III. Euro Area Household Debt

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Abstract: *Excessive household debt has potentially large negative consequences for the macroeconomy, especially in periods of stress. When large segments of the population are heavily indebted, this can pose systemic risks to the economy at large, as seen in the 2008 global financial crisis, when the housing market collapse triggered widespread debt default and even political instability. After increasing fast before the global financial crisis, household debt as a percentage of disposable income the euro area stabilised, increased again following the COVID-19 shock to diminish with the inflationary shock. Although in aggregate the stock of euro area household debt is backed by a considerable stock of financial assets, the evolution of aggregate net financial wealth is not indicative of the macrofinancial vulnerabilities associated with high household debt. These vulnerabilities can be exacerbated in a context of increasing interest rates and declining growth, which increase the debt burden through its effects on the effort needed to service accumulated debt, the so called "Fisher dynamics". This chapter shows that "Fisher dynamics" have contributed significantly to household debt developments in the euro area, both exacerbating additional households' borrowing and undermining their deleveraging efforts in crisis periods. In the euro area, in crisis times such as the global financial crisis and COVID-19, "Fisher dynamics" have even become the driving factor of changes in debt. Projections regarding future interest and growth indicate that "Fisher dynamics" will be unfavourable in the medium-to-long term and will require euro area households to reduce their credit-financed primary expenditures relative to the average of the last five years to ensure household debt sustainability.*

III.1. Introduction

It is widely acknowledged that rising household debt-to-GDP ratios before the great financial crisis have been one of the factors driving the subsequent asymmetric euro area crisis. This experience has reinforced the view that gross household debt, as a ratio to some measure of household borrowing capacity, is relevant for macroeconomic stability.

The relationship between household debt and economic growth may entail trade-offs between the short and the long run. In the short run, one expects the accumulation of household debt to be associated with credit booms and high aggregate demand as it can be related to higher consumption and household investment (housing). Indeed, the relationship between GDP growth and household debt in the short/medium term is expected to be positive. ([53])

In the long term, however, there is evidence that rising household indebtedness may be detrimental to growth. On the one hand, if consumers spend to accumulate human capital this should support long-term growth, but on the other hand, if household investment is not productivity enhancing, as is the case of housing, there may be a trade-off between the allocation of credit to households and to firms. This is shown in the overlapping generations model of Japelli and Pagano (2014), in which lower household debt leads to higher national savings, higher financing of firm investment and higher economic growth in the long term. ([54]) Although Beck et al. (2012) find no relationship between household credit and long-term growth in real GDP per capita, they do find a positive relationship for credit to firms. ([55]) Finally, the IMF (2017) finds that the positive short-term effects of an increase in household debt on growth and its negative effects on unemployment are reversed in three to five years. ([56])

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([53]) See IMF (2017), "Global Financial Stability Report: Is Growth at Risk?", International Monetary Fund. https://www.imf.org/en/Publications/GFSR/Issues/2017/09/27/global-financial-stability-report-october-2017; and Beck, Levine, and Loayza (2000), "Finance and Sources of Growth", Journal of Financial Economics 58, 261–300.

([54]) See Jappelli, T., & Pagano, M. (1994), "Saving, growth, and liquidity constraints", The quarterly journal of economics, 109(1), 83-109.

([55]) Beck, T., Büyükkarabacak, B., Rioja, F. K., & Valev, N. T. (2012), "Who gets the credit? And does it matter? Household vs. firm lending across countries", The BE Journal of Macroeconomics, 12(1).

([56]) IMF (2017) op. cit. See also Mian and Sufi (2018), "Finance and Business Cycles: The Credit Driven Household Demand Channel", Journal of Economic Perspectives 32(3), 31–58.

The experience with the global financial crisis suggests that high household debt can also be detrimental to long-term growth through its impact on macro-financial vulnerabilities. Indeed, the IMF (2017) finds that higher growth in household debt is associated with a greater probability of banking crises, with negative spillovers to the rest of the economy and important feedback loops, which can lead to prolonged recessions and increased economic uncertainty and volatility. With high debt, household balance sheets become vulnerable to shocks that affect income and wealth. In the case of a negative shock, the inability by households to fulfil their financial obligations will affect other sectors of the economy, including financial intermediaries and firms and dampen credit and growth in the long term. ([57]) More in general, cross-country studies also indicate that increases in household debt help to predict lower future income growth and financial crises in the medium term. ([58])

In the euro area context, household debt had been increasing to unprecedented levels prior to the global financial crisis of 2008-2009, in great part due to financial integration, innovation and de-regulation. ([59]) The relevance of the large accumulation of private debt for the impact of the crisis has been widely recognised. ([60]) This has been reflected in a strengthening of economic surveillance in the euro area and the EU and in the creation of the Macroeconomic Imbalance Procedure (MIP). ([61]) It has also led to the strengthening of macroprudential regulations in the EA and the EU to help maintain private debt within sustainable levels and reduce the macro-financial risks stemming from excessive debt. Additionally, there have also been numerous initiatives to strengthen the financial system in the euro area, with the overhaul of banking supervision and important steps towards further financial integration, in the form of the Banking Union and the Capital Markets Union. ([62])

Risks associated with high household debt are exacerbated in periods of high interest rates combined with low growth, due to the so-called "Fisher dynamics". ([63]) When debt is high, the increase in leverage (debt to income) is not only determined by credit-financed household primary expenditures (active leveraging). There is also the need to cover interest payments on past accumulated debt and the additional mechanical effect of changes in income on the debt-to-income ratio. These mechanical (snowball) effects of changes in interest rates and income acting on the previously accumulated stock of debt relative to income, which Mason and Jayadev (2014) have labelled "Fisher dynamics" can be particularly relevant in the current context of a high household debt stock, higher interest rates, real growth slowdown and declining inflation. ([64])

In this chapter we analyse euro area household debt developments and estimate the contribution of the "Fisher dynamics" to these developments. We also use available projections for interest rates and income to simulate how these "Fisher dynamics" may drive household debt in the future, for different scenarios regarding households' future primary expenditures.

([57]) See Mian, A., Rao, K., and Sufi, A. (2013), "Household balance sheets, consumption, and the economic slump", The Quarterly Journal of Economics, 128(4), 1687-1726; and Mian, A., & Sufi, A. (2011), "House prices, home equity–based borrowing, and the US household leverage crisis", American Economic Review, 101(5), 2132-2156. More recent research, in Leclaire, J. (2020), "Does Household Debt Matter to Financial Fragility?" Review of Political Economy, Volume 35, 2023 (2): 434-453, confirms the findings.

([58]) Jordà, Ò., Schularick, M., & Taylor, A. M. (2016), "The great mortgaging: housing finance, crises and business cycles", Economic Policy, 31(85), 107-152.

([59]) Several studies have documented the role of financial integration, innovation, and deregulation in household credit growth. See for instance Gerardi, K. S., Rosen, H. S., and Willen, P. S. (2010), "The impact of deregulation and financial innovation on consumers: The case of the mortgage market", The Journal of Finance, 65(1), 333-360; Boz, E., and Mendoza, E. G. (2014), "Financial innovation, the discovery of risk, and the US credit crisis", Journal of Monetary Economics, 62, 1-22; and Loutskina, E., and Strahan, P. E. (2015), "Financial integration, housing, and economic volatility", Journal of Financial Economics, 115(1), 25-41.

([60]) See Berti, K., M. Salto and M. Lequien (2012), "An early detection index of fiscal stress for EU countries", European Economy Economic Papers, No. 475; and ECB (2013), "Financial fragility of euro area households", ECB Financial Stability Review 2013, Box 2.

([61]) European Commission (2016), "The Macroeconomic Imbalance Procedure. Rationale, Process, Application: A Compendium", Institutional Paper 39.

([62]) For references to and explanations of the various aspects of the legislations relative to the Banking Union and the Capital Market Union see https://commission.europa.eu/business-economy-euro/banking-and-finance_en.

([63]) Irving Fisher was one of the first economists to analyse the implications for debt burdens of the interaction between real income growth and real interest rates. See Fisher, I. (1933), "The Debt-Deflation Theory of Great Depressions." Econometrica 1 (4): 337–57

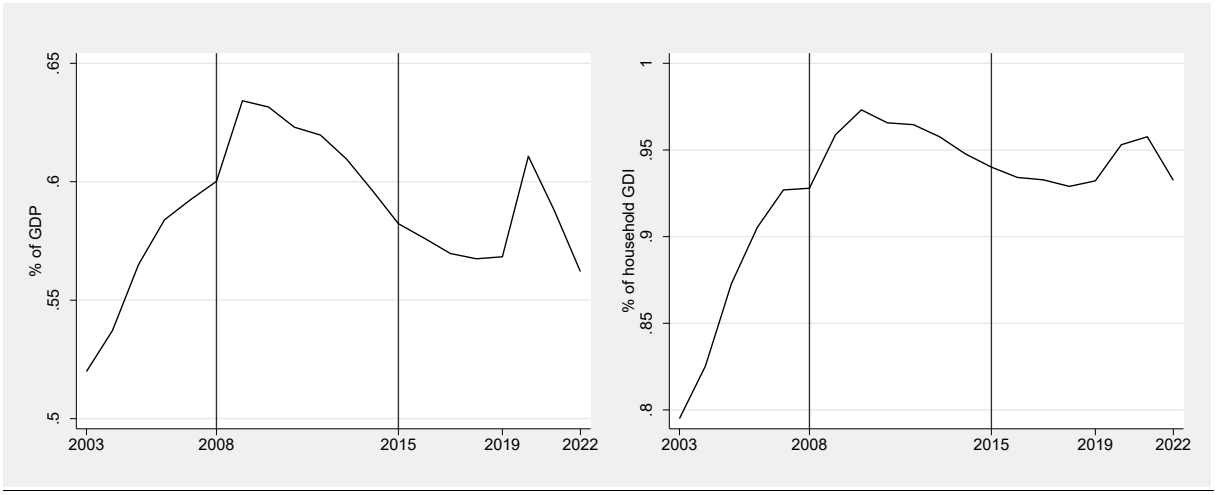
([64]) Mason, J. W., and Jayadev, A. (2014). "Fisher dynamics' in US household debt", 1929–2011. American Economic Journal: Macroeconomics, 6(3), 214-234.

The remainder of this chapter is organised as follows. Section III.2 describes trends in euro area household indebtedness and provides arguments for analysing developments in gross household debt, rather than simply looking at net debt. Section III.3 introduces the methodology and data for the analysis. Section III.4 decomposes euro area household debt developments over the period 2001-2021 into credit-financed household primary expenditures (primary deficit) and "Fisher dynamics". It also zooms in on the developments observed over the pandemic period. Section III.5 uses available projections for interest and growth and alternative scenarios for developments in credit-financed household primary expenditure to simulate the medium-to-long terms effects of "Fisher dynamics" on euro area household debt. Section III.6 concludes.

III.2. Gross versus net debt in the euro area

Graph III.1 shows household gross debt for the euro area, as a ratio to GDP (left panel) and as a ratio to household gross disposable income (GDI, right panel), over the period 2000-2022. The bulk of this debt (about 97%) is long-term loans, the great majority of which are mortgage debt (see below). In the aftermath of the global financial and the European debt crisis, households' debt decreased significantly under both metrics, thanks to a combination of factors, including the improving economic situation, declining interest rates and negative net credit transactions, which contributed to the adjustment of balance sheets after the crisis. The decrease has been interrupted by the COVID-19 crisis. The swings observed in output and income during the acute phase of the COVID-19 pandemic and the subsequent phase of recovery were more pronounced for GDP than for household GDI. As a result, the fluctuations in debt over this period were more pronounced for debt relative to GDP than relative to GDI.

Graph III.1: **Household debt in the euro area**



(1) Household gross disposable income (GDI) is calculated before interest paid and interest received is adjusted for FISIM, as explained in the Section III.3
Source: Eurostat, own computations

In the euro area in aggregate, household debt is backed by a large stock of financial assets. However, as argued by Mason and Jayadev (2014) the experience with the global financial crisis has shown, developments in net financial assets or net debt, in aggregate, are not good signals for macro-financial vulnerability. ([65]) In the euro area total debt is only about 30% of the total financial assets of households and about 70% of liquid financial assets (currency, deposits and debt securities). However, these aggregate numbers hide important differences between households with debt and households without debt and among income quintiles. The ECB Household Finance and Consumer Surveys (2017 and 2021 waves) show that the distribution of liabilities and financial assets across the euro area is hardly even and that the ratio of debt to financial assets is significantly higher for households with debt, particularly those with high

([65]) Op. cit.

debt (see Box III.1). Euro area households also hold a substantial stock of residential real estate, but a large share of these are primary residences and are overall less liquid, particularly in crisis times. Another argument to focus on the analysis of gross debt is that in the presence of large shocks, also the value of financial assets can be uncertain. For instance, in the case of stock market crashes and bank failures (and bail-in requirements), there can be large corrections in asset values, even relatively liquid ones. ([66]) From a theoretical perspective, Tirole (2011) shows that gross debts (or leverage measures, such as debt-to-income) matter when credit constraints and illiquid assets may prevent agents from achieving their preferred allocation of income across periods, constraints that are likely to hold in financial crises and recessions. ([67])

III.3. The debt equation and its components

Making a parallel with the accounting identity used to analyse the evolution of government debt, the change in the household debt ratio can be decomposed into a "primary deficit", a "Fisher dynamics" term and a stock-flow component, i.e.

$$b_t - b_{t-1} \equiv \Delta b_t = d_t + \underbrace{\frac{(\mathrm{i}_t - g_t - \pi_t)}{(1 + g_t + \pi_t)} b_{t-1}}_{\textit{Fisher dynamics}} + \mathrm{sf}_t \qquad (1)$$

Concerning the general government, b_t is the debt-to-GDP ratio at (the end of) period t, d_t is the ratio of primary deficit to GDP incurred in t, i_t is the implicit nominal interest rate paid in t on existing debt, g_t is the real growth rate of GDP in t, π_t is inflation and sf_t the stock-flow ratio over GDP. The Fisher effect captures the contribution of $(\mathrm{i}_t - g_t - \pi_t)$ to the increase in growth. This can be rewritten both as the difference between the nominal interest rate and the nominal growth rate of income $(\mathrm{i}_t - g_t^n)$ or as the difference between the real interest rate and real growth $(\mathrm{r}_t - g_t)$, where $g_t^n = g_t + \pi_t$ and $\mathrm{r}_t = \mathrm{i}_t - \pi_t$. When the interest rate is above income growth, debt continues to increase even if there is no additional net borrowing, and the reverse applies when the interest rate lies below income growth. However, when applying the accounting analysis to the evolution of households' debt, it is necessary to appropriately choose the relevant corresponding variables.

Debt

In national accounts data, loans constitute around 90 percent of the total liabilities of euro area households and non-profit institutions serving households (NPISH). Debt-securities are relevant in a limited number of euro area countries but are also typically taken into account in the definition of household debt. The remaining item in the liability side of the household sector balance sheet is other payable accounts, which is significant in a limited number of euro area countries but is very volatile. ([68]) This chapter adopts the Macroeconomic Imbalance Procedure (MIP) definition of debt, which comprises loans and debt securities. In 2021, 96% of household debt was long-term debt. When applying this type of accounting analysis to the evolution of households' debt, it is necessary to appropriately choose the relevant corresponding variables.

([66]) Claessens, S. and M. A. Khose (2013), "Financial Crises: Explanations, Types, and Implications", CAMA Working Paper 06/2013.

([67]) Tirole, J. (2011), "Illiquidity and All Its Friends", Journal of Economic Literature 49 (2): 287–325. Prior to the global financial crisis, the common assumption regarding household debt was that it matters only to the extent that it is reflected changes in household net wealth (Benito et al. 2007), however Mason and Jayadev (2014), op. cit., argue that the global financial crisis has changed these.

([68]) Other payables comprises tax liabilities due to the government and trade credits among other items. It has a very irregular behaviour and therefore is not comprised in the definition under the MIP, which we decide to follow.

Box III.1: Households' resilience to debt and debt inequality in the euro area

The total stock of gross debt of the euro area household sector in aggregate is only about 30% of total financial assets and is also lower than the aggerate stock of currency and deposits. This observation could misleadingly lead to the conclusion that household debt in the euro area does not pose any macrofinancial risk and that widespread household debt default is unlikely even in the event of a large shock. However, the aggregate numbers hold important asymmetries in the distribution of debt and financial assets among households. While yearly, comprehensive disaggregated data are not available, the ECB conducts every three years a "Household Finance and Consumption Survey" (HFCS), ([1]) which contains sufficient information to give a picture of where debt and assets are concentrated. The most recent vintages of the HFCS correspond to the years 2017 and 2021.

Graph 1 shows that the ratio of debt to total assets, including real estate, for all indebted household in 2021 was 23% and that the same figure increases to 96% if one focusses on the most indebted households (at the 90th percentile of the debt distribution). Moreover, as shown in the right column, financial assets, which are presumably a more liquid part of assets, only constitute 20% of the assets for the total survey population. Thus, should about the same proportion hold for every household the debt of indebted families would be larger than their financial assets rising to a ratio of around 500% for the median high-debt family. Even if the situation has been improving in comparison with 2017, it should be noted that around 40% of all households have debt, which implies a major economic and societal risk. ([2])

Another perspective on the existence of possible fault lines that justify focussing on gross debt is income inequality. It is well known that higher-income households own more debt in absolute value than lower-income households. However, Graph 2 shows that financial assets held by high-income households, had a value close to the value of their outstanding debt, while the debt owned by the lowest-income households had a value close to 2.5 times the value of their financial assets. Even if these figures refer to the entire population of households and not only to the indebted ones, they make clear that, in absence of more detailed data, the dynamic of aggregate gross debt is relevant from a macrofinancial stability perspective.

Regarding the distribution of debt by income groups, the most leveraged income group among the indebted households, are those between the percentiles 80 to 90 of the income scale, with a debt-to-income ratio of 92.5%, while the less indebted relative to income are the households in the percentiles 20 to 40 with a ratio of 47.5% (Graph 3). The bottom income group also has a high debt-to-income ratio, at 69%. Moreover, lower-income households have the highest debt burden (Graph 4), as measured by the median debt service to income ratio. The high percentage of their income devoted to servicing debts, coupled with the fact that they do have less financial assets than higher-income households to help in case of need, makes low-income households more vulnerable to financial distress when facing economic shocks or rising interest rates than high-income ones.

([1]) See Household Finance and Consumption Network (2020), "The Household Finance and Consumption Survey: Methodological report for the 2017 wave. ECB Statistics Paper Series No 35, and "The Household Finance and Consumption Survey: Methodological report for the 2021 wave", ECB Statistics Paper Series No 45.

([2]) This share varies significantly across income levels that for 2021, in the bottom 20% only 25.5% of households had debt, while in the top 10% the percentage of households holding debt was 61%.

(Continued on the next page)

Box (continued)

Source: Household Finance and Consumption Survey 2017 and 2021 waves and European Commission services

Interest rate

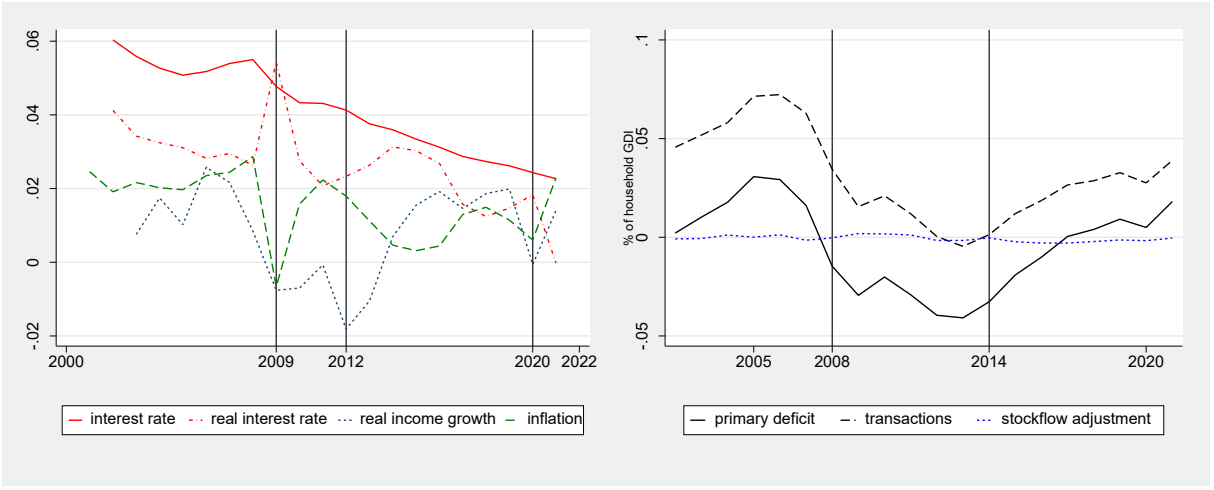
Similar to what is done in the case of the government, we compute the implicit or effective interest rate as the ratio of interest paid by households to the previous year's stock of household debt. It is appropriate to use gross interest paid rather than net interest because interest income will be included in the household disposable income. The implicit rate represents the average interest rate on the current debt stock, not the marg inal rate on new borrowing. Developments in the average rate are affected by monetary policy and market developments only via new loans, and their ratio to total outstanding loans, and depending on the average fixation period of the rate., with fix rated being in general prevalent.

Note however that we use interest paid before the allocation of financial intermediation services indirectly measured (FISIM), because this corresponds to the amount effectively paid by the households (which comprises indeed indirect fees). We consider this a better approximation of interest for households when one wants to measure the capacity of reimbursing a loan. The difference between the implicit interest rate

derived from interest payments including FISIM and that derived from interest payments deducting FISIM corresponds to financial intermediation services paid by borrowers.

Financial intermediation services charged to borrowers are estimated to be relatively constant and to correspond to a couple of basis points in general over the period considered, with a decline in the periods in which monetary policy takes a more restrictive stance. In 2021 financial intermediation services corresponded to about half of the interest paid on average by euro area households on their debt.

Graph III.2: **Fisher variables, primary deficit and stockflow adjustment**



(1) Interest is the implicit rate comprising FISIM. The primary deficit equals liability transactions excluding interest payments. The stock-flow adjustment is estimated as the difference between changes in stocks and net transactions.
Source: Eurostat and own calculations

Interest, income, and prices

When applied to public debt, equation (1) usually features the ratio of gross debt to GDP. For a similar decomposition of non-financial corporation debt, it would probably be more appropriate to define debt as a ratio to a measure of assets or wealth (stock), as this would also capture future corporate income. In the case of households, it is more appropriate to define debt as a ratio to income, as labour income still represents the largest share of income for households and future labour income cannot be captured by any stock with an observable market value (Mason and Jayadev, 2014). ([69]) Furthermore, disposable income also includes property income. While governments have the entire GDP as a potential source of income, in the case of households, disposable income is the total amount of money households have available for spending and saving after subtracting income taxes and pension contributions. As the gross disposable income found in the sectoral national accounts for households and NPISH includes net property income, in order to have a comprehensive estimate of what households have available to repay debt in each period, interest paid is added to the gross disposable income, while FISIM is deducted from the interest received. This last adjustment accounts for the fact that savers receive de facto the reference interest rates minus FISIM, which is attributed to the financial sector for their services. ([70]) To compute real income, we deflate this estimate with the consumption deflator. ([71])

The left panel of Graph III.2 shows the behaviour of the variables contributing to the Fisher dynamics component of the debt-to-income developments in equation (1). The almost continuous decrease in nominal implicit interest rates reflects the observed decreasing trend in long-term rates over the period

([69]) Op. cit.
([70]) Adjusted gross disposable income before actual interest paid is computed as disposable income plus the difference between interest paid and received plus the interest received (comprising FISIM). Using ESTA codes: B6G+D41_PAID-D41_RECEIVED+ D41G_RECEIVED
([71]) As discussed in Mason and Jayadev (2014), op. cit., the ideal measure of inflation would be the one that exactly reflects the change in household income attributable to inflation. To the extent that the various possible indexes move broadly in line, results should not be very sensitive to the choice.

and the evolution of monetary policy, with the effects of the first hiking cycle by the ECB visible after 2005. The smooth developments in the implicit average interest rate reflect in part the fact that euro area household liabilities are largely long term ([72]) and prevalently at fixed rather than variable rates. The ECB provides data on the share of new household loans at fixed and variable rates, according to which, the share of variable rate loans in total new loans for house purchase in the euro area has declined from an average of around 45% between 2003 and 2010 to an average of around 18% in the period 2015-August 2023. ([73]) According to the same ECB data, in the first semester of 2022, the share of new mortgage loans with an interest rate fixed for more than 10 years was about 60%. From this data is not easy to infer the share of variable rate loans in total loans stocks, however Tzamourani (2021) estimates that the interest rate exposure of euro area households on the liability side remains significant. ([74])

The evolution of real income in the same chart (Graph III.2, left panel) reflects the developments of the euro area economy, with the vertical bars indicating crisis years (the great financial crisis, the sovereign debt crisis and the COVID-19 crisis). Although the implicit nominal interest rate is relatively stable, the real interest rate has experienced more variation, negatively correlated to changes in the rate of inflation. Throughout most of the period the real interest rate (r) is above the real growth rate of income (g).

Table III.1 shows descriptive statistics for the implicit nominal interest rate (i), inflation (p), the real interest rates (r), the real household income growth rate (g) and r-g, by sub-periods. Although r-g has been mostly positive throughout the sample, it was close to zero in the period 2015-2019 and negative in 2021, both periods when the real interest rate was relatively low compared to growth. In highest r-g is observed in the period of the global financial crisis, when r was relatively high, and the growth rate of income was negative. Dividing the sample between crisis and non-crises periods, r-g comes out significantly higher for crisis periods, contributing to, potentially substantial, debt-increasing Fisher dynamics during crisis episodes.

Table III.1: **Fisher variables**

	i	π	r	g	r-g
2001-2008	5.4	2.3	3.9	1.5	1.6
2009-2014	4.1	1.1	4.8	-0.6	3.7
2015-2019	2.9	0.9	1.2	1.8	0.2
2020	2.4	0.6	2.5	-0.1	1.9
2021	2.3	2.3	0.9	1.4	-1.4
Normal times (2003-2008 and 2015-2019)	4.4	1.8	2.6	1.6	1.0
Crisis times (2009-2014 and 2020)	3.9	1.0	2.9	-0.5	3.4
Full sample (2001-2021)	4.1	1.5	2.6	0.8	1.8

Source: Eurostat, own calculations

([72]) We are not aware of data on average maturity of outstanding loans or debt for households, but in 2020, according to the OECD, the average duration at issuance of mortgages in the euro ranged between the 30+ of Portugal and the 15 of Belgium with Germany, France, Italy and Spain being between 20 and 25 years. Report available at https://www.oecd-ilibrary.org/docserver/e91cb19d-en.pdf?expires=1698676300&id=id&accname=oid031827&checksum=1DAB4C35076B2272962F337D3E5FC217)

([73]) ECB MIR database, share of variable rate loans in total loans for house purchase. According to ECB data available at https://data.ecb.europa.eu/data/datasets/RAI/RAI.M.U2.SVLHPHH.EUR.MIR.Z in the euro area in 2022, 16% of loans have fixation up to 1 year, 8% between 1 and 5 years, 17% between 5 and 10 and 59% over 10 years. Usually, variable rate loans are loans with a rate fixation period of up to 1 year.

([74]) Tzamourani, (2021) uses the euro area Household Finance and Consumption Survey (2017 wave) to estimate the maturing liabilities of euro area households, which according to Auclert (2019) are the liabilities exposed to interest rates changes. She finds that for the euro area these amounted to around 45% of income on average, while the median debt to income ratio for the universe of households in the survey is around 71%. See Tzamourani, P. (2021), "The interest rate exposure of euro area households", European Economic Review, 132, 103643; and also Auclert, A. (2019), "Monetary policy and the redistribution channel", American Economic Review, 109(6), 2333-2367.

Primary deficit and stock-flow adjustment

The concept of "primary deficit" is perhaps the one for which it is more difficult to make a parallel between the government and the household sector. While the government covers any expenditure that is not financed by taxes with new borrowing, the concept of expenditures and income for the households is more fluid as households may purchase assets and dispose of at least some assets at any point in time. Mason and Jayadev (2014) propose to interpret the "primary deficit" of households as their credit-financed primary expenditures, that is, the expenditures that are not financed by household disposable income. ([75]) This implies extending the concept of "expenditures" to the acquisition minus disposal of financial assets and is consistent with the focus on gross rather than net debt. ([76]) In many instances, the aggregate household "primary deficit", will be actually negative and reflect instead a "primary surplus". This will occur in periods when the household sector in aggregate will be financing other sectors of the economy, even though individual households may still be incurring in new debt to finance their expenditures.

Empirically the household "primary deficit" will be computed as net debt liability transactions, available from the Eurostat financial accounts, minus the household interest payments. The remaining item in equation (1), the stock-flow adjustment, can be obtained as the residual difference between the change in the total debt stock and net transactions. Stock-flow adjustment thus bundles together other changes in debt (which may include, for instance debt write-offs, debt-to-asset swaps or capitalisation of interest due) and valuation effects (which may refer for instance to changes in the value of debt due to exchange rate fluctuations). Isolating other changes in debt from valuation effects is difficult because the data is not available. The stock-flow adjustment is typically small in the case of the euro area, consistent with the fact that the bulk of euro area household debt comprises mortgage loans in euros (Graph III.2, right panel).

III.4. Decomposition of the evolution of debt

Over the Full Sample

To understand developments in the household debt-to-GDI ratio in the euro area, one can apply the household sector variables described above to equation (1). To recall, this equation highlights the role of the different types of factors affecting the debt ratio: the primary deficit, the "Fisher dynamics" and a stock-flow adjustment factor (Graph III.3, left panel). The first term reflects households' decision to accumulate new liabilities or repay debt in net terms. ([77])The second, the so-called "Fisher dynamics" reflects how, given the already accumulated debt stock, the debt-to-income ratio mechanically evolves due to the evolution of income and interest rates, two variables that are typically considered as being out of the control of households. The final factor is the stock-flow adjustment, which is negligible for the euro area as shown earlier. It is however important to stress that borrowing decisions are likely endogenous to economic developments, with new credit being demanded by households and supplied by banks in periods of positive economic growth (at least in expected terms) and depending on market interest rates.

A first stylised fact, emerging from this decomposition, is that the "Fisher dynamics" component is visibly important. Despite this, the primary deficit (reflecting new additional debt or repayment) has been in general the dominant factor determining the sign of the change in euro area household debt, as in almost every year the sign of the change in the debt ratio corresponds to the sign of the primary deficit. However,

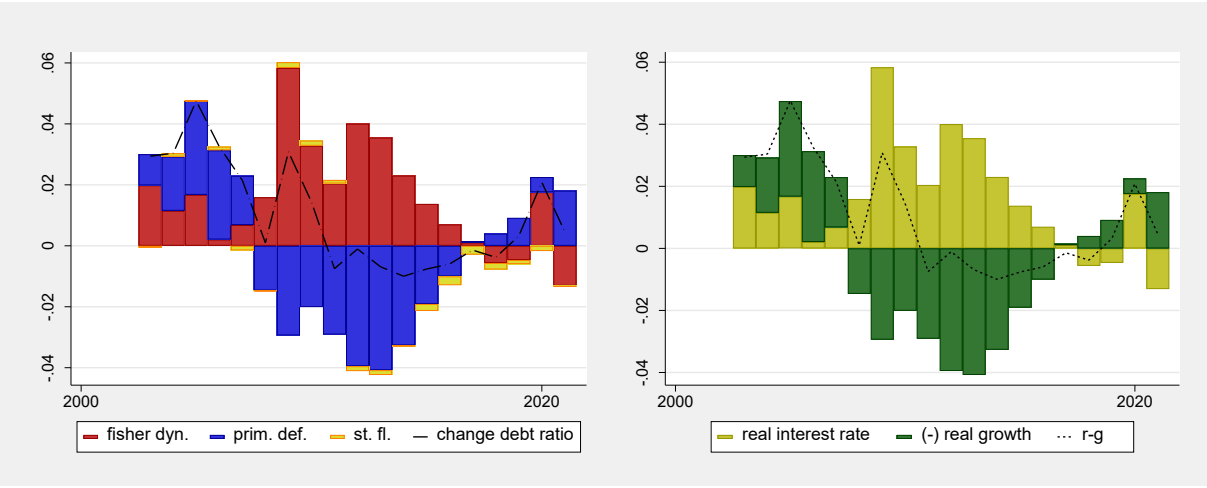
([75]) Op. cit.

([76]) It is useful to compare the concept of primary deficit used here with households' savings. Gross savings are computed from non-financial accounts by deducting the final consumption expenditure from gross disposable income and adjusting for the change in pension entitlements. When further deducting gross capital formation (mostly new dwellings), capital consumption and the difference between acquisitions and disposals of non-financial non-produced assets, one obtains net lending (B9 in statisticians' parlance), which is also the definition of deficit used to analyse government's debt sustainability. Net lending corresponds to (the negative of) the net financial transactions (B9F in statisticians' parlance), i.e. the difference between net acquisition of financial assets and net incurrence of liabilities, as households use the remaining of their budget constraints after consumption and investment plus the new (net) financial liabilities to acquire new (net) assets. This happens in theory. Unfortunately, in general, as the two data are built from different sources, the two numbers do not coincide.

([77]) Note that the "conscious decision" involves both the decision of households to demand credit and the decision of banks to grant credit.

"Fisher dynamics" have worked to either exacerbate the dynamics or dampen it in an important manner and have also been dominant in particular periods, something that Mason and Jayadev (2014) also find for the US over the period 1929–2011. (78)

Graph III.3: **Decomposition of the change of the household debt-to-income ratio and of Fisher dynamics**



(1) The primary deficit equals (net) transactions in liabilities excluding interest payments. The stock-flow adjustment is estimated as the difference between changes in stocks and transactions. Variables for the Fisher dynamics are described above. Inflation is measured by the deflator of actual individual consumption of households.
Source: Eurostat and own calculations

In periods of crises in particular, "Fisher dynamics" can be the dominant factor in explaining debt developments. In the immediate aftermath of the global financial crisis, debt repayments were fully offset by the increase in the debt ratio through the "Fisher dynamics", which was very high and positive and undermined deleveraging efforts for some time. If one considers the global financial crisis period between 2008 and the peak in debt (2010) the Fisher effect explains more than 3/4th of the total increase in the debt ratio. Also in 2020, with the pandemic-driven recession, the Fisher dynamics contributed to the increase in debt substantially more than the primary deficit.

Looking more closely at the differential between real rates and income growth in the euro area, this has been positive most of the times (Graph III.3, right panel). Exceptions are 2018-2019, when positive and relatively large income growth rates became larger than real interest rates, whose decrease was driven to some extent by the easing of monetary policy. Another exception is 2021, when the post-pandemic recovery drove up real growth and inflation.

Zooming in on the impact of the COVID-19 pandemic

The 2020 crisis impacted debt developments, even if to a lesser extent than the global financial crisis and the euro area sovereign debt crisis. Differently from the previous crises, net credit transactions remained positive in 2020, supported by government policies, complemented by ECB measures to ensure liquidity. Government support policies included moratoria on debt payments, which reduced repayments, income support and credit guarantees, while ECB measures included the pandemic emergency purchase programme (PEPP) and the temporary relaxation of capital requirements. These policy measures by euro area governments and the ECB encouraged both credit demand and credit supply over the pandemic period. As a results, in 2020, the household primary deficit experienced only a moderation instead of the sharp contraction into surplus, observed during the global financial crisis. The moderation in the

(78) Op. cit.

household sector primary deficit of 2020 was reversed in 2021 when credit-financed primary expenditures exceeded 2019 levels, possibly reflecting pent-up demand for credit. ([79])

Government support and monetary policy intervention did not prevent the appearance of adverse Fisher dynamics in 2020, driven by the sharp recession which led to a decline in income levels and an increase in real interest rates, as inflation declined faster than nominal rates. However, the contribution of the "Fisher dynamics" reversed in 2021 with the steep recovery and thanks to a fall in real interest rates, resulting from the combination of persistently low nominal interest rates with rising post-pandemic inflationary pressures. Overall, in 2021, the size of credit-financed household (primary) expenditure drove the evolution of debt so that households exited the pandemic with a further increase in the stock of debt compared with 2020 as shown in Graph III.3.

The dynamics of household debt during COVID-19 differs whether it is analysed as a ratio to household GDI or as a ratio to GDP. As a ratio to GDP, household debt experienced a sharper increase in 2020, since government measures supporting household income (short-term working schemes, and unemployment insurance, for instance) cushioned the fall in household GDI relative to GDP. In 2021, when household debt transactions recovered, debt as a ratio to GDI continued to increase even as GDI recovered, while as a ratio to GDP, debt adjusted slightly downwards, as the recovery of GDP, from a more significantly decline, was steeper. In 2022, the high growth of both nominal GDP and nominal household income, stirred in great part by high inflation, drove both ratios down to close to their 2019 levels, as can be seen in Graph III.1.

III.5. Projecting the impact of future "Fisher dynamics" on household debt

In 2023, following the COVID-19 pandemic, Russia's invasion of Ukraine and the energy-price driven inflation surge, the euro area economy appears to have entered a period of higher nominal interest rates and nominal income growth slowdown, trends that can potentially lead to a permanently higher r-g and adverse "Fisher dynamics". How much can this impact euro area household debt in the long term? To assess this, this section uses available long-term projections that can be used to simulate the potential size of the effect using equation (1). For that one needs projections of interest rates, income growth and primary deficit, assuming zero stock-flow adjustments.

III.5.1. Projecting r-g for households

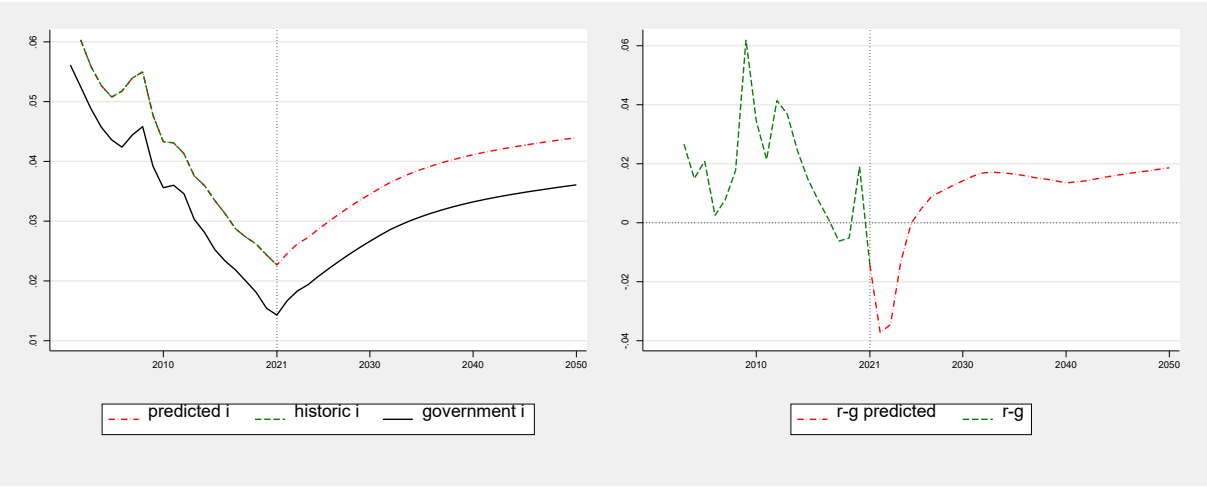
Projections for interest rates and income growth will be based on existing projections used by the European Commission in the context of the Debt Sustainability Analysis. Long-term projections of the implicit interest rate paid by households are difficult to obtain using projections of monetary policy rates, as the transmission of monetary policy to interest rates paid by households depends on detailed data on the stock of household loans regarding maturity, and type of contract (fixed or variable rate), which is not available as discussed above. Instead, to project the household implicit interest rates, we make use of an empirical observation that the spread between these and the implicit interest rates paid by their sovereigns has been rather stable over time for the euro area (Graph III.4). As projections for sovereign implicit interest rates, we use DSA projections through 2070. ([80]) The projections of the implicit interest rates

([79]) Developments in net credit flows differed between households and NFCs in the period 2020-2021. While in the case of households net credit flows moderated in 2020, in the case of NFCs net credit flows increased significantly, as the government moratoria and guarantees allowed NFCs to increase debt to cover sudden revenue losses and liquidity shortages resulting from the pandemic. This was followed by a moderation in NFCs net credit flows in 2021. See European Commission (2022), "Alert Mechanism Report 2023", Staff Working Document (2022) 381.

([80]) European Commission (2023), "Debt Sustainability Monitor 2022", Institutional paper 199. In the DSA the implicit interest rate on government debt at year t is a weighted average of market short-term and long-term interest rates and of the implicit interest rate on outstanding long-term debt in year $t-1$, with the weights depending on the maturity structure of government debt and the ratio of variable rates. Hence, depending on the weight of outstanding debt in total government debt, an increase of market interest rates will transmit more or less quickly to the implicit interest rate on government debt. Regarding market interest rates, the assumptions are that the short and long-term interest rates will converge linearly within 10 years (i.e. by 2033 in our case) to the short-term and 10-year forward rates respectively. After ten years, the long-term market interest rate converges linearly to 4% in nominal terms (2% in real terms) for all countries in an horizon of 20

paid by households are therefore computed as the government implicit interest rate, as projected by the DSA, plus the average spread between the two rates computed from the available sample.

Graph III.4: **Projected interest rates and r-g**



(1) Implicit nominal rates are named "i". The implicit rate for households is projected as the European Commission DSA government interest rate plus the average historical spread between the implicit rates paid by households and the one paid by government. Income growth is taken from the DSA by the European Commission.
Source: Eurostat, European Commission (DSA) and own calculations

Graph III.4 (left panel) shows the results of these projections alongside the historic implicit rates. In the euro area, implicit household interest rates are projected to increase, following the projected increasing path of the implicit rates for euro area sovereigns. The latter are projected to reach 3% by the mid-2030s, continuing to increase thereafter towards close to 4%. Notice that the average of the spread between the implicit rate paid by households on their debt and the implicit rate on sovereign is positive and relatively stable over the sample.

To project r-g, which is the variable driving the endogenous debt dynamic, a projection for the growth rate of income is needed on top of the projection of interest rates. To this purpose, we assume that household nominal income growth is equal to the nominal growth rate of wage income projected by the European Commission in the context of the analysis of ageing costs for the DSA analysis. The right panel of Graph III.4 uses this projection, together with the projections for the interest rate to obtain projections for $r_t - g_t = \mathrm{i}_t - g_t^n$. The resulting Fisher multiplier is projected to remain negative in the first years, due to a combination of resilient nominal wage growth and slow pass through of monetary policy rates to implicit interest rates, but over the years, the projected increase in implicit interest rates and decrease in nominal income growth should push r-g towards just below 2%.

III.5.2. Projecting households' primary deficit

Estimates of the primary deficit for 2022 and 2023 can be obtained using quarterly sectoral accounts data, which is available for net euro area debt transactions until 2023 Q2. To estimate the reminder of 2023, it is assumed that the year-on-year changes observed in the first half of the year also apply to the second half. ([81]) In addition, an estimate of interest payments, calculated using the previous stock of debt and the implicit interest projections, is deducted from these net transactions, to obtain the primary deficit for 2022

years (2053 in our case); the short-term market rate is supposed to converge linearly to the long-term market rate times a coefficient corresponding to the historical (pre-crisis) euro area yield curve (currently 0.5) for all countries by the chosen horizon.

([81]) The figures for debt and net transactions for 2022 and 2023 are reconstructed based on the quarterly series available in the Eurostat website, where the two missing quarters for 2023 are computed as the value of the corresponding quarter of 2022 times the ratio of the value of Q2/23 to Q2/22.

and 2023. ([82]) From 2023 onwards, projections are more difficult to obtain. A scenario keeping constant the primary deficit is a good reference point for household debt projections. To avoid being too influenced by the last figures (arguably reflecting exceptional times and estimates), the primary deficit in this scenario has been set equal to the average of 2019-2023. ([83]) Another indicative scenario is one in which the household primary deficit is constant and such that their debt-to-income ratio stabilises by 2050 at its 2023 value, which corresponds to maintaining a primary surplus (negative primary deficit) only slightly lower than that estimated for 2023. ([84])

Alternative scenarios may instead try to take into account the endogeneity of the household primary deficit. As credit-financed primary expenditures, resulting from consumption and asset accumulation decisions, the household primary deficit should in principle take into account the evolution of interest rates and the growth rate of disposable income. To have a broad assessment of the endogenous reaction of the primary deficit to economic conditions, the primary deficit was regressed on the lagged primary deficit, implicit real interest rates, income growth (or the difference between the two) and lagged debt. ([85])

Table III.2: **Determinants of households' primary deficit**

	(1) **Primary deficit**	(2) **Primary deficit**	(3) **Primary deficit**
L.Primary deficit	0.697*** (0.020)	0.699*** (0.021)	0.662*** (0.038)
r-g	-0.357*** (0.077)		
L.Debt ratio	-0.012*** (0.003)	-0.012*** (0.004)	-0.014*** (0.002)
L.r-g		-0.192*** (0.049)	
Real income growth			0.398*** (0.085)
Real interest rate			-0.263** (0.118)
Constant	0.016*** (0.004)	0.016*** (0.004)	0.013*** (0.004)
Observations	321	321	321
Countries	18	18	18
Overall R2	0.74	0.69	0.75
Sargan-Hansen p-value	0.35	0.45	0.14

Note: Dependent variable: primary deficit. Robust standard errors in parenthesis
* p<0.10, ** p<0.05, *** p<0.01
Source: own calculations

Table III.2 presents the regression results. Column (1) will be used as the baseline for projections. The regression shows that on average the primary deficit is persistent, as the coefficient of the primary deficit

([82]) Quarterly data for interest payments including FISIM was not available for the euro area at the time of writing, otherwise the projections for interest payments could have been based on this data.

([83]) Adjusting this average to a different period, like for example 2017-2021 did not significantly change the pattern of the projection. While in 2023, credit to households contracted significantly, it expanded significantly in 2019, hence developments average out.

([84]) The constant debt stabilizing primary deficit is given by $d^* = \frac{1-\Pi_{j=23+1}^{50} m_j}{1+\sum_{k=25}^{50}\left(\Pi_{j=k}^{50} m_j\right)} b_{23}$, where b_{23} is the debt-to-income ratio in 2023 and $m_j = \frac{(i_j - g_j - \pi_j)}{(1+g_j+\pi_j)}$ is the Fisher dynamics multiplier in period j as described in equation (1).

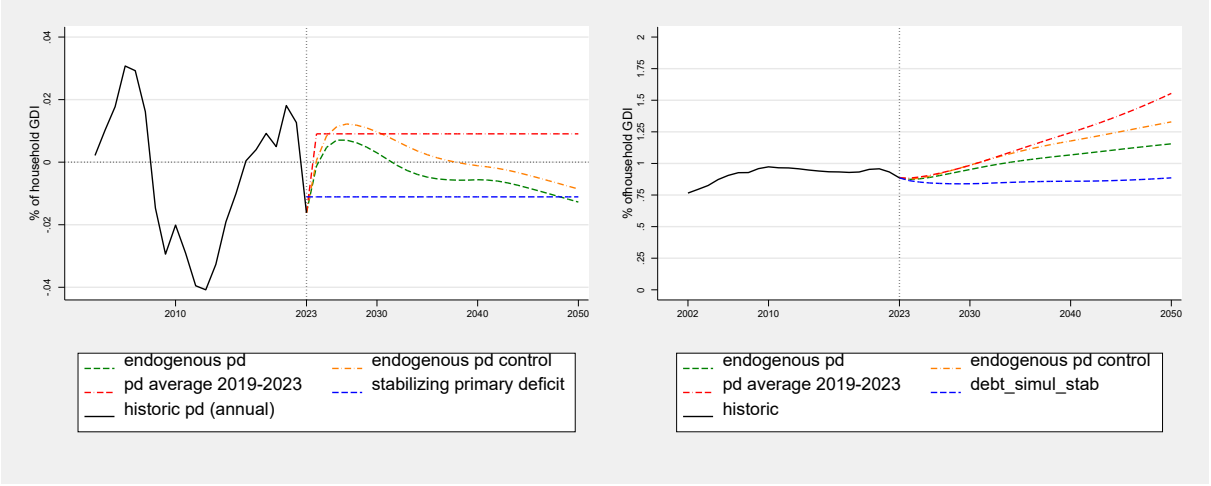
([85]) The estimates are run using a two-step GMM estimator, in which the primary deficit and r-g are instrumented by their own lags on pooled data from euro area countries after 2002. In particular the estimate is provided by the Stata command ivreg29, options cluster and gmm2, which provides estimates efficient for arbitrary heteroskedasticity and clustering on country and statistics robust to heteroskedasticity and clustering on country. The 2SLS estimate would be efficient only for homoskedasticity. The 2SLS estimates do not differ substantially from the GMM estimates. Alternatively, one could proxy new borrowing by households with pure new mortgage loans and try to forecast it using a similar model. However, data on pure new mortgage loans (excluding interest and amortization repayments) is only available from the ECB since 2017 for euro area countries and with gaps. In addition, to move from the projections for new loans to a projection for the primary deficit would also require a projection for amortization payments and this would be more difficult to obtain with the available data.

of the previous year is around 0.7. Moreover, an increase of the interest-income differential by 1 pp reduces the primary deficit by around 0.36 pp. Finally, an increase of the debt ratio by 1pp, decreases the primary deficit by around 0.01 pp. ([86])

The second column of Table III.2 shows a control regression in which the lagged r-g is used, instead of the contemporaneous one, to have some comfort that the endogeneity issue is corrected by the instruments used in the main regression. The coefficients remain similar. Projections will be made on the basis of both scenarios (on top of the scenario in which the primary deficit is kept at the average of the last five years).

The third column shows the same regressions in which the coefficient of the interest rate and of income growth have not been constrained to be identical. First, it should be noted that the other coefficients remain substantially unchanged. Second, while the coefficient of income growth is higher than the constrained coefficient and the one of interest rates lower (in absolute value), a $\chi 2$ test shows that the two cannot be distinguished from a statistical point of view. The advantage of constraining them to be equal is that projecting r-g does not require projections for the consumer price deflator over a long horizon.

Graph III.5: **Projections of households' primary deficit and debt**



Source: Eurostat, European Commission (DSA) and own calculations

The left panel of Graph III.5 compares the primary deficit under the alternative scenarios considered. ([87]) The fact that the primary deficit in 2023 was relatively low moderates the average of the previous 5 years, however this scenario still corresponds to the highest primary deficits. In the two endogenous scenarios, the primary deficit is assumed to respond to changes in r-g (current or lagged). The relatively low r-g in the beginning of the projections yields an increasing primary deficit. As both the stock of debt and r-g increase, the primary deficits decline and eventually turn into surpluses (just after 2030 for the baseline scenario and just before 2040 for the control scenario). In the remaining scenario, households would maintain a primary surplus only slightly lower than the one estimated for 2023, at a level that allows debt stabilization by 2050.

([86]) It should be noted that the coefficient of the constant of the same regression without debt is very similar to the sum of the constant and the debt coefficient in column (1), which, for a debt ratio of 1 makes the primary deficit predicted by two regressions very similar. This means that it is safe to interpret 0.003 as the increase in primary deficit that households still posted historically at this level of debt.

([87]) We present an 'exogenous' scenario in which the primary deficit is kept constant at the average of the past five years (under the name "2019-23 pd average" in the legends), and two endogenous scenarios, a scenario in which the primary deficit is projected to evolve according to column one of Table III.1 ('Endogenous pd') and a scenario in which the primary deficit evolves according to column two ('Endogenous pd control'). Note that the graph also shows a bar for the value of primary deficit of 2023.

Debt simulations through 2050 can now be assessed following a methodology akin to the one that it is followed in the DSA to analyse the evolution of government debt, applying equation (1), describing the change in the debt-to-income ratio.

The results from this exercise can be read in the right panel of Graph III.5. The latter shows that households' net borrowing will have to decline in the euro area to avoid that the gross debt-to income ratio increases significantly. Indeed, following a brief period of negative r-g, debt would be on an increasing path and above the 100% income threshold already by 2030 under all scenarios, except the one which by construction stabilises the household debt-to-income ratio at its 2023. The unfavourable debt dynamics would be particularly rapid under the assumption that new net transactions equal the average of the last five years, but it should be noted that considering the historical correlations of the primary deficit, as estimated in Table III.2 only curbs this dynamic, especially in case households react to the current r-g, but this is not sufficient to revert the increasing trend by 2050, pointing to the necessity of households diminishing their credit-financed primary expenditures beyond what has been observed historically, to counter the adverse "Fisher dynamics" that are projected and ensure long-term debt sustainability.

III.6. Conclusion

High household debt can have potentially large negative consequences for the macroeconomy, especially in periods of stress. When large segments of the population are heavily indebted, it can pose systemic risks to the economy, as seen in the 2008 global financial crisis when the housing market collapse triggered a widespread debt crisis and even political instability. The euro area household sector in aggregate does have a substantial stock of financial assets, but these are not evenly distributed among households in proportion to their debt levels, leaving large debt exposures uncovered.

The paper has shown that household debt developments in the euro area are significantly affected by the so-called "Fisher dynamics" (snowball effects resulting from financing needs generated by interest payments on debt accumulated in the past). Although most of the times the sign of the change in the debt-to-income ratio tends to correspond to the sign of the primary deficit, "Fisher dynamics" have contributed significantly to household debt developments in the euro area, at times exacerbating additional borrowing to finance household primary expenditures and other times undermining deleveraging efforts, just as previous findings for the US. In the euro area, in crisis times such as the global financial crisis and COVID-19, "Fisher dynamics" have even become the driving factor of changes in debt.

Assuming that aggregate household borrowing dynamics (primary deficit financing) follows past relationships with the key economic variables, debt by euro area households is projected to be once more on an increasing path, due to the unfavourable "Fisher dynamics" that result from r-g projections. To curb this debt dynamics, it will be necessary that euro area households, in aggregate, maintain primary surpluses at a level slightly lower than what estimated for 2023 on the basis of the data of the first months. While traditionally household net borrowing declines when the debt-income ratio becomes excessive, continuing past borrowing patterns would still leave debt on an increasing path, admittedly at a decreasing pace, at least for the next 20 years. Even if household balance sheets may be in a better position than in 2007, prudence and policies that encourage debt repayment are probably the best responses. To conclude, it is important to note, though, that the results apply to the euro area as a whole and hide existing heterogeneity across euro area countries, which is worth exploiting but is beyond the scope of the present paper.