefore of their *exposures*.

- When concerns were raised about the creditworthiness of specific entities or financial groups (e.g. Bear Stearns, American International Group (AIG), Lehman Brothers, and several European Union (EU) governments), a strong need arose to estimate which agents held exposures to these entities.
- The assessment of exposures was also made difficult by financial instruments such as collateralised debt obligations (CDOs), for which the actual risk borne by the investor is often difficult to identify and measure.
- The recourse to intermediate structures to invest in securities, e.g. securitisation vehicles or investment funds, has also blurred the link between investors and financial risks. Felettigh and Monti (2008) highlighted in particular that the country and instrument in which investors are exposed cannot be identified without “looking through” investment funds.

Second, a need to identify *linkages* between entities has been highlighted. Such a system-wide perspective would include at least the following dimensions, for all types of investors, and not only those monitored by supervisory authorities (see Caruana 2009): (a) to identify common counterparty exposures (and if possible correlated exposures) by one or several investors<sup>4</sup>, and (b) to identify interconnections between entities: an entity A exposed to entity B, itself exposed to an entity C may lead to A being affected by, e.g. a fall in the share price of B, triggered itself by the bankruptcy of C. The latter was highlighted in particular by Castrén and Kavonius (2009), who showed that looking at the financial system as a network of interlinked exposures may be extremely helpful in revealing non-obvious transmission mechanisms: for instance, parts of the financial system that are not particularly vulnerable to a given adverse scenario could still be affected due to their interconnection with sectors that are directly confronted with unexpected shocks.

## 2. Steps to develop SHS

### a. General approach of the ESCB and the main conceptual framework

Based on the background described in Section 1, the SHS initiative represents a key statistical dataset able to combine both the individual and the system-wide perspectives highlighted in the descriptions of current data needs. Moreover, the granularity of the collected information (i.e. on a security-by-security basis) has the advantage of ensuring substantial flexibility, making it possible to derive statistics that can be quickly adjusted in response to financial developments and innovations. In fact, it enables information on holdings to be linked with the characteristics of individual securities and their issuers, thus allowing for a much more detailed assessment of risk. The ESCB had already taken steps in the 2000s to collect data on the holding of securities on an instrument-by-instrument basis. A database called the Centralised Securities Database (CSDB)<sup>5</sup> was set up in order to collect and store the characteristics of securities and issuers, to be connected with the instruments

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<sup>4</sup> See e.g. Borio 2009.

<sup>5</sup> See e.g. Sanchez Muñoz and Neudorfer (2005) and ECB (2010).

held by certain categories of investors via their identification number, i.e. generally their ISIN code<sup>6</sup>.

On a legal level, several ECB legal acts already require or permit the collection of security-by-security (s.b.s.) data: Guideline ECB/2004/15 (as amended by ECB/2007/3) on the euro area balance of payments and international investment position; Regulation ECB/2007/8 on assets and liabilities of investment funds; Regulation ECB/2008/32 on assets and liabilities of monetary financial institutions (i.e. banks and money market funds); Regulation ECB/2008/30 on assets and liabilities of financial vehicle corporations. On this basis, further investigations were conducted in 2009 on the feasibility of collecting and compiling better statistics on holdings of securities. It was concluded that the overall availability of security-by-security data was already significant in the euro area and in several other EU countries. Subject to a further detailed assessment of costs, it may be feasible to extend the instruments covered to all holdings by euro area (and possibly all EU) residents of the main categories of securities, i.e. long-term and short-term debt securities, quoted shares and investment funds shares<sup>7</sup>. A further added value of the current initiative on SHS data collection will be to create a common data repository at the euro area (and possibly the EU) level for information on holdings of securities.

This approach would contribute to addressing the two main data gaps outlined in the FSB report, concerning the need for information aimed at better capturing the build-up of risk in the financial sector, as well as the need for improving information on international financial network connections.

Against this background, the main approach currently being considered in the ESCB refers to holdings of securities by institutional sectors or subsectors, as defined by the European System of Accounts (ESA95): essentially monetary financial institutions, insurance corporations and pension funds, other financial intermediaries, non-financial corporations and households. The conceptual framework applied to the ESCB initiatives related to holdings of securities generally follows national accounts statistical standards (System of National Accounts (SNA93), ESA95, supplemented by the BIS/ECB/IMF *Handbook on Securities Statistics*). However, certain features under consideration (e.g. the possibility of collecting data on the largest banking and insurance groups, including their affiliates abroad, i.e. focusing on multinational groups rather than resident statistical units) go beyond this framework where necessary.

The next two subsections will be devoted to explaining the data sources and main potential outputs related to the SHS data collection.

## **b. SHS input data and their implications**

The approach of collecting s.b.s. holdings data aims at reducing the burden for reporting agents, who would have to provide only limited information (essentially the identification number and the quantities held<sup>8</sup>) and would not need to produce aggregations of their raw data for their statistical reporting.

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<sup>6</sup> See Hille and Sedlacek (2005).

<sup>7</sup> For non-quoted shares, which often do not have any standard identification number, another approach may have to be considered.

<sup>8</sup> Some other characteristics may be needed. For instance, if sources on prices of securities were not reliable for certain instruments, it might be necessary to collect them also from reporting agents.

Three main issues need to be taken into consideration regarding the characteristics of security-by-security inputs:

- What are the main data sources;
- What is the level of detail to be obtained on the investors to be monitored;
- What is the coverage (e.g. holdings by residents or by multinational group).

### **Data sources**

A first key issue is the data source that may be used to collect s.b.s. information. For legal reasons, each country can impose mandatory reporting requirements only on resident entities. In this context, investigations have focused on two categories of agents having access to information on securities holdings, namely custodians (including centralised securities depositories) and resident investors (so-called “direct reporters”).

Resident custodians may cover only a limited part of the holdings by resident investors, given that residents are usually free to give their securities into custody abroad. In addition, they are only able to identify the account holders, and these may be other custodians. If the account holders are non-resident custodians, the final holders of the corresponding securities cannot be identified. The limitation in coverage applies, in addition, in a specific way at the euro area level: securities may be in custody in the euro area, but in a country different from that of the issuer of the security and from that of the holder. For instance, a security issued by a German issuer may be held by an Italian investor in custody in Belgium. From the point of view of the country of the custodian, these data are “third party holdings”; they are not relevant for the compilation of national statistics, and in most cases are not collected. As a result, the coverage of custodian data obtained by summing up currently available national data for all euro area countries is lower than the securities held in custody in the euro area and either issued or held by euro area investors.

In addition, there are some limitations in the quality of the data reported by most custodians:

- The sector classification reported by custodians is deemed by several national compilers to be of much lower quality than sectorisation performed by statistics compilers themselves;
- A further difficulty arises with respect to the sectorisation of euro area residents not residing in the same country as the custodian: the ability of custodians to provide an accurate sector split is more limited;
- Repos and short selling can often not be identified by custodians.

These limitations generally affect non-financial investors to a much more limited extent than financial investors: (i) non-financial holders are usually not custodians themselves, and (ii) their activities in the repo markets are much more limited. For these reasons, and given the constraints related to direct reporting by a (too) large number of institutions, many ESCB compilers consider that custodian reporting is an acceptable approach to collecting holdings data, not only regarding households but also for non-financial corporations and non-profit institutions. Custodian reporting is also deemed appropriate for general government, as this allows national central banks (NCBs) to control the sector allocation by informing custodians of the institutions to be classified in this sector. The additional reporting of resident holdings in custody abroad/outside the euro area is in principle advisable, above a certain threshold, although this is acknowledged as difficult to implement.

In the financial sector, direct reporting by banks, which often also act as custodians, is applied in most countries, and is deemed most appropriate (also in connection with the issues raised by repos). This approach, already implemented in most euro area countries regarding investment funds and financial vehicle corporations, should also apply to insurance corporations and pension funds (ICPFs).

### ***Level of detail: investor-by-investor data, or data by sector of investor***

In custodian reporting, compilers must also make a decision on whether to collect investor-by-investor data or data by groups of investors. Investor-by-investor data have the advantage of ensuring substantial flexibility, and potentially making it possible to analyse risks (e.g. interconnectedness with other entities) in a much more detailed manner, in line with the data needs expressed in Section 1.

However, as usual, there is a trade-off to be taken into consideration: an investor-by-investor data collection further increases the volume of data to be reported and processed, and implies that protection measures on the data have to be made much more stringent. In this context, the data collection currently being considered by the ESCB would require investor-by-investor data only for large banking and insurance groups (which, for the reasons described above, would in principle be obtained from direct reporting rather than from custodians). For other categories of investors, national compilers may opt for collecting either investor-by-investor data or only aggregated data, depending on national constraints.

### ***Coverage: data on resident investors, or also collection of data on non-resident investors***

Given that data requirements can only be made legally mandatory for resident reporting entities, most data collections tend to focus on holdings by residents. However, consideration has been given to expanding the scope of data collections from residents in various directions, including:

- The collection of holdings by affiliates abroad of resident investors. While those holdings are treated as belonging to other institutions resident in other countries according to international statistical standards, they are very relevant to measuring the exposures of resident investors.
- The collection of holdings attributed to non-resident customers by resident custodians. Such data may provide a hint on, e.g. who are the holders of securities issued by residents of one economy, even though they may not be fully precise.

### **c. SHS output data and fulfilment of user needs**

The collection of securities holdings allows for a wide range of outputs, with a high level of flexibility in terms of fulfilment of user needs, covering monetary policy analysis as well as financial stability or financial market analysis. This flexibility results from the granular data collection, together with detailed information on the micro data (namely the data on individual securities and issuers stored in the CSDB), which makes it possible to produce a wide range of aggregates on the characteristics of the reported holdings.

This framework makes it possible to produce standard output, e.g. the detailed breakdowns prescribed by international statistical standards (which otherwise are extremely difficult to produce, due to the prohibitive costs that such detailed data collections would involve). In particular, “from-whom-to-whom” tables of financial accounts statistics can be derived from this approach. Such tables may be used in the context of monetary analysis, but also for the purpose of macroprudential analysis, as they provide information on *linkages* across sectors of an economy, e.g. common exposures across sectors.

In addition, a wide variety of data could be produced, as illustrated by the following examples:

- A joint euro area/EU database would make it possible to compile from-whom-to-whom tables not only for the euro area/EU as one entity, but also with an identification of each national holdings and issuing sector.

This could allow further assessment of *linkages* across sectors and countries, including the extent to which exposures by certain sectors may be interconnected: for instance, Portuguese banks may be exposed to, say, the German insurance sector, while the latter could be exposed to Japanese government bonds. Of course, this might hide the fact that the German insurance corporations in which Portuguese banks are exposed could be different from the German insurance corporations being exposed to the Japanese government. However, a full assessment of interconnectedness would also depend on other instruments (exposure to credit risk should take into account loans and credit derivatives, and to a certain extent guarantees, collateral and other relevant contractual agreements). In this context, holdings by sector, which can often be collected at lower cost than investor-by-investor data, may provide a first assessment of potential links, which could be further assessed also via other data sources, such as detailed microprudential individual data.

- A focus on holdings of securities included in monetary aggregates may shed light on portfolio shifts between monetary and non-monetary assets.
- Time series with detailed data on holdings by non-financial sectors may allow analysis of the wealth effects implied for these sectors by changes in asset prices.
- *Exposures* related to specific categories of securities (e.g. vis-à-vis individual issuers, or financial groups, or country, or sector, or currency). Ideally, these data should make it possible to estimate potential mark to market writedowns, as the difference between outstanding amounts at nominal value and market values<sup>9</sup>.

While a number of these data may be produced according to the accounting rules prescribed by international statistical standards, certain analyses could depart from these principles:

- *Exposures* should, to the extent possible, be measured not only for resident entities, but also taking into account holdings by affiliates resident in other territories. This is why the collection of data on holdings by institutional sector are planned to be supplemented by consolidated data on the holdings of the largest (as a proxy for systemic relevance) banking and insurance groups (LBIGs), group by group.
- This “group-by-group” approach could also allow for a more precise assessment of *interconnectedness* across LBIGs, by checking their common exposures as well as the bilateral exposures between them.
- The link between investors and financial risks when recourse to intermediate structures (e.g. securitisation vehicles or investment funds) to invest in securities is involved may be identified according to more detailed categories than those in the ESA, where analytically relevant: for instance, one may show holdings of CDOs issued by residents of a particular country, e.g. the United States of America, by linking the identifier code (ISIN) to information on securitised products.

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<sup>9</sup> This would only be a broad estimate, as a market player may have bought a security at an even lower price than the market price at the reference date from another market participant, whose losses would be difficult to measure.

### 3. The way forward

#### *Initiatives under way*

As explained above, a procedure (so-called “merits and costs analysis”) has been launched to assess the cost of enhancing the collection of security-by-security data. This work covers not only euro area (and other EU) holdings by institutional sector, for positions and transactions, but also (i) holdings by large individual banking and insurance groups (including those by their affiliates outside the euro area), and (ii) available information on holdings by non-euro area residents on euro area securities.

A further ESCB information technology project has been launched to set up a steady-state infrastructure in which holdings data could be pooled together. This database, which will benefit from the experience gathered with the prototype built by the Oesterreichische Nationalbank (Austrian National Bank – OeNB), is expected to be used to compile both national and euro area (and if possible EU) aggregates, and should meet ESCB user needs in a timely and efficient manner. This would be key in allowing the analysis of the potential impact of specific exposures to a certain market or geographical area or the analysis of changes due to financial innovation.

Investigations have also been performed to check in particular the confidentiality constraints to be followed in setting up such a database on holdings of securities. Legal experts have confirmed that at the European level, the confidentiality of holdings data would mainly apply to holdings for which the individual holders of a given security would be identifiable. Steps are being taken to set up a procedure to systematically identify those cases. It is important to facilitate the dissemination of non-confidential data to users, while still applying strict protection measures to confidential information.

Last but not least, an enhancement of the information on holdings of securities would require, rather than an extension of data collection, a further development of the variables collected and maintained in the CSDB on the characteristics of securities and issuers. A list of requirements has been set up for this purpose, including, for instance, information on collateral, credit rating and type of interest, as well as securitisation operations. Some of these variables are available, but may raise cost issues. Others, e.g. those related to securitisation, may not be fully available from commercial sources, or might involve limitations in coverage or in data quality.

Irrespective of data sources on securities available to the CSDB, there are some additional technical challenges to enhancing information about issuers. For example, being able to show holdings of securities issued by a certain individual borrower or financial group is very difficult, in the absence of (i) an international standard identification number for financial (and non-financial) institutions<sup>10</sup>, and (ii) a register of the entities belonging to the main multinational groups. Progress in those areas largely depends on progress in the development of international standards; in that respect, it is worth mentioning that the International Organization for Standardization (ISO) is in the process of upgrading the ISO standard underlying the well-known BIC code with the aim of establishing a universal identifier for legal entities. Steps are also being taken in the ESCB to foster progress in those fields, e.g. by investigating the feasibility of standardising information on securities, and by contributing – with respect to financial entities – to the work initiated by Eurostat to identify EU entities belonging to multinational groups. Explorations are being conducted into the possibility of establishing an international infrastructure (Reference Data Utility) that would store in a standardised way descriptive information about financial instruments and legal

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<sup>10</sup> Such an identification number would have to cover at least legal units. From a statistical perspective, the identification should cover also branches recognised as (statistical) institutional units.



entities (identification, main attributes, classifications, interrelations), data that are currently produced in many versions and “data dialects” by many data vendors. This would pave the way for a significant improvement in data quality and thus in the quality of statistics based on such micro data, and to a strong reduction in the costs of producing and using these data for all users, including industry. The approach being explored may be supported by the establishment in the United States of the Office of Financial Research, which is foreseen in the US Financial Stability Act.

### ***Further challenges***

As explained above, the ESCB approach in this field aims to follow a step-by-step approach by which improvements would be brought in parallel to the building of experience. The steps under way are aimed at capitalising on experience in the practical challenges related to the compilation of aggregates from micro data on holdings of securities. A number of special cases, such as securities being split, depository receipts (for which two ISIN codes may be held and which should sum to the originally issued amount), mergers (leading sometimes in principle, but not always in practice, to the disappearance of certain securities), or the identification of repos will certainly require more detailed investigations and an appropriate treatment.

Fully meeting user needs will also require further steps. In particular, looking through investment funds resident in the EU, and ideally also those not resident in the EU, as well as CDOs, would require significant additional efforts. The assessment of correlations between exposures might need a separate database, with long time series.

While it is not possible to fill quickly all identified data gaps, the initiative launched by the ESCB aims to result in rapid improvements in the available statistical framework, and in further incremental progress over time, in the field of securities. Looking ahead, consideration might be given to extending this approach based on micro data to other instruments, e.g. loans and/or possibly some financial derivatives. Among many factors, cost constraints, as well as standardisation issues (one important aspect being the availability of standard identification numbers for individual instruments) would have to be taken into account.

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