

IMPACT OF INFLATION AND INTEREST RATE DEVELOPMENTS ON HOUSEHOLDS' FINANCIAL FRAGILITY

The cumulative growth of the harmonised index of consumer prices (HICP) in Spain from June 2021 to December 2022 was 9.8%. The 12-month EURIBOR also rose very sharply in that period (from -0.48% to 3.01%), after turning positive in May 2022 for the first time since February 2016. This increase in the 12-month EURIBOR and in other benchmark market interest rates was particularly pronounced after the first policy rate rises by the European Central Bank in July 2022.

This box analyses the impact of the high inflation environment and interest rate hikes on the proportion of households with real estate debt¹ that have spending-related liquidity problems.

Using the most recent available information from the 2020 Spanish Survey of Household Finances, these households are classified depending on their ability to meet their payment obligations (i.e. the amount of disposable income and liquid funds they have to meet their immediate expenses). Specifically, a household is considered fragile if its monthly income plus the available balance on its payment accounts is less than the main monthly expenses it must meet. These include food, utility bills, school/university expenses and fees, leisure, property service charges and travel, along with monthly car loan, mortgage or rent payments.

The classification of a household as fragile in this box does not take into account other financial and non-financial assets that the household may own and eventually dispose of to meet its payments over a longer horizon,² nor the possibility of taking out additional loans. In particular, the mortgage of a household that cannot cover its expenses in a given month will not necessarily be considered non-performing due to arrears, as this would require the household to have defaulted on its mortgage payments for more than three months. The aim, therefore, is to identify an early signal of households' probability of default, which would also indicate a deterioration of their confidence and consumption level.

Mortgage non-performance is a later stage of household financial deterioration and is specifically discussed in Box 3.1 of this FSR.

As the latest Spanish Survey of Household Finances reflects the situation of households three years ago, it is assumed that between the year of the survey (2020) and the start of the analysis (June 2021) the relative distribution of households' income and liquid assets has not changed, that household income changes proportionally to average wage growth, that total household expenditure increases in line with the HICP, that variable rate mortgage payments are revised based on the EURIBOR and that the nominal value of liquid assets remains constant. These assumptions provide an approximation of households' initial liquidity situation in June 2021.

The percentage of fragile households is estimated by measuring their individual ability to cover their expenses with their disposable income and liquid assets.³ First, the sensitivity of the percentage of fragile households to changes in the 12-month EURIBOR and HICP growth, all else being equal, is presented starting in June 2021. To analyse possible non-linearities, 50 basis point (bp) steps are considered for the 12-month EURIBOR (see Chart 1.a) and 1 percentage point (pp) steps are considered for HICP growth (see Chart 1.b), with all other macro variables constant in each case.

As Chart 1.a shows, the percentage of fragile households at June 2021 (3.31%) rises in a non-linear fashion with every increase applied to the 12-month EURIBOR. The first 100 bp rise in this interest rate leads to an increase in the percentage of fragile households of barely 2 bp⁴ (to 3.33%). The sensitivity remains relatively low in the first steps of the increase. An increase of 350 bp, in line with the actual rise from June 2021 to December 2022, raises the fragility rate by 23 bp. After a cumulative increase of 400 bp in the 12-month EURIBOR, the effects of additional increases are notably larger and continue to accelerate. For example, a cumulative increase from 400 bp to 500 bp

1 According to the Spanish Survey of Household Finances 2020, that year there were 5.2 million households with mortgage debt on their principal residence or other properties.

2 This is a similar definition to that used in A. Lusardi, D. Schneider and P. Tufano. (2011). "Financially Fragile Households: Evidence and Implications". *Brookings Papers on Economic Activity*, 2011(1), pp. 83-134. These authors identify as fragile those households unable to come up with a moderate amount (\$1,000) in less than one month to meet unexpected payments, because they do not have the immediate liquidity to do so.

3 Households are classified dichotomously according to whether or not they are able to meet their expenses. This is in contrast with alternative approaches, such as using a statistical model to estimate the probability of each household not being able to cover its expenses.

4 Each basis point increase in the proportion of fragile households is equivalent to 520 additional households out of the population of 5.2 million in 2020.

in the 12-month EURIBOR pushes up the fragility rate by 16 bp. Going from 500 bp to 600 bp increases the fragility rate by 29 bp.

The effect of inflation on the percentage of fragile households is also quite moderate for the first steps of the increase. On average, for the first 5 pp of cumulative increase, each additional 1 pp increase in the HICP raises the percentage of fragile households by 3.1 bp. By contrast, each percentage point increase of a further 5 pp increase (to a total of 10 pp) pushes up the fragility rate by 7.3 bp. A certain non-linear effect can thus also be seen for this variable (see Chart 1.b).

When interpreting the quantitative relevance of these findings, it should be borne in mind that they are assessing households' ability to pay one month ahead. Over longer horizons, the depletion of available resources in payment accounts in the face of interest rate rises or higher consumer prices may lead to greater increases in fragility and with a steeper non-linear pattern.

The second part of the exercise analyses the sensitivity of the percentage of fragile households in Spain, considering jointly the changes in the 12-month EURIBOR, in inflation (as measured by the HICP) and in wage growth, from June 2021 to December 2022. It studies both the marginal and the joint contribution to household fragility of these different factors.

The starting point is the already identified effect of a EURIBOR rise (Δ EURIBOR) equal to that observed from June 2021 to December 2022, excluding all other effects (particularly inflation). In the second scenario, observed inflation is added to the EURIBOR rise (Δ EURIBOR, Δ HICP). Finally, in the third scenario, the wage growth per worker in the period is also applied to households' income (Δ EURIBOR, Δ HICP, Δ wage).

The third part of the exercise once again estimates the percentage of fragile households under these different assumptions, considering interest rate, inflation and wage changes consistent with the macroeconomic projections for the Spanish economy between 2023 and 2025

published in March 2023.⁵ The results in terms of fragility should not, however, be interpreted as a forecast: they merely identify its sensitivity to different-sized shocks on household income and expenditure.⁶ The use of forecasts for inflation, wages and interest rates makes it possible to calibrate a plausible and useful range for these shocks.

The findings show that inflation and interest rate increases in line with the observed patterns and projected levels of all these variables would have moderate effects, on average, on the percentage of fragile households (see Δ EURIBOR, Δ HICP, Δ wage). Excluding income (wage) growth, the immediate increase in fragility is greater (see Δ EURIBOR, Δ HICP). But this immediate benefit of wage growth should be taken with caution, as wage growth can generate second-round effects on inflation, contributing to greater fragility over a longer time horizon.

The estimated percentage of households that would not be able to meet their monthly payments using their immediate liquidity considering the effect of the interest rate hike to December 2022 (Δ EURIBOR) would be 3.54%, 23 bp higher than that estimated for June 2021. This increase would rise to 72 bp if the effect of inflation is also considered (Δ EURIBOR, Δ HICP). Factoring in the wage increase (Δ EURIBOR, Δ HICP, Δ wage) would more than offset the effect of inflation and the EURIBOR, reducing the percentage of fragile households by 2 bp, to 3.29%.

If the projections for the relevant macroeconomic variables up to December 2025 are applied, the largest increase in the percentage of liquidity-constrained households would be seen under the interest rate rise (Δ EURIBOR) and the interest rate and price rise (Δ EURIBOR, Δ HICP) assumptions, with an increase with respect to June 2021 of 57 bp and 149 bp, respectively. Assuming that income rises in line with wage growth (Δ EURIBOR, Δ HICP, Δ wage), the percentage of fragile households would decline by 9 bp with respect to June 2021, to stand at 3.22%.

As an additional sensitivity exercise, the change in the percentage of fragile households assuming that all households' mortgage debts are variable rate has been estimated. This quantifies the degree of protection against

⁵ Banco de España. (2023). "Macroeconomic projections for the Spanish economy (2022-2025)", March.

⁶ A more detailed projection exercise would require estimating the monthly changes not just in income and expenses but also in the stock of households' liquid assets. Moreover, a full macroeconomic scenario would be considered, in which changes in other variables, such as stock prices or unemployment, would also be relevant.

IMPACT OF INFLATION AND INTEREST RATE DEVELOPMENTS ON HOUSEHOLDS' FINANCIAL FRAGILITY (cont'd)

Chart 1
IMPACT ON THE PERCENTAGE OF FRAGILE HOUSEHOLDS (a) (b) (c)

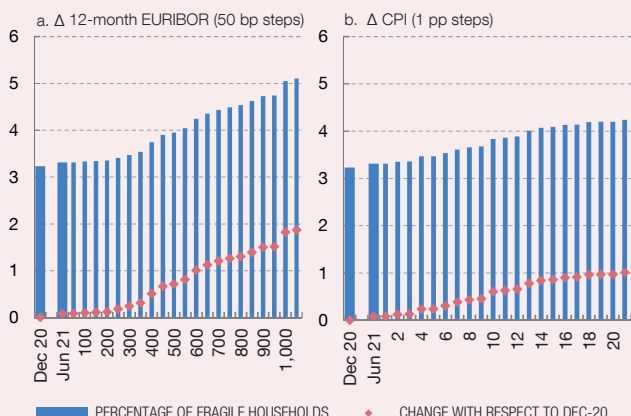


Chart 2
IMPACT ON THE PERCENTAGE OF FRAGILE HOUSEHOLDS (2022-2025) (a) (b) (d) (e)

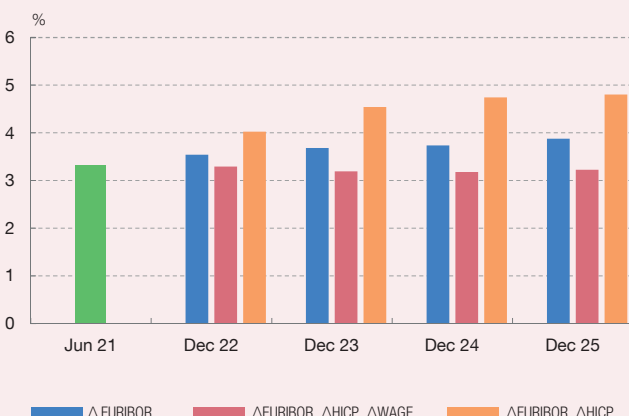


Chart 3
IMPACT ON THE PERCENTAGE OF FRAGILE HOUSEHOLDS BY INCOME QUINTILE (2022-2025) (a) (b) (d) (e)

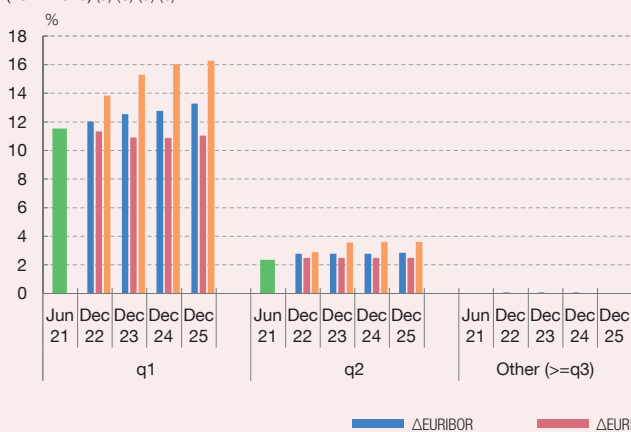
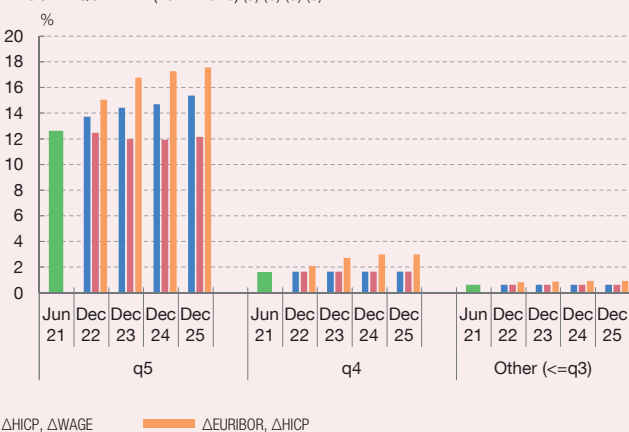


Chart 4
IMPACT ON THE PERCENTAGE OF FRAGILE HOUSEHOLDS BY DEBT BURDEN-TO-INCOME QUINTILE (2022-2025) (a) (b) (d) (e)



SOURCES: Banco de España and INE.

- a A household is considered fragile if its monthly income plus the available balance on its payment accounts is less than the main monthly expenses it must meet.
- b The percentage of fragile households in December 2020 is estimated based on the Spanish Survey of Household Finances 2020. For other dates, assumptions are made based on the aggregate increase observed in 2021 and 2022 (and the projected increase for subsequent dates) in the HICP, wages and interest rates. The resulting fragilities should not be interpreted as forecasts but as sensitivity exercises. The years in the x-axis identify the time ranges used to calibrate the size of the expenditure and income shocks used in these exercises.
- c Starting from the fragility rate in June 2021, 50 bp steps are considered for the 12-month EURIBOR (Chart 1.a) and 1 pp steps are considered for HICP growth (Chart 1.b), with all other macro variables constant in each case. The cumulative effect is shown for each step. The bars with a thick edge show the increase observed in December 2020 and June 2021.
- d From 2023, income and expenditure shocks are calibrated according to the HICP, interest rate and wage growth per worker forecasts in the March 2023 Banco de España macroeconomic projections (2023-2025).
- e Three assumptions are used: (ΔEURIBOR) interest rate rise, (ΔEURIBOR, ΔHICP) interest rate rise and consumer price growth in line with the HICP, (ΔEURIBOR, ΔHICP, Δwage) interest rate rise, consumer price growth in line with the HICP and income growth in line with wage growth per worker.

borrowing cost shocks afforded by fixed rate loans. Under this assumption, the EURIBOR rise (ΔEURIBOR) to December 2022 and December 2025 levels would be associated with an increase in the percentage of fragile households, all other things being equal, to 3.61% and

4%, respectively. Using the actual distribution between variable and fixed rate loans the impacts are not significantly greater than in the baseline scenario. This suggests that the latter would have a limited effect at aggregate level on fragility in the short term.

With regard to this and other findings, the limited scope of this box as a short-term sensitivity analysis should again be borne in mind. Under full macroeconomic scenarios and over longer time horizons, where households' liquid reserves are used over multiple months, both the impact on fragility and the protection afforded by fixed rate loans would be greater. Fixed rate loans protect households' solvency, and not just their short-term liquidity.

When the different effects by household type are analysed, it can be seen that the impact of the rise in inflation and interest rates is mainly concentrated on lower income households, particularly those in the bottom two quintiles of the income distribution (see Chart 3). In the case of the first quintile, with a much higher fragility rate at the outset (11.5% of all the households in it), the percentage of fragile households would increase by 174 bp, all other things being equal, if the expected interest rate hike between June 2021 and December 2025 (Δ EURIBOR) is applied, while it would grow by 475 bp under the combined effect of the rise in inflation and interest rates (a significant effect that could be offset by wage growth). In the second income quintile the percentage of fragile households would also increase, by 48 bp to 2.8%, if the expected interest rate rise between 2022 and 2025 (Δ EURIBOR) is applied. The effect of inflation and wage growth would have a limited impact on household fragility in this quintile. The impact on financial fragility for households in the third, fourth and fifth income quintiles is virtually nil.

By debt burden level, the households most affected by inflation and interest rate shocks are those in the top debt burden quintile (see Chart 4).⁷ In fact, the percentage of fragile households grows more for households with the highest debt burden than for households in the lowest income quintile. Specifically, the interest rate rise to December 2022 (Δ EURIBOR), all else being equal, would push up the fragility rate for households with the highest

debt burden to 13.7% (110 bp more than in June 2021). Considering the change in the 12-month EURIBOR to 2025 would entail a further increase. If only the changes in the EURIBOR and HICP until 2025 are applied (Δ EURIBOR, Δ HICP), excluding the wage growth effect, the percentage of fragile households in this quintile would increase to 17.56% (495 bp more than in June 2021). The impact for households in the remaining quintiles is very limited.

Overall, the results show that increases in inflation and interest rates which, as described in the body of this chapter, result in a greater proportion of households with a high debt burden, may also materialise, through the consumption expenditure and interest expense channels, as increased liquidity constraints. Income growth could largely offset these negative effects in the short term.

However, it should be borne in mind that the scope of this study is limited to short-term liquidity and the sensitivity to key variables. Over longer time horizons and considering additional impact channels (unemployment, deterioration of financial wealth, etc.), the expected effects will be larger. Moreover, the materialisation of the risks identified in this FSR would put household liquidity under further pressure.

The analysis also reveals significant heterogeneity across households, according to their income and debt levels, in terms of their ability to withstand financial shocks without experiencing liquidity problems. In the future, this analysis needs to be extended to study the importance of additional sources of heterogeneity, such as differences in income growth (for example, households with different average ages and income are affected in different ways by growth in wages, pensions or the minimum wage) and in consumption expenditure (for example, the relative share of spending on food is greater in lower income households). It could also be useful to analyse other populations of households, beyond those with real estate-related debts.

⁷ It is important to point out the overlap between lower income and a higher debt burden. Thus, most of the households with the highest debt burden (55%) are in the lowest income quintile.