

## Statistics Paper Series

Household Finance and Consumption Network

### Household Finance and Consumption Survey: Methodological report for the 2023 wave



No 52

### Household Finance and Consumption Network

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## Abstract

This report summarises the methodologies used in the fifth wave of the Eurosystem Household Finance and Consumption Survey, which provides household-level data collected in a harmonised way in the 20 euro area countries at the time of collection, as well as in the Czech Republic and Hungary. The total sample size comprises almost 90,000 households. Although the survey does not refer to the same time period in all countries, the most common reference period for the data is 2023. The report presents the methodologies applied in areas such as data collection, sample design, weighting, imputation and variance estimation. It also addresses statistical disclosure control issues and analyses issues that may have an effect on the comparability of the survey data across countries and waves.

**Keywords:** Household-level data, wealth, survey methodology

**JEL codes:** D12, D14, D31

## Non-technical summary

This report summarises the methodologies used in the fifth wave of the Eurosystem Household Finance and Consumption Survey (HFCS), which provides detailed household-level information on assets, liabilities, income and consumption. The survey is a joint project involving the European Central Bank (ECB), national central banks and, in some countries, national statistical institutes. It covers the 20 euro area countries at the time of data collection, as well as the Czech Republic and Hungary, with a total sample of almost 90,000 households. Although the survey does not refer to the same period in all countries, the most common reference period is 2023.

The HFCS is conducted in a decentralised manner, with national institutions responsible for data collection in their own countries, while the ECB coordinates the overall project, promotes the use of common definitions and methods, pools the national datasets, performs quality checks and disseminates the results and microdata. The report describes the main methodological steps involved in producing the survey, including the questionnaire and sample design, data collection, weighting, treatment of missing information and estimation of statistical uncertainty. It also explains how confidentiality is protected through statistical disclosure control before access to the microdata is granted.

While most information is collected directly from households, some countries also use administrative data, where these are considered reliable and sufficiently comparable with the survey definitions. The report also documents country-specific non-core information collected on topics such as intergenerational transfers, saving, payment habits, financial literacy and energy use.

The HFCS provides harmonised data for analysing the distribution of household wealth, income and consumption. Nevertheless, differences in national survey implementation, collection periods, the use of administrative sources and the coverage of wealthy households can affect comparability across countries, across survey waves and with sources such as national accounts or other household surveys.

# 1 Introduction

The Household Finance and Consumption Survey (HFCS) is a joint project among all national central banks (NCBs) of the Eurosystem, the central banks of two European Union (EU) countries that have not yet adopted the euro and various national statistical institutes. The HFCS provides detailed household-level data on various aspects of household balance sheets and related economic and demographic variables, including income, private pensions, employment and measures of consumption.

The HFCS is conducted in a decentralised manner, in the sense that each institution participating in the Household Finance and Consumption Network (HFCN), namely the NCB and/or national statistical institute (NSI), is responsible for conducting the survey. The European Central Bank (ECB) works alongside the HFCN in coordinating the whole project, ensuring that a common methodology is followed, pooling and assuring the quality of country datasets and disseminating the survey results and microdata through a single access gateway.

Table 1 below shows which countries have conducted the HFCS since its first wave, with a reference period of 2010. The first wave was conducted in 15 euro area countries, the second wave (2014) in all 18 euro area countries at the time, as well as in Hungary and Poland, and the third wave (2017) in all 19 euro area countries at the time, as well as in Croatia, Hungary and Poland. The fourth wave (2021) and fifth wave (2023) were conducted in all euro area countries, as well as in the Czech Republic and Hungary.<sup>1</sup> Poland did not participate in the fourth and fifth waves.

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<sup>1</sup> Croatia participated in the 2023 wave as a euro area country and in the 2021 wave as a non-euro area EU Member State.

**Table 1**

Overview of country participation in the HFCS

| Country                           | Wave 1 (2010) | Wave 2 (2014) | Wave 3 (2017) | Wave 4 (2021) and Wave 5 (2023) |
|-----------------------------------|---------------|---------------|---------------|---------------------------------|
| Belgium                           | X             | X             | X             | X                               |
| Czech Republic                    |               |               |               | X                               |
| Germany                           | X             | X             | X             | X                               |
| Estonia                           |               | X             | X             | X                               |
| Ireland                           |               | X             | X             | X                               |
| Greece                            | X             | X             | X             | X                               |
| Spain                             | X             | X             | X             | X                               |
| France                            | X             | X             | X             | X                               |
| Croatia                           |               |               | X             | X                               |
| Italy                             | X             | X             | X             | X                               |
| Cyprus                            | X             | X             | X             | X                               |
| Latvia                            |               | X             | X             | X                               |
| Lithuania                         |               |               | X             | X                               |
| Luxembourg                        | X             | X             | X             | X                               |
| Hungary                           |               | X             | X             | X                               |
| Malta                             | X             | X             | X             | X                               |
| Netherlands                       | X             | X             | X             | X                               |
| Austria                           | X             | X             | X             | X                               |
| Poland                            |               | X             | X             |                                 |
| Portugal                          | X             | X             | X             | X                               |
| Slovenia                          | X             | X             | X             | X                               |
| Slovakia                          | X             | X             | X             | X                               |
| Finland                           | X             | X             | X             | X                               |
| Number of participating countries | 15            | 20            | 22            | 22                              |

Table 2 below provides an overview of the fieldwork periods during which the fifth wave was conducted in the various countries. This latest wave of the HFCS was conducted mainly in 2023, with some countries conducting interviews as early as 2022 and a few doing so up to 2025.

Table 2 also shows the reference periods for wealth and income in the different countries. In the majority of countries, the reference date for wealth is the time of interview, while the reference date for income is the last calendar year with respect to the interview date.

**Table 2****2023 wave – Fieldwork period and reference periods**

| Country        | Fieldwork period |          | Reference dates/periods |                    |
|----------------|------------------|----------|-------------------------|--------------------|
|                | Start            | End      | Assets and liabilities  | Income             |
| Belgium        | Jan 2023         | Dec 2023 | Time of interview       | 2022               |
| Czech Republic | Feb 2022         | Feb 2024 | Time of interview       | Last calendar year |
| Germany        | May 2023         | Feb 2024 | Time of interview       | Last calendar year |
| Estonia        | Feb 2024         | Jul 2024 | Time of interview*      | 2023               |
| Ireland        | Jul 2023         | Jan 2024 | Time of interview       | Last 12 months     |
| Greece         | Feb 2025         | Jul 2025 | Time of interview       | Last 12 months     |
| Spain          | Oct 2022         | Jun 2023 | Time of interview       | 2021               |
| France         | Jun 2023         | Jan 2024 | Time of interview       | 2023**             |
| Croatia        | Sep 2023         | Mar 2024 | Time of interview       | Last 12 months     |
| Italy          | Jan 2023         | Dec 2023 | 31 December 2022***     | 2022               |
| Cyprus         | Apr 2023         | Dec 2023 | Time of interview       | 2022               |
| Latvia         | Jul 2023         | Dec 2023 | Time of interview       | 2022               |
| Lithuania      | Sep 2024         | Mar 2025 | Time of interview       | Last 12 months     |
| Luxembourg     | Oct 2023         | Dec 2023 | Time of interview       | 2022               |
| Hungary        | Sep 2023         | Dec 2023 | Time of interview       | Last 12 months     |
| Malta          | Nov 2023         | Feb 2024 | 31 December 2022        | 2022               |
| Netherlands    | May 2023         | Jun 2023 | Time of interview       | 2022               |
| Austria        | Mar 2023         | Feb 2024 | Time of interview       | 2022               |
| Portugal       | Mar 2024         | Jun 2024 | Time of interview       | 2023               |
| Slovenia       | Sep 2023         | May 2024 | Time of interview       | 2022               |
| Slovakia       | Oct 2023         | Feb 2024 | Time of interview       | 2022               |
| Finland        | Jan 2024         | May 2024 | 31 December 2023        | 2023               |

Source: HFCS metadata.

Notes: The periods mentioned in the "Assets and Liabilities" and "Income" columns refer to the reference periods used in the country-specific questionnaire for the respective variables.

\* Time of interview for variables collected at the interview; 30 April 2024 for variables derived from administrative data.

\*\* The reference year for the income data for France is based on 2022 administrative data (fiscal data) adjusted statistically to reflect household income in 2023 as much as possible.

\*\*\* Time of interview for the value of dwellings.

The HFCS is designed around a common set of methodological principles, which enhances the comparability of results. When compared with other international data on household wealth surveys (such as the Luxembourg Wealth Study), one of the most distinctive features of the HFCS is that the constituent country wealth surveys follow an **ex ante harmonised methodology**. In particular, all country-level HFCS datasets provide a set of core output variables that follow common definitions and descriptive features according to an output-oriented approach.

Household samples have been designed in each country to ensure representative results at both the euro area and national levels. More than 90,000 households were surveyed in the 2023 wave, with sample sizes varying across countries. All country

surveys use a **probabilistic sample design**, meaning that each household in the target population has an ex ante defined non-zero probability of being part of the sample. Given the unequal distribution of household wealth and the fact that certain financial instruments are almost exclusively held (and in large quantities) by the wealthiest households, most countries apply some type of **oversampling of wealthy households**.

Many country surveys include a **panel component**, where some households in the sample are interviewed over subsequent waves, thus allowing changes over time to be analysed. In the 2023 wave, 13 countries had a panel component.

One feature of survey data is the existence of item non-response, i.e. where a respondent is unable to provide a reliable answer to all questions asked. This is important because missing data render economic analyses of the information less reliable. **Imputing missing values** – i.e. the process of assigning values to variables that have been collected incorrectly or not at all – is a prerequisite for being able to use the data. For the HFCS, a multiple stochastic imputation strategy has been chosen.<sup>2</sup> The dataset provides five imputed values (replicates) for every missing value of the variables needed to compute household wealth, consumption or income.

The HFCS consists of representative samples for each participating country and allows for country-level estimates. However, cross-country differences in survey results should be interpreted with caution. Although ex ante harmonisation efforts have succeeded in improving the comparability of HFCS data, the other methodological differences described in this report may account for some of the differences observed across countries. For example, the coverage of the top of the wealth distribution may be affected by differences in sample design and particularly in the oversampling of the most affluent households. Moreover, differences between countries in statistics of interest must be assessed in light of relevant institutional and socio-demographic differences. The shape of the distribution of income or wealth among households crucially depends on household structure – and hence on the age composition of the population – and on factors affecting household formation, among other matters. Institutional and methodological issues affecting the cross-country comparability of results are discussed further in Section 9.2.

This document describes the methodologies used to produce the Household Finance and Consumption Survey across countries. It includes detailed descriptions of the HFCS blueprint questionnaire and output variables, data collection, sample design, unit non-response and weighting, editing, item non-response, imputation and variance estimation. It also includes chapters on statistical disclosure control and data comparability across survey waves, across countries and vis-à-vis selected benchmark statistics.

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<sup>2</sup> While multiple imputation is used in most countries, there are some exceptions. In the 2023 wave, it was not used in the Czech Republic, France, Italy, Malta and Finland. Further information on the various imputation methodologies can be found in Section 6.3.

A detailed description of the results of the 2023 wave is provided in a companion publication.<sup>3</sup>

As of the sixth wave (2026), the HFCS will be conducted in line with the requirements of the [ECB Guideline on statistical information to be reported on household wealth, income and consumption \(ECB/2025/3\)](#).

## 2 The HFCS blueprint questionnaire and list of output variables

The list of core output variables is the reference document for data production and includes the harmonised definitions of the survey variables. To facilitate the collection of the core variables, a blueprint questionnaire has been designed as a benchmark for national surveys. Countries are free to adapt the wording or sequencing of questions to cater to local needs and circumstances. The HFCS blueprint questionnaire consists of an introduction, sections on nine topics with household-level and person-level questions to collect the core output variables, and interview closure.

### 2.1 Pre-interview part of the HFCS blueprint questionnaire

#### 2.1.1 Interview introduction and selection of main respondent

The HFCS blueprint questionnaire provides a script for making contact with the sampled household, along with some introductory information (on the importance of taking part in the survey, measures to ensure data confidentiality, how the survey data will be used, etc.).<sup>4</sup>

An important part of the interview introduction is the selection of the main household respondent, known as the “financially knowledgeable person” (FKP). As the main respondent, the FKP provides financial information for the whole household. This is to minimise response burden and avoid duplication. For a survey like the HFCS, where the main focus is household finances, assets and liabilities, it is vitally important to target the right person, so that the most reliable available information on household finances can be collected during the interview. The interview introduction contains a set of sequential questions used to identify the FKP.

#### 2.1.2 Household listing, HFCS household definition and reference person

The purpose of this part of the questionnaire is to establish a list of household members, i.e. to define the perimeter of the household. The replies given later by the

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<sup>3</sup> See HFCN (2026), “The Household Finance and Consumption Survey: results from the 2023 wave”, *Statistics Paper Series*, No 53, ECB.

<sup>4</sup> Certain aspects discussed in the subsequent sections will depend on the survey mode used.

main respondent regarding the household's financial information (assets, debts, consumption, etc.) should thus refer only to the household members identified during this initial step.

When defining a household, the HFCS uses a variation of the so-called “housekeeping concept”.<sup>5</sup> A household is defined as a person living alone or a group of persons who live together in the same private dwelling and share expenditures, including the joint provision of living essentials, as well as financial decisions.<sup>6</sup>

The outcome of the screening part is the list of household members meeting the household membership definition. Individual members are then listed according to their relationship to a reference person (hereinafter referred to as the “interview RP”), chosen from among the household members. The interview RP may well be the FKP, although not necessarily. Additionally, the interview RP defined at the beginning of the interview (i.e. the person around whom the household is drawn) may not be the same as the reference person used to present the survey results.

To release survey results for characteristics that can be assigned only at the individual level, such as age, education or labour status, one person must represent the household as a whole. Such a person must be chosen on the basis of pre-defined objective criteria, as the household will be classified according to this reference person's characteristics. The information needed to apply these criteria will not yet be available at the start of the interview. The reference person for statistical outputs is therefore constructed ex post, based on the information about the household collected during the interview. In HFCS publications showing euro area results, the criteria are based on international standards for household income statistics presented by the Canberra Group (UNECE, 2011). In line with these standards, the reference person (hereinafter referred to as the “Canberra RP”) is determined by completing a number of sequential steps until a person is selected, as shown in the chart below.<sup>7</sup>

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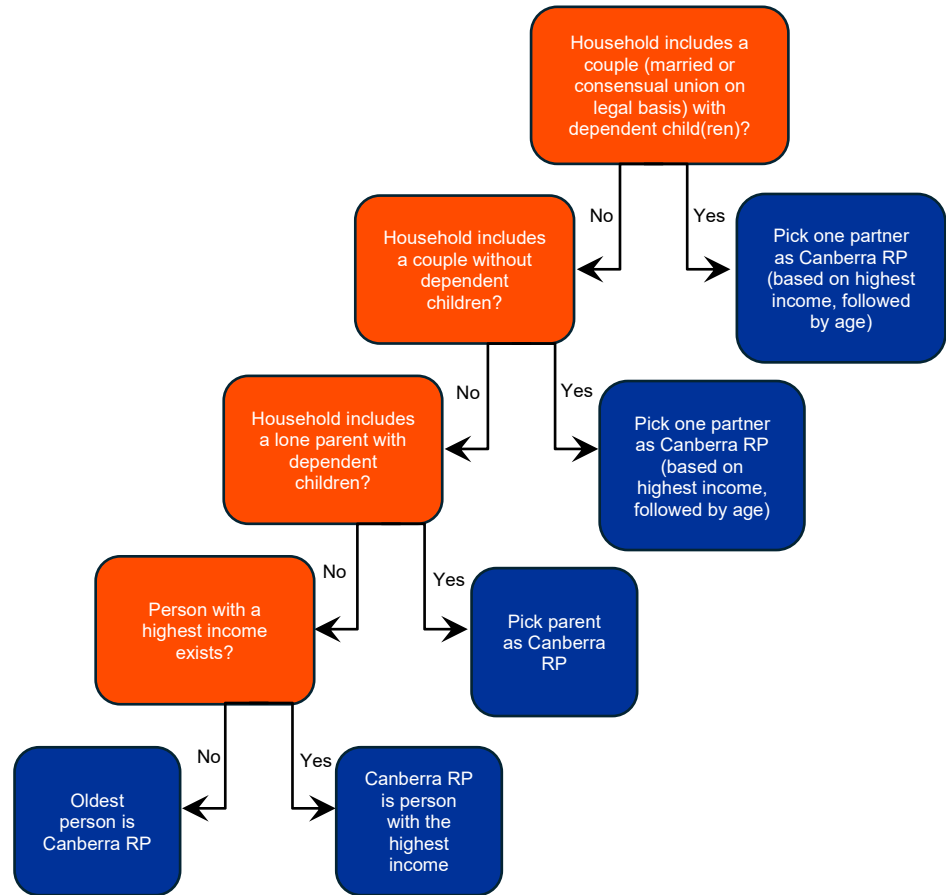
<sup>5</sup> As opposed to the dwelling concept, where all persons living in one dwelling are automatically considered as one household. For a more in-depth discussion of these two concepts, see, for example, United Nations (2025), [Principles and Recommendations for Population and Housing Censuses](#), paragraphs 2.42 and 2.43.

<sup>6</sup> The complete household definition applied for the HFCS is provided in Appendix A1.

<sup>7</sup> Note that, while the Canberra standards are followed as much as possible, the Canberra RP derived for HFCS publication purposes is conditional on the information provided on the relationship of household members vis-à-vis the interview RP (at collection). If, for example, a household includes a couple, but the interview RP is not one of the persons in that couple, then the couple will not be identified.

**Chart 1**

Flowchart for deriving the Canberra RP



As shown in the flowchart, if the household includes a couple (married or consensual union on a legal basis) with at least one dependent child<sup>8</sup> living with them, then one member of the couple should be the Canberra RP. If the household includes a couple, but no dependent children, then again one partner becomes the Canberra RP. Within the couple, the Canberra RP is selected based on highest income, followed by age.<sup>9</sup> If there is no couple in the household, but it includes a lone parent living with dependent child/children, that parent is considered the Canberra RP. If none of the first three situations apply, the adult with the highest income is selected. If all previous criteria fail to identify one unique person, the oldest adult becomes the reference person.

<sup>8</sup> Dependent children are defined as all persons aged 0-15 and persons aged 16-24 who are not working.

<sup>9</sup> For example, in a household composed of two married adults with children, the reference person will be the adult with the highest income or, in the unlikely situation that both adults have the same income, the older adult.

## 2.2 The HFCS list of core output variables

The HFCS list of core output variables is split into nine sections. The sections on demographics, employment, and pensions and insurance policies cover information collected at the personal level, i.e. individually for all persons aged 16 or over (certain demographic information is also collected for children). The sections on real assets and their financing, other liabilities and credit constraints, private businesses and financial assets, intergenerational transfers and gifts and consumption cover information collected at the household level. In the section on income, certain income components are collected at the personal level (employment-related income, pension income, etc.) and others at the household level (e.g. income from financial investments).

The full list of HFCS core output variables is available on the HFCS web page.<sup>10</sup> Changes to the core variables between the 2021 and 2023 waves are listed in Section 2.4 of this report.

### 2.2.1 Demographics

The demographics section contains a basic set of information collected for all household members, namely age, gender, country of birth and length of stay in the country (for foreign-born members). Information on marital status and the highest level of education attained is collected only for household members aged 16 or over.

### 2.2.2 Real assets and their financing

This section collects information on ownership and current values of real estate assets (household main residence (HMR) and other properties owned by the household), vehicles (cars and other types of vehicles, such as motorbikes or boats) and valuables (such as jewellery, works of art or antiques). This section is also used to collect information on the purchase of vehicles within the past 12 months, and on house price expectations.

Information is also collected on specific characteristics of the HMR owned by the household (manner and year of acquisition, value at time of acquisition, etc.). Owners and tenants alike are asked about the size of the HMR and how long they have been living in their current HMR. Tenants are also asked to provide information about the monthly amount paid in rent. For other real estate properties, respondents are asked about the type of property they own, its main use, the percentage of the property owned by the household and its current value.

The HFCS applies a collection approach that classifies mortgages by collateral. Selected characteristics or features of the mortgages are obtained, including the purpose of the loan, the year in which it was taken out, the initial and current maturity date, the interest rate, and the current monthly repayment. These variables are collected for mortgages collateralised by the HMR owned by the household and by other real estate properties. In the blueprint questionnaire, questions on each

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<sup>10</sup> [https://www.ecb.europa.eu/stats/ecb\\_surveys/hfcs/html/index.en.html](https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html).

mortgage collateralised by each property are asked immediately after information is collected on the property in question. This reduces the risk of respondents forgetting to disclose specific debts. In the 2023 wave, questions were added at the end of the block on HMR mortgages and loans using the HMR as collateral in order to collect information on changes in the mortgage terms (e.g. changes in the interest rate, maturity or balance) due, for example, to mortgage renegotiation or refinancing (see Table 3).

### 2.2.3 Other liabilities and credit constraints

The section on other liabilities contains variables relating to non-mortgage debt instruments, including leasing contracts, credit lines/overdrafts, credit cards, private loans from family or friends and other loans not collateralised by real estate. For other loans not collateralised by real estate, individual details such as the purpose of the loan, the initial amount borrowed, the interest rate and the current monthly repayments are collected. The rest of this section contains questions on loan applications (such as whether the respondent has applied for credit in the last three years) and credit constraints (credit refusal experience, or not applying for credit due to perceived credit constraints). It also contains two questions on late or missed loan repayments.

### 2.2.4 Private businesses, financial assets

The first part of this section covers self-employment private businesses (with questions on sector of activity (NACE<sup>11</sup>), legal form, number of employees and current value of the household's share in the business). These are distinguished from other "passive" investments in non-publicly traded equity, for which only information on ownership and on total current value of the equity holdings is collected.

The second part then covers financial assets, including current accounts, savings accounts, mutual funds, bonds, publicly traded shares, additional assets in managed accounts, money owed to the household, and a residual variable on other financial assets. Specific additional characteristics are collected for bonds and mutual funds. The section also includes a self-assessment question on risk attitudes.

### 2.2.5 Employment

This section includes variables collected for all household members aged 16 or over, starting with a variable on self-reported current labour status. For employed persons, information on their current job is requested, including their job description (based on the International Standard Classification of Occupations – ISCO<sup>12</sup>), sector of activity (NACE), contract type, and the number of hours they work per week. Employed persons are also asked to estimate the likelihood of losing their job during the next 12 months. Those currently unemployed or retired are asked questions about their previous work history, and unemployed persons are asked to estimate the likelihood

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<sup>11</sup> See details of the [NACE classification](#) on the website of the European Commission ("Glossary: Statistical classification of economic activities in the European Community (NACE)").

<sup>12</sup> See details of the [ISCO classification](#) on the website of the International Labour Organization.

of finding a job within the next 12 months. All persons who are not yet retired and who are either currently employed or have been so in the past are asked at what age they plan to stop working.

## 2.2.6 Pensions and life insurance policies

The HFCS classifies pension wealth into voluntary pension schemes and life insurance contracts, occupational pension plans and public pension plans. This section aims to collect basic information on participation in these types of pension plans among household members aged 16 or over, on the current value of plans with an account balance, on monthly contributions, on the age at which the respondent expects to start receiving benefits, and on the percentage of final labour income they expect to receive upon retirement from all public and occupational plans. Voluntary pension schemes and life insurance contracts are included within a household's financial wealth in the HFCS results report, while public and occupational pension plans are excluded.

This particular part of the questionnaire should be seen as indicative and includes descriptions rather than questions, since it is open to country-specific implementations.

## 2.2.7 Income

The HFCS is a survey that focuses on collecting information about household wealth. Therefore, the main aim of the income section is to gather the main components needed to construct total gross household income, without including lower-level details of each of these components (such as a further breakdown of income from financial assets or regular transfers).

This section combines personal-level questions (employee income, self-employment income, income from public pensions, income from private and occupational pensions, and unemployment benefits) with household-level questions (social benefits other than pensions and unemployment benefits, private transfers received, rental income, income from financial investments, private business or partnership income, and other residual sources of income).

The concepts and definitions of the income section were designed along the lines of those of the Canberra Group Handbook on Household Income Statistics.<sup>13</sup> Imputed rents and income-in-kind components are not covered by the HFCS core income section. The target income aggregate is gross, including taxes and social insurance contributions paid by employees.<sup>14</sup>

In addition to the income-component questions, two qualitative supplementary questions are asked on whether the level of annual income is above, in line with or below its normal level and on the subject's income expectations for the following year.

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<sup>13</sup> UNECE (2011), *Canberra Group Handbook on Household Income Statistics*.

<sup>14</sup> There are certain cross-country differences in the strategies used to collect information on income (see Section 3.3 for details).

## 2.2.8 Intergenerational transfers and gifts

This section gathers information on inheritances and substantial gifts received and is aimed at tracing household wealth accumulation patterns. It contains questions on when transfers and gifts were received, which asset types were received, their value, and from whom they were received.

## 2.2.9 Consumption and saving

This section focuses on selected aspects of household consumption and saving. It includes a question on overall spending on non-durable consumer goods and services and collects information on several consumption indicators.<sup>15</sup> These cover spending on food at home, spending on food outside the home, spending on utilities, and expenses on trips and holidays. The 2023 wave included a further question on residual non-durable consumption (i.e. the amount spent on non-durable consumer goods other than food, utilities and trips/holidays) (see Table 3).

The information collected also includes regular private transfers made to persons outside the household (alimony, assistance, etc.), whether expenditure over the previous 12 months was higher than, in line with, or lower than usual, the balance between regular expenditure and income (expenses higher than/equal to/lower than income), saving motives, and the household's ability to obtain emergency (financial) assistance from friends or relatives. The section also includes a question on how much a respondent would spend from an unexpected windfall gain, along with a question on the respondent's impatience.

## 2.3 Interview closure and post-interview debriefing/paradata

The last part of the questionnaire asks just one question covering topics and items that the respondent may have forgotten to report in the previous sections.

Following the interview, a further set of questions is included to collect feedback from the interviewer (known as paradata). The interview paradata section encompasses 16 questions covering aspects relating to the interview, such as the accuracy of the respondent's calculations, who was present during the interview, or whether the respondent appeared suspicious about the interview before and after it. This information is very valuable when it comes to the ex post treatment of the data, i.e. for data editing and imputation.

## 2.4 Changes to core variables in the 2023 wave

Drawing on the experience gained from collecting data in previous waves, certain core variables were added or amended in the 2023 wave, while others were reclassified as non-core variables. The changes made are summarised in Table 3 below.

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<sup>15</sup> For example, Browning, Crossley and Weber (2003) provide an analysis and recommendations regarding consumption questions in surveys.

**Table 3**

Variables added or removed from the list of core variables between the 2021 and 2023 waves

| <i>Variable</i>       | <i>Label</i>                                                      | <i>Section</i>                          | <i>Change</i>                                                                               |
|-----------------------|-------------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------|
| <b>HB201\$x</b>       | Change in terms of mortgage                                       | Real assets and their financing         | New question                                                                                |
| <b>HB202\$x\$y</b>    | Type of change in mortgage terms                                  | Real assets and their financing         | New question                                                                                |
| <b>HB203\$x</b>       | Time of change in mortgage terms                                  | Real assets and their financing         | New question                                                                                |
| <b>HB310\$x\$y</b>    | Other property \$x mortgage \$y: loan refinancing                 | Real assets and their financing         | Moved to the list of non-core variables                                                     |
| <b>HB313\$x\$y\$y</b> | Other property \$x mortgage \$y: reason for refinancing           | Real assets and their financing         | Moved to the list of non-core variables                                                     |
| <b>HD061\$x</b>       | Business \$x: number of household members working in the business | Private businesses and financial assets | Previous question HD060\$x (list of household members) redrafted to collect only the number |
| <b>HD1520</b>         | Any shares issued by foreign companies                            | Private businesses and financial assets | Moved to the list of non-core variables                                                     |
| <b>PFA1100</b>        | Total current value of all other plans that have a balance        | Pensions and life insurance policies    | Moved to the list of non-core variables                                                     |
| <b>HI0240</b>         | Amount spent on other consumer goods and services                 | Consumption                             | New question                                                                                |

## 2.5 Data collection approaches

### 2.5.1 Loops

Loops are repeated sets of questions designed to gather information about multiple individual items within a specific category. In the HFCS core questionnaire, there are eight categories of items that use loops: HMR mortgages, other real estate properties, mortgages on other real estate properties, private loans, non-collateralised loans, self-employment businesses, pensions and gifts/inheritances received. An “item” refers to a specific instance within these categories, such as a single mortgage or a single property. Each loop starts with a question asking how many items exist in a given category (e.g. the number of loans or the number of properties owned). Then, a sequence of questions is repeated for up to three individual items within each category<sup>16</sup>. After collecting information for the individual items, the loop usually ends with a mop-up question, which gathers aggregate information on any remaining items that were not covered in detail (e.g. the total outstanding amount for loans number four and above).<sup>17</sup>

### 2.5.2 Collection of monetary value questions

A standardised data collection script is used to collect monetary values (referred to as the “Computer loop for EUR questions” in the blueprint questionnaire). It encompasses a set of questions that should be asked in a strict sequence.

<sup>16</sup> While the default number of loops is three, some countries have only two loops, while the section on pensions has seven loops.

<sup>17</sup> In countries with two loops, the mop-up questions cover items three and above.

First, respondents are asked for the exact amount, which they may provide either in euro or in national legacy currencies. Only if respondents are unable (or unwilling) to provide the exact amount may the information instead be provided in flexible brackets, i.e. self-reported upper and lower bounds. If the respondent is still unable to answer, there is a third step involving 20 prefilled fixed intervals in euro and corresponding amounts in national legacy currencies. In this last step, the coded amount or interval (lower-upper bound) is confirmed with the respondent.

## 2.6 HFCS non-core questions

The blueprint questionnaire covers the core HFCS variables. In addition to the core survey content, the HFCN has prepared a supplementary harmonised set of non-core variables, which are used mainly to gather additional information on the topics covered by the existing core questionnaire sections. The recommended question wording is provided in the HFCS non-core variables catalogue, which also provides guidance on how the non-core questions can be integrated into the core national questionnaires.

Due to their nature, non-core variables are collected only in a subset of the HFCS countries. Appendix A2 provides an overview of non-core variables covered in one or more of the HFCS country files in the 2023 wave.

### 2.6.1 Energy module

In most countries, the 2023 wave of the HFCS took place after the peak of the energy crisis, from late 2021 to the end of 2022. During the crisis period, a special module including questions related to energy (e.g. impact on household consumption and behaviour, and expectations regarding future investment in energy-saving measures) was added to the questionnaire. Only a selected number of countries included these variables in their survey. The variables in this module belong to the non-core list and are listed in the table provided in Appendix A2.

## 3 Collection of data and other fieldwork aspects

The HFCS data collection is ex ante output-harmonised with a list of core output variables that every country should collect in accordance with a set of common definitions. However, there may be some deviations due to the different data collection modes, or other country-specific reasons. Some of the deviations from the list of core variables can be addressed during the output harmonisation stage, which might include the use of other reliable data sources to complement or complete the survey data. Aside from data collection, this chapter examines various other fieldwork-related issues.

## 3.1 Survey mode

The type of interaction between the respondent and the survey questionnaire is an important determinant of possible measurement error. The first and most important decision for a household survey is therefore the selection of the mode of data collection (see Jäckle, Roberts and Lynn, 2006; Dillman and Christian, 2005). The use of different modes for interviewing different sample units might affect the comparability of survey results (see de Leeuw, 2005). In a multinational setting, this is also the case when drawing comparisons between different countries using different survey modes. However, the use of a single mode is not always feasible, and there may be a need to use different modes across and also within countries.

In the first three waves, the main survey mode used across most participating countries was computer-assisted personal interviewing (CAPI). In the 2017 wave, almost all countries employed exclusively CAPI (15 countries) or conducted a very small percentage of their interviews in modes other than CAPI (four countries). The main exceptions were the Netherlands, which always used a web survey, and Finland, where most interviews took place via computer-assisted telephone interviewing (CATI).

CAPI consists of face-to-face interviews administered by an interviewer using a computer with the programmed questionnaire. Using a computer allows for a smooth and error-free process of routing the questions (which is particularly complex in the HFCS questionnaire). It also means that consistency checks can be run during the interview and that the data can be automatically saved and stored. Eliminating errors at the interview stage improves the quality of survey data and may save considerable resources during the subsequent data editing and cleaning phase.

In addition, interviewers play an important role in collecting high-quality income and wealth information, more precisely by: (1) persuading respondents to take part in the survey, thereby increasing response rates and reducing the risk of response bias; (2) building trust with respondents, thus making it less likely that they will drop out in the middle of an interview; (3) minimising levels of item non-response by personally assisting (i.e. offering pre-designed prompts), if required, during the interview; (4) avoiding incomplete responses; and (5) providing additional information (interviewers' observations and paradata).

However, in the 2021 wave, the choice of data collection method was affected by the COVID-19 pandemic. Many countries that had previously used CAPI as their main survey mode switched (at least partly) to other modes that did not require face-to-face contact, such as CATI or computer-assisted web interviewing (CAWI). Several countries switched completely to other modes (Ireland, Greece, Spain, Luxembourg, Malta and Portugal), or to predominantly other modes while still retaining some CAPI (Germany, Estonia, France, Italy and Latvia). Eight countries continued to use predominantly CAPI (of which five used it for 100%, or close to 100%, of their interviews).

In the 2023 wave, many countries that had moved (completely or partially) away from CAPI in the 2021 wave moved back to using mainly CAPI again (Belgium,

Germany, Ireland, France, Greece, Spain, Italy, Latvia and Malta). While Belgium, Germany, France and Greece moved back to using basically only CAPI, the remaining five countries also used some CATI (between 10% and 30%, depending on the country). Portugal moved only partially back to using CAPI, with the majority of its interviews carried out using CATI/CAWI. Two countries (Estonia and Luxembourg) did not move back to CAPI at all, and kept either a mix of CATI and CAWI (Estonia) or 100% CAWI (Luxembourg). Cyprus and Hungary, while still conducting interviews with CAPI, increased their use of other interviewing modes compared with Wave 4, with Cyprus increasing its use of CATI (but still maintaining a majority of CAPI interviews) and Hungary moving to predominantly CAWI/CATI-based interviews.

Overall, in the 2023 wave, CAPI was once again the most widely used data collection method, with 15 countries conducting the majority of their interviews using this method. However, compared with the first three waves, a shift towards CATI and CAWI can be observed. While in the 2017 wave the use of CATI/CAWI amounted to 10%, it represented 31% in the 2023 wave, having peaked at 57% in the 2021 wave.<sup>18</sup>

In the 2023 wave, the median duration of the interview was one hour or more in seven countries, while it was less than 40 minutes in a further six countries. The interview lengths are not directly comparable, as the number of core and non-core variables collected differs between countries (see Appendix A2). Moreover, national variables may be collected, especially in countries in which the HFCS is used as a continuation of an existing wealth survey. In addition, those countries that use administrative data can make their questionnaires shorter in length.

Country data regarding the survey modes used and the median length of the interviews in the 2023 wave are shown in Table 4. The survey modes used in the countries and their changes across waves are presented in Chart 2.

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<sup>18</sup> The percentage use of CATI/CAWI is derived as a simple average across countries. The figures for the 2017 and 2021 waves do not include the Czech Republic, as information on the survey mode was not available.

**Table 4**

Share of interviews by 2023 survey mode in HFCS countries and interview length

| Country        | CAPI | CATI | CAWI | PAPI | Median length of interview (minutes) |
|----------------|------|------|------|------|--------------------------------------|
| Belgium        | 98.8 | 1.2  | 0    | 0    | 60                                   |
| Czech Republic | 29.7 | 9.2  | 0    | 61.1 | 47                                   |
| Germany        | 100  | 0    | 0    | 0    | 69                                   |
| Estonia        | 0    | 61.1 | 38.9 | 0    | 32                                   |
| Ireland        | 81.4 | 18.6 | 0    | 0    | 38                                   |
| Greece         | 95.1 | 4.2  | 0.7  | 0    | 53                                   |
| Spain          | 85.3 | 14.7 | 0    | 0    | 78                                   |
| France         | 100  | 0    | 0    | 0    | 66*                                  |
| Croatia        | 100  | 0    | 0    | 0    | 55**                                 |
| Italy          | 84.7 | 15.3 | 0    | 0    | 51                                   |
| Cyprus         | 74.8 | 25.2 | 0    | 0    | 62                                   |
| Latvia         | 80.8 | 19.1 | 0    | 0.1  | 50                                   |
| Lithuania      | 94.0 | 6.0  | 0    | 0    | 50                                   |
| Luxembourg     | 0    | 0    | 100  | 0    | 54                                   |
| Hungary        | 32.4 | 21.1 | 46.5 | 0    | 37                                   |
| Malta          | 80.7 | 19.3 | 0    | 0    | 38                                   |
| Netherlands    | 0    | 0    | 100  | 0    | NA                                   |
| Austria        | 100  | 0    | 0    | 0    | 50                                   |
| Portugal       | 34.8 | 33.1 | 32.2 | 0    | 61                                   |
| Slovenia       | 100  | 0    | 0    | 0    | 32                                   |
| Slovakia       | 100  | 0    | 0    | 0    | 60                                   |
| Finland        | 0.4  | 60.9 | 38.7 | 0    | 34                                   |
| Overall***     | 66.5 | 14.5 | 16.2 | 2.8  |                                      |

Notes: CAPI: computer-assisted personal interviewing; CATI: computer-assisted telephone interviewing; CAWI: computer-assisted web interviewing; CASI: computer-assisted self-interviewing; PAPI: paper-and-pencil interviewing.

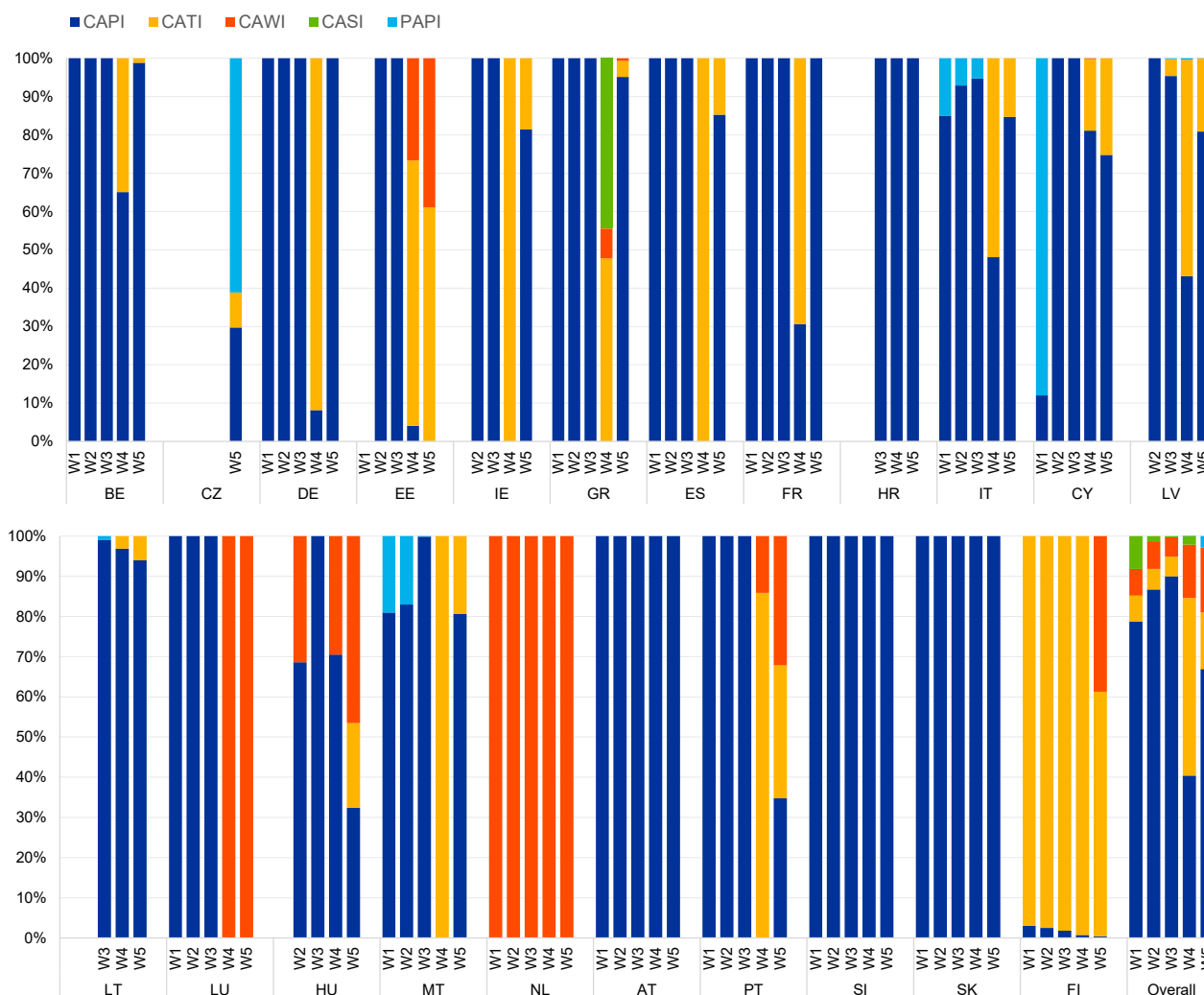
\* Refers to mainland France. The figures are higher for overseas territories. The interview duration tends to be higher for wealthy households and non-panel households.

\*\* Refers to the approximate mean length of the interview in minutes.

\*\*\* Simple average across countries.

**Chart 2**

Interview mode across waves and countries



Note: Information on the interview mode for the Czech Republic is not available for wave 4 as it was not collected.

## 3.2 Fieldwork

In ten countries, the NSI was in charge of data collection (see Table 5). In all other (12) countries, the organisation responsible for conducting interviews was an external survey agency selected by the NCB in charge of the survey.<sup>19</sup>

Interviewers were either employees of the survey agency or the NSI tasked with the data collection, or freelancers directly recruited by the survey agency or by the NSI. Before the start of the fieldwork, nearly all countries organised training sessions for interviewers. The number of interviewers varied across countries, largely depending on the sample size. The number of language versions of the questionnaire varied

<sup>19</sup> In the Netherlands, the external survey agency is a research institute responsible for collecting the HFCS data through a web survey.

from one to four. There were no interviewers in Luxembourg and the Netherlands, since CAWI was the only survey mode used.

Fieldwork periods in the 2023 wave of the HFCS varied from two months in Luxembourg and in the Netherlands to 24 months in the Czech Republic. Shorter fieldwork periods are beneficial for data comparability, either because the reference periods for income or balance sheet items are closer together or, in the case of a fixed reference period, because they minimise the risk of bias. Conversely, longer fieldwork periods provide more opportunities to increase the number of contact attempts and thus obtain a higher number of interviews. Longer fieldwork periods may therefore be necessary when countries experience declining response rates. The length of the fieldwork period may also depend on the survey mode used. For example, CAWI requires shorter fieldwork periods.

**Table 5**  
Fieldwork indicators

| Country         | Organisation responsible for fieldwork | Number of interviewers conducting the survey | Language versions of the questionnaire  | Length of fieldwork period (months) | Adaptation of existing survey |
|-----------------|----------------------------------------|----------------------------------------------|-----------------------------------------|-------------------------------------|-------------------------------|
| Belgium         | SA                                     | 68                                           | French, Dutch, English                  | 12                                  | N                             |
| Czech Republic* | NSI                                    | 319                                          | Czech                                   | 24                                  | Y                             |
| Germany         | SA                                     | 287                                          | German                                  | 10                                  | N                             |
| Estonia         | NSI                                    | 36                                           | Estonian, Russian                       | 6                                   | N                             |
| Ireland         | NSI                                    | 120                                          | English, orally in Irish (upon request) | 7                                   | N                             |
| Greece          | SA                                     | 43                                           | Greek                                   | 5                                   | N                             |
| Spain           | SA                                     | 69                                           | Spanish, English                        | 9                                   | Y                             |
| France          | NSI                                    | 507                                          | French                                  | 8                                   | Y                             |
| Croatia         | SA                                     | 61                                           | Croatian                                | 6                                   | N                             |
| Italy           | SA                                     | 283                                          | Italian, English                        | 12                                  | Y                             |
| Cyprus          | SA                                     | 23                                           | Greek, English                          | 9                                   | N                             |
| Latvia          | NSI                                    | 27                                           | Latvian, English, Russian               | 5                                   | N                             |
| Lithuania       | SA                                     | 43                                           | Lithuanian                              | 7                                   | N                             |
| Luxembourg      | SA                                     | Not applicable                               | English, French, German, Portuguese     | 2                                   | N                             |
| Hungary         | NSI                                    | 298                                          | Hungarian, English                      | 4                                   | N                             |
| Malta           | NSI                                    | 28                                           | English, Maltese                        | 3                                   | N                             |
| Netherlands     | SA                                     | Not applicable                               | Dutch                                   | 2                                   | N                             |
| Austria         | SA                                     | 48                                           | German                                  | 12                                  | N                             |
| Portugal        | NSI                                    | 183                                          | Portuguese                              | 3                                   | N                             |
| Slovenia        | SA                                     | 26                                           | Slovenian                               | 9                                   | N                             |
| Slovakia        | NSI                                    | 142                                          | Slovak                                  | 5                                   | N                             |
| Finland**       | NSI                                    | 124                                          | Finnish, Swedish, English               | 5                                   | Y                             |

Notes: SA: Survey agency; NSI: National statistical institute.

\* Parts of the data were collected from the EU-SILC and HBS survey.

\*\* Parts of the data were collected from the EU-SILC survey; selection of target variables based on the HFCS and previous wealth surveys by Statistics Finland.

In five countries, the HFCS was adapted from an existing national survey. The NCBs of Italy and Spain added harmonised HFCS output variables to their existing wealth

surveys, i.e. “Indagine sui bilanci delle famiglie italiane” (Survey on Household Income and Wealth, SHIW) in Italy and “Encuesta Financiera de las Familias” (Spanish Survey of Household Finances, EFF) in Spain. In France, the HFCS was a joint effort between the NCB and the NSI (Insee), and an adaptation of the Enquête Patrimoine previously conducted by Insee. In Finland, the HFCS was integrated with the EU-SILC survey by adding selected HFCS variables to the questionnaire and using administrative data on assets and liabilities, replacing the former separate household wealth survey (Kotitalouksien varallisuustutkimus) of Statistics Finland. In the Czech Republic, the HFCS was integrated into the existing EU-SILC household survey and the Household Budget Survey (HBS). The HFCS was implemented as an add-on module to EU-SILC, with the HFCS questions asked directly after successfully completing the EU-SILC interview. To complement this, detailed consumption information was obtained from the HBS through sample overlap or statistical matching.

In the Netherlands, the samples from the 2017 wave onwards are based on the Longitudinal Internet Studies for the Social Sciences (LISS) panel, and the questionnaire follows the wording of the HFCN questionnaire. In the first two waves, information about assets and liabilities was retrieved from the DNB Household Survey (DNB).

In Portugal, the HFCS replaced the Household Wealth Survey (Inquérito ao Património e Endividamento das Famílias, IPEF), which was already a joint project between Banco de Portugal and Statistics Portugal (INE).

### 3.3 Collection of income variables

The core output variables on income are defined in gross terms, i.e. before taxes and social contributions, except for France, where they are net of social contributions. However, different approaches were followed when collecting data on income. In seven countries, income data were collected in gross terms only. In Italy, net income was collected, while gross income was constructed by estimating the amount of taxes and social contributions using a tax model. In several countries, respondents had the option to provide net income for all or some income components. In these cases, gross income was estimated (see Table 6).

Seven countries (Estonia, Ireland, France, Latvia, Lithuania, Malta and Finland) derived income data from administrative sources to varying degrees. For instance, in France, income data were based on administrative data only, while in Latvia, administrative data were used in combination with interview-based data.

In addition to gross income variables, Italy and Finland provided income taxes and social contributions, while Italy also provided net income variables as non-core variables (see Appendix A2).

Since 2025, estimates of household disposable income, total taxes and social contributions have been made available to HFCS users as a separate dataset for the 2014, 2017 and 2021 waves, covering a subset of 15 countries. These estimates are derived from the HFCS extension of [EUROMOD](#), a tax-benefit microsimulation

model developed by the European Commission's Joint Research Centre (JRC) and originally designed for use with EU-SILC data.

**Table 6**  
Collection of income variables

| Country        | Collected | From administrative sources | Gross or net income | Additional information                                                                          |
|----------------|-----------|-----------------------------|---------------------|-------------------------------------------------------------------------------------------------|
| Belgium        | X         |                             | Gross               | Option to provide net income**                                                                  |
| Czech Republic | X         |                             | Gross and net*      |                                                                                                 |
| Germany        | X         |                             | Gross               | Option to provide net income**                                                                  |
| Estonia        |           | X                           | Gross               | Income received from abroad was collected                                                       |
| Ireland        | X         | X                           | Gross               |                                                                                                 |
| Greece         | X         |                             | Gross               | Option to provide net income**                                                                  |
| Spain          | X         |                             | Gross               |                                                                                                 |
| France         |           | X                           | Net*                | Excludes income from private business other than self-employment, and income from other sources |
| Croatia        | X         |                             | Gross               | Option to provide net income**                                                                  |
| Italy          | X         |                             | Net*                | Gross income estimated using a tax-based model***                                               |
| Cyprus         | X         |                             | Gross               |                                                                                                 |
| Latvia         | X         | X                           | Gross               | Option to provide net income**                                                                  |
| Lithuania      | X         | X                           | Net*                | Gross income estimated using a tax-based model. Option to provide gross income directly         |
| Luxembourg     | X         |                             | Gross and net       |                                                                                                 |
| Hungary        | X         |                             | Gross               | Option to provide net income**                                                                  |
| Malta          |           | X                           | Gross and net*      |                                                                                                 |
| Netherlands    | X         |                             | Gross               |                                                                                                 |
| Austria        | X         |                             | Gross               | Option to provide net income**                                                                  |
| Portugal       | X         |                             | Gross               | Option to provide net income**                                                                  |
| Slovenia       | X         |                             | Gross               | Option to provide net income**                                                                  |
| Slovakia       | X         |                             | Gross               |                                                                                                 |
| Finland        |           | X                           | Gross               |                                                                                                 |

Source: ECB – HFCS metadata.

\* In Lithuania, Malta and Italy, income variables are collected net of both income taxes and social contributions, while in the Czech Republic they are collected net of income taxes only, and in France net of social contributions only.

\*\* Respondents had the option to provide net income figures for all or some income variables. Where provided, net income figures were converted to gross income using a tax-based model.

\*\*\* Income from financial investments is not collected directly but is instead calculated using average interest rates and information collected on households' financial assets. Gross income from private business other than self-employment is not collected but imputed using average interest rates on the stock of unlisted shares held.

### 3.4 Other deviations from the data collection framework: other data sources

By harmonising HFCS output data ex ante, non-survey-based data collection methods can be used if they are considered to yield better-quality data. In particular, administrative data can be used to replace or correct survey data if the sources are reliable and the definitions used by the administrative sources are comparable to the definitions of the corresponding target variables.

In the majority of countries, however, most variables were collected directly from the respondents in the survey (Table 7). In the 2023 wave of the HFCS, five countries (Estonia, Ireland, Latvia, Lithuania and Finland) used administrative data. Administrative sources were used extensively in Estonia and Finland to replace survey data. In Ireland, they played an important role in populating debt and pension data, while in Lithuania they were used for debt data only. In Latvia, administrative data were used mainly to edit interview-based data and fill in missing values.

**Table 7**

Other data sources used for assets, liabilities and other non-income variables

| Country        | Collected | From administrative sources | Additional information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------|-----------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Belgium        | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Czech Republic | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Germany        | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Estonia        | X         | X                           | Only administrative data: non-collateralised loans, lease contracts and Estonian pension plans.<br>Mix of administrative and collected data: mortgage loans, deposits, mutual funds, bonds, managed accounts, credit lines, credit card debt and foreign pension plans.                                                                                                                                                                                                                                                                                          |
| Ireland        | X         | X                           | Mix of administrative and collected data: real estate properties, debt and personal pensions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Greece         | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Spain          | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| France         | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Croatia        | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Italy          | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Cyprus         | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Latvia         | X         | X                           | Mix of administrative and collected data: real estate properties, mortgage/loans/lease contracts, and participation in pension schemes (private voluntary pension schemes, funded and unfunded state pension schemes), financial assets (sight accounts, saving accounts, deposits, mutual funds, bonds, shares, etc) and private businesses.                                                                                                                                                                                                                    |
| Lithuania      | X         | X                           | Administrative data only: debt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Luxembourg     | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Hungary        | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Malta          |           |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Netherlands    | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Austria        | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Portugal       | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Slovenia       | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Slovakia       | X         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Finland        |           | X                           | Administrative data only (including estimates): demographic variables, mortgages, (most) non-mortgage loans, the value of owned HMRs, ownership and value of other real estate properties and vehicles, ownership and values of business wealth, forest assets, listed shares, mutual funds and bonds, ownership and values of voluntary pension schemes.<br>Combination of administrative and interview data: non-mortgage loans, loan payments.<br>Consumption variables are, to a large extent, statistically matched from the Household Budget Survey (HBS). |

Source: ECB – HFCS metadata.

In Estonia, administrative data were collected from credit institutions, leasing and life insurance companies, the Estonian Central Securities Depository, the Land Register, the Construction Works Register, the Vehicle Register, the Tax and Customs Board, the Health Insurance Fund, the Social Insurance Board and the Unemployment Insurance Fund.

In Ireland, administrative data were drawn from the Central Credit Register and the Pensions Authority. In Latvia, sources included the Land Cadastre, the State

Revenue Service, the State Social Insurance Agency, the country's four largest banks and the National Statistical Institute.

In Lithuania, the NCB's own Loan Risk database was used. In Finland, data were obtained from the Tax Administration database, the Social Insurance Institution, the Finnish Centre for Pensions, the Register of Completed Education and Degrees, and the Business Register kept by Statistics Finland.

## 4 Sample design

This chapter examines the main features of the sample designs and sampling frames chosen by the countries participating in the HFCS. Given the high degree of inequality in terms of wealth distribution, all participating countries are encouraged to explore different methods for oversampling the wealthiest households, which are described throughout this chapter.

### 4.1 General features

A sound sampling design should provide the most efficient and unbiased representation of the relevant population (Kennickell, 2005). Sampling design and implementation are among the main sources of potential estimation errors in survey data, including errors relating to coverage, sample selection and estimation bias.

The first and probably most important feature of the HFCS sample design is the use of probability sampling. This means that each household in the target population has a non-zero probability of being selected for the sample, and that this probability should be known beforehand. The sample size is determined so as to ensure representativeness at both national and euro area levels.

Another relevant feature of the sample design for any survey is whether it is intended to incorporate a panel component, i.e. whether (at least a portion of) the same households will be interviewed again over subsequent waves. In such cases, survey compilers must take care to ensure the representativeness of both the cross-sections and the longitudinal component, as well as proper refreshment coverage to compensate for sample attrition. All this may substantially add to the complexity of the sample design.

### 4.2 Main country features

While all countries applied probability sampling in the 2023 wave,<sup>20</sup> the approaches adopted in their sampling designs varied. The methodologies used were largely dependent on the external data (population registers, postal addresses, dwelling registers, etc.) available for building the sample.

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<sup>20</sup> Probability sampling was also used by all countries in the previous four waves. In the 2010 wave, probability sampling was used in 14 out of 15 countries; only Slovakia used quota sampling.

## 4.2.1 Sampling designs applied

In household surveys, stratification of the population prior to sample selection is a commonly used technique. In a stratified sample, various strata are constructed on the basis of auxiliary information known about the population, and sample units are selected independently from each stratum in a manner consistent with the survey's measurement objectives (UN, 2005). Units to be interviewed can be selected in one or multiple stages. In a multi-stage design, the first stage (or stages) involves a selection of geographical areas, from which individual households are then selected during the final stage.

Table 8 shows the sampling designs used in the countries. Six countries used one-stage stratified sampling, while 15 countries used a multi-stage stratified sampling design. In the Netherlands, no stratification was applied.

**Table 8**  
Sampling designs in the HFCS

| Type of sampling design          | Countries adopting                                                   |
|----------------------------------|----------------------------------------------------------------------|
| 1-stage stratified sampling      | BE, EE, CY, LU, MT, FI                                               |
| 2-stage stratified sampling      | CZ, IE, GR, ES <sup>1</sup> , FR, HR, IT, LV, LT, HU, AT, PT, SI, SK |
| 3-stage stratified sampling      | DE <sup>2</sup>                                                      |
| 1-stage sampling, not stratified | NL                                                                   |

<sup>1</sup> One-stage for households living in municipalities with over 100,000 inhabitants (except the Basque Country and Navarre) and two-stage for the rest and Basque Country and Navarre.

<sup>2</sup> Three-stage for households living in municipalities with over 100,000 inhabitants, two-stages for all other households.

Table 9 below shows the sampling frames and stratification criteria in the countries.

The sampling frames were typically population registers or censuses. They also involved data on regions in the first stage (in multi-stage designs) and information on persons, households or dwellings in the second stage (or in the first stage in one-stage designs).

The most frequently used stratification variables were regions (in some cases further divided by degree of urbanisation) and the population size of regional units. Luxembourg and Finland were the only countries that did not apply any geographic stratification. Other stratification variables included personal or regional average income, employment status, personal taxable wealth, value of dwellings and nationality.

Table 9 also shows the number of units, such as geographical areas or clusters, selected in the first stage of multi-stage designs (primary sampling units, or PSUs for short).

**Table 9****Sampling frames, stratification criteria and numbers of primary sampling units**

| Country        | Sampling frame(s)                                                                                                                           | Stratification variables                                                                                                              | No of PSUs selected for multi-stage designs |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Belgium        | Population register                                                                                                                         | Region, average taxable income by statistical sector and median dwelling price by municipality                                        |                                             |
| Czech Republic | List of postal addresses                                                                                                                    | 14 NUTS 3 regions, divided into smaller territorial units                                                                             | 852                                         |
| Germany        | List of municipalities and number of inhabitants; list of street sections for large cities; register of local residents from municipalities | Municipality size, anticipated wealth, region (Bundesland)                                                                            | 154                                         |
| Estonia        | Population register                                                                                                                         | 5 NUTS 3 regions and two income groups (the highest decile and the rest)                                                              |                                             |
| Ireland        | Census 2016 (occupied private dwellings)                                                                                                    | 8 NUTS 3 regions and five bands of deprivation/affluence                                                                              | 900                                         |
| Greece         | Census 2021 (list of municipalities, cities, villages and building blocks)                                                                  | NUTS 2 and degree of urbanisation (urban, semi-urban, rural)                                                                          | 722                                         |
| Spain          | Population register supplemented with tax record information in large municipalities                                                        | Municipality size, taxable wealth                                                                                                     | 410*                                        |
| France         | Tax register on main residence                                                                                                              | Geographic area, wealth, age, labour status, occupation, income                                                                       | 541+22**                                    |
| Croatia        | Census 2021                                                                                                                                 | NUTS 2 regions, type of municipality (urban/rural), two groups according to annual household income                                   | 800                                         |
| Italy          | List of municipalities, population register/tax register                                                                                    | Municipalities by region and demographic size; households by income group                                                             | 391                                         |
| Cyprus         | Customer register of the electricity authority                                                                                              | Districts, urban/rural, main/wealthy households                                                                                       |                                             |
| Latvia         | Population register; tax register; list of addresses                                                                                        | Degree of urbanisation (4 groups), income (3 groups)                                                                                  | 582                                         |
| Lithuania      | List of municipalities, Population register                                                                                                 | Municipalities, estimated wealth                                                                                                      | 17                                          |
| Luxembourg     | Social security register & Population register                                                                                              | Nationality (LU, other), employment status, individual gross income                                                                   |                                             |
| Hungary        | Register of dwellings                                                                                                                       | PSU: settlements based on regions, personal income tax base, number of dwellings, internet penetration; SSU: estimated value of flats | 345                                         |
| Malta          | Population and dwellings register (not official register, built around the Census and supporting administrative sources)                    | Locality at LAU 2 level (68 categories), type of household (all members Maltese, all members foreign citizen, mix)                    |                                             |
| Netherlands    | Population register (LISS panel)                                                                                                            | No stratification                                                                                                                     |                                             |
| Austria        | List of enumeration districts, list of postal addresses                                                                                     | 35 NUTS 3 regions * Community size class (Municipality size). In Vienna according to districts                                        | 689                                         |
| Portugal       | National dwelling register                                                                                                                  | Subdivisions or divisions of NUTS 2 regions, classes of useful area of dwellings                                                      | 664                                         |
| Slovenia       | Population register                                                                                                                         | Demographic size of municipality                                                                                                      | 391                                         |
| Slovakia       | Census 2021 (occupied household units)                                                                                                      | 8 NUTS 3 regions                                                                                                                      | 606                                         |
| Finland        | Population register                                                                                                                         | Income level, type of income                                                                                                          |                                             |

Notes: The number of PSUs selected are shown for countries with multi-stage sampling designs.

PSU: Primary sampling units, for multi-stage designs; SSU: Secondary sampling units.

\* In small municipalities and Basque Country and Navarre (since 2-stage sampling design).

\*\* 22 PSUs for overseas territories (DOM).

## 4.2.2 Panel component

Altogether, 13 countries had a panel component in the 2023 wave of the HFCS. Table 10 describes the panel designs of the countries.

A majority of countries use the “pure panel with refresher sample” design, where panel members are followed across time for an indefinite period, with a refreshment sample to compensate for attrition or to restore population representativeness. Refreshment samples help mitigate possible problems related to changes in the population structure, which may arise when the same sample is used over time for cross-sectional purposes. For instance, the population ages between waves and, if a panel is reused multiple times, it may no longer be representative of the actual population. Section 9.3.1 includes a comparison between the age structure in the HFCS and the population statistics. They are very close, suggesting that this is not an issue for the HFCS.

Three countries use a “rotating design”, where panel households are interviewed for a predetermined number of consecutive waves and then rotated out of the sample, while newly sampled units are rotated in. As a result, each wave contains both continuing and new respondents. This eases the response burden on households.

### Chart 3

Rotating design – Example with number of waves fixed at 4

| Rotation group (4 waves) | Wave 1 | Wave 2          | Wave 3          | Wave 4          | Wave 5          |
|--------------------------|--------|-----------------|-----------------|-----------------|-----------------|
| Group starting wave 1    |        | Panel component | Panel component | Panel component |                 |
| Group starting wave 2    |        |                 | Panel component | Panel component | Panel component |
| Group starting wave 3    |        |                 |                 | Panel component | Panel component |
| Group starting wave 4    |        |                 |                 |                 | Panel component |

The designs of Latvia and Slovakia are referred to as “two-wave panel designs” in Table 10 and can be described as follows:

In Latvia, panel components are available every second wave (currently W3 and W5), so in selected waves, a subset of households interviewed in the preceding wave is re-contacted, creating short-term panel observations. Other waves are conducted as fully independent cross-sections. No household is followed beyond two consecutive waves.

In Slovakia, a new sample of households is drawn in each wave and a subset of households is re-interviewed in the subsequent wave only, after which they permanently exit the sample. It therefore follows that no household is observed in more than two waves.

**Table 10**

Countries with a panel component in the 2023 wave

| Country     | Households re-contacted at wave 5<br>(percentage of all contacted households) | Panel design                     |
|-------------|-------------------------------------------------------------------------------|----------------------------------|
| Belgium     | 15.6                                                                          | Pure panel with refresher sample |
| Germany     | 37.7                                                                          | Pure panel with refresher sample |
| Estonia     | 64.7                                                                          | Rotating design (4 waves)        |
| Ireland     | 48.2                                                                          | Pure panel with refresher sample |
| Spain       | 41.1                                                                          | Rotating design (4 waves)        |
| France      | 55.1                                                                          | Rotating design (4 waves)        |
| Italy       | 24.0                                                                          | Pure panel with refresher sample |
| Cyprus      | 65.5                                                                          | Pure panel with refresher sample |
| Latvia      | 25.9                                                                          | Two-wave panel design            |
| Lithuania   | 26.3                                                                          | Pure panel with refresher sample |
| Malta       | 29.2                                                                          | Pure panel with refresher sample |
| Netherlands | 74.5                                                                          | Pure panel with refresher sample |
| Slovakia    | 18.6                                                                          | Two-wave panel design            |

Source: ECB – HFCS metadata.

Table 11 below shows the HFCS waves in which countries introduced a panel component, as well as any disruptions to these panel components for certain countries/waves.

In the 2014 wave, only seven countries had a panel component. Out of these, Spain, Italy and the Netherlands made use of the panel component of a pre-existing wealth survey.

The number of countries with a panel component increased to 12 in the 2017 wave. Finland, which introduced a panel component for the first time, also made use of a pre-existing panel. Meanwhile, the Netherlands changed its data collection method in the 2017 wave<sup>21</sup> and no households were re-contacted. As a result, the Netherlands did not have a panel component in the 2017 wave and there was a break in the panel between the 2014 and 2017 waves.

The number of countries with a panel component increased to 13 in the 2021 wave. Ireland and Lithuania had a panel component for the first time and the Netherlands had a panel component once again following the change in data collection from the 2017 wave onwards. Given the panel design of Latvia (see above), it had a panel component in the 2017 wave but not in the 2021 wave.

In the 2023 wave, the number of countries with a panel component remained at 13. However, the composition of countries changed. Latvia included a panel component in 2023 but not in 2021, given its specific panel design. In contrast, Finland had a panel component in 2021 but not in 2023. This is because Finland uses the EU-SILC

<sup>21</sup> The samples from the 2017 wave onwards were based on the Longitudinal Internet Studies for the Social Sciences (LISS) panel. In the first two waves, information was retrieved from the existing Dutch household survey.

sample, which has a rotational panel component. The panel component used in the 2023 HFCS wave entered the EU-SILC after the last wave of the HFCS, so there are no previously collected HFCS data for it.<sup>22</sup>

**Table 11**  
Data with a panel component across waves

| Country                        | Wave 2 | Wave 3 | Wave 4 | Wave 5 |
|--------------------------------|--------|--------|--------|--------|
| Belgium                        | X      | X      | X      | X      |
| Germany                        | X      | X      | X      | X      |
| Estonia                        |        | X      | X      | X      |
| Ireland                        |        |        | X      | X      |
| Spain                          | X      | X      | X      | X      |
| France                         |        | X      | X      | X      |
| Italy                          | X      | X      | X      | X      |
| Cyprus                         | X      | X      | X      | X      |
| Latvia                         |        | X      |        | X      |
| Lithuania                      |        |        | X      | X      |
| Malta                          | X      | X      | X      | X      |
| Netherlands                    | X      |        | X      | X      |
| Slovakia                       |        | X      | X      | X      |
| Finland                        |        | X      | X      |        |
| Number of countries with panel | 7      | 12*    | 13     | 13     |

Source: ECB – HFCS data.

\* This number includes Poland, which transmitted HFCS data in waves 2 and 3 and had a panel component in wave 3.

### 4.2.3 Non-coverage of specific sub-populations in the sampling frame

In principle, the target population of the HFCS includes all *private* households *resident* in the country where the survey is conducted.

A private household means a person living alone or a group of persons who live together in the same private dwelling and share expenditures, including the joint provision of living essentials, as well as financial decisions. Further details are provided in Appendix A1.

Collective households and homeless people are not covered by the target population of the HFCS, since they do not form private households. Collective households (sometimes also referred to as institutions) include nursing/retirement homes, hospitals/long-term care facilities, prisons, military barracks, student dormitories or boarding schools, religious communities (monasteries, convents), accommodation for refugees or asylum seekers, and shelters for the homeless or victims of violence.

<sup>22</sup> A new rotational group enters EU-SILC every year and remains in the survey for four years. For waves 2, 3 and 4, the Finnish HFCS data were collected every three years (i.e. 2013, 2016 and 2019), while for wave 5 the data were collected four years later (i.e. 2023). The rotation group that started in 2013 was the panel in wave 3 (collected in 2016), while the rotation group that started in 2016 was the panel in wave 4 (collected in 2019). The rotation group that started in 2019 reported until 2022. In wave 5, there is no rotation group for which HFCS data were previously collected (i.e. no HFCS data were collected for the rotation group that started in 2020).

In most national HFCS surveys, collective households and homeless people are left out of the sampling frame. However, certain exceptions exist in individual countries. In Luxembourg, for example, collective households have been included in the sampling frame since the introduction of the CAWI mode in the 2021 wave, although they are most likely not covered in the net sample. In Finland, military conscripts are included in the target population, while Estonia and Spain include homeless people in their sampling frame.

In some national surveys, certain groups of people are excluded, even though they should in principle form part of the target population. These include hard-to-reach groups such as islanders in Ireland or certain marginalised communities in Slovakia.

It should be noted that individuals belonging to some of the excluded groups may still be included in the sample if they are considered part of a household that falls within the sampling frame. For example, an institutionalised person with an economic connection to a sampled household (e.g. student living in a dormitory) may be treated as part of that household.<sup>23</sup>

#### 4.2.4 Use of replacements

In some countries, non-responding units may be replaced by reserve units during the fieldwork period. The use of replacements can be particularly helpful when collecting information from hard-to-reach groups of households. However, replacement units may meaningfully differ from the original non-respondents and the ready availability of replacement units may reduce the interviewer's incentive to secure an interview with the initially selected unit. In the HFCS, the use of replacements should therefore be strictly controlled. Replacement units should be chosen to closely match the original units in terms of key characteristics, and replacements should be permitted only after special efforts have been made to convert refusals.

Replacements were foreseen in the design of three countries in the 2023 wave: Spain, Italy and Cyprus.

In Spain, tightly controlled replacements were chosen. In large cities and provincial capitals, up to four replacements were provided for each original household in the sample to serve as replacements for that household only. The replacements for each original household were the two households immediately before and the two immediately after the original household in a list ranked by income quartile (for non-filers of wealth tax returns), wealth stratum and per capita household income. Replacements had to belong to the same income quartile (for non-filers of wealth tax returns) or the same wealth stratum as the sample household. This was done within the same municipality so as to ensure that the replacements were not too geographically distant from the original sample household. In the case of smaller municipalities, as well as in Navarre and the Basque Country, four replacement households were drawn for each refreshment sample household from the same PSU. No replacements were provided for panel households.

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<sup>23</sup> See definition of household in Appendix A1.

In Italy, households that could not be contacted were replaced by others with similar characteristics in the same municipalities. The replacements were based on a strict protocol intended to limit the interviewer's influence over the replacement process. For example, interviewers had to make at least four contact attempts on different days and at different times. Any contact attempt could be scrutinised by the survey agency. No households were substituted in the sample for the 2023 wave.

In Cyprus, replacements were selected from the same stratum as the original sample unit.

In Belgium, while no replacements were foreseen in the original sample design, a small number of replacements were introduced in the final stage of the fieldwork to address response shortfalls. The replacements were selected using the same sampling criteria to ensure adequate coverage of strata that were harder to reach.

### 4.3 Oversampling of the wealthy

Wealth surveys pose several additional challenges when it comes to sample design compared with other household surveys. Wealth surveys typically aim to conduct several kinds of analyses covering all parts of the distribution. However, the distribution of wealth is known to be skewed, and some types of assets are possessed only by a small fraction of households. Consequently, for the sample to adequately represent the full distribution of wealth in the population, it is essential to have a relatively high proportion of wealthy households in the sample (Kennickell, 2008). Data on the wealthiest households should be collected as efficiently as possible so as to obtain unbiased estimates of total wealth.

Furthermore, the inability to collect data from the upper fractions of the distribution affects the general picture of wealth inequality. This has an impact on indicators such as the Gini index, the share of wealth owned by the top 1%, and quantile ratios (for example, the ratio of net wealth between households in the top 20% and bottom 20% of the wealth distribution), all of which are sensitive to the values of the richest households (see, for example, Kennickell, 2019). Attempts have been made to measure the bias caused by the inability of survey data to sample the wealthiest households in the population with the help of external sources, such as data from Forbes' World's Billionaires list (see Vermeulen, 2018).

Capturing the values of assets from the wealthiest households is even more important in the case of certain individual items, particularly financial assets that are owned only by a small share of households.

In addition, previous wealth surveys show that unit non-response rates are higher among wealthier households. This is due firstly to the particular difficulty in making contact with wealthy respondents, since they are more likely to be absent from their principal residence for prolonged periods of time, to possess more than one residence and to be surrounded by additional security measures. Moreover, available time and self-perceived value/time ratios often predispose wealthy

households to refuse to take part in surveys.<sup>24</sup> These differences in the response rate can cause measurement bias unless post-survey adjustments are made to compensate for this factor. Furthermore, if the sample is selected using information correlated with wealth, this same supporting information may also be useful in guiding post-survey adjustments, compensating for non-response and reducing sampling error.

In conclusion, achieving a given level of precision would require either a rather large (and costly) sample or, if efficiently designed, a sample that includes a disproportionately high number of wealthy households. Indeed, using data from a purely random selection of units would yield a statistically very inefficient estimate of the distribution of wealth. These challenges should be anticipated during the sampling design phase.

Of the 22 participating countries, 17 were able to oversample wealthy households through various strategies (Table 12). The Czech Republic, Malta, the Netherlands, Austria and Slovenia did not apply oversampling.

The oversampling strategies varied significantly between countries and were heavily dependent on the available data, as shown in Table 12.

Spain and France were able to use personal wealth data to define strata and sample richer strata at higher rates. Lithuania used individual data on real assets as a proxy for wealth. Six countries (Estonia, Croatia, Italy, Latvia, Luxembourg and Finland) used personal income data for oversampling. Proxies for wealth included electricity consumption (Cyprus), the size of the dwelling (Portugal) and the estimated value of the dwelling (Hungary).

Other countries (Belgium, Germany, Ireland, Greece and Slovakia), which did not have access to personal level income or wealth data or other proxies, adopted different oversampling strategies based on regional-level information such as average income and real estate/property prices (used as area-level correlates of a household's wealth). These included oversampling in geographical areas with higher average income and/or more expensive housing.

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<sup>24</sup> For further information, see the references in Sánchez-Muñoz (2011).

**Table 12**  
*Oversampling strategies*

| Country    | Oversampling criteria        |                         | Regional indicators | Details                                                                                                                                                                                                                                                                                                                            |
|------------|------------------------------|-------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | Based on administrative data |                         |                     |                                                                                                                                                                                                                                                                                                                                    |
|            | Personal income              | Other                   |                     |                                                                                                                                                                                                                                                                                                                                    |
| Belgium    |                              |                         | X                   | Neyman allocation* based on income dispersion. Oversampling of households belonging to statistical sectors (smallest geographical units) with a greater average taxable income and living in municipalities where housing is more expensive.<br><br>Auxiliary sources: fiscal sources and housing market sources.                  |
| Germany    |                              |                         | X                   | In cities with 100,000 or more adult inhabitants, wealthy street sections were oversampled. Among the smaller municipalities, those with a high share of taxpayers with a total taxable income above a threshold were oversampled.<br><br>Auxiliary sources: tax register, micro-geographical information on street section level. |
| Estonia    | X                            |                         |                     | Income is divided into two groups for each region, one for the top income decile and one for the rest.<br><br>Auxiliary sources: Tax and Customs Board data on total income for total population (includes net labour income, benefits, gains and losses from securities transactions, and certain other sources of income).       |
| Ireland    |                              |                         | X                   | Oversampling from areas with relatively high home ownership rates and high average Local Property Tax (LPT) bands.<br><br>Auxiliary source: local property tax register.                                                                                                                                                           |
| Greece     |                              |                         | X                   | Oversampling from strata of predefined affluent areas. The oversampling strategy is based on the 90th percentile of median equivalised disposable income and the 90th percentile of median per capita taxable value of property, in line with the 2021 wave.                                                                       |
| Spain      |                              | Personal wealth         |                     | Seven wealth strata based on the percentile distribution of wealth tax among households. Oversampling progressively higher in strata with higher taxable wealth.<br><br>Auxiliary sources: wealth and income tax returns.                                                                                                          |
| France     |                              | Personal wealth         |                     | Within each selected primary unit, two samples were selected. The first targeted wealthy households while the second targeted other households. For the wealthy sample, three strata were defined and oversampled: wealthy city dwellers, wealthy country dwellers and households with lower wealth.                               |
| Croatia    | X                            |                         |                     | Auxiliary source: fiscal data on income, 2021 Census data for household structure.                                                                                                                                                                                                                                                 |
| Italy      | X                            |                         |                     | Secondary sampling units are stratified based on household income (50 strata).<br><br>Auxiliary source: tax registers.                                                                                                                                                                                                             |
| Cyprus     |                              | Electricity consumption |                     | Oversampling of wealthy households, considered to be those in the top 10% of the distribution of annual electricity consumption.<br><br>Auxiliary source: customer register of the electricity authority.                                                                                                                          |
| Latvia     | X                            |                         |                     | Different sampling fraction for the highest income decile.<br><br>Auxiliary source: tax register.                                                                                                                                                                                                                                  |
| Lithuania  |                              | Real assets             |                     | 25% of the gross sample was drawn from the top decile based on real assets.<br><br>Auxiliary source: combination of population register and real property register.                                                                                                                                                                |
| Luxembourg | X                            |                         |                     | 20% of the gross sample was drawn from the top decile of the gross (employment) income distribution.<br><br>Auxiliary source: social security register (IGSS).                                                                                                                                                                     |
| Hungary    |                              | Dwelling values         |                     | Mixture of Neyman and proportional allocation* based on dwelling values.<br><br>Auxiliary sources: register of sold dwellings from the National Tax and Customs Administration, Census data.                                                                                                                                       |

|          |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|---|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Portugal |   | X | X | <p>The oversample accounted for 30% of the total gross sample.</p> <p>The following criteria were applied using the national dwellings register: households living in dwellings whose useful area was at least a certain number of square meters, depending on the region (e.g. 100 m<sup>2</sup> for the "Grand Lisboa" division, and 120 m<sup>2</sup> or 150 m<sup>2</sup> for other divisions)</p>                                                                                                                                                                                                                                                                                                                              |
| Slovakia |   | X | X | <p>The oversampling rate was based on the 2021 Census and the Structure of Earnings Survey.</p> <p>The following household criteria (which correlate with high wealth levels) were drawn from the 2021 Census: family houses with a floor area above 180 m<sup>2</sup> and a year of construction of 2001 or later; age of the household main member above 40; occupational status of the household main member among the list of highest-earning occupations; household address in a list of streets with a high incidence of top 10% income earners (provided by the Slovak Tax Office).</p> <p>Half of the oversampled households were offered a valuable commemorative coin issued by the NCB to boost participation rates.</p> |
| Finland  | X |   |   | <p>Farmers, entrepreneurs and high-income earners were oversampled, based on the personal taxable income of the main income earner of the household dwelling unit.</p> <p>Auxiliary sources: tax registers and the register of household-dwelling units.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Source: ECB – HFCS metadata.

\* Under proportional allocation, sample sizes are distributed across strata in proportion to their population sizes, whereas under Neyman allocation sample sizes are distributed in proportion to both stratum size and within-stratum variability.

The oversampling strategies enrich the sample with a higher proportion of households with high asset values or less common financial assets, leading to more precise estimates of wealth. However, the final representation of wealthy households in the sample is also influenced by other factors, such as non-response rates. An indicator of the extent to which the wealthy are represented in the final sample is the "effective oversampling rate of the wealthy" (see Table 13), which indicates the extent to which the share of wealthy households in the sample exceeds their share in the population. These rates are given separately for households belonging to the richest 5% and 10% of the population.

To compute this indicator, the net wealth values of the 90th and 95th percentiles were first calculated from the weighted data. Subsequently, the (unweighted) shares of interviewed households exceeding these values were computed. When the net sample includes a relatively large number of wealthy households with, on average, small final estimation weights, it indicates a high degree of effective oversampling of wealthy households. This measure is indicative only, as the oversampling rate may be biased to some degree. The values associated with the percentiles are determined from the survey, which might not reflect the true level of wealth.

**Table 13****Effective oversampling rates of the wealthy**

| Country        | Effective oversampling rate of the top 10% | Effective oversampling rate of the top 5% |
|----------------|--------------------------------------------|-------------------------------------------|
| Belgium        | 44                                         | 63                                        |
| Czech Republic | -18                                        | -19                                       |
| Germany        | 131                                        | 126                                       |
| Estonia        | 24                                         | 24                                        |
| Ireland        | 102                                        | 124                                       |
| Greece         | 4                                          | 3                                         |
| Spain          | 165                                        | 299                                       |
| France         | 164                                        | 270                                       |
| Croatia        | -1                                         | 1                                         |
| Italy          | 97                                         | 159                                       |
| Cyprus         | 44                                         | 63                                        |
| Latvia         | 64                                         | 63                                        |
| Lithuania      | 51                                         | 46                                        |
| Luxembourg     | 28                                         | 14                                        |
| Hungary        | 36                                         | 48                                        |
| Malta          | -1                                         | -4                                        |
| Netherlands    | 39                                         | 39                                        |
| Austria        | -24                                        | -23                                       |
| Portugal       | 17                                         | 18                                        |
| Slovenia       | 4                                          | 8                                         |
| Slovakia       | 41                                         | 48                                        |
| Finland        | 107                                        | 129                                       |

Notes: "Effective oversampling rate" of the top 10%:  $(S90 - 0.1)/0.1$ , where S90 is the share of sample households in the wealthiest 10%. "Effective oversampling rate" of the top 5%:  $(S95 - 0.05)/0.05$ , where S95 is the share of sample households in the wealthiest 5%.

The wealthiest households are defined as those having higher net wealth than 90% (95%) of all households, calculated from weighted data.

The figures provided in Table 13 should be interpreted as follows: if the share of rich households in the net sample is exactly 10%, the effective oversampling rate of the top 10% is 0. If the share of households in the wealthiest decile is 20%, the effective oversampling rate is 100, meaning that there are 100% more wealthy households in the sample than there would be if all households had equal weights. A negative oversampling rate indicates that there are fewer wealthy households in the net sample than there would be if all households had equal weights.

A high effective oversampling rate means that analyses of wealthy households – and accordingly of aggregate wealth and wealth inequality indicators – are more efficient. The range of oversampling rates is considerable in the HFCS. For some countries, the share of wealthy households in the sample is smaller than their share in the population. In other cases, effective oversampling rates of the top 10% are over 150%, and the corresponding rates for the top 5% are even higher.

## 5 Unit non-response and weighting

High unit non-response rates increase the variability of estimates drawn from the sample and, to the extent that non-response is non-randomly distributed, may lead to biased estimates of the variables of interest. Weight adjustments may be used to some extent to alleviate non-response bias.

This chapter compares indicators of response behaviour observed over time in the HFCS and describes the common weighting procedure applied in the survey, along with the most significant country-specific features regarding weighting and calibration.

### 5.1 Unit non-response in wealth surveys

Unit non-response is the failure to obtain information from an eligible sample unit. This situation can arise where attempts to contact the selected sample unit are unsuccessful, where the unit refuses to take part in the survey, or owing to other factors such as language barriers or an inability to take part in the interview. Owing to the relative sensitivity of wealth data, unit non-response rates are generally higher in wealth surveys than in income surveys.<sup>25</sup>

To improve the quality of the analysis to be conducted with survey data, there is a broad consensus that the basic survey weights determined by the sample design must be adjusted to address non-response and other imperfections in the final sample, such as coverage problems. Furthermore, to maximise comparability in such a multinational survey, it is generally considered important that the procedures used be as standard as possible across countries and be compatible with the structure of the sample and the data available for making adjustments.

Although a survey with a 20% response rate has a greater potential for bias than a comparable survey with a 100% response rate, evidence suggests that response rates and non-response bias are not always inversely related (see Groves and Peytcheva, 2008). It is therefore common practice to evaluate the degree to which there is identifiable response bias in a survey and the degree to which non-response adjustments may ameliorate such problems. In the case of the HFCS, it is also important to investigate differences across national surveys that may lead to systematic differences in non-response bias.

### 5.2 Unit non-response in the HFCS

The HFCS endeavours to limit non-response and thereby reduce the risk of non-response bias by promoting the use of best practices. For example, it highlights the importance of interviewer selection and training, as well as the incentives provided to interviewers and the workload assigned to them. To minimise variability in potential bias across the countries participating in the HFCS, emphasis is placed on the use of common practices, to the extent that this is feasible. Despite these efforts and the fact that information flows well and best practices are exchanged across countries,

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<sup>25</sup> For further information, see references in Pérez-Duarte et al. (2010).

potentially significant differences in procedures persist, such as the protocols used to contact survey respondents.

Table 14 below presents indicators on response behaviour in the 2023 wave of the HFCS. These indicators are based on standard definitions (see AAPOR, 2023) and include the following:

- Response rate = Completed interviews / Eligible sample units<sup>26</sup>
- Refusal rate = Sample units refusing to participate / Eligible sample units
- Cooperation rate = Completed interviews / Sample units contacted
- Contact rate = Sample units contacted / Eligible sample units
- Eligibility rate = Eligible sample units / Gross sample size

The response rate is probably the most commonly used survey quality indicator. Because non-response reduces the number of observations available for analysis, it has direct implications on the sampling variability of survey estimates. Refusal, cooperation and contact rates all provide useful information on the structural characteristics of non-response and may help to better direct survey resources towards respondents with a higher tendency to refuse to take part in the survey, with a view to minimising the risk of non-response bias. Eligibility rates indicate the quality of the sampling frame.

There is a significant variation in the response rates achieved in the HFCS, as shown in Table 14. For those countries with a panel component, response rates are reported both for households interviewed for the first time and for the entire sample. When comparing response rates, it is worth noting that the Finnish figures refer to an income survey (EU-SILC), and that in France and Portugal, the survey is compulsory for households, though participation is never enforced.

In recent years, a general downward trend in survey participation has been observed (see, for instance, Jabkowski and Cichocki, 2025), raising concerns about the potential implications for policymaking (see Leduc et al. 2025). However, as shown in Chart 4, unit response rate data from the HFCS show a mixed picture, with substantial heterogeneity across countries. While several countries reported declining response rates over time, others experienced stable or even improving participation. As observed in the 2021 wave, the coronavirus (COVID-19) pandemic further affected these trends by disrupting fieldwork schedules (interrupting or postponing fieldwork in several countries) and by temporarily reducing response rates compared with the 2017 wave, especially among first-time (non-panel) households. By contrast, panel households generally exhibited a smaller decline, and the introduction of a panel component in Ireland modestly lifted overall response rates.

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<sup>26</sup> For sample units for which eligibility could not be defined during fieldwork, the share of eligible units is estimated from the corresponding share of those sample units for which eligibility was determined.

A generalised difficulty in achieving target sample sizes has been observed across countries, mainly due to refusals, questionnaire length and complexity, and interviewer-related issues. These challenges increase fieldwork duration and costs. Countries that recorded a decline in response rates have adopted mitigation measures, both ex ante (mixed-mode data collection, re-contact strategies, respondent incentives) and ex post (weighting, imputation). The mode of survey collection may also play a role: in the 2023 wave, mixed-mode approaches were associated with higher unit response rates (see also Section 3.1 on survey collection modes).

Eligibility rates indicate the quality of the sampling frames and are above 90% in most countries and above 95% in more than two-thirds of the countries. Contact rates also vary significantly across countries, but are around 90% or above in the majority of cases.

**Table 14**  
Response behaviour indicators in the HFCS

| Country        | Gross sample size | Net sample size | Response rate* | Response rate** (including panel) | Refusal rate | Cooperation rate | Contact rate | Eligibility rate |
|----------------|-------------------|-----------------|----------------|-----------------------------------|--------------|------------------|--------------|------------------|
| Belgium        | 7,951             | 2,019           | 16.1           | 26.2                              | 37.7         | 32               | 82           | 96.8             |
| Czech Republic | 4,126             | 3,246           | 80.3           |                                   | 18.4         | 80.4             | 99.9         | 98               |
| Germany        | 14,826            | 3,985           | 10             | 29.9                              | 50           | 35.1             | 85.1         | 90.0             |
| Estonia        | 3,925             | 2,599           | 51.5           | 68.7                              | 22.8         | 73.1             | 93.9         | 96.4             |
| Ireland        | 14,633            | 5,179           | 28.6           | 35.6                              | 18.5         | 62.5             | 57           | 99.3             |
| Greece         | 8,985             | 3,629           | 42             |                                   | 46.3         | 44.8             | 93.9         | 96.1             |
| Spain          | 15,173            | 6,385           | 28.2           | 45.5                              | 44.1         | 49.8             | 91.7         | 92.6             |
| France#        | 17,325            | 11,941          | 65.5           | 73.8                              | 9.5          | 80.5             | 91.7         | 93.3             |
| Croatia        | 4,000             | 1,446           | 37.9           |                                   | 51.5         | 41.3             | 91.7         | 95.4             |
| Italy          | 36,505            | 9,641           | 17.6           | 27.2                              | 29.9         | 40.7             | 66.9         | 97.1             |
| Cyprus         | 2,286             | 1,256           | 37.2           | 55.7                              | 33.2         | 58.3             | 95.5         | 98.6             |
| Latvia         | 2,969             | 1,217           | 37.6           | 42.5                              | 18.2         | 69.5             | 61.1         | 96.5             |
| Lithuania      | 5,480             | 1,697           | 31.2           | 31.5                              | 33.4         | 42.5             | 74.1         | 98.4             |
| Luxembourg     | 20,000            | 3,699           | 20.7           |                                   | 79.3         | 20.7             | 100          | 96.1             |
| Hungary        | 15,237            | 7,014           | 52.8           |                                   | 30.6         | 60.6             | 87           | 87.2             |
| Malta          | 2,215             | 1,023           | 49.3           | 47.7                              | 12.9         | 70.6             | 67.5         | 96.9             |
| Netherlands    | 3,743             | 2,527           | 64.6           | 67.5                              | 28           | 67.5             | 100          | 100              |
| Austria        | 7,636             | 2,849           | 37.7           |                                   | 59.1         | 38.1             | 99           | 98.9             |
| Portugal#      | 8,553             | 5,465           | 69.2           |                                   | 10.9         | 79.3             | 97.5         | 92.4             |
| Slovenia       | 5,858             | 1,987           | 34.6           |                                   | 52.3         | 38               | 91.2         | 97.9             |
| Slovakia       | 4,035             | 2,128           | 49.2           | 54.9                              | 40.1         | 57.5             | 95.5         | 96.1             |
| Finland        | 12,492            | 8,982           | 72.7           |                                   | 20.8         | 76.5             | 95           | 98.9             |

Source: ECB – HFCS metadata.

Note: Gross sample includes panel households that have responded to previous waves of the same survey.

# In France and Portugal, survey participation is compulsory for households.

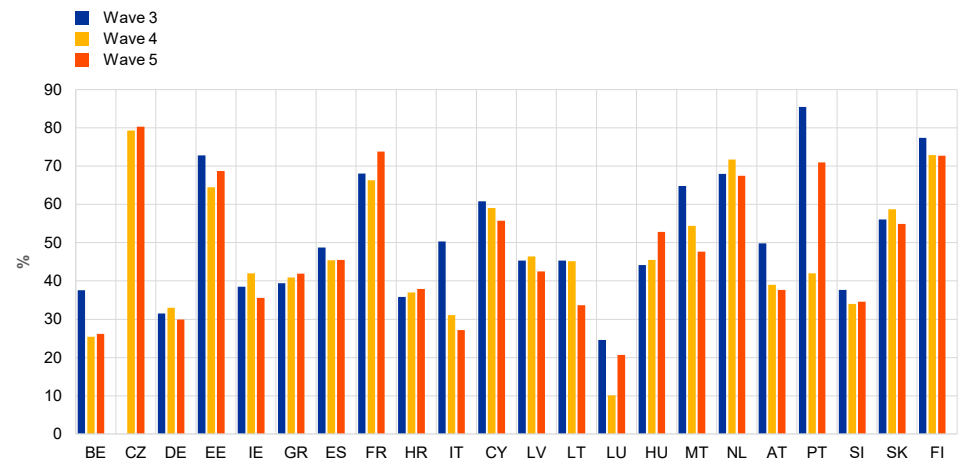
\* For comparability, response rates are shown for households interviewed for the first time. The figure for Finland includes households that are part of the EU-SILC panel.

\*\* Response rates for the whole sample in countries that have a panel component.

Lastly, it is worth mentioning that oversampling of wealthy households may decrease the response rate and should be taken into account when comparing the response rates of individual surveys. In spite of this possible drawback, oversampling of specific population groups is beneficial for survey quality.

**Chart 4**  
Response rates (including panel)

(percentages, interviewed households/eligible units)



## 5.3 Weighting

Weighting procedures are an essential tool for adjusting, to the extent that this is possible, both for the bias caused by unit non-response and for other irregularities in the sample. In the HFCS, all participating surveys follow common high-level weighting procedures to ensure the comparability of survey data. However, there are minor differences in some of the details of implementation across countries participating in the HFCS. There are also differences in more granular elements, such as the structure of the samples, the sampling frames and the external sources used to adjust the weights.

### 5.3.1 Weighting procedures in the HFCS

The standard HFCS procedure for computing and adjusting survey weights takes into account: (i) the unit's probability of selection, (ii) coverage issues, (iii) unit non-response, and (iv) an adjustment of weights to external data (calibration). The methodology is coherent with existing international standards (Eurostat, 2024 and United Nations, 2005). These steps are implemented sequentially as follows:

Design weights are computed as the inverse of the selection probability of each unit in the gross sample, that is, both responding and non-responding units.

The first-stage weights are adjusted for coverage, including adjustments both for non-eligible units in the gross sample (frame over-coverage) and for multiple selection probabilities. This stage of adjustment is particularly relevant for sampling frames based on registers of dwellings rather than registers of households or individuals.

The coverage-adjusted weights are further adjusted in an attempt to minimise bias potentially induced by discrepancies between the characteristics of survey respondents and non-respondents. This adjustment involves estimating response probabilities as functions of characteristics available for both responding and non-responding households, and dividing the coverage-adjusted weights of each responding unit in the achieved sample by the response probability. In the HFCS, such adjustments are conducted primarily through regression-based modelling or response homogeneity groups.

To obtain the final weights, the non-response-adjusted weights are modified using auxiliary information to align the estimates of a set of variables with the corresponding population estimate totals and category frequencies (see Särndal, 2007). This weight adjustment process is motivated by a desire to reduce bias induced by discrepancies between the initial sample and the total population that are not captured in the coverage adjustments or that are induced through the other stages of weight adjustment. The HFCS uses a methodology that adjusts weights so that their totals by groups match their representation in the full population of households. To be effective, the calibration variables must be strictly comparable in both the survey and the source of the population data and be correlated with the principal study variables, but not too closely correlated with each other. While the selection of calibration variables varies by country, partly depending on available data sources, calibrating for at least age, gender and household size is common across most countries in the HFCS (see Table 15).

In surveys that have a panel component, the cross-sectional weighting procedure includes several additional features. First of all, personal – and ultimately household – weights need to be adjusted for persons leaving and entering the households between waves. Secondly, household weights need to be adjusted for attrition and for households leaving and entering the target population. Different survey waves are treated as independent samples in the first stage of the weighting procedure, and subsequently the samples are merged and their weights adjusted to the target population of the current wave before the final calibration step.

In sample surveys where different units have unequal probabilities of being sampled, using the inverse selection probabilities in weight construction will produce unbiased estimates of means and totals (see Horvitz and Thompson, 1952). However, the variability of weights often increases the sampling variances of important survey estimates relative to those of a sample of the same size without weight variation, and there is a trade-off between unbiasedness and the efficiency (low variance) of estimates (see Little, 1991). In the case of highly variable weights, the estimates can be made more efficient by setting limits for weight adjustment factors in calibration or by trimming extreme weights. However, oversampling of wealthy households

introduces variability in design weights, and this needs to be taken into account when trimming weights or setting limits.

### 5.3.2 Variables used for calibration

Table 15 shows the external variables and sources used in calibration. Note that in some cases, combinations of individual variables (for example, age by region or by municipality size) were used.

**Table 15**  
*Calibration variables and sources*

| Country        | Age | Gender | Household size | Region | Other                                                                                                                                                | Source                                                                                                                                                                                     |
|----------------|-----|--------|----------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Belgium        | X   | X      |                | X      | Household type, education, labour status                                                                                                             | Official population statistics                                                                                                                                                             |
| Czech Republic |     |        |                |        | Household composition, labour status, type of dwelling/house, municipality size, capital/other region, household income per capita (quintiles)       | EU-SILC                                                                                                                                                                                    |
| Germany        | X   | X      | X              | X      | Education level, labour status and nationality (German/non-German) of main income earner, size of main residence (for homeowners), municipality size | Microcensus statistics                                                                                                                                                                     |
| Estonia        | X   | X      |                | X      | Education and urbanisation type                                                                                                                      | Statistical Population Register                                                                                                                                                            |
| Ireland        | X   | X      |                | X      | Employment status, deprivation quintile, home ownership, household composition, agricultural hectares                                                | LFS, Agricultural Census of Ireland                                                                                                                                                        |
| Greece         |     |        | X              | X      | Number of households, home ownership                                                                                                                 | LFS, EU-SILC                                                                                                                                                                               |
| Spain          | X   | X      | X              |        | Municipality size                                                                                                                                    | Population registers (census and others)                                                                                                                                                   |
| France         | X   | X      | X              | X      | Degree of urbanisation, education and socio-professional category of the reference person, household type, home ownership, labour and wealth income  | Census, LFS                                                                                                                                                                                |
| Croatia        | X   | X      |                | X      | -                                                                                                                                                    | Population statistics, EU-SILC                                                                                                                                                             |
| Italy          | X   | X      | X              |        | Municipality size, education, fiscal income, debt size                                                                                               | Population register, tax register, credit register                                                                                                                                         |
| Cyprus         | X   | X      | X              | X      | Household size, households per district                                                                                                              | Census 2021                                                                                                                                                                                |
| Latvia         | X   | X      |                | X      | Income                                                                                                                                               | Population statistics, tax register                                                                                                                                                        |
| Lithuania      | X   | X      | X              |        | Urban or rural area, values of real assets, loans for HMR purchase, and income                                                                       | The population register, the real property register, loan risk database in the NCB and social security database                                                                            |
| Luxembourg     | X   | X      | X              |        | -                                                                                                                                                    | Census 2021                                                                                                                                                                                |
| Hungary        | X   | X      | X              | X      | Education, labour status, type of locality                                                                                                           | Census, LFS                                                                                                                                                                                |
| Malta          | X   | X      | X              | X      | -                                                                                                                                                    | NSI                                                                                                                                                                                        |
| Netherlands    | X   | X      | X              |        | Home ownership, education                                                                                                                            | NSI                                                                                                                                                                                        |
| Austria*       | X   |        | X              | X      | Housing tenure                                                                                                                                       | Mikrozensus 2022                                                                                                                                                                           |
| Portugal       | X   | X      | X              | X      | Education, value of mortgages                                                                                                                        | Labour force survey, population estimates, credit register                                                                                                                                 |
| Slovenia       | X   | X      | X              | X      | -                                                                                                                                                    | Population statistics                                                                                                                                                                      |
| Slovakia       | X   | X      |                | X      | Labour status, income group                                                                                                                          | Census, demographic statistics, social insurance agency                                                                                                                                    |
| Finland        | X   | X      | X              | X      | 1. EU-SILC variables: level of education and 16 income-related variables<br>2. HFCS-specific calibration variables: 5 wealth-related variables       | NSI, population information system, tax and other income registers, register files on the values of listed shares and mutual funds, Statistics Finland register of buildings and dwellings |

Notes: LFS: Labour force survey. NSI: national statistical institute. EU-SILC: EU Statistics on Income and Living Conditions.  
\* Cell-based post-stratification.

### 5.3.3 Weights

The outcomes of the weighting procedures are shown in Table 16, including the sums, means and coefficients of variation of final estimation weights by country.

**Table 16**  
Final estimation weights by country

| Country        | Sum        | Mean   | Coefficient of variation, percentage |
|----------------|------------|--------|--------------------------------------|
| Belgium        | 5,130,920  | 2505.3 | 108.5                                |
| Czech Republic | 4,545,489  | 1,400  | 49                                   |
| Germany        | 40,964,998 | 10,280 | 140                                  |
| Estonia        | 616,570    | 237    | 70                                   |
| Ireland        | 1,916,091  | 370    | 137                                  |
| Greece         | 4,298,067  | 1,187  | 89                                   |
| Spain          | 19,116,272 | 2,994  | 108                                  |
| France         | 31,064,775 | 2,602  | 125                                  |
| Croatia        | 1,418,864  | 981    | 62                                   |
| Italy          | 25,056,921 | 2,599  | 143                                  |
| Cyprus         | 357,840    | 285    | 95                                   |
| Latvia         | 832,517    | 684    | 132                                  |
| Lithuania      | 1,495,321  | 881    | 116                                  |
| Luxembourg     | 261,498    | 71     | 109                                  |
| Hungary        | 4,037,389  | 576    | 74                                   |
| Malta          | 221,069    | 216    | 103                                  |
| Netherlands    | 8,270,244  | 3,273  | 48                                   |
| Austria        | 4,095,350  | 1,437  | 51                                   |
| Portugal       | 4,466,159  | 817    | 69                                   |
| Slovenia       | 859,782    | 433    | 61                                   |
| Slovakia       | 1,726,618  | 811    | 118                                  |
| Finland        | 2,950,000  | 328    | 88                                   |

Notes: The sum refers to the sum of the final estimation weights over the households and corresponds to the size of the target population, i.e. the number of households. Mean weights indicate the average number of households that one net sample unit represents. Coefficient of variation is the relative standard deviation of final estimation weights (as a percentage of the mean of weights). This indicates the variability of the final weights in the net sample.

## 6 Editing, item non-response and multiple imputation

Data editing is an essential part of processing survey data in order to minimise errors and inconsistencies in collected observations. Kennickell (2006) shows the effect of editing data in the Survey of Consumer Finances by comparing the distributions of net worth of imputed but unedited data with those of imputed and edited data. For example, the unedited data show underestimation at the bottom of the distribution, but strong overestimation at the top.

A certain degree of item non-response<sup>27</sup> is to be expected in any household survey. In a wealth survey like the HFCS, which contains sometimes difficult and sensitive questions on personal finances, one can expect a higher level of missing answers, particularly for some of the most important variables used to produce statistical indicators and as components of research models. Imputation is the most frequently used process to correct for item non-response by assigning estimated values to a variable when it was not collected at all or not correctly collected. The estimated value is based on the information collected from other households.

In order to provide users with information about the quality of the data, each variable has a shadow (or “flag”) variable, which indicates the origin of the information. This information is available for all variables and observations. Flags indicate, for example, whether an individual observation was collected, edited, imputed from a range value provided by the respondent or imputed because the respondent could not, or did not want to, provide a valid answer.

## 6.1 Data editing

The procedure for detecting errors in and between data records, during and after data collection and capture, and for adjusting individual items is known as editing (UN, 2010). The use of carefully programmed computer-assisted interviews can significantly reduce the number of consistency checks needed after the fieldwork phase. Furthermore, comments made by interviewers during data collection can help to identify possibly unreliable values.

In the majority of countries, interviewer comments were used systematically or in most cases when reviewing data values. The countries applied several distinct editing rules, including logical, range and consistency checks, as well as checks for outliers. Six countries (Estonia, Ireland, Latvia, Lithuania, Malta and Finland) used administrative data when editing to supplement the information collected during the interviews. In addition to correcting unreliable observations, values were changed for other purposes, such as converting net amounts of income variables to gross amounts and amounts in legacy currencies to euro.

Audio records of the interviews can also be used in the editing process. For instance, in Spain this has been done since the 2017 wave and has been used to correct values and to decide whether to re-contact households when wrong or unclear answers are detected.<sup>28</sup>

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<sup>27</sup> Item non-response occurs when survey participants do not answer all questions (i.e. the respondent participates in the survey, but leaves certain questions unanswered). This is different from unit non-response where the entire survey is not completed because, for example, a household declined to take part in the survey (see section 5)

<sup>28</sup> In Spain, audio records are used to help ensure that interviewers adhere to survey protocols when administering the interview. In addition, audio records provide valuable insights into the interaction between interviewers and respondents and the difficulties that respondents encounter when answering specific questions.

## 6.2 Imputation of HFCS data

In the HFCS, observations for which no valid response was received from the households should in principle be imputed. In addition to a common methodology on imputations, imputation software tools have been developed in order to maximise the degree of methodological commonality.

### 6.2.1 Imputation requirements

A complete-case analysis that discards non-observed units and analyses only units with complete data would disregard too much information and is thus not considered appropriate for the HFCS. Inferences should be made from the survey data on the entire population rather than on only those units that have provided answers to certain questions (see Little and Rubin, 2002). Since imputing all missing values for all variables might not be feasible, a minimum set of variables that need to be imputed has been defined for the HFCS. The set of variables that were fully imputed in the 2023 wave included all components of household income, consumption and wealth, so that the indicators on household balance sheets could be based on the observations for all households that took part in the survey. In addition, selected variables that are most frequently used in the reporting of HFCS results, in monetary policy and financial stability analysis, and as good predictors of balance sheet variables in the imputation models, were fully imputed.

Each NCB/NSI that produces data has the responsibility to impute missing observations. Rubin (1996) makes the case explicitly, claiming that modelling the missing data must be, in general, the data constructor's responsibility, since "In general, ultimate users have neither the knowledge nor the tools to address missing data problems satisfactorily." Database constructors using individual HFCS country data have better information on the reasons for non-response and on the relationship between different variables. Furthermore, country-specific questions or different interviewing strategies are better evaluated at the country level. Lastly, part of the information used to construct the imputation models is available only at the country level due to confidentiality reasons (wealth strata, regional data, interviewer comments and so on). With this in mind, the HFCS imputation process is fully decentralised and therefore operates at the country level, even though the process strictly follows a common methodology (see following sections).<sup>29</sup>

### 6.2.2 Multiple imputation

Imputation seeks to preserve the characteristics of the distribution of, and the relationships between, different variables (Rubin, 1987). In addition to a complete-case analysis, several other simple procedures could be performed to get around the problem of missing values.

Probably the simplest approach is to fill in missing values with the means of observed values. This would naturally lead to a large and inappropriate decrease in variance and would fail to reproduce the distributions obtained from the survey data.

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<sup>29</sup> See Biancotti et al. (2009) for further references.

In stochastic regression imputation, missing values are replaced with a value predicted by a regression plus a residual, to reflect the uncertainty in the predicted value. For normal linear regression models, the residual is treated as normal, with zero mean and variance equal to the residual variance in the regression. For binary or multinomial regressions, the predicted value is a probability distribution, and the imputed value is drawn from that distribution. While this method preserves the distribution of the imputed values, the uncertainty of the imputation process is not fully reflected in a single imputation.

With multiple imputation (MI), M imputed values based on different random draws are provided to the user for each missing value, resulting in M copies of the complete dataset. MI shares the advantages of single imputation in that it allows complete-data methods of analysis and the use of all information available to the data collector. However, uncertainty can also be taken into account (i.e. in order to avoid underestimating the resulting estimation variance) when using MI, which is particularly important in cases of significant item non-response.

The construction of multiple imputation models in the HFCS is based on the methodologies used in similar surveys by the Federal Reserve Board and Banco de España (see Kennickell, 1991 and 1998, and Barceló, 2006). HFCS datasets include five implicates (imputed sets of values) for each missing observation. The variability across the five implicates accounts for the underlying level of uncertainty. The imputation technique has an iterative and sequential structure. The models follow a path in which all variables are filled in according to a predefined sequence. The models are run iteratively several times, and imputed values from each of the previous rounds are treated as observed values in the subsequent iterations.

Furthermore, a broad-conditioning approach is used, meaning that a high number of covariates, based on several criteria, are included in the models for all variables to be imputed. The model should include, first of all, variables that have predictive power – empirically shown by regressions – for the variable to be imputed. The covariates should also include variables that possess explanatory power suggested by economic theory, although potentially not empirically exhibited for the dataset in question. Because of the sequential structure of the model, predictors of the most frequently used covariates for other variables are also important. Finally, any variables that could potentially explain the non-response pattern of households should appear as covariates in the imputation model. MI in the HFCS is based on the assumption of “missing at random”, meaning that the distribution of the complete data depends only on the observed data, conditional on the determinants of item non-response and other covariates. Consequently, this complete set of variables must be incorporated into the imputation models (Barceló, 2006).

## 6.3 Imputation methodologies in the HFCS

Table 17 shows the methodological choices of the participating countries for the imputation models. The first column shows whether multiple imputation is applied. The columns under “Use of weights” show whether survey weights are used in the imputation models and, if so, whether this is done through weighted regressions or by using survey weights as covariates. There is evidence that ignoring information

on sampling design in the imputation models will lead to biased results (see Reiter et al., 2006; Zhang et al., 2009). However, weighted regression potentially leads to less efficient estimates (see Faiella, 2010). The last set of columns describes the process of selecting covariates for the imputation model.

**Table 17**  
Imputation methodology

| Country        | Use of weights |                     |                       | Selection of predictors in the imputation model |                                |                                                      |
|----------------|----------------|---------------------|-----------------------|-------------------------------------------------|--------------------------------|------------------------------------------------------|
|                | Use of MI      | Weighted regression | Weights as covariates | No weights used                                 | Automatic with limited editing | Automatic pre-selection with case-by-case evaluation |
| Belgium        | X              |                     | X                     |                                                 |                                | X                                                    |
| Czech Republic |                |                     |                       | X                                               |                                | X                                                    |
| Germany        | X              | X                   | X                     |                                                 |                                | X                                                    |
| Estonia        | X              |                     |                       | X                                               | X                              |                                                      |
| Ireland        | X              |                     | X                     |                                                 |                                | X                                                    |
| Greece         | X              |                     |                       | X                                               |                                | X                                                    |
| Spain          | X              |                     |                       | X                                               |                                | X                                                    |
| France         |                | X                   |                       | X*                                              |                                | X                                                    |
| Croatia        | X              | X                   |                       |                                                 |                                | X                                                    |
| Italy          |                |                     |                       | X                                               |                                | X                                                    |
| Cyprus         | X              |                     |                       | X                                               | X                              |                                                      |
| Latvia         | X              | X                   | X                     |                                                 |                                | X                                                    |
| Lithuania      | X              |                     | X                     |                                                 | X                              |                                                      |
| Luxembourg     | X              | X                   |                       |                                                 | X                              |                                                      |
| Hungary        | X              | X                   |                       |                                                 |                                | X                                                    |
| Malta          |                |                     | X                     |                                                 | X                              |                                                      |
| Netherlands    | X              |                     |                       | X                                               |                                |                                                      |
| Austria        | X              |                     | X                     |                                                 |                                | X                                                    |
| Portugal       | X              |                     | X                     |                                                 |                                | X                                                    |
| Slovenia       | X              |                     |                       | X                                               |                                | X                                                    |
| Slovakia       | X              |                     |                       | X                                               |                                | X                                                    |
| Finland        |                | X                   |                       |                                                 |                                | X                                                    |

Source: ECB – HFCS metadata.  
\* Depending on the variable.

## 6.4 Comparative information on item non-response and imputation

Tables 18 to 20 below show information on the imputed observations for three key balance sheet variables: the current value of the HMR, the outstanding balance of the biggest loan collateralised by the HMR and the value of savings accounts. The first column indicates the share of households that have reported holding the item.<sup>30</sup> The next five columns show the share of observations that were collected (including those collected from administrative data), edited, estimated, imputed from a range value provided by the respondent or imputed from a missing value. The last two columns show the difference between the conditional means of all observations and

<sup>30</sup> These figures are unweighted.

“all observations, excluding those which were imputed from missing”. These indicators reflect the impact of imputations in different countries.

The difference between the mean of all values excluding those imputed from missing and the mean of all observations does not necessarily imply a biased imputation. It may just reflect differences between households that are able to provide asset values in the interview and those that are not.

In many cases, a high share of balance sheet values has been imputed from a range value provided by the respondent. This procedure should be distinguished from an imputation for a missing value, since the range value provides a fair estimation of the point value directly received from the respondent.

When comparing item non-response rates, a few issues should be noted. In some countries, the HFCS blueprint questionnaire was not implemented as originally designed and some of the HFCS variables were converted from variables collected in more detail for national-level purposes. Interviewing in more detail, as well as differences in the routing of the national questionnaire, might lead to higher non-response in the HFCS data. Moreover, when one HFCS variable is constructed from several national variables, non-response to any of the national questions will be reflected in the HFCS variable.

**Table 18**

Item non-response rates: current value of HMR

| Country        | Percentage owning HMR | Of those owning HMR |        |           |                     |                      | Conditional mean (EUR) |                                            |
|----------------|-----------------------|---------------------|--------|-----------|---------------------|----------------------|------------------------|--------------------------------------------|
|                |                       | Collected*          | Edited | Estimated | Imputed from ranges | Imputed from missing | All                    | Subtotal (excluding imputed from missing)# |
| Belgium        | 71.9                  | 86.5                | 2.9    | 0         | 9.2                 | 1.4                  | 351,699                | 352,698                                    |
| Czech Republic | 77.6                  | 100.0               | 0      | 0         | 0                   | 0                    | 177,838                | 177,838                                    |
| Germany        | 57.7                  | 94.8                | 0      | 0         | 2.8                 | 2.4                  | 390,860                | 390,137                                    |
| Estonia        | 81.0                  | 62.4                | 0.1    | 0         | 32.4                | 5.2                  | 131,432                | 131,896                                    |
| Ireland        | 83.0                  | 91.5                | 1      | 7.3       | 0                   | 0.2                  | 382,307                | 382,540                                    |
| Greece         | 57.2                  | 69.6                | 0.1    | 0         | 28.3                | 2.1                  | 128,390                | 129,105                                    |
| Spain          | 77.3                  | 88.1                | 0      | 0         | 10.1                | 1.8                  | 203,584                | 204,506                                    |
| France         | 75.5                  | 22.6                | 0      | 0         | 64.8                | 12.6                 | 307,033                | 317,766                                    |
| Croatia        | 86.7                  | 82.3                | 0.7    | 0         | 5.2                 | 11.8                 | 150,348                | 146,198                                    |
| Italy          | 79.4                  | 99.5                | 0.5    | 0         | 0                   | 0                    | 214,743                | 214,743                                    |
| Cyprus         | 77.2                  | 81.1                | 0.2    | 0         | 0                   | 18.8                 | 303,293                | 312,393                                    |
| Latvia         | 80.9                  | 61.4                | 0.1    | 0         | 23.3                | 15.2                 | 72,426                 | 80,361                                     |
| Lithuania      | 91.5                  | 89.8                | 0.9    | 0         | 0                   | 9.3                  | 98,360                 | 93,633                                     |
| Luxembourg     | 70.1                  | 74.0                | 0.1    | 0         | 10.2                | 15.8                 | 1,041,175              | 1,034,633                                  |
| Hungary        | 85.6                  | 100.0               | 0      | 0         | 0                   | 0                    | 98,865                 | 98,865                                     |
| Malta          | 81.5                  | 72.7                | 0      | 0         | 23.9                | 3.5                  | 417,545                | 418,074                                    |
| Netherlands    | 65.9                  | 83.8                | 4.9    | 0         | 6.1                 | 5.2                  | 411,910                | 414,570                                    |
| Austria        | 38.9                  | 75.6                | 0      | 0         | 19.7                | 4.7                  | 443,047                | 447,140                                    |
| Portugal       | 75.0                  | 56.0                | 0.1    | 0         | 20.6                | 23.3                 | 229,504                | 227,517                                    |
| Slovenia       | 77.9                  | 74.3                | 0.1    | 0         | 19.2                | 6.4                  | 190,577                | 191,309                                    |
| Slovakia       | 90.2                  | 95.9                | 0.4    | 0         | 0                   | 3.7                  | 143,453                | 142,969                                    |
| Finland        | 77.2                  | 0                   | 0      | 100       | 0                   | 0                    | 201,409                | 201,409                                    |

\* Collected observations include those collected from administrative sources.

# Includes observations collected (also from administrative sources), edited, estimated or collected as range values and then imputed.  
Note: Item response rates are not weighted, though conditional means are.

**Table 19**

Item non-response rates: largest mortgage on HMR: value still owed

| Country        | Percentage having mortgage | Of those having mortgage |        |           |                     |                      | Conditional mean (EUR) |                                            |
|----------------|----------------------------|--------------------------|--------|-----------|---------------------|----------------------|------------------------|--------------------------------------------|
|                |                            | Collected*               | Edited | Estimated | Imputed from ranges | Imputed from missing | All                    | Subtotal (excluding imputed from missing)# |
| Belgium        | 29.6                       | 85.5                     | 0      | 14.4      | 0.2                 | 0                    | 111,924                | 111,924                                    |
| Czech Republic | 9.7                        | 100.0                    | 0      | 0         | 0                   | 0                    | 50,474                 | 50,474                                     |
| Germany        | 16.8                       | 94.6                     | 0      | 0         | 2.8                 | 2.6                  | 105,675                | 107,037                                    |
| Estonia        | 24.9                       | 100.0                    | 0      | 0         | 0                   | 0                    | 50,388                 | 50,388                                     |
| Ireland        | 28.3                       | 98.0                     | 0      | 0         | 0                   | 2.1                  | 135,909                | 137,132                                    |
| Greece         | 5.9                        | 78.6                     | 0      | 0         | 16.3                | 5.1                  | 47,658                 | 48,673                                     |
| Spain          | 24.6                       | 94.1                     | 0      | 0         | 4.2                 | 1.7                  | 75,671                 | 75,910                                     |
| France         | 27.5                       | 54.1                     | 0      | 0         | 0                   | 45.9                 | 123,640                | 145,934                                    |
| Croatia        | 8.1                        | 72.7                     | 1.7    | 0         | 2.6                 | 23.1                 | 43,685                 | 44,425                                     |
| Italy          | 10.3                       | 95.5                     | 4.5    | 0         | 0                   | 0                    | 82,604                 | 82,604                                     |
| Cyprus         | 29.3                       | 88.1                     | 0.3    | 0         | 0                   | 11.6                 | 112,791                | 112,025                                    |
| Latvia         | 14.1                       | 93.6                     | 0      | 0         | 5.3                 | 1.2                  | 39,634                 | 39,620                                     |
| Lithuania      | 10.5                       | 81.5                     | 1.7    | 0         | 0                   | 16.9                 | 51,223                 | 49,507                                     |
| Luxembourg     | 38.7                       | 73.3                     | 0.4    | 0         | 10                  | 16.3                 | 365,467                | 337,319                                    |
| Hungary        | 15.7                       | 99.9                     | 0      | 0         | 0                   | 0.1                  | 20,004                 | 20,005                                     |
| Malta          | 13.6                       | 94.2                     | 0.7    | 0         | 0                   | 5                    | 101,760                | 103,403                                    |
| Netherlands    | 50.8                       | 76.6                     | 2.7    | 0         | 9.7                 | 11                   | 140,919                | 151,167                                    |
| Austria        | 10.7                       | 79.8                     | 0      | 0         | 8.8                 | 11.3                 | 95,380                 | 93,210                                     |
| Portugal       | 25.4                       | 62.3                     | 0.1    | 0         | 16.3                | 21.3                 | 73,098                 | 74,759                                     |
| Slovenia       | 9.2                        | 88.3                     | 1.1    | 0         | 3.8                 | 6.8                  | 52,268                 | 53,017                                     |
| Slovakia       | 27.9                       | 85.7                     | 1.4    | 0.2       | 0                   | 12.8                 | 50,746                 | 51,762                                     |
| Finland        | 36.8                       | 100.0                    | 0      | 0         | 0                   | 0                    | 94,955                 | 94,955                                     |

\* Collected observations include those collected from administrative sources.

# Includes observations collected (also from administrative sources), edited, estimated or collected as range values and then imputed.

Note: Item response rates are not weighted, though conditional means are.

**Table 20**

Item non-response rates: value of savings accounts

| Country        | Percentage having savings account | Of those having savings account |        |           |                     |                      | Conditional mean (EUR) |                                            |
|----------------|-----------------------------------|---------------------------------|--------|-----------|---------------------|----------------------|------------------------|--------------------------------------------|
|                |                                   | Collected*                      | Edited | Estimated | Imputed from ranges | Imputed from missing | All                    | Subtotal (excluding imputed from missing)# |
| Belgium        | 95.6                              | 71.0                            | 9.5    | 0         | 9.4                 | 10.1                 | 46,630                 | 44,208                                     |
| Czech Republic | 27.6                              | 100.0                           | 0      | 0         | 0.0                 | 0.0                  | 8,910                  | 8,910                                      |
| Germany        | 73.6                              | 93.6                            | 0      | 0         | 2.3                 | 4.1                  | 35,549                 | 35,530                                     |
| Estonia        | 43.8                              | 99.7                            | 0      | 0         | 0.3                 | 0.1                  | 16,860                 | 16,813                                     |
| Ireland        | 67.3                              | 68.5                            | 0      | 0         | 11.6                | 19.9                 | 31,650                 | 29,743                                     |
| Greece         | 96.0                              | 74.4                            | 0      | 0         | 0.0                 | 25.6                 | 11,206                 | 7,384                                      |
| Spain          | 15.2                              | 90.8                            | 0      | 0         | 5.3                 | 3.9                  | 29,369                 | 29,206                                     |
| France         | 90.9                              | 75.4                            | 0      | 0         | 16.7                | 8                    | 29,557                 | 29,298                                     |
| Croatia        | 18.1                              | 46.2                            | 0      | 0         | 0.0                 | 53.8                 | 24,604                 | 15,408                                     |
| Italy          | 14.9                              | 72.8                            | 0      | 0         | 27.2                | 0.0                  | 15,885                 | 15,885                                     |
| Cyprus         | 20.4                              | 77.3                            | 0      | 0         | 0.0                 | 22.7                 | 61,561                 | 63,946                                     |
| Latvia         | 35.0                              | 90.6                            | 0      | 0         | 0.9                 | 8.5                  | 3,666                  | 3,232                                      |
| Lithuania      | 23.8                              | 83.0                            | 0      | 0         | 0.0                 | 17.0                 | 12,016                 | 12,880                                     |
| Luxembourg     | 72.3                              | 65.4                            | 0      | 0         | 14.0                | 20.6                 | 101,911                | 112,293                                    |
| Hungary        | 21.5                              | 61.4                            | 38.7   | 0         | 0.0                 | 0.0                  | 13,480                 | 13,480                                     |
| Malta          | 34.2                              | 60.9                            | 0      | 36.9      | 1.4                 | 0.9                  | 28,726                 | 28,813                                     |
| Netherlands    | 80.8                              | 73.8                            | 0      | 0         | 11.4                | 14.8                 | 46,904                 | 44,307                                     |
| Austria        | 82.7                              | 70.3                            | 0      | 0         | 12.9                | 16.8                 | 30,321                 | 27,906                                     |
| Portugal       | 45.3                              | 47.1                            | 0      | 0         | 19.0                | 33.9                 | 39,164                 | 39,402                                     |
| Slovenia       | 18.9                              | 65.4                            | 0      | 0         | 8.0                 | 26.6                 | 23,824                 | 23,850                                     |
| Slovakia       | 37.6                              | 67.9                            | 0      | 0         | 0.0                 | 32.1                 | 11,698                 | 10,489                                     |
| Finland        | 53.5                              | 35.4                            | 0.2    | 58.3      | 2.3                 | 3.8                  | 34,882                 | 34,560                                     |

\* Collected observations include those collected from administrative sources.

# Includes observations collected (also from administrative sources), edited, estimated or collected as range values and then imputed.  
Note: Item response rates are not weighted, though conditional means are.

## 7 Variance estimation

Variance estimation allows researchers to distinguish between a statistically significant phenomenon and a spurious result caused by the random nature of the sample. Underestimating the variance of an estimate may lead to incorrect conclusions (too many false positives), while overestimating the variance seemingly renders the data less useful, as fewer outcomes are estimated as being statistically significant.

The variance of an estimator can have several components, though not all components can be estimated. One central component is sampling error, which can arise when the units participating in the survey are selected at random. A second key component is item non-response, which is addressed in the section on imputation

and which will be connected to the total variance estimation discussed in this chapter.<sup>31</sup>

Users of the HFCS need to be able to estimate the variance of several kinds of indicators. This chapter explains the use of replication-based methods and describes the one chosen for the HFCS.

## 7.1 Variance estimation using replication-based methods

Since sampling error is linked to sample design, its estimation relies on the provision of sample design information. In most surveys, information on the number of stages of sampling, the strata at each stage, the identification of sampling units (primary, secondary, etc.) and the selection method (e.g. with or without replacement, equal or unequal probabilities) is sufficient to allow end users to estimate sampling variance, using linearisation techniques for estimators other than means or totals. Even so, calculating these variance estimates is far from simple when the sample design is complex.

Moreover, sample design information is often withheld for confidentiality reasons: in many countries, the first level of stratification is often geographic (regions), and primary sample units are often linked to geographical units (municipalities, blocks, etc.). This increases re-identification risk, and survey producers are understandably concerned about providing sample design information in such cases.

Replication techniques are a robust and flexible way of estimating variance, even when dealing with complex survey designs. Although in theory they apply only to linear statistics, and asymptotically in the case of the bootstrap, in practice these techniques have been found to be very useful because they are flexible enough to cope with a range of sampling designs and various kinds of statistics, without requiring an explicit formula for the variance of each statistic (as with linearisation techniques).

In replication techniques, the full sample is used to draw (in different ways) sub-samples or replicate samples, which are then used to estimate the statistic of interest and its variation across replicate samples and which can be provided to users as a (large) set of replicate weights. Various replication techniques exist, including jackknife, balanced repeated replication and bootstrap, each with many variants.

The HFCS uses bootstrap to compute replicate weights, as it is sufficiently flexible to cover the various national sample designs and powerful enough to cover many types of estimators.

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<sup>31</sup> Other potentially relevant sources of variability, which the survey is not currently able to estimate, include variations in the understanding of questions by respondents, in interviewers' adherence to survey protocol, in formal sample coverage and in decisions made in data editing or other aspects of processing.

In the bootstrap procedure, a with-replacement<sup>32</sup> sample of primary sampling units (PSUs) from each stratum is selected.<sup>33</sup> The number of PSUs per stratum does not need to be constant. The number of replicates (bootstrap samples), as well as the number of PSUs sampled in each replicate, can be chosen freely, although there are practical recommendations for both these quantities (for example, in the rescaling bootstrap proposed by Rao and Wu, 1988, and generalised by Rao et al., 1992). The bootstrap becomes more precise as the number of replicates increases.

## 7.2 The Rao-Wu rescaled bootstrap and its extensions

The variant of bootstrap used for the HFCS is the rescaling bootstrap of Rao and Wu (1988), as further specified by Rao, Wu and Yue (1992). It is suitable for one-stage samples and can also be used in the case of a multi-stage sample drawn with a low sampling fraction in the first stage. This is the case in several popular setups of stratified sampling, although other sampling designs can also be approximated using this setup. While, like all bootstrap methods, the rescaling bootstrap is computationally intensive and the resulting variance estimates may be less stable than with other methods (such as jackknife and linearisation), it provides consistent variance estimates in the case of non-smooth statistics such as distribution quantiles.

The Rao-Wu bootstrap can be described as follows. We consider the case of strata indexed by  $h = 1, \dots, H$ , with  $N_h$  units in each of them, out of which  $n_h$  are sampled without replacement. The sampling fraction is thus  $f_h = n_h/N_h$ . To each unit  $(h, i)$ , there is a variable of interest  $y_{hi}$  and a weight  $w_{hi} = N_h/n_h$ . The total of this variable is  $Y = \sum_{h=1}^H \sum_{i=1}^{N_h} y_{hi}$ , which is estimated without bias by  $\hat{Y} = \sum_{h=1}^H \sum_{i=1}^{n_h} w_{hi} y_{hi}$ . The parameter of interest is a function of this total, say  $\hat{\theta} = f(\hat{Y})$ . For the Rao-Wu bootstrap applied in the HFCS, the following is carried out  $B$  times:

A sample of size  $m_h$  is taken with replacement from each stratum.

Writing  $r_{hi}^*$  for the number of times unit  $(h, i)$  is resampled, the weights are adjusted as follows:  $w_{hi}^* = \left(1 - \lambda_h + \lambda_h \frac{n_h}{m_h} r_{hi}^*\right) w_{hi}$  with  $\lambda_h = \sqrt{\frac{m_h(1-f_h)}{n_h-1}}$ .

The bootstrap total is computed as  $\hat{Y}_b^* = \sum_{h=1}^H \sum_{i=1}^{m_h} w_{hi}^* y_{hi}$  and  $\hat{\theta}_{*b} = f(\hat{Y}_b^*)$ .

The bootstrap variance is then calculated as  $V_{*(\theta)} = \frac{1}{B-1} \sum_{b=1}^B \left(\hat{\theta}_{*b} - \bar{\hat{\theta}}_*\right)^2$ , where  $\bar{\hat{\theta}}_*$  is the mean of the bootstrap total over all  $B$  iterations.

### 7.2.1 Replicate sample size

In the HFCS, the replicate samples are drawn independently and with replacement in each stratum. The number of units  $m_h$  drawn in each stratum of size  $n_h$  is set to  $m_h = n_h - 1$ . The final estimation weight for each observation is then rescaled by a

<sup>32</sup> Meaning that each selection is independent, such that an element may be selected more than once and thus may appear multiple times in the same sample.

<sup>33</sup> In case of multi-stage sample designs, the methods below only consider the first sampling stage, as in practice this stage represents the largest part of the variance.

specific factor  $\frac{n_h}{n_h-1}$  and multiplied by the frequency of the observation in the replicate sample (number of hits).

## 7.2.2 Number of replicates

The number of replicates is at least 1,000, as a commonly used compromise between computational efficiency and stability of the variance estimates. Given the way bootstrap works, in practice it is not necessary to use all the weights. It is possible to use only, say, the first 200 or 500 replicates for faster (but somewhat more unstable) variance estimation. This may depend on the type of estimator and the size of the domain (e.g. mean of the total population vs. medians for specific population subgroups).

## 7.2.3 Variance estimation model

Given that the standard Rao-Wu rescaled bootstrap is suited to one-stage stratified simple random samples, but that two- and three-stage designs are used in some countries, a variance estimation model is used in those countries. Most notably, the second sampling stage is dropped (as in practice most of the variance originates from the first stage), except when the PSU is sampled with certainty, in which case the second sampling stage is used in the bootstrap. Strata may be merged, especially if the number of units is small. In countries with dual-list samples, some adaptation of the methods was required when conducting this survey.

## 7.2.4 Calibration of replicate weights

Since the final weights are adjusted for non-response (see Section 5.3 of this report), post-stratified or calibrated (the specific technique not being important), the replicate weights have been adjusted according to the same procedure, such as by running the calibration procedure with the same margins on each of the replicate weights. This can be considered an additional rescaling factor. For instance, after drawing the sample and rescaling the weights as described in Section 7.2, the weights are further rescaled to satisfy post-stratification or calibration constraints for each replicate. This is to ensure that the replicate estimates are close to unbiased in each replicate sample.

In most countries, each set of replicate weights sums up to the same number of households, consistent with the sum of the final estimation weights, and to the same number of persons. When they do not, the variation in the number of households/persons is limited.

## 7.2.5 Extension to multi-stage sampling

In each stage, the sampling of units (primary, secondary, and so on, up to ultimate) induces an additional component of variability. In multi-stage designs, the usual assumption is that sampling variance comes mostly from the first stage of sampling (i.e. the selection of PSUs and not the selection of secondary sampling units (SSUs) in each PSU). This helps to simplify the variance formulae and reduce the computation burden, with a negligible loss of information in the presence of small

sampling fractions in the subsequent stages. Preston (2009) proposes an alternative that extends the without-replacement bootstrap to include multistage sample designs.

## 7.3 Combining replicate weights and multiple imputation

In the description below, we consider the general features of a multiply-imputed sample survey, as described in Chapter 6 of this report. Each observation has a final estimation weight  $w_i$ . There are  $M$  imputates (multiple imputation) indexed by  $m$ , and  $B$  replicate weights  $w_{ib}$  indexed by  $b$ . In the HFCS,  $M = 5$  and  $B = 1000$ .

For each impute  $m$ , the estimator of interest  $\theta_m$  is calculated using the estimation weight  $w_i$  (for example, the population total of a variable  $y$  is calculated as  $\sum_i w_i y_{im}$ ). The variance of this estimator is estimated using the bootstrap weights as follows: for each of the  $B$  replicates,  $\theta_{mb}^*$  is calculated using the replicate weight  $w_{ib}$ , with mean across replicates  $\bar{\theta}_m^* = \frac{1}{B} \sum_{b=1}^B \theta_{mb}^*$ . The partial variance for impute  $m$  is  $U_m = \frac{1}{B-1} \sum_{b=1}^B (\theta_{mb}^* - \bar{\theta}_m^*)^2$ . This is the standard bootstrap variance used in complete case analysis.

The total variance is then calculated according to the MI formula:

$$T = W + \left(1 + \frac{1}{M}\right) Q,$$

where  $W$  is the within variance,  $W = \frac{1}{M} \sum_{m=1}^M U_m$ ,  $Q$  is the between-imputation variance,  $Q = \frac{1}{M-1} \sum_{m=1}^M (\theta_m - \bar{\theta})^2$ , and the final estimator of interest is  $\bar{\theta} = \frac{1}{M} \sum_{m=1}^M \theta_m$ .

### 7.3.1 Test statistics

According to multiple imputation theory, the quantity  $(\theta - \bar{\theta})T^{-\frac{1}{2}}$  is approximately distributed as a t-distribution with  $\nu_M$  degrees of freedom, and where  $\nu_M =$

$$(M-1) \left(1 + \frac{W}{(1+\frac{1}{M})Q}\right)^2.$$

Barnard and Rubin (1999) recommend an alternative measure in the case of small samples, as in that case, the  $\nu_M$  can be much larger than the complete data degrees of freedom. This recommended measure is  $\nu_M^* =$

$$\left(\frac{1}{\nu_M} + \frac{1}{\nu_{obs}}\right)^{-1}, \text{ where } \nu_{obs} = \frac{\nu_0+1}{\nu_0+3} \nu_0(1-\gamma), \nu_0 \text{ is the complete-data degrees of freedom, and } \gamma = \frac{(1+\frac{1}{M})Q}{T}.$$

In the context of sample surveys, degrees of freedom are customarily calculated as  $n - L$ , where  $n$  is the number of PSUs and  $L$  is the number of strata. For the HFCS, at the euro area level as a whole, it is likely that the large sample assumption holds, and that the measure  $\nu_M$  is more appropriate. However, when looking at country-level data, where the number of PSUs is not large, it may be more appropriate to use small-sample formulas. It is proposed to leave this decision to final users.

## 7.4 Variance estimation of changes between waves

In addition to estimating variances of indicators at a given time  $t$ , the five waves of the HFCS add a time-series dimension to the data analysis. It is therefore necessary

to understand the principles of estimating the variance of changes between time  $t$  and  $t + 1$  for different estimators. The estimator for a parameter  $Y$  at a given time  $t$  for a probability sample  $s_t$  is denoted as  $\hat{Y}_t$ .  $\hat{Y}_t$  appropriately reflects the sampling design used to select  $s_t$ . Correspondingly,  $\hat{Y}_{t+1}$  denotes the estimator for the same parameter at time  $t + 1$ , which again appropriately reflects the sampling design used to select  $s_{t+1}$ .

The change in the estimator of parameter  $\hat{Y}$  between  $t$  and  $t + 1$  can be denoted as  $\hat{D} = \hat{Y}_{t+1} - \hat{Y}_t$ . The variance of  $\hat{D}$  is given by:

$$\text{Var}(\hat{D}) = \text{Var}(\hat{Y}_t) + \text{Var}(\hat{Y}_{t+1}) - 2\text{Cov}(\hat{Y}_t, \hat{Y}_{t+1}),$$

where  $\text{Var}(\hat{Y}_t)$  and  $\text{Var}(\hat{Y}_{t+1})$  denote the unconditional variances of  $\hat{Y}_t$  and  $\hat{Y}_{t+1}$ , respectively, and  $\text{Cov}(\hat{Y}_t, \hat{Y}_{t+1})$  denotes the unconditional covariance between  $\hat{Y}_t$  and  $\hat{Y}_{t+1}$ .<sup>34</sup> When the sampling designs at time  $t$  and  $t + 1$  are statistically independent, the estimators of parameter  $Y$  are also independent. Consequently, the covariance between the two estimators of parameter  $Y$  is 0 and the variance of the change in the parameter is equal to the sum of variances of  $\hat{Y}_t$  and  $\hat{Y}_{t+1}$ . If the two samples are not statistically independent, usually  $\text{Cov}(\hat{Y}_t, \hat{Y}_{t+1}) > 0$  and the estimates of change are more efficient.

The HFCS includes samples with a panel component, which means that the cross-sectional samples at  $t$  and  $t + 1$  are not statistically independent. On the other hand, there are no instances where the net samples at  $t$  and  $t + 1$  would consist of exactly the same population, due to refresher samples, attrition and other types of entries to and exits from the sample population.

While it is important to acknowledge the impact of sample coordination on the variance of changes in parameter values, calculating exact measures of such variance is not easy.<sup>35</sup> Furthermore, taking the covariance between these estimators as zero in two household surveys conducted with identical sampling designs at different times will lead to conservative estimates of the precision of changes and overstate variance.

## 8 Statistical disclosure control

Statistical disclosure control for the HFCS has two facets: “safe users” and “safe data”. Safe users refers to the procedure for granting access to the HFCS dataset, as explained in Section 8.1 below. Safe data is the process whereby the data collected during the survey are anonymised, i.e. treated in such a way that the effort needed to re-identify a particular respondent – either a household or a person – is disproportionately high. This anonymisation procedure is described in Section 8.2.

<sup>34</sup> See Eurostat (2013).

<sup>35</sup> Several papers, including Berger (2004) and Berger and Priam (2010), propose methodologies to estimate covariance matrices for estimators measured at different points of time for overlapping samples using various kinds of information on sampling designs.

## 8.1 Access to HFCS microdata

Access to HFCS microdata may be requested for research projects. Researchers must submit a microdata access request form, which includes a confidentiality commitment that must be signed. Further information on accessing microdata can be found on the [HFCS main page](#), including the [access request form](#).

The following sections explain the anonymisation procedure of this dataset.

## 8.2 General principles of statistical disclosure control in the HFCS

The anonymisation procedure has two main components: “general anonymisation procedures” and “country-specific anonymisation procedures”. General anonymisation procedures are applied to the data of all countries and are designed to ensure data comparability, insofar as possible. Meanwhile, country-specific anonymisation procedures are applied to the extent necessary and on a case-by-case basis, depending on local data protection regulations, assessments of disclosure risk or customs.

The ECB applies the general anonymisation procedure before disseminating the data externally, although this procedure may already have been applied by the NCB (or NSI) before submitting the data to the ECB. Country-specific anonymisations are usually applied by the NCB (or NSI), but may also be applied by the ECB in close coordination with the NCB (or NSI) concerned, to ensure the confidentiality of responses where necessary.

### 8.2.1 General anonymisation procedures

For all countries, the following steps are taken:

- Most information on the sample, such as the date of interview or characteristics of the dwelling or sampling units, is not included in the research dataset for anonymisation purposes.
- Only those households that participated in the survey are included in the research dataset, meaning that non-respondents are not included.
- Some variables are top- or bottom- coded. These include age (top-coded at 85), length of stay in the country (top-coded at 85), time lived in the HMR (top-coded at 85), year of property acquisition (bottom-coded at 1935), total time in employment (top-coded at 73), number of years contributing to a pension plan (top-coded at 73) and the year in which a gift/inheritance was received (bottom-coded at 1935).
- For a number of variables, bracketed versions are included in the research dataset. The original variables are included only for those countries where further anonymisation is not required. These include age (18 brackets), size of

the HMR (ten brackets) and number of employees in self-employment businesses (five brackets).

- For several variables, the categories are grouped together. These include country of birth (recoded in four categories, showing only the country where the survey took place, other euro area countries, other EU countries, and other countries), education (recoded in four categories, according to the International Standard Classification of Education (ISCED), version 1997, namely ISCED 1, ISCED 2, ISCED 3+4 and ISCED 5+6+7+8) and ISCO description of employment (limited to the first digit of the ISCO classification).

## 8.2.2 Country-specific anonymisation procedures

In addition to the general procedures that the ECB applies to certain variables for the whole dataset, similar procedures (deletion, top- or bottom-coding, bracketing, grouping of categories) may also be applied to other variables for individual countries if this is considered necessary at national level for anonymisation purposes.

Furthermore, random rounding is applied to certain numeric variables in a number of countries. The approach used is based on Kennickell and Lane (2007). The idea is to prevent identification disclosure through matching with the exact amounts provided by the household. The solution is to round the numbers to a specified precision, randomly, in a way that does not bias the results (either up or down, based on how far the amount is from the rounded values above and below).

This procedure is equivalent to adding random noise of mean 0 to each amount, with heteroscedastic variance. For example, 12,345 would be rounded to 12,000 approximately two-thirds of the time, and to 13,000 one-third (if rounded to two digits). This is done independently across implicates.

Altogether, this is a minor statistical disclosure control measure, the effect of which is limited, as the respondents themselves often spontaneously round many amounts. It should be applied only when there is a clear case of re-identification risk (e.g. matching with administrative data). Internal tests have shown that rounding to two digits has a minimal effect on sample means and that rounding to three digits has a similar minimal effect on medians.

# 9 Comparability issues

## 9.1 Data comparability between survey waves

Countries are continuously working to improve their surveys by expanding coverage, reducing non-response, limiting response bias, and refining sampling, imputation and other methodological aspects. As a result, survey methods and coverage do change over time.

Because of these ongoing improvements, differences in results between survey waves should be interpreted with caution. Some of the observed changes may reflect methodological updates rather than actual changes in the underlying trends. Furthermore, the impact of COVID-19 on the 2021 wave (in terms of data collection and the economic and financial situation of households)<sup>36</sup> should also be considered when interpreting changes between the 2021 and the 2023 waves.

Detailed metadata covering various aspects of data collection are collected from all NCBs and NSIs participating in the HFCS. To conclude our description of methodologies, this section describes the most important methodological changes to have occurred between the most recent and the previous survey wave(s) across various countries.

In [Estonia](#), information on non-collateralised loans and leasing has been obtained from administrative data since the 2017 wave, whereas in the 2014 wave this information was collected via interviews. Information on private loans has been collected separately since the 2017 wave, while previously it was included in other non-collateralised loans. From the 2021 wave onwards, information on mortgage loans has also been taken from administrative sources.

Until the 2021 wave, gross wages included social security contributions paid by employers, although since the 2023 wave these amounts have been excluded to ensure compliance with HFCS definitions.

Additionally, following the 2021 Pillar II pension reform, pensions have been classified as voluntary pension schemes as of the 2023 wave, while they were treated as public pensions in previous waves.

In [Ireland](#), administrative data from the Central Bank of Ireland's Central Credit Register (CCR) has been used since the 2021 wave to supplement responses to debt questions in the survey, thus improving the accuracy and coverage of debt data. This marks an important change from previous waves, where data collection for debt variables was based solely on information self-reported by households. A revised version of the 2017 wave data incorporating the CCR is available, making it comparable to subsequent waves. However, this leads to comparability issues between the 2014 and the 2017 wave data, since CCR data are not available for the former.

Further methodological changes were introduced in the 2023 wave. These include the incorporation of register data provided by the Pension Authority for Personal Retirement Savings Accounts (PRSAs), an updated calibration procedure using population benchmarks from Census 2022 (replacing the Labour Force Survey demographic data used for 2018 and 2020), and a new calibration benchmark incorporating the number of agricultural holdings by NUTS2 region. Accordingly, revised data for the 2017 and 2021 waves have also been made available.

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<sup>36</sup> See HFCN (2023), "[Household Finance and Consumption Survey: Methodological report for the 2021 wave](#)", *Statistics Paper Series*, No 45, European Central Bank, June.

In [the Netherlands](#), the first two waves were based on smaller samples (around 1,200 households) and information on assets and liabilities was derived from existing Dutch surveys. Since the 2017 wave, samples of approximately 2,500 households have been used and the exact wording of the HFCN questionnaire has been followed. Therefore, the first two waves may show more sampling uncertainty, and differences in the wording may also have influenced the outcomes.

In [Luxembourg](#), the COVID-19 pandemic forced a change in the survey mode in the 2021 wave, moving from 100% CAPI in the 2017 wave to 100% CAWI in the 2021 wave. This led to a drop in the response rate from 24% to 10% and may affect the comparability of results between the 2017 and 2021 waves. While the 100% CAWI survey mode was maintained in the 2023 wave, certain changes were made to the incentives scheme, which resulted in an increase in response rates from 10% in the 2021 wave to 20.7% in the 2023 wave.

In the 2021 wave, the survey included, for the first time, residents employed at extraterritorial institutions (e.g. EU institutions, NATO), which represent around 10% of the total population. This change is expected to provide better coverage of the target population.

The pension section was redesigned in the 2021 wave due to issues with the questionnaire previously used. This resulted in a substantial increase in participation rates in the pension section in the 2021 wave.

In [Italy](#), the sample design of the survey was modified as of the 2021 wave in order to improve the statistical coverage of indebted households and high-income households. However, this redesign has made it difficult to compare the results with those obtained in previous waves. To account for this drawback, an additional weighting system has been constructed to enable comparisons of results across waves.<sup>37</sup> Following the publication of the 2021 wave and the availability of improved benchmark data, the weighting methodology was refined, including a revision of the weights for the 2021 wave (see Loschiavo et al., 2024).

During the 2021 wave, the oversampling strategy had to account for both household income and debt due to the inclusion of an independent sample of indebted households, which was needed to achieve the intended sample size due to pandemic-related constraints. In contrast, for the 2023 wave, the originally planned oversampling strategy was implemented. This approach focused exclusively on household income strata for each main region, eliminating the need for adjustments related to debt oversampling.

In [Croatia](#), the wealth oversampling strategy for the 2023 wave was revised, drawing on experience from previous waves. Previously, oversampling was based on dwelling characteristics, specifically targeting households with a floor space exceeding 120 square metres. For the 2023 wave, the strategy shifted to an income-

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<sup>37</sup> Data available in variable HW0010A. Details on the construction of the weight for time series comparisons can be found in Gambacorta and Porreca (2022).

based approach based on administrative fiscal data, combined with census information to determine household structure.

*Slovakia* also updated the wealth oversampling strategy for the 2023 wave based on expected non-response rates from previous waves. The revised approach relied on a combination of income, regional and dwelling characteristics criteria, which significantly improved the effective oversampling rate compared with previous waves, which were based solely on personal income.

## 9.2 Data comparability between countries

Household net wealth varies substantially across euro area countries, with the median ranging from €44,000 to €676,000 and the mean from €99,000 to €1,160,000. A great deal of work has gone into making figures comparable across the euro area. Nevertheless, cross-country differences should be interpreted with care, as institutional and methodological aspects affect the indicators across countries.

A key aspect of the HFCS that affects cross-country comparability is the fieldwork period. Considerable efforts have been made to harmonise the timing of fieldwork, along with the reference years for income, assets and liabilities. In the 2017 wave, most countries carried out the majority of interviews in 2017. However, this harmonisation was disrupted in the 2021 wave (originally referred to as the 2020 wave) due to the COVID-19 pandemic. In several countries, fieldwork originally scheduled for 2020 was postponed to 2021. In the 2023 wave, the majority of interviews were carried out in 2023, although two countries already started their fieldwork in 2022, while four countries started as late as 2024 and one only in 2025. As a result, cross-country comparisons should take into account that fieldwork took place at different times.

Furthermore, household characteristics and institutional factors vary across countries. For example, in this survey, wealth is measured at the household level, yet the average size of a household differs from country to country. For instance, the share of one-person households is more than 40% in Germany, Lithuania, the Netherlands and Finland, but only 25% or less in Ireland, Croatia, Cyprus and Slovakia. Since higher levels of household wealth are generally observed for larger households, differences in the demographic structure should be taken into account when comparing indicators on household assets.

The same holds true for rates of home and land ownership and for household preferences when it comes to holding real or financial assets. Most importantly, house price developments and the extent to which households take up loans to acquire property differ markedly across countries. Homeownership rates, in particular, have a strong impact on wealth differences across countries. In Germany and Austria less than 50% of households own their main residence, whereas this share is higher than 80% in Lithuania, Croatia, Hungary and Slovakia. The share of non-financial assets in households' portfolios also affects the survey results – particularly mean values of wealth – since financial assets are usually not reported in surveys as comprehensively as real assets are. Furthermore, the definition of

household wealth excludes certain items considered relevant in specific countries. Most notably, defined benefit schemes for occupational pensions are significant components of household wealth in the Netherlands.<sup>38</sup> In Estonia, car leasing (capital leases) is an important financial activity, yet the HFCS framework does not include such leases as part of real assets or liabilities.

The magnitude of “public” wealth (including pensions, social housing and the provision of public services) varies across countries, and the expected value of, say, public pensions can have a significant impact on households’ saving behaviour. It is crucial to understand that the HFCS measures household wealth only and does not provide any insight into the wealth of the public sector.

From a methodological standpoint, in complex surveys like the HFCS, every step of data collection and processing can influence the statistical inference based on the final dataset. All decisions made with regard to the construction of the questions asked, sampling design, non-response, protocols for survey execution, editing, imputation, weighting design, tools for variance estimation and all other steps of survey production may significantly influence the bias and variance of estimates based on the final data.

Survey execution protocols differ significantly across countries and this report reflects those differences. For statistical processing, the HFCS provides high-level frameworks and, in some areas, fairly detailed guidance. Nevertheless, room for interpretation and professional judgement remains. These choices can affect how far the results depart from the truth (bias), how uncertain the estimates are, and how well that bias or uncertainty is captured in the reported figures. Choices in statistical processing often involve a trade-off between measured bias and measured uncertainty. As a consequence, datasets produced under approaches that reduce variance at the expense of bias may yield statistically significant results more frequently, even if the underlying (and unobservable) bias is larger.

## 9.3 Demographic information in the HFCS compared with other statistics

The HFCS provides a unique source of data on household-level wealth, indebtedness, income and consumption for the euro area, Hungary and the Czech Republic. There are no other data sources that cover all these topics at both the personal and household level, although individual components of the survey are measured by other statistics. Even though the definitions of variables and data production approaches in other statistics are sometimes quite different from those used in the HFCS, these sources can still be used as a benchmark.

The target population of the survey consists of private households residing in the country at the time of data collection, as well as all individuals who are members of those households at that time. For the survey results to be reliable, the composition

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<sup>38</sup> A non-core variable on occupational pension schemes without an account balance is included in the HFCS user database so that adjustments can be made for the otherwise distorted net median and mean wealth position of Dutch households in comparison with other countries.

of the surveyed population – by age, household size, economic activity and other characteristics – needs to reflect the target population.

Several external sources measure the composition of the household population in euro area countries and can be used as benchmarks against which the HFCS data can be compared:

- *Eurostat population statistics* provide reliable figures on the size of the population and include breakdowns by characteristics such as age and gender, enabling comparisons with basic person-level data.
- *EU statistics on income and living conditions (EU-SILC)*, a harmonised annual survey conducted in all EU countries (using the same household definition as the HFCS), include household information such as household size or labour status of household members.

The following sections explore how HFCS data compare with these external benchmarks, focusing on demographic characteristics such as age, household size and labour status. When comparing the HFCS with EU-SILC, it is important to note that both surveys face similar challenges in conducting household surveys, and differences in their results may stem from methodological variations.

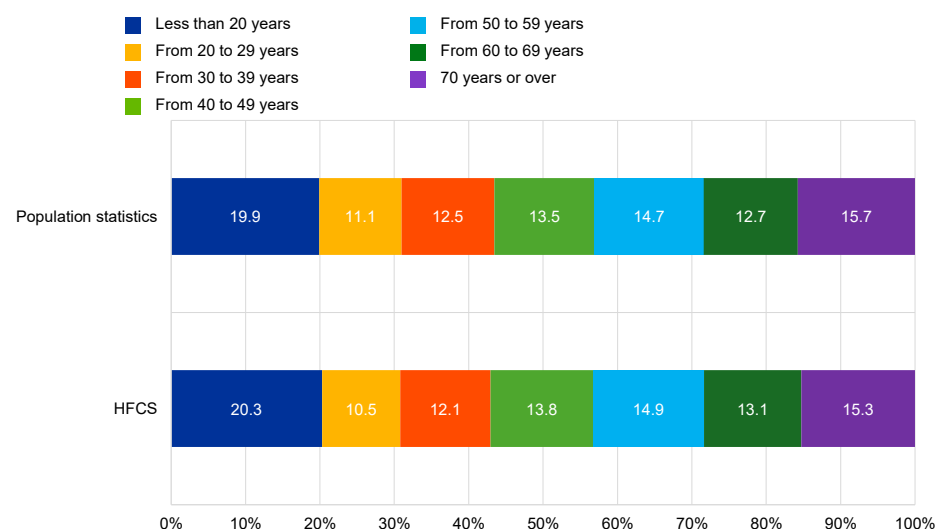
### 9.3.1 Age structure

Household net wealth by age of RPs displays a hump-shaped profile, generally increasing up to approximately age 60 and then gradually declining. Differences in wealth are substantial between households with younger RPs and those with RPs approaching retirement age. Therefore, it is essential that the age distribution of the survey sample accurately represents the target population.

Chart 5 below presents the age distribution observed in the HFCS alongside that derived from population statistics. The age structure of the euro area population is very similar in the HFCS and in the population statistics.

**Chart 5**

Euro area population structure by age in the HFCS and population statistics



Sources: ECB – HFCS and Eurostat – Population statistics.  
 Note: Population statistics data refer to 2023.

### 9.3.2 Household size

In the HFCS, wealth is reported at the household level without applying equivalence scales<sup>39</sup>, which differs from most income statistics such as EU-SILC. This approach aligns with international recommendations to use households as the preferred unit for analysing household wealth (OECD, 2013). As a result, the distribution of the survey population by household size is an important consideration – not only for comparing wealth levels, but also for assessing the sample’s representativeness.

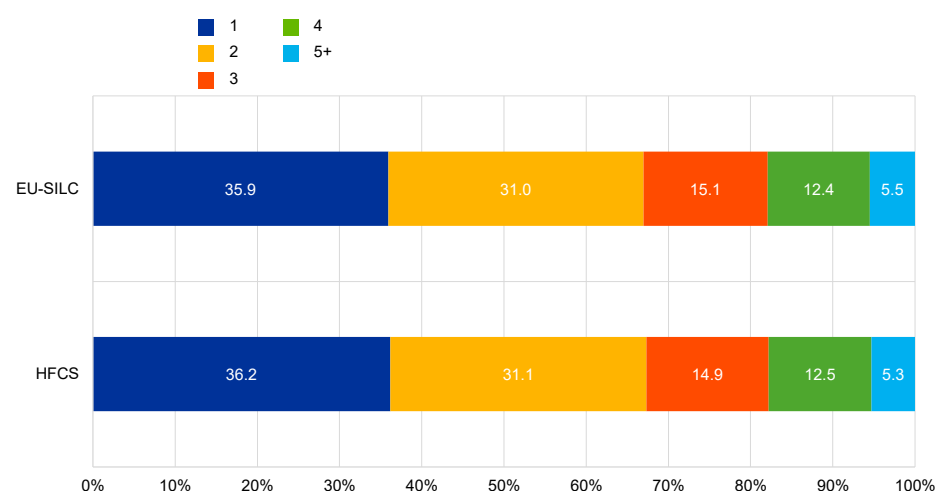
Larger households generally hold more wealth than smaller ones because they have more adult members who contribute individual wealth, and they also tend to live in larger, more valuable homes. Given the significance of the HMR in the wealth portfolios of households, most countries included household size as a calibration variable, using data from censuses or other surveys.

Chart 6 below shows the distribution of the euro area household population by household size compared with the distribution in EU-SILC (which is a comparable benchmark since it uses the same household definition as the HFCS). The distributions in the two surveys are very similar. As with the age distribution, the small differences should not lead to significant bias when interpreting the HFCS results.

<sup>39</sup> Wealth is measured and reported for the household as a whole, without adjusting for household size or composition. For example, a household of one person and a household of four people are compared based on their total net wealth, with no scaling to account for the number of members.

**Chart 6**

Euro area household structure by household size in the HFCS and EU-SILC



Sources: ECB – HFCS and Eurostat – EU-SILC.

Note: EU-SILC data refer to 2023.

### 9.3.3 Labour status

Another key factor influencing household wealth is labour status. The HFCS collects information on the labour status of every household member aged 16 or over, indicating whether a person is employed, retired, unemployed or in another situation. For those employed, there is an additional question on whether the person is an employee or self-employed.

The composition of the population by labour status carries important implications for the results. According to the HFCS results, households whose RP is self-employed tend to report the highest average levels of wealth, while households whose RP is not economically active<sup>40</sup> record the lowest wealth holdings.

As in the case of household size, the distribution by labour status can be compared with the distribution in EU-SILC, which uses a similar classification. The main exception concerns the HFCS category of “on sick/maternity/other leave (except holidays), planning to return to work”, which is not separately identified in EU-SILC; individuals in this situation are most often recorded as employees.

Chart 7 below presents the distribution of individuals aged 16 or over in the HFCS and EU-SILC by self-defined labour status for the euro area. Overall, the two surveys show very similar population structures. While the HFCS shows a slightly larger share of employees (by about 1.8 percentage points, assuming the category of “on maternity/sick leave” is allocated to employees in EU-SILC), the shares of the other labour statuses are slightly higher in EU-SILC (by up to 1.6 percentage points for “other inactive”). However, some degree of divergence between the two sources is to be expected, since labour status can sometimes be difficult to self-report, and

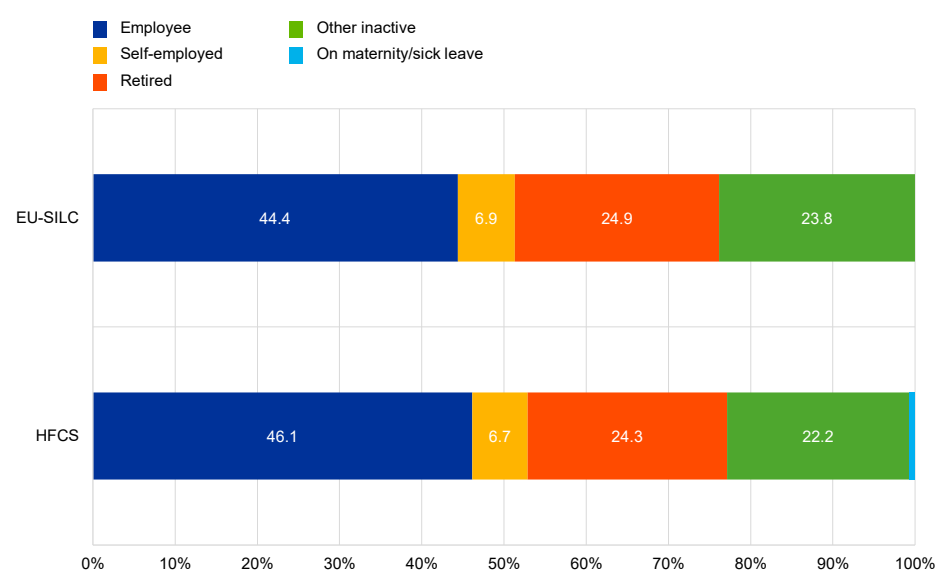
<sup>40</sup> Not economically active includes the unemployed, students, the permanently disabled, military personnel and those fulfilling domestic tasks.

because of differences in the timing of data collection (HFCS data collection is more spread out).

Differences are also linked to the methodological features of both surveys. In the HFCS, the oversampling of the wealthy may affect the distribution. Moreover, in the HFCS, detailed questions on self-employment activities are asked before labour status is recorded, which can influence how respondents classify themselves. The role of interviewers is crucial in ensuring accurate reporting for questions such as those relating to labour status.

**Chart 7**

Euro area population structure by labour status in the HFCS and EU-SILC



Sources: ECB – HFCS and Eurostat – EU-SILC.

Notes: EU-SILC data refer to 2023. The "other inactive" category includes individuals such as students, those who are permanently disabled, individuals in military service and people fulfilling domestic tasks.

## 9.4 Comparing the HFCS and macro data on financial wealth and liabilities

Information on household wealth and liabilities is also available from macroeconomic sources, particularly national accounts. While it is useful to compare wealth data obtained from micro and macro statistics, it should be noted that definitions and methodologies underlying the two statistics differ substantially. As a result, divergences in measured wealth levels are to be expected.

Several factors explain the gap between totals derived from micro data and those obtained from macro sources, including differences in the delineation of the household sector, in asset valuation methods and reference periods, and in the definition of wealth and its components. Furthermore, despite the oversampling of wealthy households, the HFCS may fail to capture some very wealthy households, whose assets and liabilities are instead reflected in national accounts figures.

Such discrepancies have been examined in several research papers, including Andreasch and Lindner (2014) and Honkkila and Kavonius (2013). In addition, an expert group coordinated by the ECB assessed and quantified the differences between survey data and national accounts figures for household wealth (Expert Group on Linking Macro and Micro Data for the Household Sector, 2020). Since 2024, [Distributional Wealth Accounts](#) are available as experimental statistics, linking the HFCS and national accounts. Based on this body of work, this section focuses on comparing items that are conceptually more aligned and therefore more directly comparable.

### 9.4.1 Financial assets

Financial wealth recorded in survey data tends to be lower than the amounts reported in national accounts, with the gap generally larger for financial assets than for real assets. The ratios of HFCS financial wealth to the corresponding national accounts totals also show important cross-country differences, part of which is likely caused by differences in the methodologies used at national level in compiling both sets of statistics.

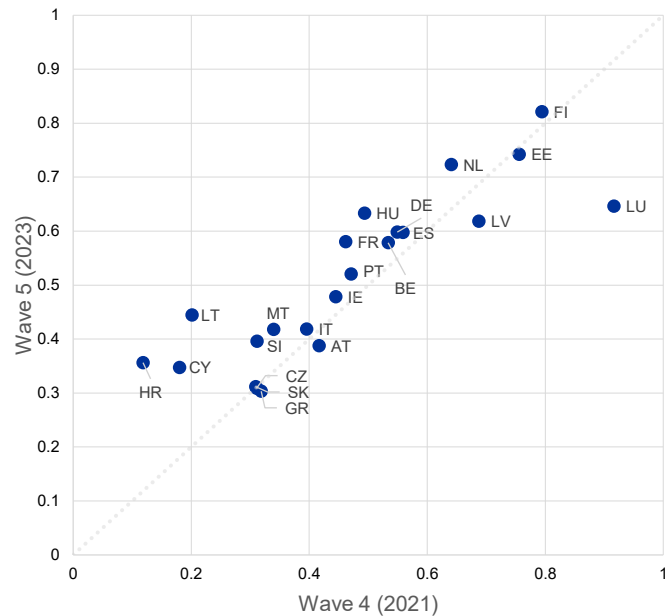
Previous research suggests that certain instruments – namely deposits, mutual fund shares, listed shares and bonds – are defined in a broadly consistent way in the HFCS survey and national accounts. The sum of these components is hereinafter referred to as adjusted financial wealth. For each country participating in the two most recent HFCS waves, these items are aggregated in both datasets, and Chart 8 shows the ratio of adjusted financial wealth per capita in the HFCS to that included in the national accounts.

Chart 8 confirms that the HFCS produces lower levels of financial wealth per capita than macro sources, even when the comparison is restricted to conceptually aligned items. At the same time, there is also substantial cross-country heterogeneity in the coverage ratios, ranging from around 30% to over 80% in the 2023 wave. In the majority of countries, these ratios changed little, or showed a slight improvement in coverage, between the 2021 and 2023 waves. In a few countries, the degree of coverage improved more significantly between the two waves. In one country it decreased substantially, although this is due to an outlier in the 2021 wave.

### Chart 8

#### Ratio of adjusted financial wealth per capita in the HFCS to that in the national accounts

(2021 – horizontal axis; 2023 – vertical axis)



Sources: ECB – HFCS and ECB – Annual Sector Accounts.

Notes: All HFCS countries included. Annual Sector Accounts data refer to the reference year of each country.

## 9.4.2 Liabilities

On the liabilities side of the household balance sheet, conceptual differences between micro and macro statistics are relatively limited. While the type of information collected under the two systems differs, the overall definition of total loans is largely comparable across the two statistics. The main exception concerns private loans (i.e. loans from other households), which are typically outside the scope of macro data. Their exclusion has only a minor effect on the comparison, as they account for roughly 1% of total household debt in the HFCS.

The benchmark for liabilities used for comparison in this section is the balance sheet statistics of monetary financial institutions (MFIs) compiled by the ECB. These data offer several advantages over information drawn from national accounts. For instance, they are harmonised across the euro area and are collected directly from the lending institutions, meaning that, unlike national accounts data, they are not subject to balancing adjustments. Moreover, lending to sole proprietors can be separated from loans to households. In national accounts, sole proprietors are largely included within the household sector, whereas in the HFCS their liabilities are not recorded as household liabilities. A limitation of the MFI statistics is that they do not distinguish between households and non-profit institutions serving households.

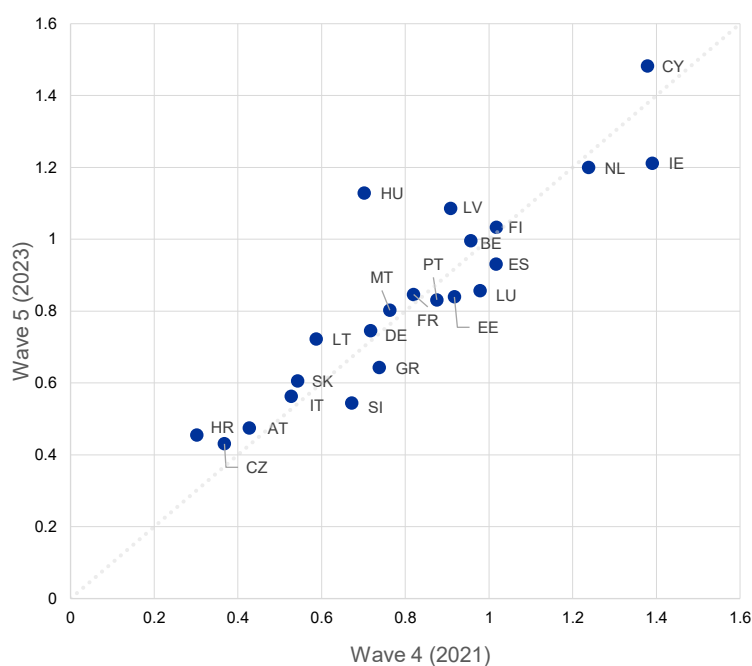
Chart 9 shows the ratio of household liabilities in the HFCS to those included in MFI statistics. In general, survey-based estimates of debt are closer to the macro figures than is the case for adjusted financial wealth (see previous section). This is not surprising, as the sampling bias arising from the underrepresentation of the very richest households tends to be less pronounced for liabilities than for financial wealth. Financial wealth is highly concentrated among a relatively small number of very affluent individuals, while debt is distributed more evenly. Furthermore, the incentive for underreporting is possibly higher for assets than for liabilities.

That said, cross-country variation in the HFCS-to-MFI ratios can be observed, ranging from 40% to 140% in the 2023 wave. As with adjusted wealth, the country ratios are typically quite stable across the two most recent waves, with one exception, where the ratios moved from 70% in wave 4 to 113% in the 2023 wave.

### Chart 9

#### Ratio of household liabilities per capita in the HFCS to those in MFI statistics

(2021 – horizontal axis; 2023 – vertical axis)



Sources: ECB – HFCS and ECB – Statistics on balance sheets of monetary financial institutions.  
Note: All HFCS countries are included. MFI statistics use the same reference year as for the HFCS data.

## 9.5 Comparison of income data between the HFCS and EU-SILC

The main objective of the HFCS is to gather detailed information on household balance sheets. Although income is not the central focus of the survey, reliable income data are essential for many analytical uses. Wealth and debt indicators are often examined across income groups, and measures of financial vulnerability –

such as debt-to-income or debt-service-to-income ratios – play an important role in assessing household resilience.

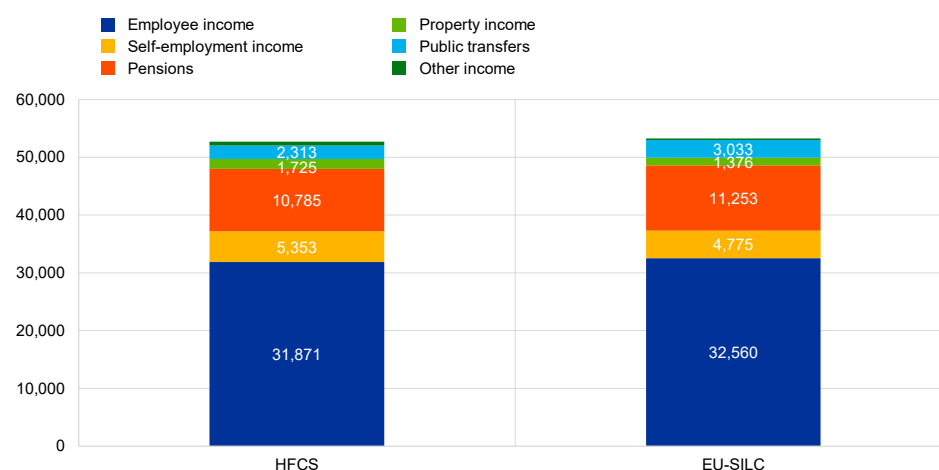
The HFCS primarily collects information on gross income, which is defined in broadly the same way as in EU-SILC, the most comprehensive harmonised survey on household income in Europe. This alignment allows for meaningful comparisons of levels and distributions between the two datasets.

Chart 10 compares the euro area average annual gross household income as reported by the HFCS and EU-SILC. The EU-SILC figures refer to the 2022 reference year, which corresponds to the most common income reference period in the 2023 HFCS wave (see Table 2). The figures are nearly identical in the two datasets. However, there are some minor variations: pensions and public transfers are somewhat higher in EU-SILC, while the HFCS records higher averages for self-employment income and property income.

**Chart 10**

### Euro area gross income structure in the HFCS and EU-SILC

(in euro per household)



Sources: ECB – HFCS and Eurostat – EU-SILC.

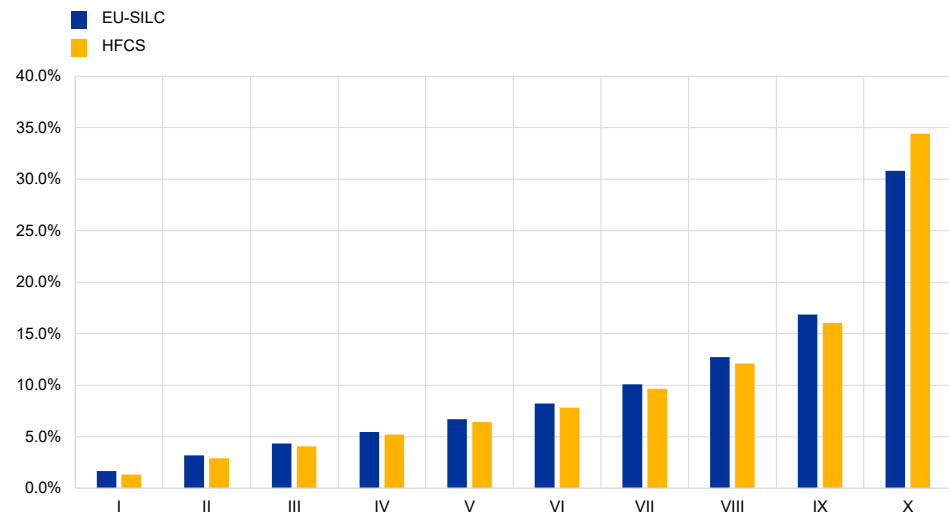
Note: EU-SILC data refer to the 2023 survey (income reference year 2022).

Because income data in the HFCS are mainly intended for distributional and vulnerability analysis, the HFCS should also produce a reliable picture of the income distribution. The comparison that follows therefore focuses on the distribution of income across households in the two data sources.

Chart 11 compares the gross income distributions produced by the HFCS and EU-SILC, by showing each decile's share of total income. The HFCS implies a somewhat more unequal distribution than EU-SILC, a pattern also observed in previous waves. The differences are moderate: the bottom half of the distribution accounts for 21.3% of total gross income in EU-SILC and 19.9% in the HFCS. The largest gap appears at the top, where the highest decile receives 30.8% in EU-SILC compared with 34.4% in the HFCS.

**Chart 11**

Share of total household gross income by deciles in the HFCS and EU-SILC



Sources: ECB – HFCS and Eurostat – EU-SILC.

Note: EU-SILC data refer to the 2023 survey (income reference year 2022).

These divergences can be explained by the differences in the structure of income described earlier. The HFCS provides higher estimates for property income, while EU-SILC provides higher estimates for transfer income, which tends to have an equalising impact on income distribution. In addition, the oversampling of wealthy households in the HFCS likely raises the share accruing to the very top of the distribution.

In sum, the level, composition and distribution of household gross income in the HFCS are broadly coherent with those observed in EU-SILC. However, the concepts and dissemination practices of the two surveys differ, and the results are therefore not always directly comparable.

# Appendices

## A1 HFCS definitions

### Financially knowledgeable person

The “financially knowledgeable person” (FKP) is the person most knowledgeable about the financial affairs of both the household as a whole and its individual members and is therefore best suited to provide information on the household’s finances. The FKP may or may not be a member of the household.

### HFCS household

The target reference population for national surveys consists of all private households and their current members residing in the national territory at the time of data collection.

A private household means a person living alone or a group of persons who live together in the same private dwelling and share expenditures, including the joint provision of living essentials, as well as financial decisions.

People who do not usually live in the household but who are completely or mostly financially dependent on it are included.

Employees or other residents (e.g. live-in domestic servants, au-pairs) and flatmates without other family or partnership attachments to household members (e.g. resident boarders, lodgers, tenants, visitors) are considered separate households.

Subject to the conditions described below, the following persons must, if they share household expenses and financial decisions, be regarded as household members:

1. persons usually resident and related to other household members;
2. persons usually resident but not related to other household members;
3. persons usually resident but temporarily absent (for reasons of holiday travel, work, education or similar);
4. children of the household being educated away from home;
5. persons absent for long periods, but having household ties, such as those working away from home;
6. persons temporarily absent but having household ties, such as persons in hospital or at a nursing home, boarding school, or other institution.

The following further conditions for inclusion as household members also apply:

For point 3 above, the person should currently have no private address elsewhere and the actual or intended duration of absence should be less than six months.

For points 4 and 5, irrespective of the actual or intended duration of absence, the person should be the partner or child of a household member, should continue to retain close ties with the household, should regularly return to this address (for instance, at the end of the academic term) and should consider it to be his or her main residence.

For point 6, the person should have clear financial ties to the household and the actual or expected duration of absence from the household should be less than six months.

Sharing in household expenses includes benefiting from expenses (e.g. children, persons with no income) as well as contributing to expenses. If expenses are not shared and finances are kept separate, then the person constitutes a separate household at the same address.

A person will be considered a usually resident member of the household if they spend most of their daily night rest there, assessed over the preceding six months (including children in joint custody and elderly parents if they spend more days living in the household dwelling than anywhere else).

Persons forming new households or joining existing households are normally considered members of the household at their new location; similarly, those leaving to live elsewhere will no longer be considered members of the original household. The “preceding six months” criterion (see above) is replaced by the intention to stay for a period of six months or longer at the new place of residence. Account must be taken of what may be considered “permanent” movements into or out of households. Thus, a person who has moved into a household for an indefinite period or, with the intention to stay for a period of six months or longer, is considered a household member, even though the person has not yet stayed in the household for six months and has in fact spent most of that time at another place of residence. Similarly, a person who has moved out of the household to some other place of residence with the intention to stay out of the first household for six months or more will no longer be considered a member of that household.

If the person who is temporarily absent is in private accommodation, determination of which household they belong to will depend on the length of absence.

Exceptionally, certain categories of persons with very close ties to the household may be included as members of that household irrespective of the length of their absence, provided they are not also considered members of another private household. In particular, students who live elsewhere but retain close ties with the household, regularly return to that household address and consider that household to be their main residence are to be considered part of the household irrespective of their length of stay at another address.

In applying these criteria, the aim is to minimise the risk that individuals who have two private addresses at which they might be deemed to reside are not double-counted in the sampling frame. It also minimises the risk of persons being excluded

from membership of any household, even though they belong to the private household sector.

Persons living in collective households and in institutions, as defined below, are excluded from the target population and are not covered by the definition of “private household”.

“Collective household” refers to a non-institutional collective dwelling such as a boarding house, a dormitory in an educational establishment or other living quarters shared by more than five persons without sharing household expenses. Persons living as lodgers in households with more than five lodgers are also included.

“Institution” refers to old people’s homes, health care institutions, religious institutions (convents, monasteries, etc.) and correctional and penal institutions. Institutions are distinguished from collective households by the fact that those resident in institutions have no individual responsibility for their housekeeping. In certain cases, old people’s homes may be considered as “collective households” on the basis of this principle.

## A2 Collection of non-core items

Table A.1

HFCS non-core variables collected in national surveys

Demographics

| Variable                                                                   | Collected in:                                       |
|----------------------------------------------------------------------------|-----------------------------------------------------|
| RNA0200 – Citizenship                                                      | France, Italy, Luxembourg, Portugal                 |
| PNA0100 – Field of study                                                   | Italy                                               |
| PNA0200 – Health                                                           | Luxembourg                                          |
| PNA0300 – Siblings                                                         | France                                              |
| PNA0400 – Are you the eldest?                                              | France                                              |
| PNA0500 – RP's/partner's father alive                                      | France                                              |
| PNA0501 – RP's/partner's mother alive                                      | France                                              |
| PNA0510\$y – Age of father and mother                                      | France                                              |
| PNA0600\$y – Education of father/mother                                    | Cyprus, Italy, Portugal                             |
| PNA0700 – Occupation of father                                             | France, Portugal                                    |
| PNA0701 – Occupation of mother                                             | France, Portugal                                    |
| PNA0850 – Legal arrangements for marriage or recognised partnership        | France                                              |
| PNA0851 – Sort of legal arrangement for marriage or recognised partnership | France                                              |
| HDZ0310 – Life satisfaction                                                | Germany, Estonia, Greece, Malta, Portugal, Slovakia |
| HND3500 – Risk-taking attitude                                             | Portugal                                            |

### Real assets and their financing

| Variable                                                                         | Collected in:                     |
|----------------------------------------------------------------------------------|-----------------------------------|
| HB310\$x\$y – Other property \$x mortgage \$y: loan refinancing/renewal          | Italy, France, Greece             |
| HB313\$x\$y\$y – Other property \$x mortgage \$y: reason for refinancing/renewal | Greece                            |
| HNB0800 – HMR: Any part used for business purposes?                              | France, Malta                     |
| HNB0810 – HMR: Year of construction                                              | Greece, Portugal, Finland, Cyprus |
| HNB0910\$y – HMR: External support for housing acquisition                       | France, Malta                     |
| HNB0920 – HMR: Imputed rent                                                      | Greece, Italy, Malta, Finland     |
| HNB1000 – House price expectations                                               | Malta                             |
| HNB130\$x – HMR mortgage \$x: institution you have loan with                     | France                            |
| HNB140\$x – HMR mortgage \$x: work for institution granting the loan             | Portugal                          |
| HNB1700 – Overpaying/voluntary step-up payments on HMR mortgages                 | Portugal                          |
| HNB1710 – Monthly amount of extra voluntary payments on HMR mortgages            | Portugal                          |
| HNB1800 – Rent net or including other charges                                    | France                            |
| HNB1830 – Owner of rented HMR                                                    | Italy                             |
| HNB190\$x – Other property \$x: how property was acquired                        | France, Italy, Cyprus, Malta      |
| HNB2000 – Remaining other properties: renting out of property                    | France, Italy, Malta              |

|                                                                                    |                       |
|------------------------------------------------------------------------------------|-----------------------|
| HNB2010 – Other properties: how much rent is collected                             | Italy, Malta          |
| HNB205\$x – Other property \$x: located abroad                                     | Belgium, Italy, Malta |
| HNB2300 – Overpaying/voluntary step-up payments: loans on other properties         | Portugal              |
| HNB2310 – Monthly amount of voluntary payments: loans on properties other than HMR | Portugal              |
| HNB2800 – Sold properties or consumer durables                                     | Malta                 |
| HNB2820 – Amount received: Sale of properties or consumer durables                 | Malta                 |
| HNB3000 – Reasons for moving                                                       | Portugal              |
| HB4510\$v – Number of other vehicles                                               | Greece                |

#### Other liabilities, credit constraints

| <i>Variable</i>                                                  | <i>Collected in:</i>    |
|------------------------------------------------------------------|-------------------------|
| HNC004\$x – Non-collateralised loan \$x: year the loan was taken | France, Italy, Portugal |
| HNC005\$x – Non-collateralised loan \$x: nature of the lender    | France                  |
| HNC0126 – Any outstanding overdue payments                       | Cyprus, Portugal        |
| HNC0150 – Any non-bank liabilities                               | Belgium                 |
| HNC0200\$v – Reasons for being refused credit                    | France, Cyprus          |

#### Private businesses, financial assets

| <i>Variable</i>                                            | <i>Collected in:</i>             |
|------------------------------------------------------------|----------------------------------|
| HND010\$x – Business \$x: year the business was started    | France, Portugal                 |
| HND020\$x – Business \$x: last year's total business sales | France, Portugal                 |
| HND0400 – Any guarantees provided to businesses            | Portugal                         |
| HND0420 – Any guarantees provided to non-HH members        | Portugal                         |
| HND1000\$v – Market value by type of bond                  | Italy                            |
| HD1520 – Any shares issued by foreign companies            | Hungary, Luxembourg, Latvia      |
| HND3000\$v – Largest asset in HH balance sheet             | Belgium                          |
| HND3010 – Portfolio shifts last two years?                 | Belgium                          |
| HND3020 – Portfolio shifts last two years: money out       | Belgium                          |
| HND3030 – Portfolio shifts last two years: money in        | Belgium                          |
| HND3040 – Would not invest again?                          | Belgium                          |
| HND3050\$v – Assets HH would not invest again              | Belgium                          |
| HND3100 – Net worth past two years                         | Belgium, France, Malta, Portugal |
| HND3200 – Net worth next two years                         | Belgium, Malta, Portugal         |

## Employment

| <i>Variable</i>                                                          | <i>Collected in:</i>                            |
|--------------------------------------------------------------------------|-------------------------------------------------|
| PNE0100 – Seasonal employment                                            | Greece, Italy, Portugal                         |
| PNE0110 – Number of working weeks per year                               | Italy, Portugal                                 |
| PNE0200 – Gross monthly income: main job (employees)                     | Portugal                                        |
| PNE0300 – Gross monthly income from self-employment                      | Portugal                                        |
| PNE0500 – Private-public organisation                                    | France, Italy, Malta, Portugal, Finland, Cyprus |
| PNE0600 – Number of employees: main employer                             | Portugal                                        |
| PNE0700 – Hours worked: additional employment contracts (as an employee) | Italy                                           |
| PNE1000 – Looking for job                                                | Greece, Cyprus                                  |
| PNE1600 – Year they stopped being employed (for retirees)                | Portugal                                        |
| PNE1800 – Full-time/part-time: last job                                  | France                                          |
| PNE2000 – Former job title and description / ISCO                        | France, Portugal                                |
| PNE2100 – Time in former employment                                      | France                                          |
| PNE2200 – Total time in full-time employment                             | France                                          |
| PNE2210 – Total time in all part-time employment                         | France                                          |
| PNE2400 – Number of different employers                                  | Italy                                           |
| PNE2700\$v – Worsening of job conditions past two years                  | Greece, Portugal                                |
| PNE2800\$v – Expected worsening of job conditions next two years         | Greece                                          |

## Pensions and life insurance

| <i>Variable</i>                                                                 | <i>Collected in:</i> |
|---------------------------------------------------------------------------------|----------------------|
| PFA1100 – Total current value of all other plans that have a balance            | France               |
| PNF0720 – Current value of all occupational plans that do not have an account   | Netherlands          |
| PNF100\$x – Occupational pension plan \$x: is employer contributing             | France               |
| PNF180\$x – Occupational pension plan \$x: expected age of collecting pension   | France               |
| PNF310\$x – Voluntary pension plan \$x: whole life insurance policy: cash value | France               |
| PNF3600 – Has private health insurance                                          | Italy                |

## Income

| <i>Variable</i>                                                  | <i>Collected in:</i> |
|------------------------------------------------------------------|----------------------|
| HGZ027\$ <i>v</i> – Non-financial assistance received            | Portugal             |
| HNG0110 – Net income from regular social transfers               | Italy                |
| HNG0210 – Net income from regular private transfers              | Italy                |
| HNG0310 – Net rental income from real estate property            | Italy                |
| HNG0410 – Net income from financial investments                  | Italy                |
| HNG0610 – Net income from other sources                          | Italy                |
| HNG0710 – Income taxes and social contributions                  | Italy, Finland       |
| PNG0110 – Net employee income                                    | Italy                |
| PNG0210 – Net self-employment income                             | Italy                |
| PNG0310 – Net income from public pensions                        | Italy                |
| PNG0410 – Net income from private and occupational pension plans | Italy                |
| PNG0510 – Net income from unemployment benefits                  | Italy                |

## Intergenerational transfers, gifts

| <i>Variable</i>                                                             | <i>Collected in:</i>            |
|-----------------------------------------------------------------------------|---------------------------------|
| HH0700 – Expect to receive inheritance in the future                        | Portugal, Greece, Cyprus, Malta |
| HNH0500 – Substantial gift made to children/other people outside household? | France                          |
| HNH0600 – Who was the beneficiary of the gift?                              | France                          |
| HNH0700 – Year donation was made                                            | France                          |
| HNH0800 – How much was donation made worth?                                 | France                          |

## Consumption and saving

| <i>Variable</i>                                                 | <i>Collected in:</i> |
|-----------------------------------------------------------------|----------------------|
| HI0350 – Financial assistance provided to relatives and friends | Portugal             |
| HI0360 – Amount given as financial assistance per year          | Portugal             |
| HIZ0240 – Monthly expenses on recreation and entertainment      | Malta                |
| HNI0410 – Household has savings?                                | Malta                |
| HNI0420 – Amount of savings                                     | Malta                |
| HNI0610 – Ability to make ends meet                             | Belgium, Italy       |
| HNI0700 – More or less savings in the next year                 | Belgium              |
| HNI0800 – General price expectations                            | Belgium              |
| HNI1000 – General personal financial situation expectations     | France               |

## Payment habits and financial literacy

| <i>Variable</i>                                                    | <i>Collected in:</i> |
|--------------------------------------------------------------------|----------------------|
| <b>HNJ1100 – Any debit or/and ATM cards?</b>                       | Italy                |
| <b>HNJ2300\$ – Number of credit/store cards</b>                    | Italy                |
| <b>HNJ3100 – Computer at home?</b>                                 | Finland              |
| <b>HNM0100 – Financial literacy: variable/fixed interest rates</b> | Slovakia             |
| <b>HNM0200 – Financial literacy: inflation</b>                     | Greece, Slovakia     |
| <b>HNM0300 – Financial literacy: portfolio diversification</b>     | Greece, Slovakia     |
| <b>HNM0400 – Financial literacy: Riskiness</b>                     | Greece, Slovakia     |

## Energy module

| <i>Variable</i>                                                             | <i>Collected in:</i>                               |
|-----------------------------------------------------------------------------|----------------------------------------------------|
| <b>HNX0200\$ – Type of energy used in the HMR</b>                           | Belgium, Estonia, Latvia, Malta, Slovenia          |
| <b>HNX0100 – Main type of energy used for heating the HMR</b>               | Belgium, Estonia, Croatia, Latvia, Malta, Slovenia |
| <b>HNX0210 – Amount spent on energy (current)</b>                           | Belgium, Latvia, Malta, Slovenia                   |
| <b>HNX0220 – Amount spent on energy in 2021</b>                             | Belgium, Latvia                                    |
| <b>HNX0230 – Access to social tariff on electricity or gas consumption</b>  | Belgium                                            |
| <b>HNX0240\$ – Impact on household of increase of energy prices in 2022</b> | Belgium, Cyprus, Estonia, Croatia, Italy, Latvia   |
| <b>HNX0300 – Expectation of investment in energy saving</b>                 | Belgium, Estonia, Croatia, Italy, Malta, Slovenia  |
| <b>HNX0310 – Priority of investment</b>                                     | Belgium, Estonia, Croatia, Italy, Malta, Slovenia  |
| <b>HNX0320 – Required amount for energy savings</b>                         | Belgium, Croatia, Malta, Slovenia                  |

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## Abbreviations

### Countries

|           |                |
|-----------|----------------|
| <i>AT</i> | Austria        |
| <i>BE</i> | Belgium        |
| <i>CY</i> | Cyprus         |
| <i>CZ</i> | Czech Republic |
| <i>DE</i> | Germany        |
| <i>EE</i> | Estonia        |
| <i>IE</i> | Ireland        |
| <i>ES</i> | Spain          |
| <i>FI</i> | Finland        |
| <i>FR</i> | France         |
| <i>GR</i> | Greece         |

|           |             |
|-----------|-------------|
| <i>HR</i> | Croatia     |
| <i>HU</i> | Hungary     |
| <i>IT</i> | Italy       |
| <i>LT</i> | Lithuania   |
| <i>LU</i> | Luxembourg  |
| <i>LV</i> | Latvia      |
| <i>MT</i> | Malta       |
| <i>NL</i> | Netherlands |
| <i>PT</i> | Portugal    |
| <i>SI</i> | Slovenia    |
| <i>SK</i> | Slovakia    |

### Other

|                |                                                      |
|----------------|------------------------------------------------------|
| <i>CAPI</i>    | Computer-assisted personal interviewing              |
| <i>CATI</i>    | Computer-assisted telephone interviewing             |
| <i>CASI</i>    | Computer-assisted self-interviewing                  |
| <i>CAWI</i>    | Computer-assisted web interviewing                   |
| <i>EU-SILC</i> | EU Statistics on Income and Living Conditions        |
| <i>FKP</i>     | Financially knowledgeable person                     |
| <i>HBS</i>     | Household Budget Survey                              |
| <i>HFCN</i>    | Household Finance and Consumption Network            |
| <i>HFCS</i>    | Household Finance and Consumption Survey             |
| <i>HMR</i>     | Household main residence                             |
| <i>ISCED</i>   | International Standard Classification of Education   |
| <i>ISCO</i>    | International Standard Classification of Occupations |

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| <i>LFS</i>  | Labour force survey                                                         |
| <i>MFI</i>  | Monetary financial institution                                              |
| <i>MI</i>   | Multiple imputation                                                         |
| <i>NACE</i> | Statistical Classification of Economic Activities in the European Community |
| <i>NCB</i>  | National central bank                                                       |
| <i>NSI</i>  | National statistical institute                                              |
| <i>NUTS</i> | Nomenclature of Territorial Units for Statistics                            |
| <i>PAPI</i> | Paper-and-pencil interviewing                                               |
| <i>PSU</i>  | Primary sampling unit                                                       |
| <i>RP</i>   | Reference person                                                            |

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