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**Article**

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# 4

## Consistency of property income

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**Abstract:** This article aims at presenting a tool to identify issues to improve the consistency of the financial and non-financial accounts by institutional sectors. The international statistical standards clearly relate property income and financial assets categories. It is thus possible to derive implicit rates of return, in other words property income in relation to the respective financial position. Implicit returns are calculated to compare the data across institutional sectors and EU Member States with a metric that is intuitive to compilers and users of sector accounts.

For Member States, three broad categories of property income are analysed: (i) interest, (ii) return on equity (dividends, withdrawals ...) (iii) other property income (from insurance, pensions investment funds ...) and the related financial positions. Implicit rates of return were compiled using the most detailed national data of the October 2020 vintage. Most of the observed variations across sectors and Member States are assessed as largely plausible. However, some observed differences necessitate further analysis for specific resident sectors, as well as for the positions in relation to the rest of the world.

Summarising, the results are fairly plausible for implicit interest rates and implicit rate of returns for other property income, and Member State differences are limited. For the implicit return on equity, large cross-Member State differences still exist. The outliers are particularly large for non-financial corporations liabilities and for household assets. Equity issued by non-financial corporations and held by households is largely in the form of unlisted shares and other equity, which makes the recording of the financial positions as well as the respective property income more difficult than for listed shares.

Another important result is that the data show no major differences between annual and quarterly rates for implicit interest, return on equity and return on other property income. Structural and repetitive significant inconsistencies across different income type variables and sectors were only observed for few Member States.

**JEL codes:** C82, E01, G20

**Keywords:** national accounts, sector accounts, statistical practices

<sup>(1)</sup> European Central Bank (ECB), DG-Statistics – External statistics and sector accounts.

<sup>(2)</sup> Eurostat, Unit C2 – National accounts production.

## 1. Introduction

The relationship between financial assets and liabilities and the related property income is an important issue to improve consistency between financial and non-financial transactions (in other words, vertical consistency).

In April 2020, 14 EU Member States <sup>(3)</sup> indicated that they regularly review the consistency of property income and financial assets. In three of those cases (Germany, Hungary and Italy), consistency is achieved through a fully integrated approach, meaning that financial assets and liabilities are used when compiling property income in the non-financial accounts. In some other Member States (Belgium, Spain, Cyprus, Austria, Finland and Sweden), an integrated approach of compiling property income and financial positions is applied only to some types of property income (for example, only to interest or to reinvested earnings).

This note presents an overview of the consistency of property income and the related financial positions. Section 2 provides an overview of the methodological background. Sections 3, 4 and 5 are devoted to a detailed analysis of each of the elements of property income: interest rates, return on equity and other property income. Section 6 presents a detailed analysis of the consistency between annual and quarterly data. Finally, Section 7 includes concluding remarks.

The following analysis focuses on the comparison of implicit rates of return for assets and liabilities across Member States. Overall, the assumption that implicit return rates for assets and liabilities as well as implicit return rates across Member States should be closely related is not so straightforward. However, the presence of outliers can indicate that for some instruments the assets/liabilities are underestimated when implicit rates of return are high (or overestimated when implicit rates of return are low) and/or the relevant property income categories are overestimated (or underestimated). In other words, outliers can indicate a possible cause of discrepancy between financial and non-financial transactions as errors in the estimation of property income have a direct effect on non-financial net lending/net borrowing. For errors in the estimation of financial stocks, the link to financial net lending / net borrowing is not straightforward; however, detecting such errors may help in finding related issues that do affect the vertical discrepancy such as incomplete coverage or delimitation issues.

## 2. Methodological background

Property income (D.4) accrues when the owners of financial assets and natural resources put them at the disposal of other institutional units.

This paper compares the consistency of financial assets and liabilities and their related property income flows by sector <sup>(4)</sup> across the Member States for 2018. Due to a lack of data

<sup>(3)</sup> Information available as of April 2020 and collected in the framework of the stocktaking exercise on national reconciliation practices for the financial and non-financial accounts by institutional sector.

<sup>(4)</sup> For Sections 3, 4 and 5, quarterly data were used when available both for financial and non-financial sectoral accounts. In case of the unavailability of quarterly data (for at least one of the two domains), an annual frequency was chosen for both.

availability for 2018, 2017 data are used for Bulgaria. The analysis is based on the October 2020 vintage. The focus of the analysis is on households and on financial and non-financial corporations (the results for general government, for which vertical discrepancies are generally much smaller, are shown in the annex).

Annual data are used for Greece in this article because, in October 2020, Greece transmitted revised annual non-financial sector accounts that incorporated the results of the benchmark revision from 2010 onwards but are still pending for the quarterly data. This means that, temporarily, the quarterly non-financial accounts for Greece are not fully aligned with the annual non-financial accounts.

According to ESA 2010 paragraph 4.41, property income (D.4) is defined as ‘... the sum of investment income and rent.’ The only property income component which is not covered in this analysis is D.45 (rent) as it relates to non-financial assets only.

ESA 2010 paragraph 4.41 classifies investment income as follows:

- Interest (D.41)
- Distributed income of corporations (D.42)
  - Dividends (D.421)
  - Withdrawals from income of quasi-corporations (D.422)
- Reinvested earnings on foreign direct investment (D.43)
- Other investment income (D.44)
  - Investment income attributable to insurance policyholders (D.441)
  - Investment income payable on pension entitlements (D.442)
  - Investment income attributable to collective investment funds shareholders (D.443)

And the corresponding financial assets and liabilities are:

- Stock of deposits (F.2M)
- Debt securities (F.3)
  - Short-term debt securities (F.3S)
  - Long-term debt securities (F.3L)
- Loans (F.4)
  - Short-term loans (F.4S)
  - Long-term loans (F.4L)
- Equity (F.51): listed and unlisted shares, and other equity
- Investment fund shares/units (F.52)
- Insurance, pension and standardised guarantees (F.6)
- Other accounts payable/receivable (F.8)

For this analysis, three main categories of property income have been identified and each of them was divided by the corresponding financial instruments <sup>(5)</sup> (Table 1) with the aim of computing their implicit rates of return. Resources have been related to assets and uses have been related to liabilities.

<sup>(5)</sup> Financial transactions can be classified by the type of income they generate. Reinvested earnings on foreign direct investment (D.43) are generated by corporations with listed shares (F.511) as well as by corporations with unlisted shares (F.512) and other equity (F.519). Thus, only the sum of D.42 (generated by listed shares) and D.43 can be related to equity (F.511 + F.512 + F.519). The transmission of these detailed (3-digit) breakdowns of D.44 is voluntary for quarterly data. In this document D.44 is used to have the possibility of including the largest number of Member States.

**Table 1: Overview**

	<b>Assets</b>	<b>Liabilities</b>
<b>Implicit interest rate</b>	$\frac{\text{receivable: D.41G}}{\text{assets: F.2M} + \text{F.3} + \text{F.4}}$	$\frac{\text{payable: D.41G}}{\text{liabilities: F.2M} + \text{F.3} + \text{F.4}}$
<b>Implicit return on equity</b>	$\frac{\text{receivable: D.42+D.43}}{\text{assets: F.51}}$	$\frac{\text{payable: D.42+D.43}}{\text{liabilities: F.51}}$
<b>Implicit return on other property income</b>	$\frac{\text{receivable: D.44}}{\text{assets: F.52} + \text{F.6}}$	$\frac{\text{payable: D.44}}{\text{liabilities: F.52} + \text{F.6}}$

The implicit rates of return have been calculated as the relation between the (four quarter cumulated or annual) property income (receivable/payable) and the average stock (assets/liabilities) of the period. The average stock has been calculated as an average of the stock at the beginning of the period (end of previous period) and the stock at the end of the period.

### 3. Implicit interest rates <sup>(6)</sup>

Interest is a form of income that is receivable by the owners of certain kinds of financial assets, namely deposits, debt securities, loans and other accounts receivable for putting the financial asset at the disposal of another institutional unit <sup>(7)</sup>.

In order to compute implicit interest rates for each Member State, the stocks of deposits (F.2M), debt securities (F.3), and loans (F.4) (and other accounts payable/receivable (F.8)) have been compared with paid/received interest before the correction for FISIM (financial intermediation services indirectly measured), in other words gross interest (D.41G). Gross interest was divided by the respective financial position as this ratio is comparable to the interest rates observable in financial markets. Gross interest should thus be more comparable across Member States and sectors. As a result, the analysis is not affected by different estimation methods for the implicit service fees on loans and deposits.

#### 3.1. Comparing implicit interest rates for assets and liabilities: resident sector

Figure 1 shows, on the left-hand side, the resident sector (S.1) implicit interest rate for assets and liabilities for the Member States and for the euro area aggregate. The values considered for the euro area aggregate are those published by Eurostat and the ECB and do not necessarily equal the sum of Member State data due to the integration of additional data sources (such as the euro area balance of payments) and balancing adjustments.

For the resident sector, it can be considered that most assets are matched by resident liabilities, thus assets and liabilities should have the same risk and maturity structure. In other

<sup>(6)</sup> The analysis was performed excluding other accounts receivable (F.8). While ESA specifies that interest income may accrue on F.8, data availability for this instrument and for the related interest income may not be comparable across Member States. The charts including the instrument F.8  $\rightarrow$   $(D.41G)/(F.2M+F.3+F.4+(F.8))$  are available in an Annex but are not commented, as the main results presented here are not affected by the inclusion or exclusion of F.8.

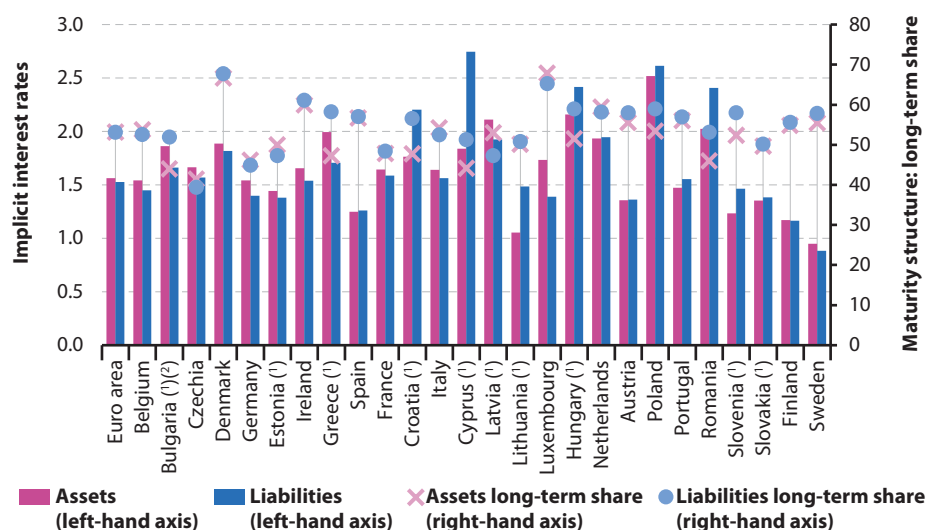
<sup>(7)</sup> *Handbook of National Accounting: Financial Production, Flows and Stocks in the System of National Accounts*, ESA 2010 (paragraph 4.42) specifies that – in addition to these four instruments – income on SDR holdings and allocations and income on unallocated gold accounts are also treated as interest; however, these amounts are not included in the calculations as they are relatively small.

words, financial instruments issued and held by resident sectors should result in equal implicit interest rates of assets and liabilities. For most of the Member States, the resident sector implicit interest rates are similar for assets and liabilities; however, in four Member States (Croatia, Cyprus, Lithuania and Romania) the implicit interest rates are relatively higher on the liability side, and in two Member States (Greece and Luxembourg) they are significantly higher on the asset side. These exceptions may be due to higher risk and/or compositional effects (such as the longer maturity) on assets and liabilities with non-resident counterparts <sup>(6)</sup>.

On the right-hand scale it is possible to observe the share of long-term assets/liabilities over the total stocks generating interest in the resident sector <sup>(7)</sup>. In general, one would expect to observe higher interest rates when the share of long-term stocks is higher, and this positive correlation could be used as a proxy to explain differences in the level of implicit interest rates among Member States. For some small Member States, due to the high share of cross-border assets and liabilities, the maturity structure is indeed different between assets and liabilities (for example, Croatia and Cyprus) and it is possible to observe a larger spread among implicit interest rates.

For the individual resident sectors, differences in risk and maturity structure between assets and liabilities may play a larger role; this issue will be further investigated in Section 3.3.

**Figure 1: Implicit interest rates and maturity structure for the total economy (S.1), 2018 (%)**



Note: Malta, not available.

<sup>(1)</sup> Based on annual data rather than annualised quarterly data.

<sup>(2)</sup> 2017.

Implicit interest rates are generally between 1.0 % and 2.0 % with some exceptions including: Sweden, where rates are slightly below 1.0 %, Lithuania, with lower rates on the assets sides; Cyprus, where the rates from the liability side are above 2.0 %.

<sup>(6)</sup> The consistency of the accounts ensures that S.1 + S.2 must be equal for both assets and liabilities. This means that if we observe a higher (lower) interest rate on the asset side of the resident sector, then we must observe a higher (lower) interest rate on the asset side for the resident position in relation to the rest of the world. Please see Section 3.2 for further information.

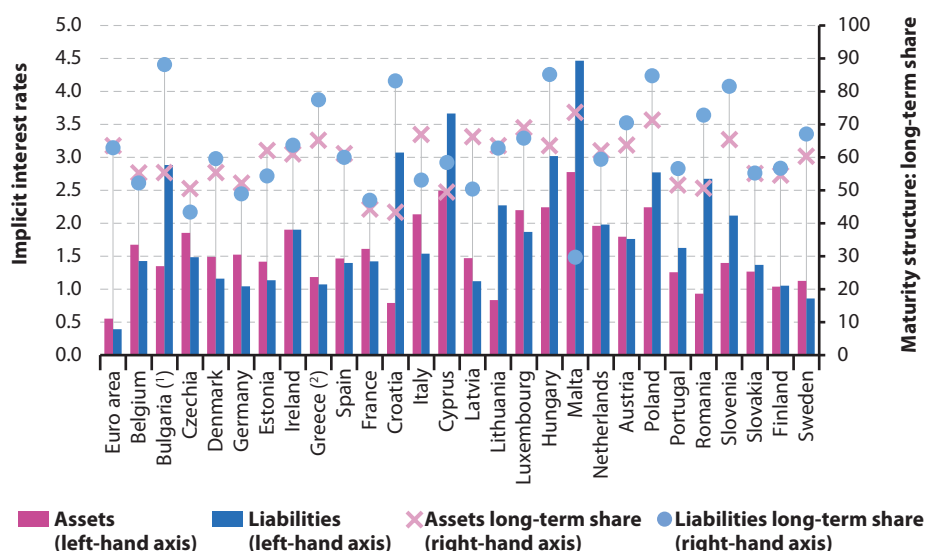
<sup>(7)</sup> The share of long-term is defined as:  $(F.3L+F.4L)/(F.2M+F.3+F.4)$

### 3.2. Comparing implicit interest rates for assets and liabilities: resident sector in relation to the rest of the world

As mentioned, the differences between the implicit interest rates for assets and liabilities for the resident sector in relation to the rest of the world (Figure 2) drive the differences for assets and liabilities for the resident sector in relation to all counterparts (Figure 1). Bulgaria is the only Member State that does not fit this expected pattern. The observed differences between asset and liabilities implicit interest rates (Figure 2) may be explained by different maturity risk structures of the position in relation to the rest of the world, for example a higher implicit interest rate on the asset side may be due to a longer maturity structure of assets compared with liabilities for Czechia, Estonia, Italy, Latvia and Malta. This may explain the lower values as well for the asset implicit interest rates in Bulgaria, Croatia, Cyprus, Hungary, Poland, Portugal, Slovenia, Slovakia and Finland. The lower interest rate on liabilities – despite equal long-term shares for example for Belgium, Denmark, Germany and Luxembourg – is likely due to the perceived lower risk in these Member States. Lower interest rates on liabilities for example in Greece despite the long-term maturity are possibly due to some liabilities granted at preferential, low interest rates. Not easily explainable are the differences in Lithuania which exhibits much lower implicit interest rates on assets, despite a similar share of long-term assets and liabilities.

**Figure 2: Implicit interest rates and maturity structure for the total economy positions in relation to the rest of the world (S.2), 2018**

(%)



(1) 2017.

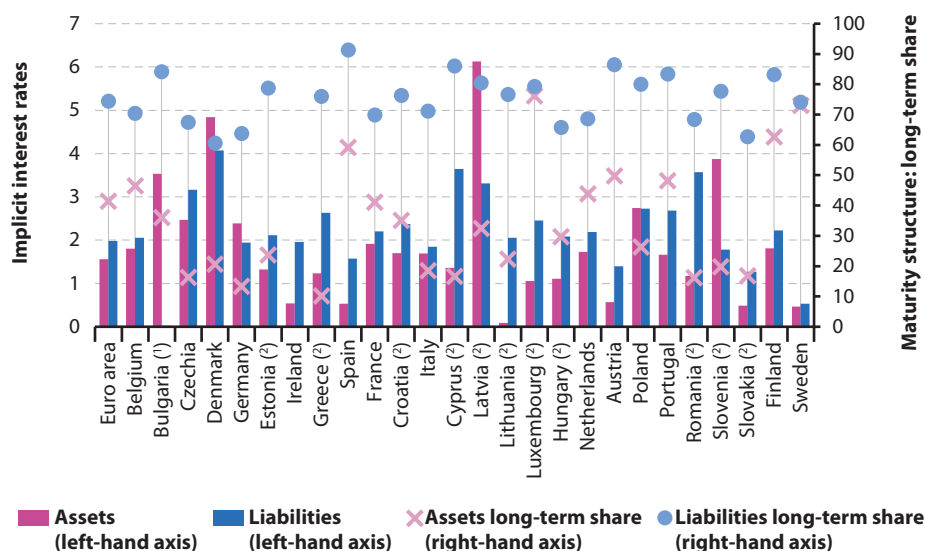
(2) Based on annual data rather than annualised quarterly data.

### 3.3. Comparing implicit interest rates for assets and liabilities: resident sector breakdown

#### NON-FINANCIAL CORPORATIONS

Figure 3 shows that there is considerable variation in the implicit interest rates of **non-financial corporations (NFCs)** across Member States. In general, implicit interest rates are higher on the liability side which is in line with the usually longer maturity of liabilities. In addition, given that gross interest of a FISIM consumer is compared here, this is to be expected as gross interest includes the service charge (FISIM) on the liability side, whereas FISIM leads to a lower interest paid to the asset holder<sup>(10)</sup>. There are some exceptions in which NFCs receive significantly higher implicit rates on assets (Bulgaria, Denmark, Germany, Latvia and Slovenia), even though the maturity structure for assets and liabilities is similar to most Member States.

**Figure 3: Implicit interest rates and maturity structure for non-financial corporations (S.11), 2018 (%)**



Note: Malta, not available. Ireland: long-term shares not available.

(1) 2017.

(2) Based on annual data rather than annualised quarterly data.

Values are considerably higher in Denmark<sup>(11)</sup> and Latvia (4.9 % for assets and 4.0 % for liabilities) and for Cyprus and Romania (3.7 % for liabilities) than in other Member States. The case of Denmark appears strange when one considers the proportion of long-term stocks held by NFCs. In all other cases, the implicit rates on the asset side are generally low, below 1.5 %; in a few Member States, the rates are close to or below 0.5 % (Ireland, Spain, Cyprus, Lithuania, Austria<sup>(12)</sup>, Romania, Slovakia and Sweden). In Lithuania, Romania or Slovakia,

<sup>(10)</sup> For details on FISIM see the dedicated Chapter 14 in ESA 2010.

<sup>(11)</sup> A full implementation of new source data is being carried out in Denmark; such an adjustment will be undertaken with the next benchmark revision and is expected to affect the interest levels dramatically.

<sup>(12)</sup> Austrian NFCs usually do not have high volumes of debt securities on the asset side. They hold 10 times more deposits than debt securities. This could provide an explanation.



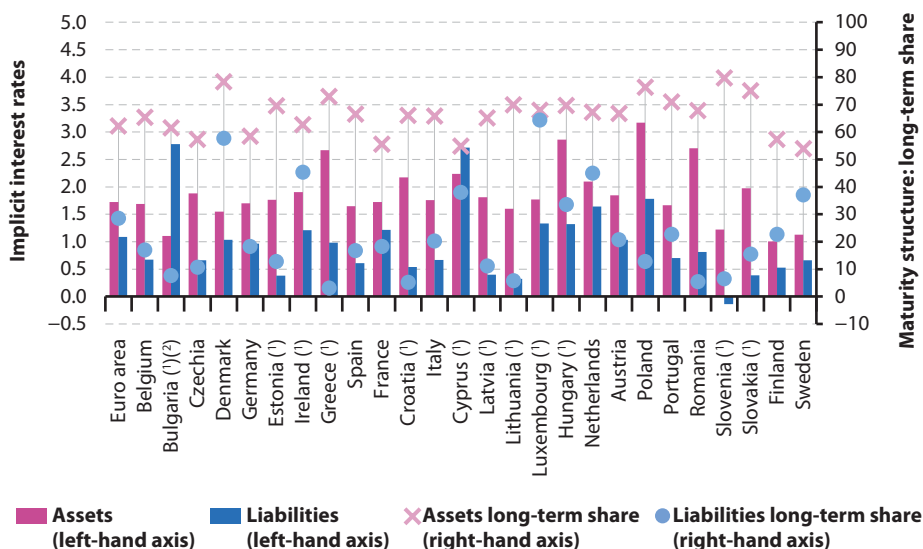
this could be explained by the high share of short-term stocks while for the rest there is no evident reason for the very low interest rate on assets; it could be related to different instrument composition across Member States in other words deposits with close to zero (or possibly negative) interest rates, while debt securities may have higher returns.

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For **financial corporations**, implicit interest rates (Figure 4) are generally much higher for assets than for liabilities which reflects the maturity transformation of financial intermediaries. Financial corporations generally hold a high share of long-term instruments on the asset side and a high share of short-term instruments on the liability side (for example, deposits). In addition, for financial corporations as FISIM providers, FISIM is added to net interest on the asset side and deducted on the liability side. Implicit interest rates are always higher on the asset side except in Bulgaria and Cyprus.

Overall, interest rates are consistent across Member States in the euro area (slightly higher in Estonia, Greece, Cyprus and Slovakia). The slightly negative implicit interest rate on liabilities in Slovenia may be explained by monetary financial institutions charging depositors for the acceptance of deposits. In non-euro area Member States, interest rates differ substantially; they are high in Bulgaria, Hungary, Poland and Romania and low in Sweden. Considering the maturity structure, we observe a very low long-term share (3 %) on the liability side for Greece but a high implicit interest rate, and a similar situation for Czechia (9 %) and Romania (5 %). The opposite is observed for Sweden (35 %), where one would expect higher interest rates for the liability side.

**Figure 4: Implicit interest rates and maturity structure for financial corporations (S.12), 2018**  
(%)



Note: Malta, not available.

(\*) Based on annual data rather than annualised quarterly data.

(?) 2017.

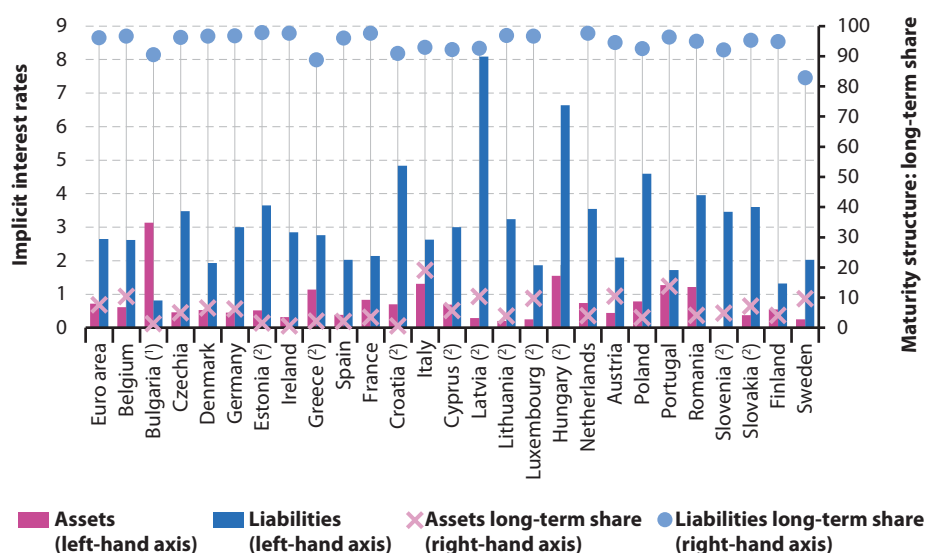
## HOUSEHOLDS

Implicit interest rates in the **households sector** (Figure 5) are, as expected, higher on the liability side as households are FISIM consumers (see explanation in NFC section). Household sector liabilities mainly consist of loans. In the euro area, interest rates on the liability side are relatively high in Latvia (8 %) while they are below 4 % in other euro area Member States. Non-euro area Member States show high liability side interest rates in the case of Croatia, Hungary and Poland; in the other non-euro area Member States interest rates on liabilities are below 4 % and therefore generally in line with the observed values for the euro area Member States.

On the asset side, implicit interest rates are generally low, below 1 % in most Member States. The highest values are observed in Italy (1.2 %), Greece and Portugal (1.1 %) for the euro area Member States and Bulgaria (2.5 %) for the non-euro area Member States.

It should be noted that an important part of assets and property income for households stems from the claims on insurance and pension schemes and these are shown in Section 5.

**Figure 5: Implicit interest rates and maturity structure for households and NPISH (S.1M), 2018**  
(%)



Note: Malta, not available. Hungary: long-term shares not available.

(1) 2017.

(2) Based on annual data rather than annualised quarterly data.

## 4. Implicit return on equity

Implicit rates of distributed income on equity – for simplicity called return on equity – have been calculated comparing the sum of distributed income of corporations (D.42) <sup>(13)</sup> and reinvested income on foreign direct investment (D.43) with equity (F.51). Equity (F.51) comprises listed and unlisted shares and other equity. A more specific matching of property income with the respective financial instrument is not possible as both D.42 and D.43 may accrue to all subcategories of equity. The analysis has been carried out for all relevant positions of the resident sectors of the economy. Market values for assets and liabilities of unlisted shares and other equity are generally difficult to obtain or estimate. This is why abnormal yields could flag difficulties in non-financial and – in particular – financial accounts.

### 4.1. Comparing implicit return on equity for assets and liabilities: resident sector

Comparing the return on equity for the resident sector across Member States (Figure 6), the implicit rate of return is generally between 2 % and 7 %. Among the euro area Member States, Luxembourg shows particularly low implicit return on equity, below 1.5 %; a similar situation can be observed for Croatia among the non-euro area Member States.

Six Member States present notably higher rates of return, both on the asset and on the liability side: Czechia (5.8 % and 9.0 %), Germany (both 10.9 %), Italy (both 7.8 %), Latvia (7.1 % and 9.0 %), Lithuania (14.6 % and 14.3 %) and Slovakia (7.5 % and 8.2 %), and some of them are more than double the euro area average whose implicit return on equity is close to 4.5 % on both sides. In general, the spread between assets and liabilities is small, with some exceptions. For instance, in Czechia, Ireland and Romania the spread is higher than 2.5 percentage points.

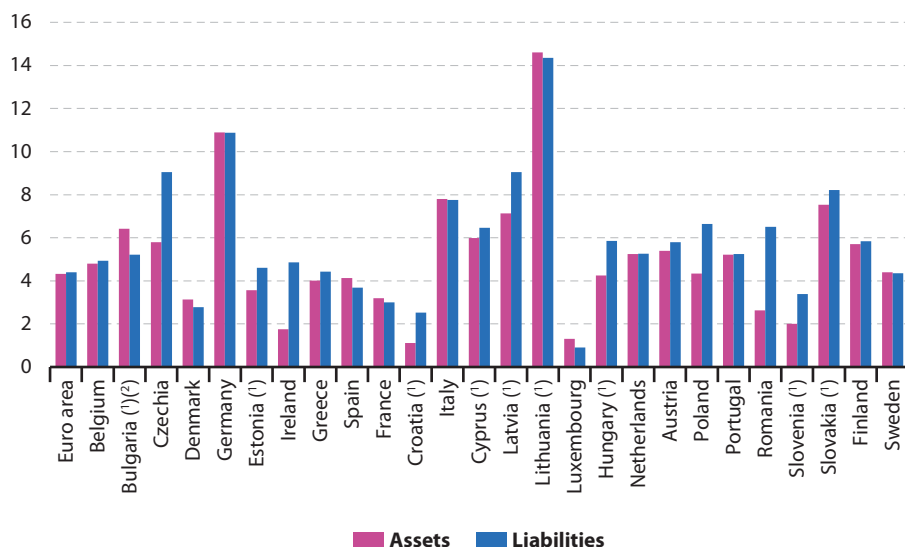
### 4.2. Comparing implicit return on equity for assets and liabilities: resident sector in relation to the rest of the world

As shown in Figure 7, the non-resident sector generally presents rates of returns between 4 % and 6 % on the asset side. The liability side is slightly more heterogeneous. Czechia, Latvia, Lithuania, Poland and Romania show rates above 10 % and are also the Member States with the largest spread between assets and liabilities. It is also worth noting the low yields for Luxembourg (less than 2 %) which may be related to the high outstanding amounts of unlisted shares and other equity.

<sup>(13)</sup> D.42 covers dividends (D.421) and withdrawals from income of quasi-corporations (D.422).

**Figure 6: Implicit return on equity for the total economy (S.1), 2018**

(%)



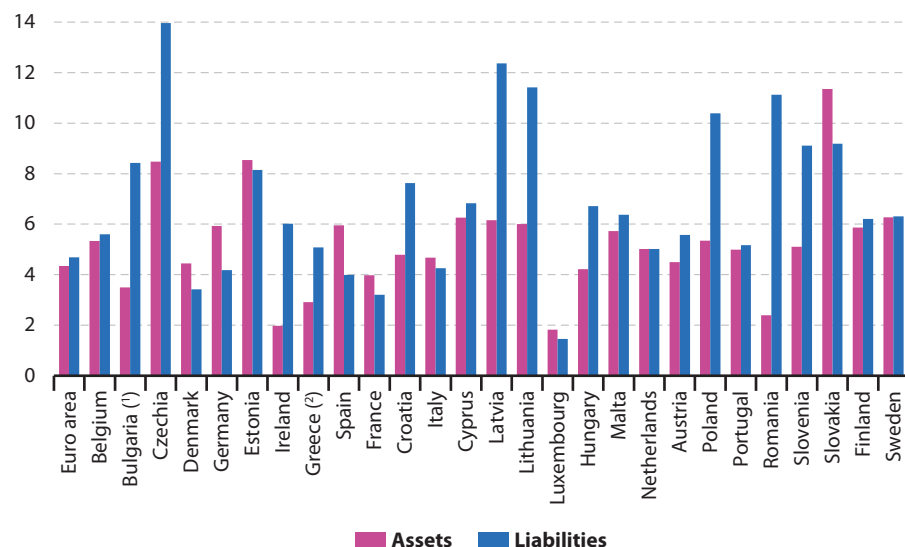
Note: Malta, not available.

(1) Based on annual data rather than annualised quarterly data.

(2) 2017.

**Figure 7: Implicit return on equity for the total economy positions in relation to the rest of the world (S.2), 2018**

(%)



(1) 2017.

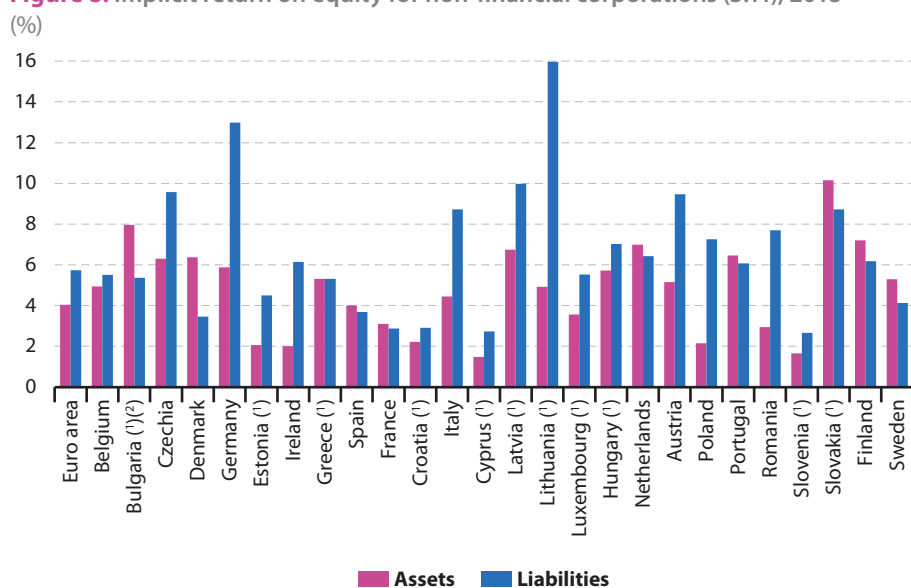
(2) Based on annual data rather than annualised quarterly data.

### 4.3. Comparing implicit return on equity for assets and liabilities: resident sector breakdown

#### NON-FINANCIAL CORPORATIONS

Figure 8 shows the implicit rates of returns of the NFCs. On the liability side, yields are notably high in Czechia, Germany, Ireland, Italy, Latvia, Lithuania, Austria and Slovakia. The contrast among implicit returns on equity on the asset side and on the liability side is particularly notable in Germany, Italy, Latvia, Lithuania, Poland and Slovakia. Cyprus and Slovenia show the lowest yields.

**Figure 8: Implicit return on equity for non-financial corporations (S.11), 2018**



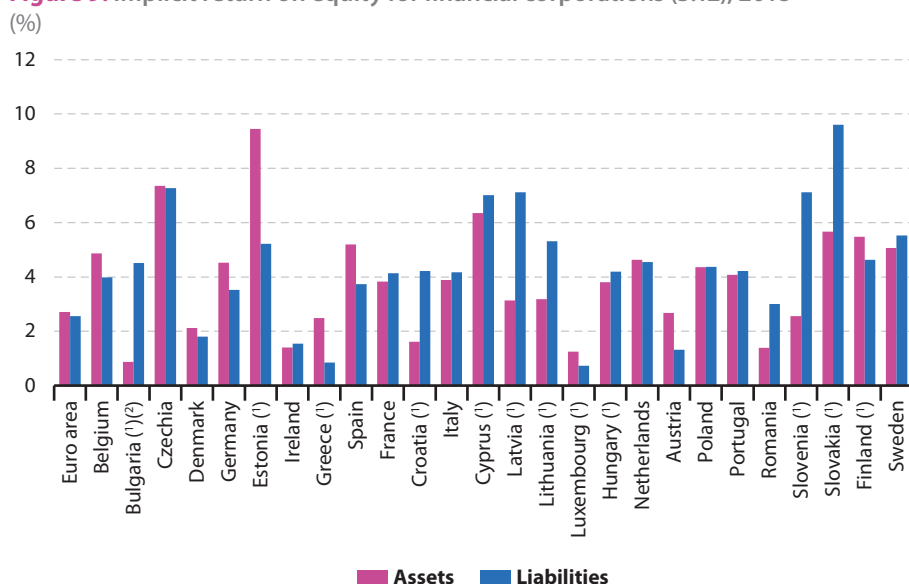
Note: Malta, not available.

(1) Based on annual data rather than annualised quarterly data.

(2) 2017.

#### FINANCIAL CORPORATIONS

As it is the case for implicit interest rates, for returns on equity there is also evidence of a relatively lower variability of rates of return in the financial corporations sector among Member States (Figure 9). Considerably higher yields are observed in Slovakia (above 10 % on the liability side).

**Figure 9: Implicit return on equity for financial corporations (S.12), 2018**

Note: Malta, not available.

(\*) Based on annual data rather than annualised quarterly data.

(\*) 2017.

## HOUSEHOLDS

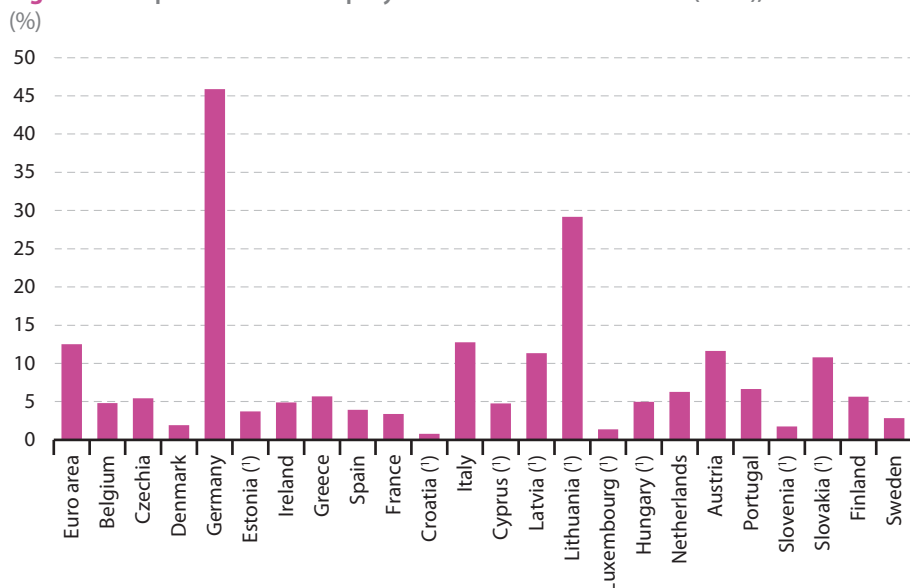
Figure 10 shows the implicit return on equity for the household sector. As this sector does not issue equity, only the asset side is analysed. Germany and Lithuania show particularly high (above 25 %) rates of return, followed by Italy, Latvia and Austria with returns slightly above 10 %. The euro area also presents high returns, about 12 %. The rest of the Member States generally present rates of return of around 4 % to 6 %. Croatia (0.8 %) Luxembourg (1.3 %) and Slovenia (1.8 %) stand out for their low returns. Compositional effects, such as higher proportions of unlisted shares and other equity, may help explain some cross-Member State differences. The proportion of companies issuing other equity is much higher in some Member States and it is mostly held by households <sup>(14)</sup>. The valuation of other equity is difficult as generally no market prices are available. While the valuation of listed shares is closely linked to stock market indices, the valuation changes of unlisted shares and other equity are less dynamic in most Member States. Estimation methods for other equity may yield values which do not fully reflect the profitability of a corporation <sup>(15)</sup>. Overall, differences of rates of return across Member States appear to be very high and should be further investigated. In a first step, rates of return for the total of shares and other equity significantly exceeding 10 % should be examined, as it seems either property income may be overestimated <sup>(16)</sup> and/or the financial positions are underestimated <sup>(17)</sup>.

<sup>(14)</sup> Member State comparisons are, however, difficult as the outstanding amounts are affected by different valuation methods. For example, in Germany the outstanding amount of other equity is lower than in France, despite the large number of limited liability companies (with a form such as a GmbH) issuing other equity in Germany. Something similar happens in Austria, where the vast majority of NFCs (also GmbH) issue other equity.

<sup>(15)</sup> For the valuation of other equity in quasi-corporations (such as limited liability and other partnerships) ESA 2010 prescribes the own funds method. This method tends to yield relatively low values with regard to profitability as the profits of the enterprise are also driven by assets such as human capital which are not fully reflected in the accounts.

<sup>(16)</sup> A possible explanation to property income data overestimation is that it is not always possible to separate the labour income received by owners working in their own enterprise from their return on capital. See [Information Note on the Recording of Self-employment and Related Income Flows in Sector Accounts](#), Eurostat July 2019.

<sup>(17)</sup> The ECB established in 2020 a virtual Expert Group on Unlisted Equity, and the valuation of outstanding amounts is one main topic of its work.

**Figure 10: Implicit return on equity for households and NPISH (S.1M), 2018**

Note: Bulgaria, Malta, Poland and Romania, not available.

(\*) Based on annual data rather than annualised quarterly data.

## 5. Implicit return on other property income

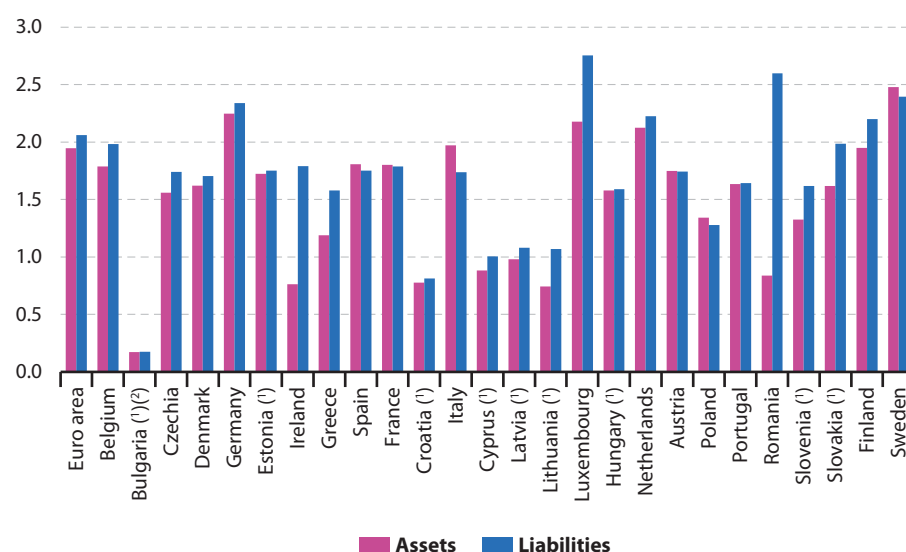
Other property income (D.44) covers income attributable to insurance policyholders (D.441), investment income payable/receivable on pension entitlements (D.442) and investment income attributable to collective investment funds shareholders (D.443). As this detailed level (3- digits) of breakdown is not mandatory for quarterly data and thus not available for several Member States, D.44 was compared to the sum of investment fund shares (F.52) and insurance, pension and standardised guarantees (F.6). Given that the available financial and non-financial accounts under the ECB and the ESA 2010 transmission programmes do not enable an identification of the underlying financial instruments to which insurance, pension and investment funds allocate their financial investment, the analysis of the results for other property income is particularly difficult.

## 5.1. Comparing implicit rates of return for assets and liabilities: resident sector

Figure 11 shows the other property income implicit rates of return on the assets and liability sides for the resident sector. Rates are generally consistent across Member States (between 1 % and 2.5 %) and are very similar on the assets and on the liability sides; this is in line with what is expected as most life insurance corporations pass the returns to their investors. Only a few Member States (Ireland, Luxembourg and Romania) stand out as the rates of return are significantly higher on the liability side. For Member States acting as an international financial centre for investment funds, in particular Ireland and Luxembourg in the EU, it should be taken into account that assets held by resident sectors are only a small fraction of the liabilities of resident funds as they are mostly held by foreign investors (see next section).

**Figure 11: Other property income for the total economy (S.1), 2018**

(%)



Note: Malta, not available.

(\*) Based on annual data rather than annualised quarterly data.

(\*) 2017.

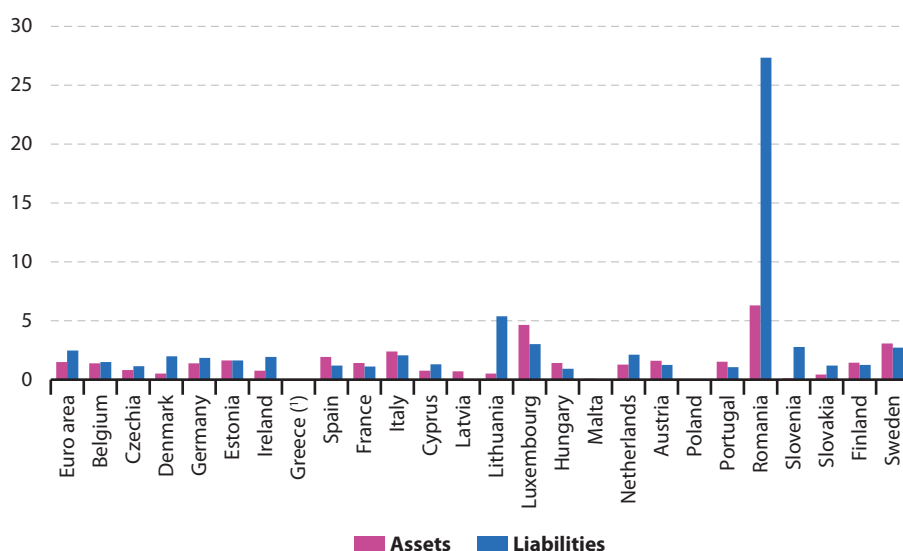


## 5.2. Comparing implicit rates of return for assets and liabilities: resident sector in relation to the rest of the world

Other property income implicit rates of return in relation to the non-resident sector (rest of the world; Figure 12) are similar to the resident sector, close to 1.5 % in most cases with some exceptions. Romania has a rate of return of 27.3 % on the liability side. The rates of return of the two Member States which act as international financial centre for investment funds (Ireland and Luxembourg) differ substantially on the asset side; the rate is particularly high in Luxembourg (4.6 %), while it is rather low in Ireland (0.8 %).

**Figure 12: Other property income for the total economy position in relation to the rest of the world (S.2), 2018**

(%)



Note: Bulgaria and Croatia, not available. Greece financial values do show positive values, but the correspondent rate of return is zero due to reported zero income data.

(¹) Based on annual data rather than annualised quarterly data.

### 5.3. Comparing implicit rates of return for assets and liabilities: by resident sector breakdown

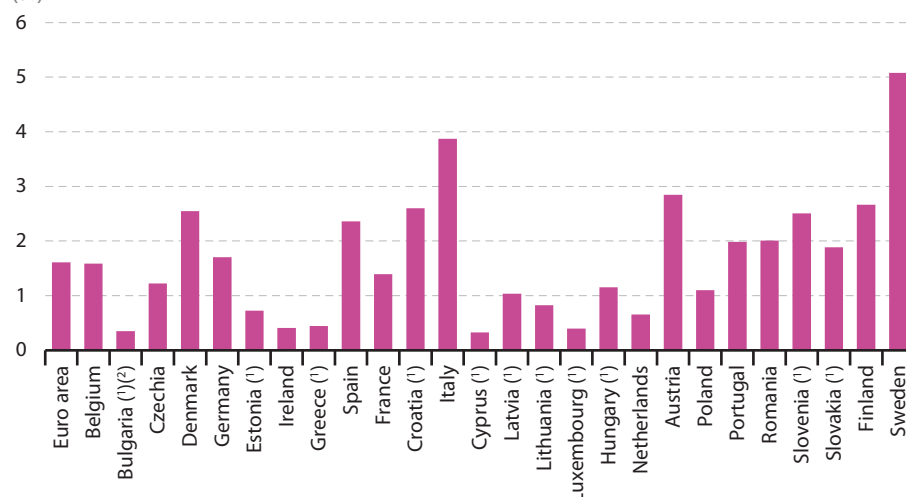
Non-financial corporations (S.11) and households and NPISH (S.1M) do not generally issue liabilities on which other property income payable accrues (the exception being non-autonomous pension fund liabilities which exist only in a few Member States). Thus, only the complete analysis for financial corporations (S.12) is presented. For S.11 and S.1M, the asset side is shown as well, but it cannot be compared with the liabilities.

#### NON-FINANCIAL CORPORATIONS

Other income receivable in non-financial corporations is mostly derived from the holdings of investment fund shares (F.52), while the holdings of insurance, pensions and standardised guarantee schemes (F.6) are much smaller, and the rates of returns are likely also lower on F.5 than on F.52. Rates of return (Figure 13) are below 4 % in most cases, the exception being Sweden with a rate of above 5 %.

**Figure 13: Other property income for non-financial corporations (S.11), 2018**

(%)



Note: Malta, not available.

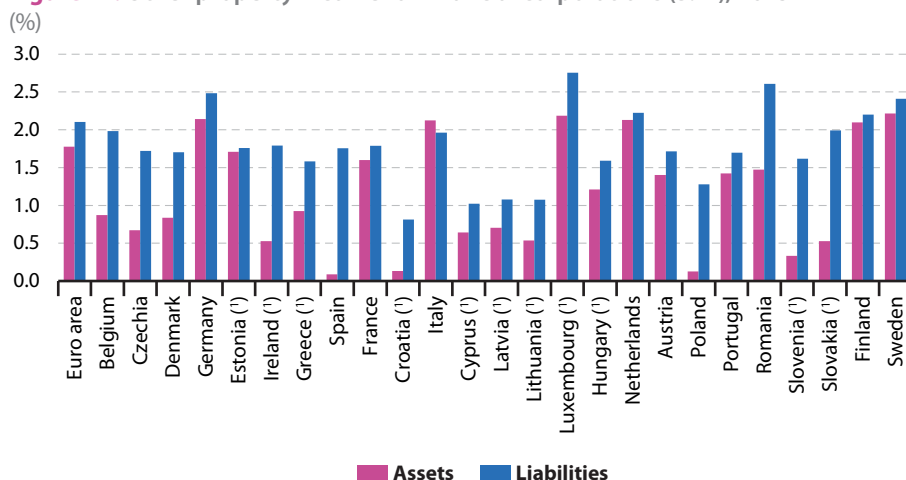
(1) Based on annual data rather than annualised quarterly data.

(2) 2017.

## FINANCIAL CORPORATIONS

Rates are in general higher on the liability side (see for example Spain or Poland). However, rates are generally between 0.5 % and 2.5 %.

**Figure 14: Other property income for financial corporations (S.12), 2018**



Note: Bulgaria and Malta, not available.

(¹) Based on annual data rather than annualised quarterly data.

## HOUSEHOLD SECTOR

As shown in Figure 15, rates of return on the asset side of the household sector in most Member States are between 1.0 % and 2.5 %. Bulgaria, Croatia and Romania had the lowest rates with 0.2 %, 0.7 % and 0.6 % respectively.

**Figure 15: Other property income for households and NPISH (S.1M), 2018**



Note: Malta, not available.

(¹) Based on annual data rather than annualised quarterly data.

(²) 2017.

## 6. Consistency between the quarterly and annually derived income rates

### 6.1. Introduction and methodology

As a general concept within this article, the annual sum of quarterly data is preferred over the annual data if fully available for both financial and non-financial accounts, as users often prefer quarterly and more timely data. Only if the quarterly data are not available, annual data are used to calculate the income rates <sup>(18)</sup>. This section aims to test the impact of this choice of frequency, as the consistency of quarterly and annual data is also of interest to users. Therefore, the different income rates have been recalculated based on the annual data <sup>(19)</sup> and then compared with the rates resulting from the annual sum of quarterly data for the year of 2018 <sup>(20)</sup>.

This analysis was conducted for 15 Member States that regularly record both quarterly and annual data. Because some Member States compile quarterly data for some but not all sectors or variables, the analysis is done in two steps. The first step included the comparison of the quarterly income rates with the annual rates (quarterly to annual differences of up to 0.05 percentage points are deemed negligible and thus ignored for the analysis).

In the second step, the underlying non-financial accounts and financial accounts variables were compared. Checking their quarterly to annual consistency may help explaining where the differences in the income rates have their origins. As the different instruments (for example D.43, F.2M) differ largely in their size, a simple difference between quarterly and annual data will not indicate the magnitude of the quarter to annual discrepancy. To better gauge their extent, the quarterly data was divided by the annual data and then expressed as a percentage. A result of '100 %' means that the data are equal and no inconsistencies exist.

### 6.2. Implicit interest rate

The implicit interest rate is calculated based on four variables (see also Section 2). On the side of the non-financial accounts, D.41G – the total interest before FISIM allocation – can be found in the numerator of the equation. The three variables in the denominator are all from the financial accounts: deposits (F.2M), debt securities (F.3) and loans (F.4). Figure 16 shows those Member States (Bulgaria, Czechia, Ireland, Hungary and Poland) that have significant differences (>0.05 percentage points) between the quarterly and annually derived implicit interest rates for the listed sectors <sup>(21)</sup>.

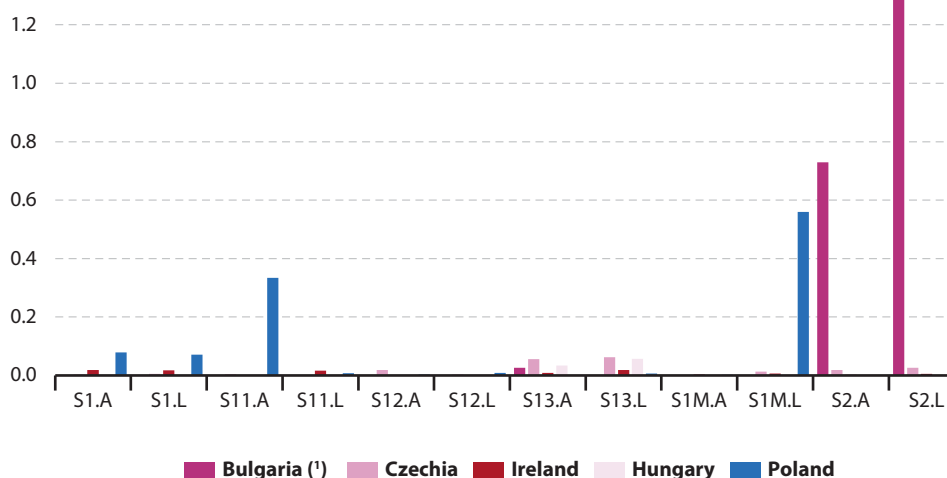
<sup>(18)</sup> Except for Greece, where the annual data is used for calculating the ratios. In October 2020, Greece transmitted revised annual non-financial sector accounts that incorporated the results of the benchmark revision from 2010 onwards but are still pending for the quarterly data. On these grounds, Greece has been excluded from the analysis of consistency between the quarterly and annually derived income rates.

<sup>(19)</sup> See in Table 1 of this article the formulas used to calculate the different implicit interest rates for each property income category. For the numerator the annual non-financial accounts were taken directly. For the financial accounts in the denominator the average stock has been calculated as an average of the stock at the beginning of the period (end of 2017) and the stock at the end of the period (end of 2018).

<sup>(20)</sup> Due to limited availability of data, for Bulgaria, the use of 2017 data is selected.

<sup>(21)</sup> Member States that show differences that are deemed insignificant (below 0.05 %) for any sector, include Germany, Italy, Cyprus and Luxembourg.

**Figure 16: Implicit interest rate: absolute difference quarterly to annual data, 2018**  
(percentage points)



(¹) 2017.

Poland is the only Member State that has slight differences between the quarterly and annual implicit interest rates for the **resident sector (S.1)**. They are based on small inconsistencies between the annual and quarterly data in non-financial variable D.41.

For **non-financial corporations (S.11)**, the analysis shows that differences between the quarterly and annual non-financial variables are only relevant for Poland. Table 2 provides an overview of the components of the implicit interest rate and the source of discrepancy between annual and quarterly values.

For **financial corporations (S.12)**, the differences between quarterly and annual data are not relevant.

Regarding the **general government sector (S.13)**, the largest difference between quarterly and annual rates both on the asset and liability sides is for Czechia (0.06 percentage points).

Within the **households and NPISH sector (S.1M)**, there were some large discrepancies for Poland, reaching up to 0.57 percentage points due to the instrument D.41G.

Lastly, for the **rest of the world (S.2)** Bulgaria shows massive discrepancies on both the assets (0.73 percentage points) and liabilities (1.31 percentage points) sides.

**Table 2:** Instruments that compose the implicit interest rate for quarterly data as a percentage of annual data, 2018

(%)

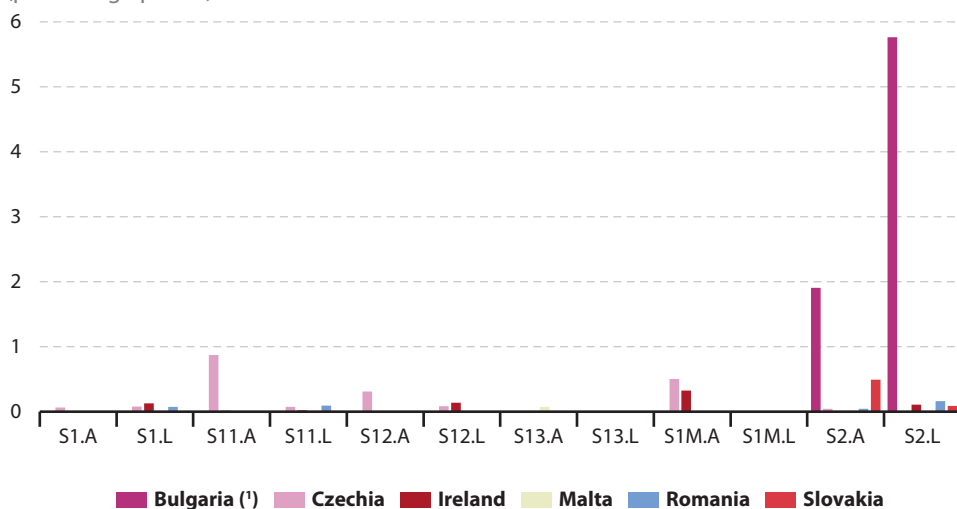
D41G			F2M			F3			F4		
Bulgaria											
D41G	A	L	F2M	A	L	F3	A	L	F4	A	L
S1	NA	NA	S1	100	100	S1	100	100	S1	100	100
S11	NA	NA	S11	100	NA	S11	100	100	S11	100	100
S12	NA	NA	S12	100	100	S12	100	100	S12	100	100
S13	97	103	S13	100	NA	S13	100	100	S13	100	100
S1M	NA	NA	S1M	100	NA	S1M	100	NA	S1M	100	100
S2	62	205	S2	100	100	S2	100	100	S2	100	100
Czechia											
D41G	A	L	F2M	A	L	F3	A	L	F4	A	L
S1	100	100	S1	98	98	S1	100	100	S1	103	103
S11	100	100	S11	99	NA	S11	91	100	S11	99	100
S12	100	100	S12	101	100	S12	101	105	S12	101	97
S13	100	100	S13	74	0	S13	36	97	S13	209	200
S1M	100	100	S1M	100	NA	S1M	100	112	S1M	90	99
S2	100	100	S2	100	100	S2	100	100	S2	100	100
Poland											
D41G	A	L	F2M	A	L	F3	A	L	F4	A	L
S1	104	104	S1	100	100	S1	100	100	S1	100	100
S11	149	100	S11	100	NA	S11	100	100	S11	100	100
S12	100	100	S12	100	100	S12	100	100	S12	100	100
S13	100	100	S13	100	100	S13	100	100	S13	100	100
S1M	100	114	S1M	100	NA	S1M	100	NA	S1M	100	100
S2	100	100	S2	100	100	S2	100	100	S2	100	100

In summary, it can be stated that the vast majority of the Member States showed no differences between annual and quarterly implicit interest rates. The heat map indicates that, on average, the non-financial instrument D.41G more frequently shows differences between quarterly and annual data. Moreover, even though some Member States (like Czechia) present relevant differences in financial instruments (in other words, F.2M, F.3 and F.4), the impact on the implicit interest rate is rather limited, as can be seen in Figure 16. Overall, preferring quarterly data over annual data for the analysis, or the other way around, does not have an impact on the results of this article.

### 6.3. Implicit return on equity

To calculate the return on equity, three different instruments are used. Two are from the non-financial accounts: distributed income of corporations (D.42) and reinvested earnings on foreign direct investment (D.43). The remaining variable is equity (F.51), sourced from financial accounts. Figure 17 shows the Member States for which significant differences (above 0.05 percentage points) are observed.

**Figure 17: Implicit return on equity: absolute difference quarterly minus annual data, 2018**  
(percentage points)



(¹) 2017.

For the **resident sector (S.1)**, the differences are very limited and always below 0.15 percentage points. Ireland on the liabilities side shows the largest discrepancies. Table 3 provides an overview of the components of the implicit return on equity, and the source of discrepancy between the annual and the quarterly values.

For **non-financial corporations (S.11)**, the discrepancies are relevant on the assets side, where Czechia presents differences above 0.85 percentage points. Differences of this magnitude, might distort the analysis depending on which frequency is used. According to the heat map, these differences for Czechia are mainly driven by F.51.

The **financial corporations sector (S.12)** differences are not relevant (below 0.3 percentage points).

The **general government sector (S.13)** shows small inconsistencies between quarterly and annual data. Due to data unavailability, the comparison of annual and quarterly data could not be conducted for the liability side of the S.13 sector.

For the **households and NPISH sector (S.1M)**, Czechia and Ireland present significant differences that can be up to 0.5 percentage points coming from the financial instrument F.51. As regards the liability side, there are no data to be analysed, as the household sector does not issue equity.

The **rest of the world (S.2)** revealed the highest difference between the quarterly and annual return on equity. Bulgaria, whose 2017 data are used due to the unavailability of 2018 data, records on the liabilities side a return on equity based on quarterly values of 8.4 % and a rate of 2.7 % based on annual values, leading to a difference of 5.8 percentage points. On the assets side, the difference for Bulgaria is not as large but still very substantial (1.9 percentage

points). These discrepancies are based entirely on inconsistencies in the non-financial variables D.42 and D.43. Whether these differences would also have appeared in the other sectors is not clear, as Bulgaria has not recorded sufficient quarterly data to do this analysis. Furthermore, Ireland and Slovakia recorded significant differences between the quarterly and annual returns on equity.

**Table 3: Instruments that compose the implicit return on equity for quarterly data as a percentage of annual data, 2018**

(%)

D42			D43			F51		
Bulgaria								
D42	A	L	D43	A	L	F51	A	L
S1	NA	NA	S1	NA	NA	S1	100	100
S11	NA	NA	S11	NA	NA	S11	100	100
S12	NA	NA	S12	NA	NA	S12	100	100
S13	100	NA	S13	NA	NA	S13	100	105
S1M	NA	NA	S1M	NA	NA	S1M	100	100
S2	295	255	S2	123	668	S2	100	100
Czechia								
D42	A	L	D43	A	L	F51	A	L
S1	100	100	S1	100	100	S1	101	101
S11	100	100	S11	100	100	S11	114	101
S12	100	100	S12	100	100	S12	104	101
S13	100	NA	S13	NA	NA	S13	103	0
S1M	100	NA	S1M	100	NA	S1M	91	NA
S2	100	100	S2	100	100	S2	99	100
Ireland								
D42	A	L	D43	A	L	F51	A	L
S1	100	100	S1	100	100	S1	101	103
S11	100	100	S11	100	100	S11	101	100
S12	100	100	S12	100	100	S12	101	109
S13	100	NA	S13	NA	NA	S13	100	207
S1M	100	NA	S1M	NA	NA	S1M	93	NA
S2	100	100	S2	100	100	S2	100	102
Slovakia								
D42	A	L	D43	A	L	F51	A	L
S1	NA	NA	S1	100	100	S1	98	99
S11	NA	NA	S11	NA	NA	S11	222	101
S12	NA	NA	S12	NA	NA	S12	100	90
S13	100	NA	S13	NA	NA	S13	100	95
S1M	NA	NA	S1M	NA	NA	S1M	4	233
S2	100	100	S2	100	100	S2	96	99

To conclude, the comparison of quarterly and annual returns on equity revealed inconsistencies across more Member States, sectors and variables than was the case for implicit interest rates. The origin of the inconsistencies is mixed as for some Member States it lies in the non-financial instruments, while for others only the financial instruments



present differences. The strong outlier for Bulgaria in S.2 needs to be examined through an individual Member State analysis. Excluding the exceptional cases of Bulgaria and Czechia, the preference of quarterly data over annual data has a rather negligible effect on the analysis for the majority of the Member States and sectors.

## 6.4. Implicit return on other property income

The implicit return on property income is calculated from other investment income (D.44) on the non-financial side, and investment fund shares or units (F.52) and insurance, pensions and standardised guarantees (F.6) on the financial side. For three sectors (S.11, S.13, S.1M), no data were available on the liability side.

Due to the small number of inconsistencies (Figure 18), it is not necessary to conduct a sector-by-sector analysis. Only four Member States reported substantial quarter to annual differences. Difference above 0.5 percentage points can be observed on the assets side for Czechia, Slovakia and Romania. On the liabilities side, Romania reported a large outlier for the external sector, almost 10 percentage points (27 % using quarterly data and 17 % using annual data). However, the vast majority of Member States showed highly consistent quarterly and annual data.

**Figure 18: Other property income: absolute difference quarterly minus annual data, 2018**  
(percentage points)

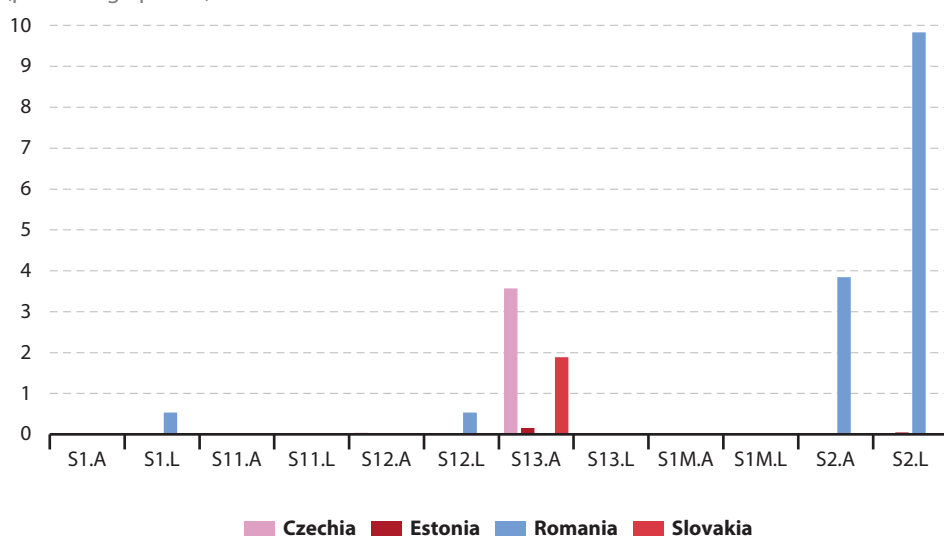


Table 4 presents the heat map for other property income. It is important to note that positions of the F.6 variable are, by comparison with F.52, so minor that even the large relative discrepancies for this variable will not significantly impact the calculation of the implicit

returns on other property income. Nevertheless, the F.6 discrepancies might deserve further investigation for individual Member States.

The discrepancies observed for Czechia come mainly from the financial instrument F.6 and to a smaller extent from instrument F.52 for the case of general government.

In Romania, the discrepancies are only present from the non-financial transaction D.44. However, in some cases the differences can be very large and might require further investigation.

To summarise the observations of the other property income rates, it can be stated that most Member States show highly consistent rates without any differences between quarterly and annual data. There are still some significant outliers for Romania and some negligible to moderate differences for at most one sector in just a few Member States.

**Table 4: Instruments that compose other property income for quarterly data as a percentage of annual data, 2018**

(%)

	D44			F52			F6		
	Czechia								
D44	A	L	F52	A	L	F6	A	L	
S1	100	100	S1	100	100	S1	100	100	
S11	100	NA	S11	100	NA	S11	101	NA	
S12	100	100	S12	100	100	S12	131	103	
S13	100	NA	S13	64	NA	S13	16	NA	
S1M	100	NA	S1M	100	NA	S1M	100	NA	
S2	100	100	S2	100	100	S2	99	100	
	Romania								
D44	A	L	F52	A	L	F6	A	L	
S1	100	126	S1	100	100	S1	100	100	
S11	100	NA	S11	100	NA	S11	100	NA	
S12	100	126	S12	100	100	S12	100	100	
S13	NA	NA	S13	100	NA	S13	100	100	
S1M	100	NA	S1M	100	NA	S1M	100	NA	
S2	256	156	S2	100	100	S2	100	100	

## 6.5. Summary of comparison of quarterly and annual data

It can be concluded that the majority of Member States show consistent quarter to annual data and thus no relevant differences between annual and quarterly rates for implicit interest, return on equity and other property income. Structural and repetitive inconsistencies between quarterly and annual implicit income rates across different income types and sectors are only observed for a few Member States. For Czechia, the national statistical office indicated that most of the discrepancies can be explained by the different sector classification (between S.12 and S.13) of some units in the quarterly and annual financial accounts. Bulgaria showed significant discrepancies for the implicit interest rate and the return on equity rate mainly for S.2.

## 7. Conclusions

This paper includes an overview of implicit rates of returns by creditor and debtor sectors across the Member States. It is meant to provide data compilers an indication for which sectors the relations between assets and liabilities and the correspondent property income deviate from other Member States. National data compilers may use these results as a starting point for further investigations. Member States' experts are best placed to assess whether the observed differences compared to other Member States are due to economic differences and/or at least partially to due statistical sources and methods which could potentially be improved. Reducing differences due to statistical issues would also be a contribution to improve the vertical consistency of the accounts.

The analysis shows that for the implicit rates of return of the three components of property income (interest, distributed income on equity and other property income) the relation between assets and liabilities is generally plausible for the resident sector, although some questions for specific Member States remain. More differences and need for clarification are present in the resident sector breakdown as well as for the positions in relation to the rest of the world.

Secondly, the presence of specific outliers for some Member States can indicate that some instruments assets/liabilities are underestimated when implicit rates of return are high (or overestimated when implicit rates of return are low) and/or the relevant property income categories are overestimated in the non-financial accounts. This analysis across Member States can indicate a possible cause of vertical discrepancy.

In terms of property income categories and related financial positions, most outliers are observed for implicit returns on equity, followed by the implicit return of other income on insurance and investment fund positions. Some of the largest implicit returns on equity concern large economies (for example, Germany and Italy); this therefore impacts euro area and EU aggregates.

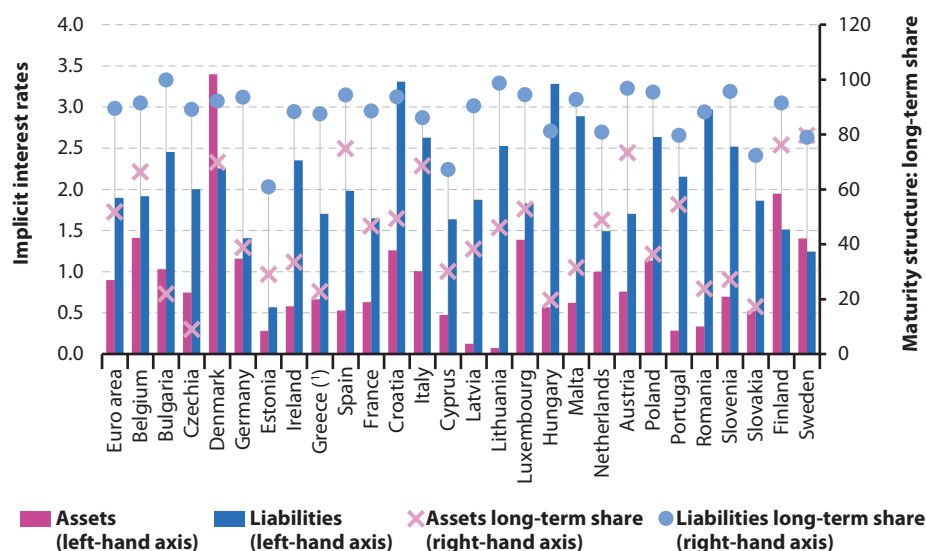
A series of checks on consistency between quarterly and annual data have also been presented. They show that there are no differences between them for the majority of Member States. Thus, the choice of using quarterly data over annual data has no major impact on the analysis. Nevertheless, some (unexplored) structural inconsistencies between the two frequencies are observed for Bulgaria, especially for the implicit return on equity, and for Romania for the implicit return on other property income. They should be investigated further.

## 8. Acknowledgements

The authors would like to thank Henning Ahnert (ECB, DG-Statistics – External statistics and sector accounts) for his valuable comments.

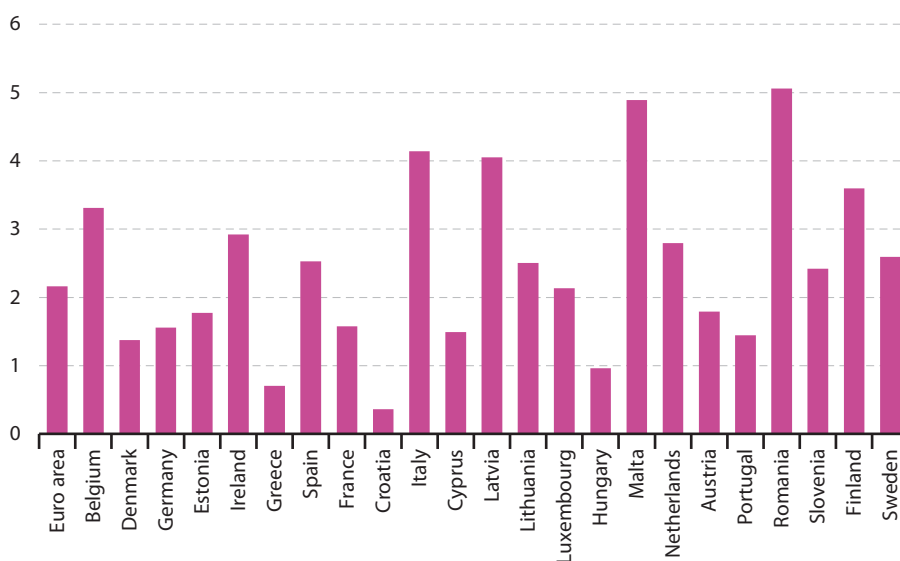
## Annex 1: General government (S.13)

**Figure A1.1: Implicit interest rates and maturity structure, 2018**  
(%)



(\*) Based on annual data rather than annualised quarterly data.

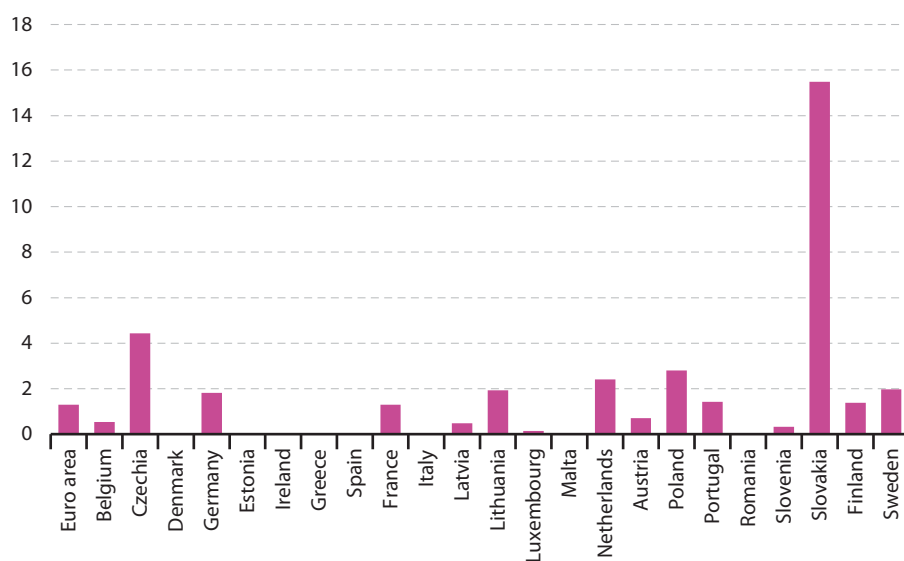
**Figure A1.2: Implicit return on equity, 2018**  
(%)



Note: Bulgaria, Czechia, Poland and Slovakia, not available.

**Figure A1.3: Implicit return on other property income, 2018**

(%)

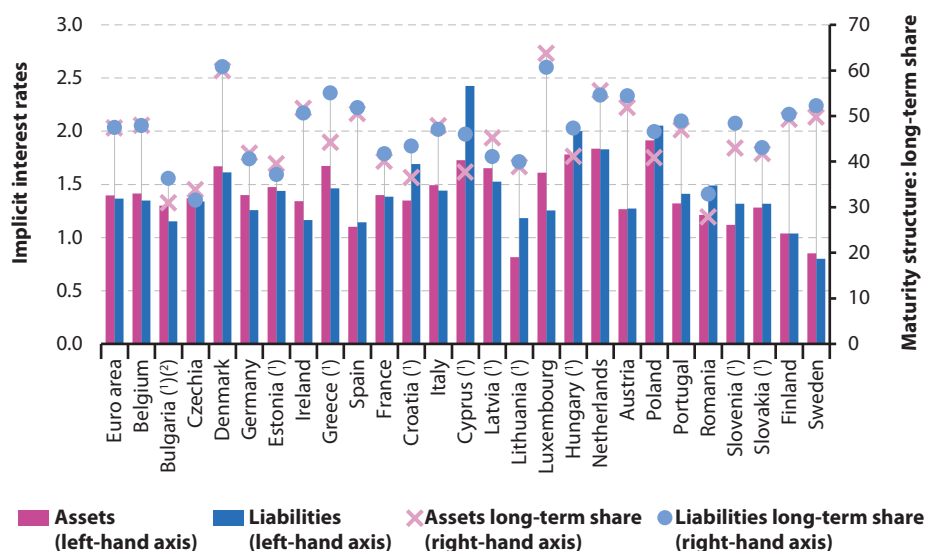


Note: Bulgaria, Croatia, Cyprus and Hungary, not available.

## Annex 2: Implicit interest rate and maturity structure (including other accounts receivable F.8)

**Figure A2.1: Total economy (S.1), 2018**

(%)

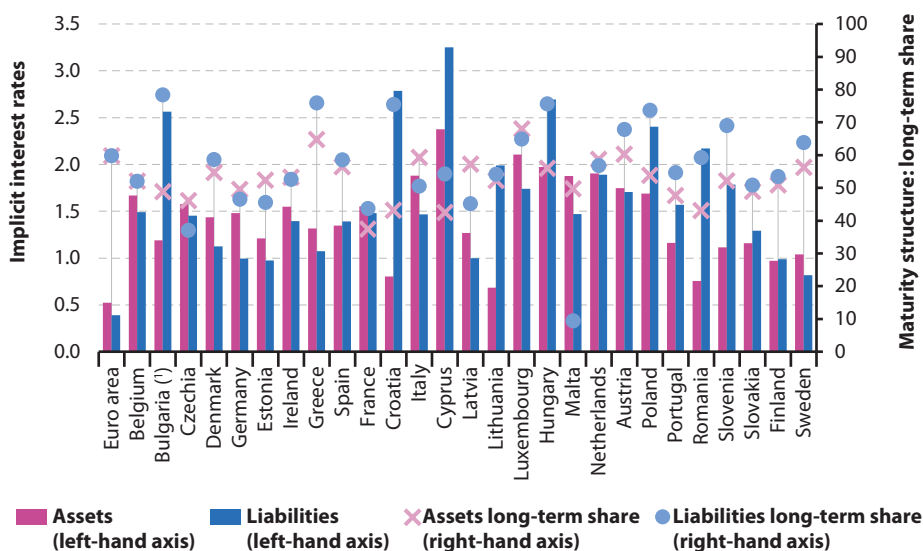


Note: Malta, not available.

(\*) Based on annual data rather than annualised quarterly data.

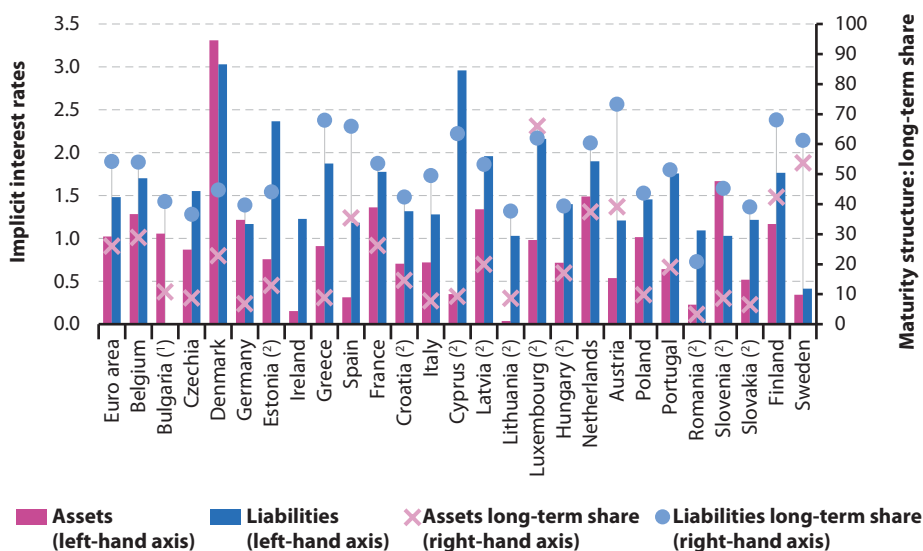
(†) 2017.

**Figure A2.2: Total economy positions in relation to the rest of the world (S.2), 2018**  
(%)



(1) 2017.

**Figure A2.3: Non-financial corporations (S.11), 2018**  
(%)



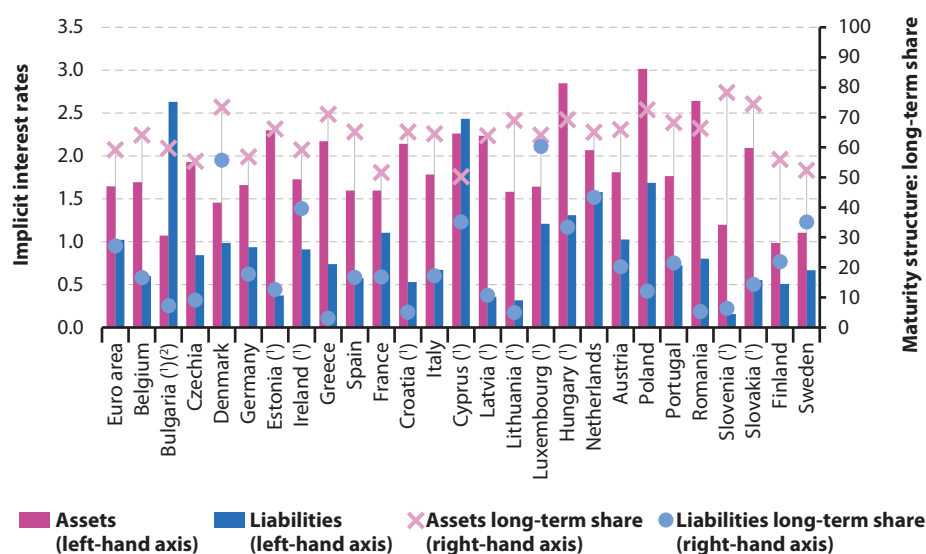
Note: Malta, not available. Ireland: long-term shares not available.

(1) 2017.

(2) Based on annual data rather than annualised quarterly data.

**Figure A2.4: Financial corporations (S.12), 2018**

(%)



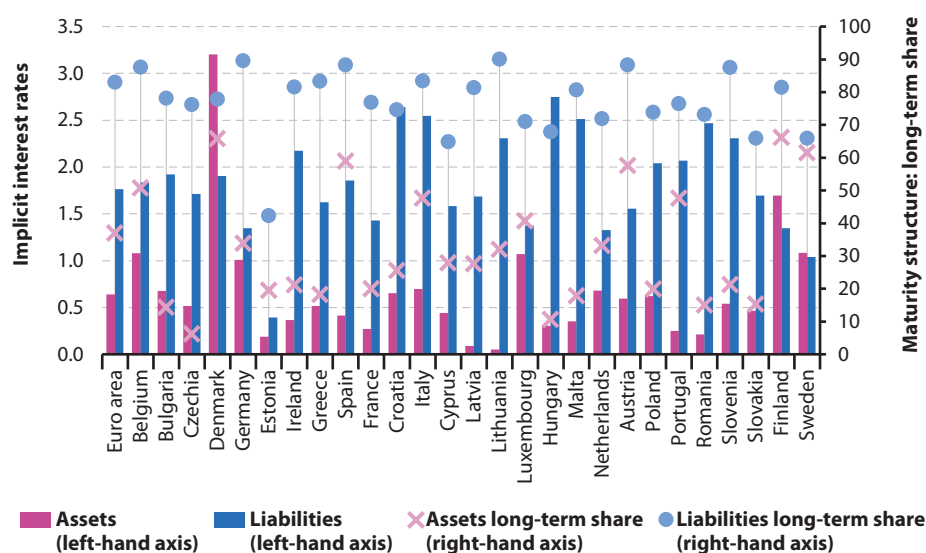
Note: Malta, not available.

(\*) 2017.

(\*) Based on annual data rather than annualised quarterly data.

**Figure A2.5: General government (S.13), 2018**

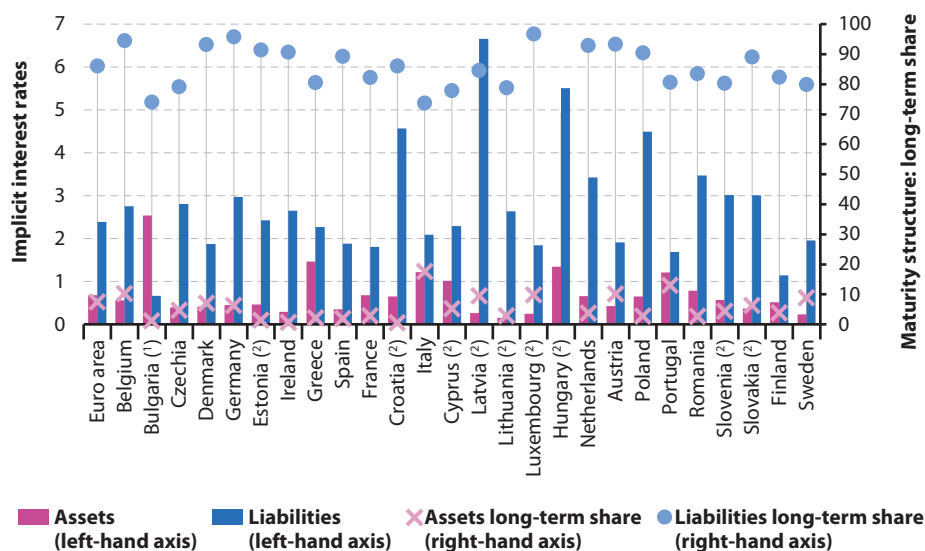
(%)





**Figure A2.6: Households and NPISH (S.1M), 2018**

(%)



Note: Malta, not available. Hungary: long-term shares not available.

(1) 2017.

(2) Based on annual data rather than annualised quarterly data.