Discussion Papers

# Interest rate exposure of Slovenian households

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# Abstract

Using data from the Household Finance and Consumption Survey, this paper examines the exposure of Slovenian households to changes in interest rates. I discuss the composition of assets and liabilities of Slovenian households and quantify their direct interest rate exposure by identifying components of their balance sheets that have cash flows directly responsive to changes in interest rates. The HFCS data show that the direct interest rate exposure of Slovenian households is, on average, moderately positive, implying that the net interest income of Slovenian households should increase as interest rates rise. Within the sample of households, there is, however, substantial heterogeneity, and I show that households' direct interest rate exposure varies systematically with several key household characteristics. Among these, housing status is the single most important determinant of households' interest rate exposure. In comparison with the euro area, Slovenia does not stand out, as the direct interest rate exposure of Slovenian households lies close to the middle of the distribution of countries.

**JEL codes:** D14, D31, E52, E58, G51

**Keywords:** interest rate exposure, Household Finance and Consumption Survey, household heterogeneity, household balance sheets, monetary policy

# 1 Introduction

Over the course of the past two years, interest rates have risen sharply as monetary policy turned restrictive in response to the high inflation that followed the COVID-19 pandemic and the war in Ukraine. Between July 2022 and September 2023, the ECB raised its policy rates by 4.5 percentage points and continued to scale down its non-standard policy measures. This caused a noticeable tightening of financing conditions for the overall economy, which was also reflected in a substantial upward repricing of interest rates facing households.

A question that naturally arises in light of these developments is to what extent such increases in interest rates affect the household finances of Slovenian households.

In this paper, I approach this question by analysing the interest rate exposure of Slovenian households using data from the latest wave of the Household Finance and Consumption Survey (HFCS) that was conducted in 2020 and 2021. The HFCS is a euro area-wide survey that provides detailed household-level data on the composition of household balance sheets, and is therefore particularly suitable for a granular analysis of households' interest rate exposure.

The first part of the paper gives an overview of the balance sheets of Slovenian households in order to provide the basis for the later discussion of interest rate exposure. I discuss the composition of assets and liabilities of households and evaluate several measures of their net wealth position. Slovenian households have, on average, a fairly rudimentary composition of assets, mostly consisting of real estate on the side of real assets and deposits on the side of financial assets. In terms of liabilities, Slovenian households exhibit a very low level of indebtedness, which is mostly related to mortgage loans and, in a lesser manner, to consumer loans. As a result of significant asset holdings (EUR 200,500) and a low level of debt (EUR 8,700), Slovenian households have, on average, EUR 191,700 of net wealth. By far the largest source of their net wealth is the net value of households' main residence, i.e., the property in which they reside.

The second part of the paper then examines the interest rate exposure of Slovenian households. I categorise the effects of interest rate changes on households into direct and indirect effects. Direct effects relate to the short-run first-order effects that changes in interest rates have on households' net interest income. Meanwhile, indirect effects reflect the predominantly general equilibrium effects of changes in interest rates on households' non-interest income and asset valuations. Due to the nature of the HFCS data and the fact that an evaluation of indirect effects would require an additional general equilibrium model, the main focus of my analysis is on examining the direct interest rate exposure of Slovenian households.

I quantify the direct interest rate exposure of households by identifying components of household balance sheets in the HFCS data that have cash flows responsive to changes in interest rates. Based on this, I construct a summary measure of direct interest rate exposure as the difference between deposits and the sum of variable-rate mortgages and non-mortgage debt.

The HFCS data show that Slovenian households had, on average, EUR 4,100 of direct interest rate exposure in 2021, implying that the net interest income of Slovenian households is, on average, positively exposed to changes in interest rates. Within the

sample of households, there is, however, substantial heterogeneity and I show that direct interest rate exposure varies systematically with age, income, net worth, history of inheritance and housing status. Among the analysed household characteristics, housing status is by far the most important determinant of direct interest rate exposure. In this aspect, homeowners with a mortgage particularly stand out. Contrary to the average Slovenian household, homeowners with a mortgage have, on average, a strongly negative level of direct interest rate exposure and are the group whose net interest income declines most when interest rates increase.

Additionally, this paper examines how the direct interest rate exposure of Slovenian households compares within the wider context of euro area countries. Slovenia lies close to the middle of the distribution of countries, although somewhat below the euro area average. The degree of heterogeneity in direct interest rate exposure across euro area countries is substantial. While households in the vast majority of countries have, as in Slovenia, positive direct interest rate exposure, there are also five countries in which households have on average negative direct interest rate exposure. I explore possible explanations for these differences across countries and conclude that differences in the relative indebtedness of households across the euro area and, crucially, in the variability in the prevalence of variable rate mortgages are likely the main drivers of heterogeneity.

This paper contributes to the literature that examines households' interest rate exposure using household-level data. The closest to my paper are Tzamourani (2021) and Slacalek, Tristani, and Violante (2020), who use the HFCS data to study how interest rate changes affect euro area households. Tzamourani (2021) estimates the "unhedged interest rate exposure", a welfare metric based on Auclert (2019), to find that interest rate exposure varies substantially across euro area households, both between countries as well as within countries. Slacalek, Tristani, and Violante (2020) take a step further and quantify how changes in interest rates affect household consumption in the euro area through direct and indirect channels.[1] I complement these studies by providing a detailed analysis of the interest rate exposure of Slovenian households. Furthermore, I also complement their work by providing a discussion of the determinants of heterogeneity in interest rate exposure in Slovenia and the euro area.

The rest of the paper is structured as follows: Section 2 discusses the characteristics of the balance sheets of Slovenian households by detailing the composition of their assets and liabilities. Section 3 then examines the interest rate exposure of Slovenian households. I introduce a measure of direct interest rate exposure and examine its determinants. I also briefly discuss the relationship between the direct and indirect interest rate exposures of households. Section 4 concludes.

[1] Somewhat less related are also Bech and Mikkelsen (2021), who quantify the effect of an increase in interest rates on Danish homeowners' cash flow and balance sheets using Danish register data.

# 2 Assets and liabilities of Slovenian households

In order to assess how changes in interest rates affect household finances, it is crucial to first understand the composition of household balance sheets. In contrast to firms, which in Slovenia have a legal obligation to periodically produce balance sheets, no such requirement exists for households. Therefore, while the state of firms' balance sheets can be easily examined using publicly available financial statements, the state of household finances is subject to a great degree of opacity.

In this paper, I use data from the Household Finance and Consumption Survey (HFCS) to examine the composition of assets and liabilities of Slovenian households. The HFCS is a survey conducted approximately every four years in euro area countries as well as some non-euro area countries and provides detailed household-level data on various aspects of household balance sheets, income, consumption, and related economic and demographic variables (ECB, 2023).

The analysis in this paper uses data from the latest 2021 wave of the HFCS, which was conducted in Slovenia between June 2020 and December 2021. The sample is composed of 1,951 Slovenian households, which were sampled in a way to ensure representative results at the national level.

## 2.1 Assets

Household assets can be divided, at the least granular level, into real assets and financial assets. Real assets consist of real estate property, the household's vehicles, valuables, and the value of self-employment businesses.[2] Meanwhile, financial assets consist of deposits, holdings of financial instruments (mutual funds, bonds, shares and managed accounts), the value of non-self-employment businesses[3], money owed to households, the value of voluntary pension and life insurance plans, and other assets.

In 2021, Slovenian households had, on average, EUR 200,500 of total assets (see Table 1). Out of this, real assets amounted to EUR 184,900 and financial assets to EUR 15,500, representing 92.3% and 7.7% of total assets, respectively.

Among real assets, real estate is the most important asset class. In 2021, Slovenian households held, on average, EUR 151,500 of real estate, mostly in the form of the household's main residence (EUR 120,000) and partly in the form of other real estate (EUR 31,500). The preeminent role of real estate in the composition of total assets is highlighted by the fact that real estate accounts for 87.3% of total assets, making it by far the most important asset class. Among the remaining real assets, the two other important asset classes are the value of self-employment businesses (EUR 25,500) and the household's vehicles (EUR 8,500).

The vast majority of household financial assets is composed of deposits, which, standing at EUR 9,700 on average, represent 64.5% of financial assets and 4.8% of total assets. Holdings of financial instruments (mutual funds, bonds, shares and managed accounts) jointly amount to EUR 2,200, while voluntary pension and life insurance plans

[2] Self-employment business is any business where household members have an active role in running the business and that is not publicly traded.

[3] Non-self-employment business is any business where household members act only as an investor or silent partner and that is not publicly traded.

amount to EUR 2,000. Other categories of financial assets are of lesser importance as they are smaller than EUR 1,000.

When discussing the composition of household assets, it is worth keeping in mind that the average value for a particular asset (column 2 of Table 1) is a product of the share of households holding the asset (column 4) and the average value for the asset for households invested in the asset (column 5). Therefore, high average values for certain asset types (e.g., value of self-employment business) are a result of low participation among households (13.2%) but high average holding among the participating households (EUR 186,400).

As shown in column 4 of Table 1, the participation rate can differ substantially across asset classes. While 79.6% of households own a vehicle (the most prevalent asset class), only 0.2% have a managed account (the least prevalent asset class).

The majority of households have a relatively rudimentary composition of assets. They own their main residence, a vehicle, and have savings in the form of deposits. These three asset types are the only ones that have a participation rate higher than 50% among Slovenian households.

Some other common types of assets (in descending order of prevalence) are: other/secondary real estate property (27.4%), voluntary pension and life insurance plans (19.7%), the value of self-employment business (13.2%), mutual funds (9.1%), and publicly traded shares (5.2%). The remaining asset classes have a participation rate lower than 5%.

Table 1: **Assets of Slovenian households**

| | **Average** (in EUR 1,000) | **Share** (in %) | **Participation rate** (in %) | **Conditional average** (in EUR 1,000) |
|---|---|---|---|---|
| Household's main residence | 120.0 | 59.9 | 77.4 | 155.1 |
| Other real estate property | 31.5 | 15.7 | 27.4 | 114.8 |
| Household's vehicles | 8.5 | 4.3 | 79.6 | 10.7 |
| Valuables | 0.4 | 0.2 | 2.6 | 14.2 |
| Value of self-employment businesses | 24.5 | 12.2 | 13.2 | 186.4 |
| **Total real assets** | **184.9** | **92.3** | **93.4** | **198.0** |
| Deposits | 9.7 | 4.8 | 84.8 | 11.4 |
| Mutual funds | 1.4 | 0.7 | 9.1 | 14.9 |
| Bonds | 0.0 | 0.0 | 0.5 | 10.0 |
| Value of non self-employment private business | 0.6 | 0.3 | 0.4 | 153.3 |
| Shares, publicly traded | 0.8 | 0.4 | 5.2 | 15.8 |
| Managed accounts | 0.0 | 0.0 | 0.2 | 10.0 |
| Money owed to households | 0.5 | 0.3 | 3.2 | 17.0 |
| Other assets | 0.4 | 0.2 | 2.8 | 14.5 |
| Voluntary pension/whole life insurance | 2.0 | 1.0 | 19.7 | 10.2 |
| **Total financial assets** | **15.5** | **7.7** | **87.7** | **17.7** |
| **Total assets** | **200.5** | **100.0** | **98.1** | **204.4** |

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Statistics are computed using the final estimation weights, which ensure that the figures are representative of the population.

## 2.2 Liabilities

Household liabilities consist of mortgage debt and non-mortgage debt. Mortgage debt can be related either to the main residence or to other secondary properties. Non-mortgage debt relates to credit lines and overdrafts, credit card debt and other non-mortgage loans.

In 2021, Slovenian households had, on average, EUR 8,700 of total liabilities (see Table 2). Of this, mortgage debt amounted to EUR 6,200 and non-mortgage debt to EUR 2,600, representing 70.6% and 29.4% of total liabilities, respectively. Thus Slovenian households carry, on average, a relatively low debt burden.

The single largest household liability is mortgage debt on the household main residence, which accounts for 57.8% of total liabilities and 81.9% of total mortgage debt. This is followed by other non-mortgage loans, which account for 28.0% of total liabilities and 95.2% of total non-mortgage debt. This category includes all consumer, employer and instalment loans, in addition to any private loans. The only other remaining category with a share higher than 10% in total liabilities is mortgages on other properties at 12.8%.

Even more so than for the asset side, these results are heavily influenced by differences in the extensive margin of indebtedness across households. As shown in column 4 of Table 2, 71.1% of households have no liabilities. The remaining 28.9% of households that have non-zero liabilities have, on average, EUR 30,200 of debt. Mortgage debt in particular is quite concentrated, with 10.6% of households that carry positive mortgage debt balances having on average EUR 58,200 of combined mortgage debt. At 21.8%, non-mortgage debt is the least uncommon category of debt.

Table 2: **Liabilities of Slovenian households**

| | **Average** (in EUR 1,000) | **Share** (in %) | **Participation rate** (in %) | **Conditional average** (in EUR 1,000) |
|---|---|---|---|---|
| Household main residence mortgages | 5.0 | 57.8 | 9.1 | 55.2 |
| Mortgages on other properties | 1.1 | 12.8 | 2.0 | 55.8 |
| **Total mortgage debt** | **6.2** | **70.6** | **10.6** | **58.2** |
| Credit line/overdraft | 0.1 | 1.1 | 7.7 | 1.3 |
| Credit card debt | 0.0 | 0.4 | 3.4 | 0.9 |
| Other non-mortgage loans | 2.4 | 28.0 | 15.4 | 15.9 |
| **Total non-mortgage debt** | **2.6** | **29.4** | **21.8** | **11.8** |
| **Total liabilities** | **8.7** | **100.0** | **28.9** | **30.2** |

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Statistics are computed using the final estimation weights, which ensure that the figures are representative of the population.

## 2.3 Net wealth

By combining information on household assets and liabilities, summary measures of household wealth can be computed. The four measures I consider in this section are:

- **net wealth** = total assets – total liabilities,
- **net value of housing wealth** = value of the household main residence (HMR) – outstanding amount of HMR mortgages,
- **net financial position** = total financial assets – total debt,

- **net liquid assets** = liquid financial assets[4] – non-mortgage debt.

In 2021, Slovenian households had, on average, EUR 191,700 of net wealth. This is the value by which household assets, on average, exceeded liabilities (see Table 3). Almost all households (96.1%) had positive net wealth in 2021.

More than half of the net wealth of Slovenian households originates from the net value of their main residence, i.e., the property in which they reside. In 2021, the net value of housing wealth averaged EUR 114,900.

The net financial position of Slovenian households, i.e. the differences between total financial assets and total debt, is fairly modest. In 2021, they had a net financial position of EUR 6,800 on average.

Additionally, Slovenian households hold a fairly low level of net liquid assets. This is the portion of household wealth that can be relatively easily converted into cash and used for consumption and emergencies. On average, net liquid assets stood at EUR 10,000 in 2021. The biggest contributor to liquid assets was deposits.

Table 3: **Net wealth of Slovenian households**

| | **Average** (in EUR 1,000) | **Share with a positive position** (in %) |
|---|---|---|
| Net wealth | 191.7 | 96.1 |
| Net value of housing wealth | 114.9 | 77.1 |
| Net financial position | 6.8 | 70.0 |
| Net liquid assets | 10.0 | 73.5 |

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Statistics are computed using the final estimation weights, which ensure that the figures are representative of the population.

# 3 Exposure of household portfolios to interest rate changes

Having outlined the main characteristics of household portfolios, this section examines how changes in interest rates affect household finances of Slovenian households.

As a starting point, equation 1 spells out the law of motion for household net wealth.[5] The change in net worth between period $t$ and $t-1$ equals the sum of net income in period $t$ and the change in the valuation of assets and liabilities between period $t$ and $t-1$.

Net income can be further decomposed into net interest income and net non-interest income. As the name suggests, net interest income is the difference between interest

[4] Liquid financial assets include deposits, mutual funds, bonds, the value of non-self-employment business, publicly traded shares, and managed accounts.
[5] Net worth is measured at the end of the period.

income and interest expenditures. Meanwhile, net non-interest income is the difference between all other income (i.e., labour income, transfers, non-interest financial income, etc.) and all other expenses (consumption expenditures, non-interest financial expenditures, etc.).

$$\Delta NW_t = NW_t - NW_{t-1} = \underbrace{(Y_t^N - E_t^N)}_{\substack{\text{net} \\ \text{non-interest} \\ \text{income}}} + \underbrace{(Y_t^I - E_t^I)}_{\substack{\text{net} \\ \text{interest} \\ \text{income}}} + \Delta Val_t \quad (1)$$

Based on this decomposition, the effects of changes in interest rates on household net worth can be classified into three channels.

The first channel, which is also the most direct one, captures the effect of interest rate changes on interest income and interest expenditures. When interest rates increase, interest-bearing assets (e.g., term deposits) generate higher interest income, while variable-rate liabilities (e.g., variable-rate mortgages) require higher interest payments. The exact magnitude of this effect depends on the structure of household portfolios and their interest rate type. The higher the share of assets and liabilities linked to variable interest rates, the higher the exposure of household portfolios to changes in interest rates.

The second channel captures the effect of interest rate changes on the valuation of household assets and liabilities. According to economic theory, asset prices should respond negatively to interest rates since the present value of future cash flows decreases when interest rates increase, other things being equal. However, it can be argued that in practice, this effect is typically not mechanical and instantaneous. While such behaviour correctly describes, for example, the valuation of regular bonds, the pricing of real estate and business equity typically exhibits a more complex pattern that also depends on the transmission of interest rates to the macroeconomy via general equilibrium effects.

The third channel captures the effects of changes in interest rates on non-interest income and expenditures. This includes the general equilibrium effects of interest rate changes on employment, wages, firm profitability and dividends, household consumption, etc. All of these aspects alter the net non-interest income position of households and thus their net worth. Among the discussed channels, this is the most indirect one.

For the purpose of forthcoming analysis, I will define the first channel as the direct one and the latter two channels as the indirect ones.

### 3.1 Direct interest rate exposure

To quantify the direct exposure of household portfolios to interest rate changes, I first need to identify components of household balance sheets that have cash flows responsive to interest rates.

On the asset side, this includes only deposits. For all the other assets, I assume that interest rate changes have an effect primarily through changes in the valuation of the asset and not through interest income.

On the liability side, I split debt according to interest rate type and consider only variable-rate debt. For mortgage loans, HFCS data allow me to distinguish mortgage debt

on the basis of its interest rate type. For non-mortgage debt, this is, however, not possible. Therefore, for all non-mortgage debt, I conservatively assume that it is of the variable rate type. This implies that the direct interest rate exposure of households will likely be to a certain degree biased downwards.

Based on this classification, I construct a summary measure of direct interest rate exposure (DIRE) as the difference between deposits and the sum of variable-rate mortgages and non-mortgage debt (see equation 2). This measure gives an indication of whether households' net interest income is exposed positively (positive DIRE) or negatively (negative DIRE) to interest rate changes.

$$DIRE = deposits - (variable\text{-}rate\ mortgages + non\text{-}mortgage\ debt) \quad (2)$$

Based on the information in Tables 1 and 2 and the fact that 48.4% of mortgage debt is of variable rate type, it is possible to compute that Slovenian households had, on average, EUR 4,100 of direct interest rate exposure in 2021. This results from Slovenian households having EUR 9,700 of deposits, EUR 3,000 of variable-rate mortgage debt and EUR 2,600 of non-mortgage debt, on average.

This shows that the net interest income of Slovenian households is, on average, positively exposed to changes in interest rates, and thus higher interest rates should, in principle, translate into higher net interest income. Nonetheless, the absolute magnitude of this exposure is relatively limited, especially in comparison with the average net wealth of EUR 191,700. The computed average for DIRE implies that a 1 percentage point increase in interest rates should lead to an increase in net interest income of EUR 41, assuming that the increase in deposit and borrowing interest rates is symmetric.

It is worth pointing out, though, that the assumption of a symmetric increase in deposit and lending interest rates is not without caveats. While it typically holds that these interest rates comove fairly tightly in the long run, there can be periods when one rate or the other exhibits a much stronger dynamic. An example of this is the current monetary tightening episode, when the increases in ECB policy rates transmitted quite heterogeneously to lending and deposit rates. In Appendix 6.1, I highlight this heterogeneity in the case of Slovenia by showing the recent evolution of interest rates for new household loans and deposits. As is evident from Figure 11, interest rates in recent years rose most sharply for variable-rate loans, whereas the response of deposit rates—especially those for overnight deposits—was much more muted. Such heterogeneity has important implications for DIRE, as it implies that interest rates on the liability side of DIRE rose more strongly than on the asset side. Therefore, the effect of recent increases in interest rates on household net interest income has likely been less positive than implied by the above calculation, which assumed a symmetric increase in interest rates.

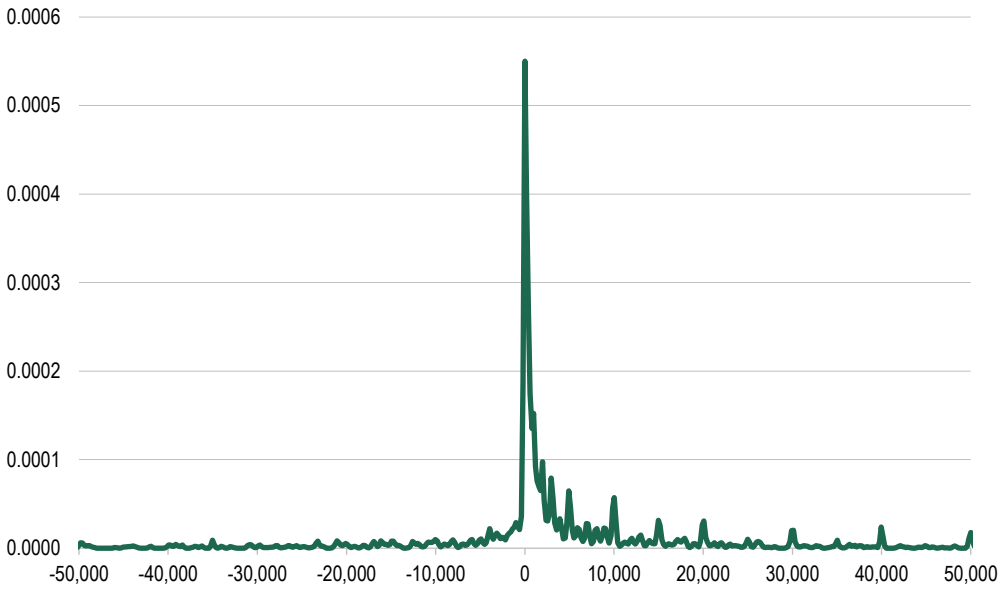
Additionally, several aspects of households' saving decisions can amplify the asymmetric transmission of interest rate changes into net interest income. One key aspect relates to the decision of households to keep their deposits in sight versus time deposits, since interest rates on time deposits tend to be more responsive to policy rates than interest rates on sight deposits (see Figure 10 in Appendix 6.1). Therefore, the higher the share of sight deposits, the more asymmetry can be expected in the transmission of interest rate changes into interest income and expenses. According to the HFCS data, Slovenian households kept 69% of their deposits in the form of sight deposits in

2021, which implies that they likely benefited only to a limited degree from the recent rise in interest rates. However, it should also be pointed out that households' saving decisions are not static and that the allocation of deposits can change in response to interest rate changes. An example of such dynamic behaviour is provided by Adalid, Lampe and Scopel (2024), who show that euro area households responded to the recent rise in deposit rates by rebalancing their deposits from sight deposits to time deposits.

### 3.2 Heterogeneity in direct interest rate exposure across households

The sample average for direct interest rate exposure presented above masks substantial heterogeneity across the sample of Slovenian households. As seen from the kernel density shown in Figure 1, while most households have modestly positive values of DIRE, there are also many households with negative values of DIRE or with large positive values of DIRE. The distribution of DIRE shown in Figure 1 exhibits a mild right skew and has fat tails.

Figure 1: **Distribution of direct interest rate exposure**



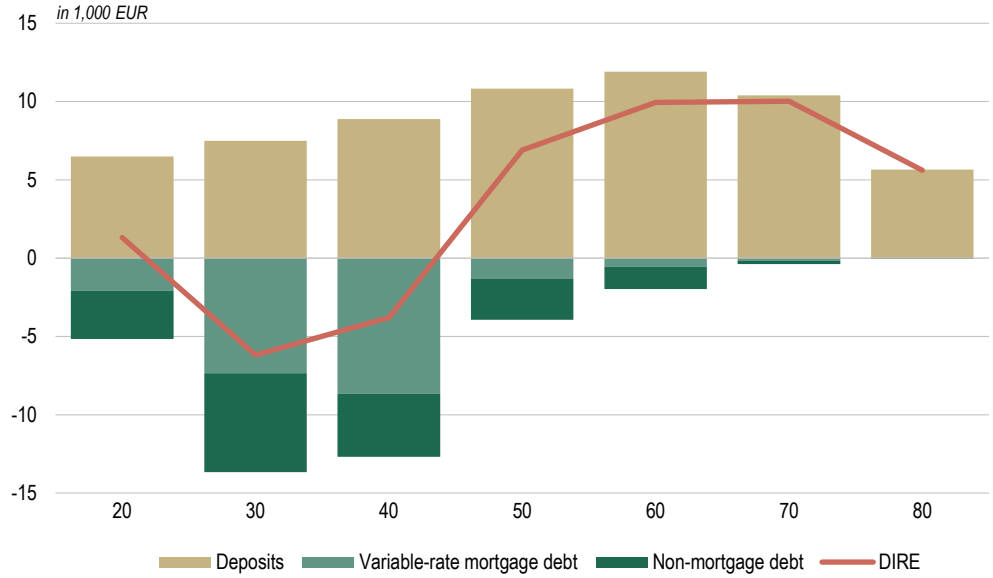

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: The kernel density estimate of DIRE was performed with a Guassian kernel and a bandwidth of 131.3, as selected by the Sheather and Jones (1991) method. Density is estimated only for households that have DIRE in the range between EUR -50,000 and EUR 50,000 in order to make the figure more legible. This interval captures 94% of households.

In the remainder of this subsection, I therefore examine how DIRE differs across some key household characteristics, such as age, net worth, income and housing status.

Figure 2 shows how DIRE varies with the age of the household reference person.[6] On average, I find that younger households have lower DIRE than older households. However, the relationship between age and DIRE is not linear. DIRE starts at small positive levels for young households (age 20) and turns negative for households of ages 30 and 40. Thereafter, it turns positive again at age 50 and reaches the highest level in the life cycle at ages 60 and 70.

[6] The household reference person is the person selected to represent the household based on a set of selection criteria related to couple status, parental status, income, and/or age.

Figure 2: **Direct interest rate exposure by age**

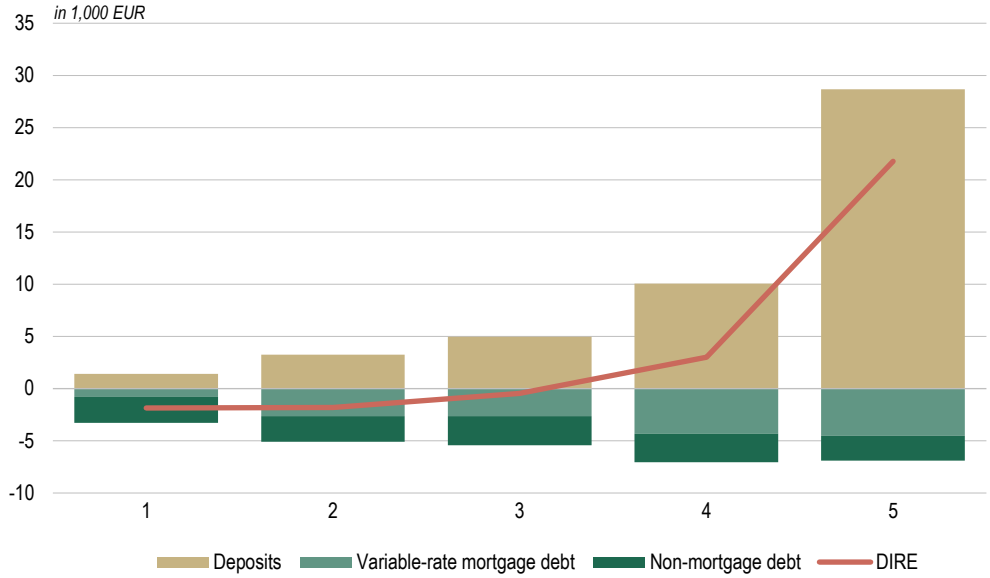



Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Age (on the horizontal axis) represents the age of the household reference person in 10-year age bins.

The main driver of this pattern is the life-cycle profile of debt accumulation. Whereas very young households (age 20) tend to have little debt, slightly older households (ages 30 and 40) start to accumulate substantial amounts of debt as they transition to becoming homeowners. Most of the debt accumulated by households between ages 30 and 40 is thus mortgage debt, although non-mortgage debt is also substantial, especially in the earlier part of this life phase (age 30). Households in the later part of the life cycle tend to pay off the debt gradually, which contributes to increasing DIRE. On top of this dynamic, households also linearly increase the amount of deposits between ages 20 and 60, contributing to the upward sloping profile of DIRE.

Figure 3 explores the relationship between DIRE and the net wealth of the household expressed in quintile groups. I find that DIRE increases significantly with net wealth, especially at the top of the wealth distribution. While the bottom 40% of households in terms of net wealth have negative DIRE, the top 40% have positive DIRE. This pattern can be explained primarily by the fact that deposits tend to increase faster than debt as we move along the wealth distribution. While wealthier households tend to have, on average, more debt, they tend to have even more deposits. This is particularly true for the top 20%, which has DIRE six times higher than the 20% of households just below them. Nearly all of this difference in DIRE between these two groups is driven by greater deposit holdings.

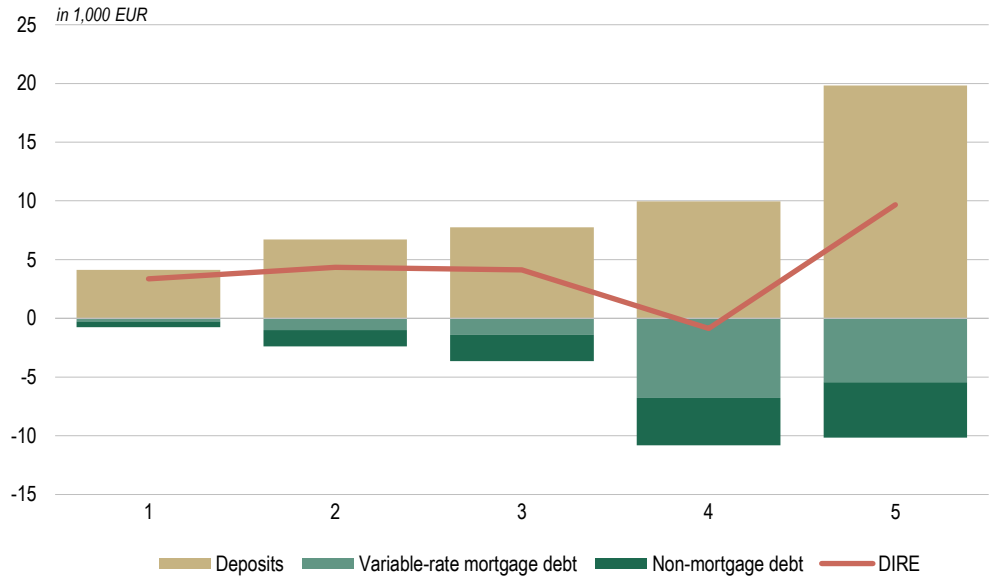
Figure 3: **Direct interest rate exposure by net wealth quintile group**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Household net wealth (on the horizontal axis) is shown using quintile groups, with each group representing 20% of the households.

The relationship between DIRE and household income expressed in quintile groups is shown in Figure 4. This relationship is more muted than the strong positive relationship between wealth and DIRE shown in Figure 3. While the top 20% of households in terms of income have somewhat higher DIRE than the bottom 20%, the middle 60% of the distribution does not exhibit a positive relationship between income and DIRE. In fact, the 4th income quintile group (i.e. the 60th–80th percentile of the income distribution) shows the lowest DIRE along the entire income distribution. As seen already in previous figures, this pattern is mostly explained by the differences in the amount of household debt, which is the highest for the 4th income quintile. On the other hand, deposits increase monotonically with income.

Figure 4: **Direct interest rate exposure by income quintile group**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: Household income (on the horizontal axis) is shown using quintile groups, with each group representing 20% of the households.

Finally, Figure 5 shows how DIRE changes with the housing status of the household. DIRE is positive for outright homeowners and for households whose residence is rented, but is strongly negative for homeowners with a mortgage. Among all the analysed groups in Figures 1–5, this group has by far the most negative DIRE. This highlights the role of mortgage debt related to the household's main residence in driving the overall patterns of DIRE.

Figure 5: **Direct interest rate exposure by housing status**


Source: Household Finance and Consumption Survey - wave 2021, own calculations.

Therefore, among the groups considered, the one key demographic group that is expected to sustain the most negative effects of an increase in interest rates is the group of homeowners with an outstanding variable-rate mortgage. For this group, a 1% increase in interest rates leads to a EUR 247 decline in net interest income on average.

### 3.3 Determinants of direct interest rate exposure

Up to this point, the analysis of determinants of direct interest rate exposure focused on each explanatory factor separately, although, in reality, there likely exists a correlation structure between these explanatory factors. In this section, I therefore examine how different household characteristics jointly influence direct interest rate exposure by performing a regression analysis.

In particular, I estimate the linear model set out in equation 3, which regresses DIRE (in EUR thousand) on the following set of variables:

- a constant,
- household net wealth (in EUR thousand),
- household income (in EUR thousand),
- a dummy variable that takes value 1 if any member of the household ever received an inheritance or a substantial gift,
- a dummy variable that takes value 1 if the household has a mortgage on their main residence,
- a dummy variable that takes value 1 if the household is renting their main residence,

- age of the reference person in the household,
- a dummy variable that takes value 1 if the household reference person has high education (ISCED ≥ 5), and
- a dummy variable that takes value 1 if the household reference person is female.

$$DIRE_i = \beta_0 + \beta_1 net\_wealth_i + \beta_2 income_i + \beta_3 inheritance_i + \beta_4 owner\_with\_mortgage_i + \beta_5 tenant_i + \beta_6 age_i + \beta_7 high\_education_i + \beta_8 female_i + \varepsilon_i \quad (3)$$

In addition to this model, I also estimate two further models, where the left-hand side variable of equation 3 (DIRE) is replaced either by a dummy variable that indicates if the household has a positive value of DIRE[7] or by a variable for DIRE normalised by household income.

Summary statistics for the estimation sample are shown in Table 4, while regression estimates for all three models are reported in Table 5.

Table 4: **Summary statistics**

| | Mean | SD | P10 | P50 | P90 |
|---|---|---|---|---|---|
| **Financial status** | | | | | |
| DIRE | 4.260 | 30.972 | -10.588 | 0.500 | 21.146 |
| DIRE > 0* | 0.687 | 0.464 | 0 | 1 | 1 |
| DIRE/income | 0.168 | 0.913 | -0.380 | 0.028 | 0.797 |
| Net wealth | 189.604 | 296.771 | 3.059 | 118.809 | 400.527 |
| Income | 31.249 | 25.200 | 6.814 | 25.045 | 63.119 |
| Inheritance* | 0.206 | 0.404 | 0 | 0 | 1 |
| **Housing status** | | | | | |
| Owner/partial owner outright* | 0.682 | 0.466 | 0 | 1 | 1 |
| Owner/partial owner with mortgage* | 0.091 | 0.288 | 0 | 0 | 0 |
| Tenant/Free use* | 0.226 | 0.418 | 0 | 0 | 1 |
| **Demographic variables** | | | | | |
| Age | 56.144 | 15.315 | 36 | 56 | 78 |
| Low education* | 0.708 | 0.455 | 0 | 1 | 1 |
| High education* | 0.292 | 0.455 | 0 | 0 | 1 |
| Male* | 0.564 | 0.496 | 0 | 1 | 1 |
| Female* | 0.436 | 0.496 | 0 | 0 | 1 |

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: The table shows summary statistics for the estimation sample. SD denotes the standard deviation. P10, P50, and P90 are the 10th, 50th, and 90th percentiles, respectively. All statistics are calculated using the final estimation weights. DIRE, DIRE/income, net wealth, and income are winsorized at the 2.5 and 97.5th percentiles. * denotes dummy variables.

Regression results for all three models confirm my earlier descriptive findings. Households with higher financial status have, on average, higher DIRE. Net wealth and income are positively associated with DIRE, and I find that being a recipient of inheritance

[7] I estimate a linear probability model to ease the interpretability of results across models. Results obtained using a logistic probability model are similar.

or a significant gift tends to have a particularly significant effect in terms of increasing DIRE.

Table 5: **Determinants of direct interest rate exposure – regression results**

| | DIRE | I(DIRE > 0) | DIRE/income |
|---|---|---|---|
| Constant | -22.99 *** | 0.34 *** | -0.62 *** |
| | (4.17) | (0.06) | (0.12) |
| **Financial status** | | | |
| Net wealth | 0.02 *** | 0.00 ** | 0.00 *** |
| | (0.00) | (0.00) | (0.00) |
| Income | 0.17 ** | 0.00 *** | -0.00 |
| | (0.06) | (0.00) | (0.00) |
| Inheritance | 6.63 ** | 0.08 ** | 0.19 *** |
| | (2.00) | (0.02) | (0.05) |
| **Housing status** | | | |
| Owner with mortgage | -28.66 *** | -0.38 *** | -0.70 *** |
| | (3.65) | (0.04) | (0.08) |
| Tenant/Free use | 5.19 ** | 0.03 | 0.16 * |
| | (1.94) | (0.03) | (0.07) |
| **Demographic variables** | | | |
| Age | 0.33 *** | 0.01 *** | 0.01 *** |
| | (0.06) | (0.00) | (0.00) |
| High education | 3.84 | 0.02 | 0.23 ** |
| | (2.09) | (0.02) | (0.07) |
| Female | -3.20 * | -0.03 | -0.07 |
| | (1.38) | (0.02) | (0.04) |
| $R^2$ | 0.18 | 0.11 | 0.16 |
| N | 1951 | 1951 | 1951 |

Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: DIRE, DIRE/income, net wealth, and income are winsorized at the 2.5 and 97.5th percentiles. Regressions are estimated using the final estimation weights. Standard errors, displayed in parentheses, are calculated using the bootstrap replicate weights (1000 replicates) and are adjusted for the fact that the data are multiply imputed.
*** p < 0.001, ** p < 0.01, * p < 0.05

However, as expected from the earlier results, the housing status of the household is an even more important determinant of DIRE than financial status. Being a homeowner with a mortgage has a very large and highly statistically significant negative effect on DIRE. Owners with a mortgage have on average EUR 29,000 lower DIRE, are 38 percentage points less likely to have positive DIRE, and have a 0.7 point lower DIRE-to-income ratio.

Among all the variables in the models, this is by far the largest effect. For comparison, increasing net wealth from the first decile to the ninth decile of the distribution increases DIRE by around EUR 8,000, while going from the first decile to the ninth decile of household income leads to an increase in DIRE of around EUR 10,000.

Looking at the role of the demographic characteristics of the household, only age is estimated to have a strong and clearly statistically significant effect on DIRE. As expected from the usual pattern of life-cycle wealth accumulation, the age of the household reference person is clearly positively associated with DIRE, with a 10-year increase in age associated with EUR 3,300 higher DIRE. On the other hand, the effects related to the education and gender of the household reference person are less significant. While being female is negatively associated with DIRE, education shows no statistically significant effect on the level of DIRE.

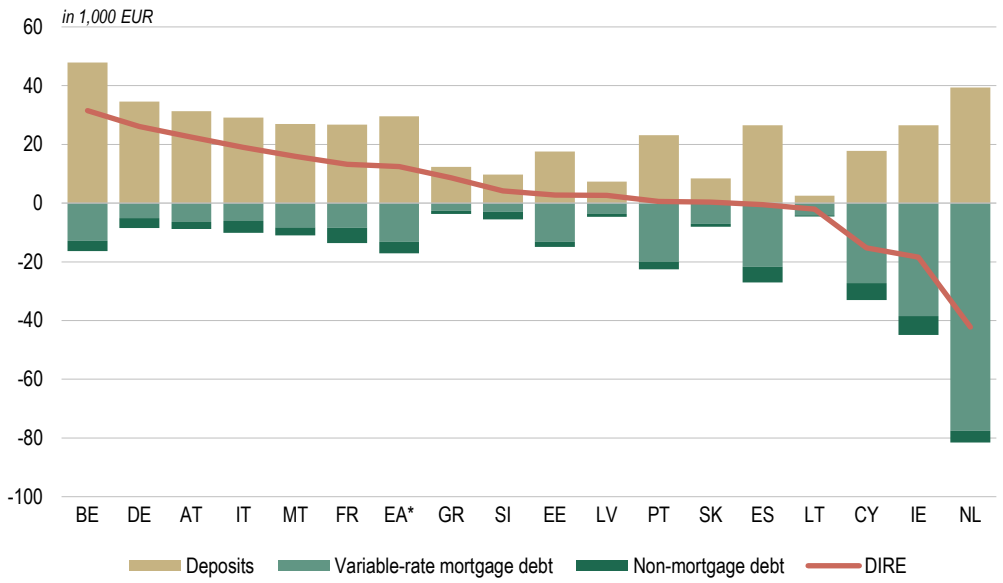
Overall, the results presented so far indicate that housing status is the single most important predictor of the direct interest rate exposure of households, while all the other household characteristics appear to play a less important role.

### 3.4 Direct interest rate exposure across euro area countries

In order to place the value of DIRE for Slovenian households in a wider international context, this section examines how direct interest rate exposure varies across euro area countries. I consider the EA-19 countries, excluding Finland and Luxembourg, since data on the interest rate type for mortgage loans are not available for these two countries.

As shown in Figure 6, the degree of heterogeneity in direct interest rate exposure across euro area countries is substantial. While households in the vast majority of countries have positive DIRE, there are also five countries in which households have on average negative DIRE. This implies that although euro area households on average tend to benefit from a rise in interest rates (in the narrow sense analysed in this section), this does not apply universally across the monetary union.

Figure 6: **Direct interest rate exposure in euro area countries**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: * Euro area average excluding Finland and Luxembourg. For these two countries data on interest rate type for mortgage loans are not available.

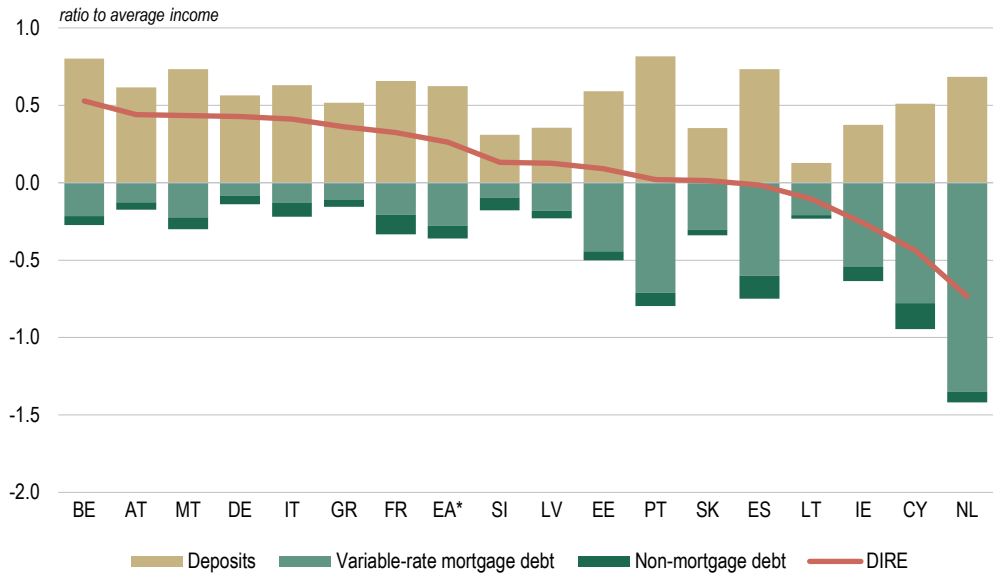
With DIRE of EUR 4,100, Slovenia lies close to the middle of the distribution, although still somewhat below the euro area average of EUR 12,500. In terms of the underlying components of DIRE, both the asset and the liability sides contribute to this result. Compared to the euro area average, Slovenian households have a substantially lower

stock of deposits (EUR 9,700 vs. 29,600), which is, however, partially offset by the fact that Slovenian households also have a lower stock of interest-sensitive liabilities (EUR 5,500 vs. 17,100).

The distribution of DIRE across countries does not follow the usual split between old EU member states and new member states. While it holds that the four countries with the largest DIRE are all old EU member states (Belgium, Germany, Austria and Italy), the same also applies to the country with by far the most negative DIRE (Netherlands). By contrast, new member states tend to be clustered around the middle and in the bottom half of the distribution.

Given the substantial heterogeneity in average income levels within the euro area, it could be the case that such a ranking of countries is distorted by differences in average income levels across countries. However, Figure 7 shows that this is not the case. When I normalise DIRE and its components by average household income in the respective country, the ranking of countries remains broadly unchanged. Slovenia remains close to the middle of the distribution, and its normalised DIRE (0.13) is still below the euro area average (0.26).

Figure 7: **Direct interest rate exposure in euro area countries (normalized by average income)**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: DIRE and its components are normalised by country-specific average gross income. * Euro area average, excluding Finland and Luxembourg. For these two countries, data on interest rate types for mortgage loans are not available.

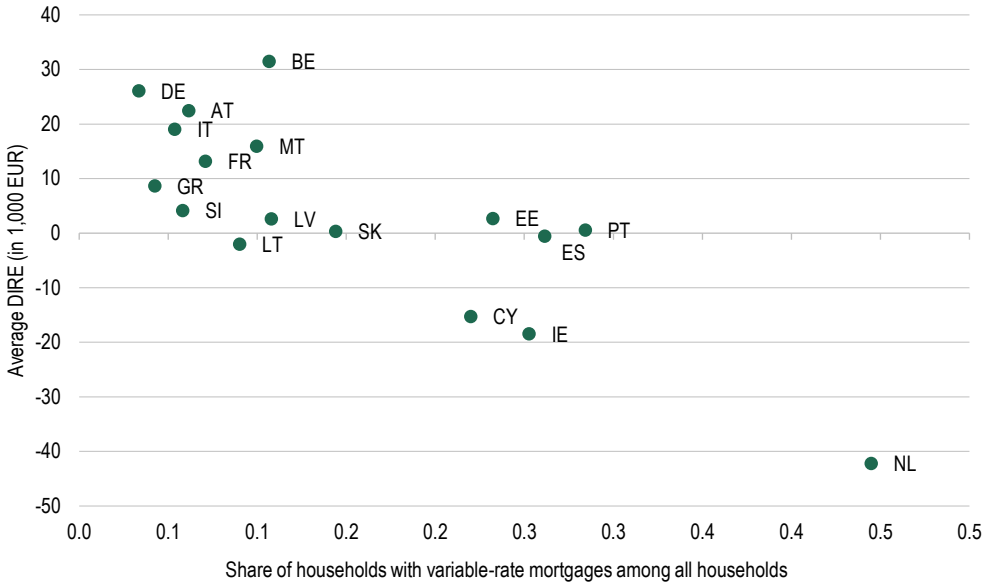
Furthermore, these differences across countries also appear not to be driven primarily by the heterogeneity in the household characteristics that were the subject of analysis in Table 5. In Appendix 6.2, I perform a regression analysis that partials out the effect of these household characteristics (i.e. households' financial status, housing status and demographic characteristics) and isolates the country fixed effects. The ranking of countries remains broadly the same even when only country fixed effects are considered, and the correlation between the (unadjusted) average DIRE and the respective country fixed effect is very high (see Figures 12 and 13 in Appendix 6.2). This fact shows that country-specific factors, instead of household heterogeneity, are the main drivers of cross-country heterogeneity.

What are then the main determinants of a country's average DIRE? As is evident in Figure 7, differences in DIRE across countries are driven to a greater degree by the variability of the liability side of household balance sheets than by the variability of the

asset side. While the standard deviation of the asset side of the normalised DIRE (i.e. deposits) is 0.19, the standard deviation of the liability side (i.e. the sum of variable-rate mortgage debt and non-mortgage debt) is almost twice as high at 0.34.

In a related study, Tzamourani (2021)[8] attributes these differences on the liability side mainly to the differences in the relative indebtedness of households across the euro area and, crucially, to the variability in the prevalence of variable-rate mortgages. I replicate this finding in Figure 8 by showing a cross-country scatter plot of average DIRE against the share of households with variable-rate mortgages among all households in a given country.[9] The correlation between the two variables is very strong, and countries with a higher prevalence of variable-rate mortgages among all households have on average substantially lower DIRE. This suggests that the specifics of local financial systems and local institutional factors are major contributors to the cross-country heterogeneity in DIRE in the euro area.

Figure 8: **Average DIRE and share of households with variable rate mortgages across euro area countries**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.

## 3.5 Indirect interest rate exposure

The analysis up to this point examined only direct interest rate exposure, which relates to the effect that interest rate changes have on net interest income. This exposure can be explored using the HFCS data, since detailed data on the composition of household assets and liabilities allow for a fairly direct inference on how changes in interest rates translate into changes in interest income and expenses.

The indirect effects of interest rate changes, on the other hand, cannot be evaluated only using the HFCS micro-level data. These effects originate from the general equilibrium effects of interest rate changes on asset prices, aggregate income, employment, wages, etc., and relate to the effects that interest rate changes have on non-interest income and on the valuation of assets and liabilities.

[8] Relative to my paper, Tzamourani (2021) uses a slightly different definition of interest rate exposure that builds on the work of Auclert (2019).

[9] This share captures variations in the prevalence of mortgage debt across countries as well as variations in the prevalence of variable-rate mortgage debt among mortgage holders because it is computed in relation to all households in a given country.

The literature that examines these macro-level effects at the theoretical and empirical level is vast, and providing a complete survey is beyond the scope of this paper. The standard finding in the literature is that a decline in interest rates (i.e. a monetary easing) stimulates economic activity and thus contributes to stronger price growth, higher employment, and faster wage growth. A broad overview of recent evidence on this topic is provided by Ramey (2016), while recent euro area-specific results can be found in Badinger and Schiman (2023), Corsetti, Duarte, and Mann (2021), and Jarociński and Karadi (2020).

When it comes to the effects of monetary policy shocks on asset prices, the available evidence tends to show that a decline in interest rates leads to an increase in house prices and stock prices. For the case of house prices, such evidence is provided by Corsetti, Duarte, and Mann (2021), Paul (2020) and Calza, Monacelli, and Stracca (2013), while for stock prices, it can be found in Corsetti, Duarte, and Mann (2021), Jarociński and Karadi (2020), Paul (2020) and Rigobon and Sack (2004).

Based on these findings in the literature and the evidence presented in this paper, it is thus clear that an increase in interest rates has opposing effects on households when examined from the perspective of direct and indirect interest rate exposure. The direct effect of higher interest rates on net interest income is expected to be positive due to the fact that households (in Slovenia as well as in the euro area) have, on average, positive direct interest rate exposure. Meanwhile, the indirect effect of an increase in interest rates is expected to be negative, as higher interest rates dampen economic activity, reduce employment and wages, and put downward pressures on house prices and asset prices.

The key question therefore remains about the sign of the net effect of an increase in interest rates on household finances. For the euro area, this question is explored by Slacalek, Tristani, and Violante (2020), who find that, on average, indirect effects of interest rates outweigh the direct effects. According to their analysis, the effect of an increase in interest rates on net interest income is relatively small in comparison with the overall effect.

# 4 Conclusions

In this paper, I quantified the interest rate exposure of Slovenian households using the data from the Household Finance and Consumption Survey. I analysed the determinants of its heterogeneity and placed the results for Slovenia in a wider euro area context.

Focusing on the direct effects of changes in interest rates, my results show that Slovenian households have, on average, a moderately positive direct interest rate exposure. Thus, a symmetric increase in interest rates should translate into higher net interest income for the average household. However, not all households are equally affected by changes in interest rates, and I show that direct interest rate exposure varies systematically with age, income, net worth, history of inheritance and housing status. Among the analysed household characteristics, housing status is by far the most important determinant of direct interest rate exposure.

Looking at the heterogeneity across euro area countries, Slovenia does not stand out, as the direct interest rate exposure of Slovenian households lies close to the middle of the distribution of countries. An analysis of the determinants of cross-country heterogeneity shows that cross-country differences are primarily not linked to the heterogeneity in households' financial, demographic or housing status but mostly to the differences in the relative indebtedness of households across countries and to the variability in the prevalence of variable-rate mortgages.

In terms of policy implications, the results show that the vast majority of households have a fairly low level of direct interest rate exposure. The big exception to this is the group of home owners with a mortgage. However, as the prevalence of variable-rate mortgages has decreased substantially in recent years in Slovenia, it is likely that the direct interest rate exposure of this group is currently even lower than implied by my analysis of the HFCS data from 2020 and 2021.

Overall, this suggests that for a typical Slovenian household, the effect of changes in interest rates will mostly materialise through the indirect channel that reflects the general equilibrium effects that interest rates have on employment, wages and asset prices, and not through the direct effect on their net interest income.

# 5 References


Adalid, R., Lampe, M., & Scopel, S. (2024). Monetary dynamics during the tightening cycle. *Economic Bulletin Boxes, 8*.

Auclert, A. (2019). Monetary Policy and the Redistribution Channel. *American Economic Review, 109*, 2333-67.

Badinger, H., & Schiman, S. (2023). Measuring Monetary Policy in the Euro Area Using SVARs with Residual Restrictions. *American Economic Journal: Macroeconomics, 15*, 279-305.

Bech, S. L., & Mikkelsen, J. G. (2021). *Measuring household interest-rate sensitivity in Denmark.* Copenhagen: Danmarks Nationalbank.

Calza, A., Monacelli, T., & Stracca, L. (2013). Housing Finance and Monetary Policy. *Journal of the European Economic Association, 11*, 101-122.

Corsetti, G., Duarte, J. B., & Mann, S. (2021). One Money, Many Markets. *Journal of the European Economic Association, 20*, 513-548.

ECB. (2023). *Household Finance and Consumption Survey: Results from the 2021 wave.* Frankfurt a. M.: European Central Bank.

Jarociński, M., & Karadi, P. (2020). Deconstructing Monetary Policy Surprises—The Role of Information Shocks. *American Economic Journal: Macroeconomics, 12*, 1-43.

Paul, P. (2020). The Time-Varying Effect of Monetary Policy on Asset Prices. *The Review of Economics and Statistics, 102*, 690-704.

Ramey, V. A. (2016). Chapter 2 - Macroeconomic Shocks and Their Propagation. V J. B. Taylor, & H. Uhlig (Ured.). Elsevier.

Rigobon, R., & Sack, B. (2004). The impact of monetary policy on asset prices. *Journal of Monetary Economics, 51*, 1553-1575.

Sheather, S. J., & Jones, M. C. (1991). A Reliable Data-Based Bandwidth Selection Method for Kernel Density Estimation. *Journal of the Royal Statistical Society: Series B (Methodological), 53*, 683-690.

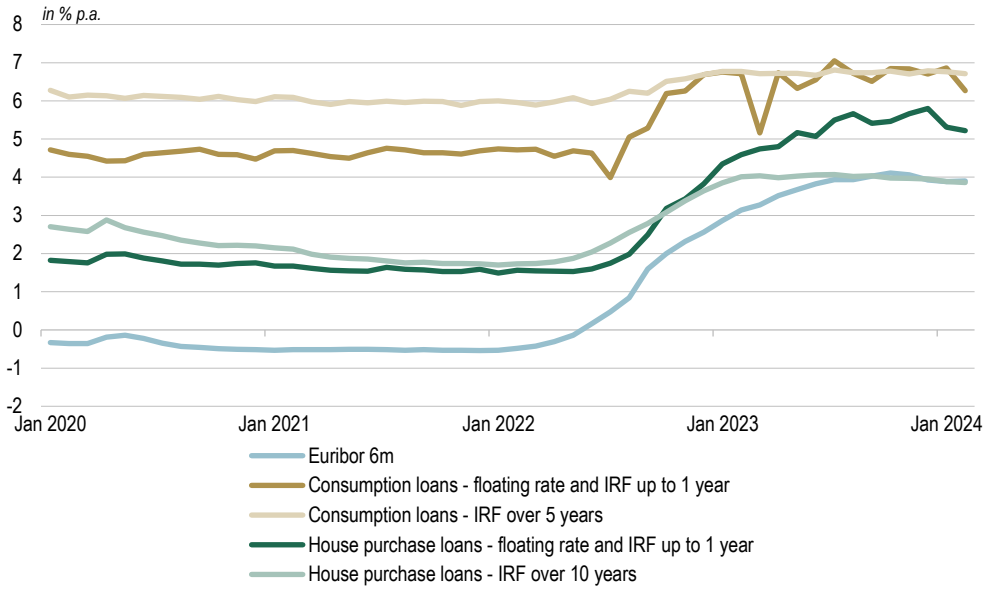
Slacalek, J., Tristani, O., & Violante, G. L. (2020). Household balance sheet channels of monetary policy: A back of the envelope calculation for the euro area. *Journal of Economic Dynamics and Control, 115*, 103879.

Tzamourani, P. (2021). The interest rate exposure of euro area households. *European Economic Review, 132*, 103643.

# 6 Appendix

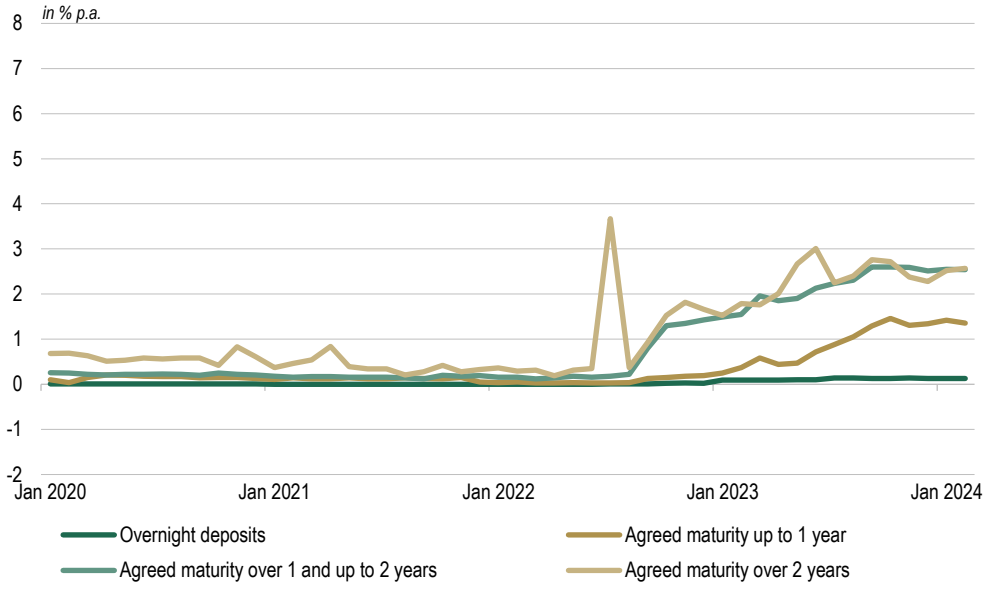
## 6.1 Recent trends in loan and deposit interest rates for households in Slovenia

Figure 9: **MFI interest rates for new loans to households**



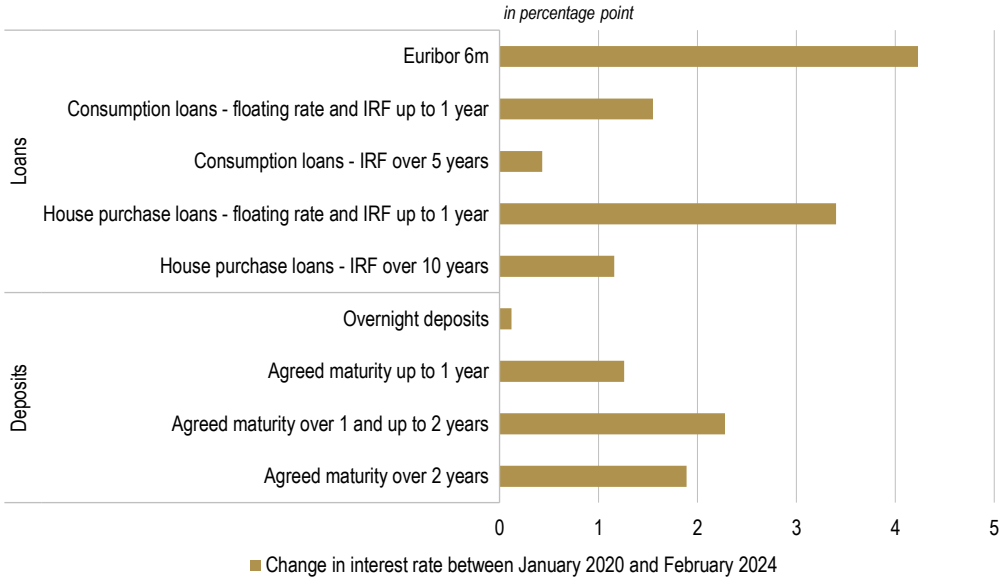

Source: Banka Slovenije.
Notes: IRF stands for initial rate fixation period.

Figure 10: **MFI interest rates for new deposits by households**




Source: Banka Slovenije.

Figure 11: **Changes in MFI interest rates for households between January 2020 and February 2024**




Source: Banka Slovenije, own calculations.
Notes: IRF stands for initial rate fixation period.

## 6.2 Determinants of direct interest rate exposure in the euro area

This section examines cross-country heterogeneity in direct interest rate exposure in the euro area. As shown in Figure 6 of Section 3.4, households in the euro area differ substantially in terms of their direct interest rate exposure, with households in some countries having, on average, positive DIRE and households in other countries having negative DIRE.

To better understand the drivers behind such heterogeneity, I extend the regression analysis presented in Section 3.3 to the pooled sample of euro area households. I regress DIRE on the same set of variables for households' financial status, housing status and demographic characteristics as in Section 3.3.[10] Given that I am working on the pooled sample for the euro area, I additionally include country dummies to capture country-specific fixed effects. I select Estonia as the reference country and exclude its dummy variable from regressions to avoid the problem of multicollinearity. The choice of Estonia for the reference country is motivated solely by the fact that Estonia lies approximately in the middle of the distribution of euro area countries in terms of average DIRE (see Figure 6).

For the reasons of missing data explained in Section 3.3, the estimation sample includes the EA-19 countries, excluding Finland and Luxembourg.

Table 6 reports regression results for the baseline model discussed above (Model 1) and for the reduced model that excludes the variable indicating whether any member of the household ever received an inheritance (Model 2). The reason for excluding this variable from the reduced model is the fact that these data are not available for Italy. This is also why the fixed effect for Italy is not shown in the estimation results for the baseline model in Table 6.

[10] Due to data limitations, I include binned age in the regressions since the original age variable is not available for all euro area countries. In most cases, binned age represents the age of the reference person rounded down to a multiple of 5 years: 16-19=>16, 20-24 =>20, 25-29 =>25, 30-34 =>30, 35-39 =>35, 40-44 =>40, 45-49 =>45, 50-54 =>50, 55-59 =>55, 60-64 =>60, 65-69 =>65, 70-74 =>70, 75-79 =>75, 80-84 =>80, 85+ =>85

Regression results for the euro area sample broadly confirm my earlier findings regarding the effect of household characteristics on DIRE. The estimated regression coefficients for the euro area sample have, with the exception of the estimate for the variable that indicates whether a household is a tenant, the same sign as the coefficients obtained on the Slovenian sample. Thus, the economic relationships between household characteristics and DIRE are broadly comparable across the two samples, although some differences in the magnitudes of the estimated effects can be observed in the regression results.

The key focus of this section, however, lies in the question of whether differences in household characteristics across countries can explain the differences in average DIRE across countries reported in Figure 6. The bottom part of Table 5, which reports the estimated country fixed effects, indicates that this is not the case. Most of the fixed effects are highly statistically significant and have a large and economically meaningful magnitude.

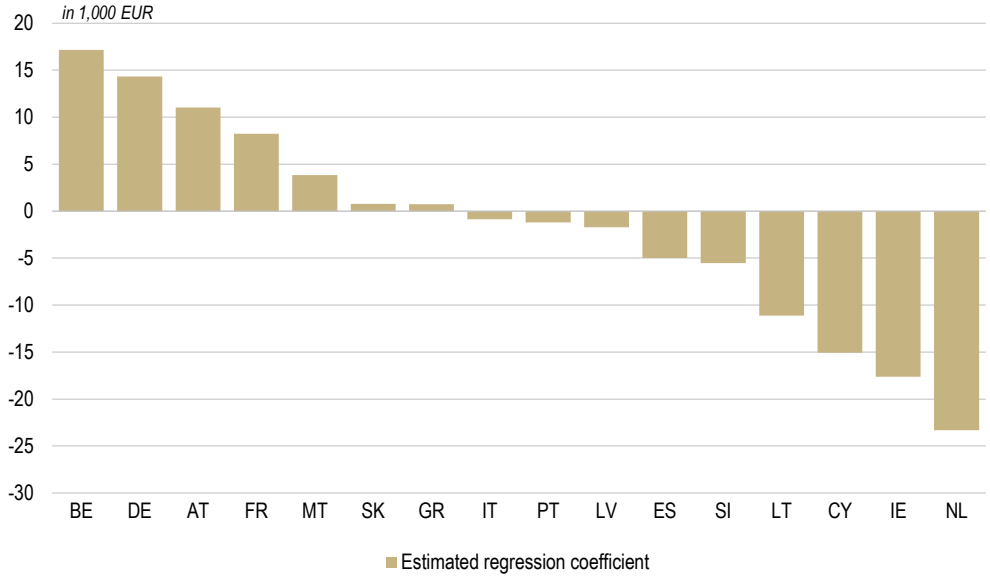
The results also show that once the effects of differences in household characteristics are partialled out, the ordering of countries in terms of DIRE remains broadly the same. This can be seen by comparing the ordering of the estimated country fixed effects in Figure 12 with the ordering of the average (unadjusted) DIRE in Figure 6. The Pearson correlation coefficient for the two variables is high at 0.94 (see Figure 13).

Table 6: **Determinants of direct interest rate exposure in the euro area – regression results**

| | DIRE: Model 1 | DIRE: Model 2 |
|---|---|---|
| Constant | -16.19 (1.96) *** | -16.06 (1.82) *** |
| **Financial status** | | |
| Net wealth | 0.03 (0.00) *** | 0.03 (0.00) *** |
| Income | 0.07 (0.02) ** | 0.09 (0.02) *** |
| Inheritance | 5.34 (1.10) *** | |
| **Housing status** | | |
| Owner with mortgage | -44.40 (1.61) *** | -43.62 (1.47) *** |
| Tenant/Free use | -5.49 (1.48) *** | -4.49 (1.21) *** |
| **Demographics** | | |
| Age | 0.37 (0.03) *** | 0.37 (0.02) *** |
| High education | 7.09 (1.06) *** | 7.01 (1.03) *** |
| Female | -1.05 (0.99) | -0.97 (0.89) |
| **Country fixed effects** | | |
| AT | 10.90 (1.63) *** | 11.01 (1.59) *** |
| BE | 17.48 (1.94) *** | 17.15 (1.93) *** |
| CY | -15.62 (2.54) *** | -15.06 (2.50) *** |
| DE | 15.77 (1.57) *** | 14.34 (1.53) *** |
| ES | -5.23 (1.30) *** | -5.00 (1.30) *** |
| FR | 7.31 (1.17) *** | 8.24 (1.13) *** |
| GR | 0.97 (1.20) | 0.74 (1.19) |
| IE | -17.21 (1.71) *** | -17.64 (1.66) *** |
| IT | | -0.86 (1.21) |
| LT | -11.83 (1.21) *** | -11.13 (1.15) *** |
| LV | -1.61 (1.28) | -1.73 (1.27) |
| MT | 4.04 (1.07) *** | 3.86 (1.02) *** |
| NL | -22.00 (1.87) *** | -23.32 (1.82) *** |
| PT | -1.53 (1.13) | -1.21 (1.11) |
| SI | -5.42 (1.13) *** | -5.53 (1.12) *** |
| SK | -0.16 (1.23) | 0.78 (1.21) |
| $R^2$ | 0.24 | 0.24 |
| N | 54920 | 61159 |

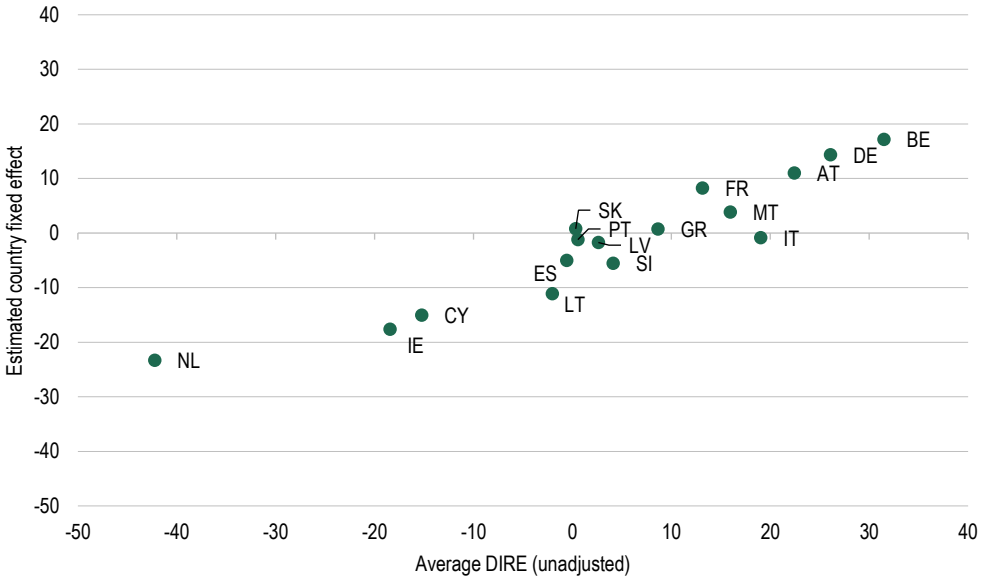
Source: Household Finance and Consumption Survey - wave 2021, own calculations.
Notes: DIRE, net wealth and income are winsorized at the 2.5 and 97.5th percentiles. The sample includes euro area countries, excluding Finland and Luxembourg. Regressions are estimated using the final estimation weights. Standard errors, displayed in parentheses, are calculated using the bootstrap replicate weights (1000 replicates) and are adjusted for the fact that the data are multiply imputed.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Figure 12: **Estimated country fixed effects**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.

Figure 13: **Estimated country fixed effects versus average DIRE**




Source: Household Finance and Consumption Survey - wave 2021, own calculations.