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# Inflation and mortgage repayments: the household expenditure channel

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# Inflation and mortgage repayments: the household expenditure channel

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**Abstract**

Ongoing inflationary conditions will reduce real incomes of those households whose wage growth is not in line with the increase in prices. In this *Note*, I measure the effect of general expenditure inflation on households' mortgage repayment capacity. By defining a basket of essential items, I assess the availability of income after essential expenditure that remains to service mortgage payments, before and after an inflationary shock. The baseline and downside scenarios for 2022, in which inflation significantly exceeds nominal income growth, could lead to distress levels increasing by one-quarter to one-third respectively. Simulations show disproportionate increases in risk for lower-income, rural and older mortgage holders.

## 1 Introduction

Inflation erodes the purchasing power of income, and can adversely affect the capacity of borrowers to service their debts if they do not experience sufficient nominal wage growth. This *Note* considers the implications of ongoing inflationary conditions for Irish households servicing mortgages. I model a budget constraint, or expenditure channel, through which inflation on an essential basket of goods can erode the residual income available to service debt. An increase in the share of income spent on essential expenditures decreases the share of income remaining to

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service debt, posing additional risks to financial stability beyond those that may arise through interest rate increases or wider labour market shocks. The *Note* further examines variation in risks across household types, identifying cohorts of households that may face heightened vulnerabilities in servicing their mortgages.

The financial stability implications of household debt are well known. Notably, Mian and Sufi (2009, 2016) and Schularick and Taylor (2012) provide strong evidence of credit and house price booms to be key determinants of major recessions. After the 2007-08 financial crisis, substantial research was conducted on the determinants of mortgage arrears. However, the impact of changes in the price level of household expenditure on arrears is less well understood than other factors, due to stable inflation rates on baskets of essential items that had been experienced in developed economies from the 1990s until 2021. This study seeks to shed light on how inflation rates outstripping wage growth in a sustained fashion could affect mortgage repayment capacity, with knock-on implications for the banking sector and the wider economy.

Previous work for Ireland has shown that affordability challenges, measured using income shocks and unemployment, lead to rising arrears and defaults. Lydon and McCarthy (2012) suggest that affordability issues, including those brought about by adverse economic conditions and change in value of equity, have sizeable effects on mortgage arrears over time. Even though job loss plays an important role in explaining mortgage delinquency, McCarthy (2013) provides evidence that many borrowers experiencing arrears faced a significant drop in income brought about by fragile labour market conditions without having become unemployed. Separately, research on macroprudential regulation has examined the role of origination credit conditions such as loan-to-value and loan-to-income ratios in explaining future credit risk (Hallissey, Kelly and O'Malley, 2014). This *Note* contributes to our understanding of the role of *current*, rather than *original*, household financial positions in mortgage distress, with a particular focus on changes in the current financial position driven by shocks in the price of essential expenditure. A related recent contribution from the USA is Low (2022), who shows that a range of expenditure shocks, usually unmeasured in most studies, are as important as shocks to income in explaining mortgage default in the USA.

This note is structured as follows. Section 2 discusses the data and methodology used in the paper. Section 3 assesses the impact of inflation on mortgage-related risk of households by considering characteristics related to geography, age, and income category. The final section draws conclusions for potential future research and policy.

## 2 Calculating households at risk – methodology and data

This study uses the latest available iteration (2015/16) of the Household Budget Survey (HBS) collected by the CSO which contains extensive data on income and expenditure for a representative sample of 6,800 Irish households. While the date of data collection is quite some time ago, the modest levels of inflation in Ireland from 2015 to 2020 allow the cross-section to be used as a reasonable proxy for a pre-pandemic starting point. In this *Note*, only mortgaged households are considered, which brings the initial sample down to 2,094 households. The data also contain information on other attributes of the borrower households such as age and region which are used in this paper. Regional variation in mortgage repayment risks is likely to be prevalent in the data. For example, Lydon and McCarthy (2013) show negative income shocks to be more severe for borrowers in regions which experience greater economic shocks.

The starting methodological point of the analysis is the construction of an essential basket of goods. The choice of items in this basket of goods was, in part, guided by the components of the consensual budget guidelines laid out by the Insolvency Service of Ireland.[2] I then manually review the detailed list of expenditure in the dataset and include only those expenses which a household would ordinarily fund out of their monthly income and are needed to maintain a minimum standard of living.[3] As my primary objective is to look at the impact of inflation on mortgage arrears, I only consider non-housing related expenditure. Further, the simulation assumes mortgage related expenditure to be constant, i.e. I do not consider the interest rate channel in this analysis and focus solely on the expenditure channel.

[2]https://www.isi.gov.ie/en/ISI/RLEs_Background_Information_29_April_2022.pdf/Files/RLEs_Background_Information_29_April_2022.pdf

[3] For a full description of items included in the essential expenditure variable, please see Appendix A.

Figure 1 shows the average share of essential expenditure as a proportion of disposable income by income quartile and region. We see that the households in the lowest quartile, irrespective of their location, on average, spend more than 50% of their income on essential non-housing expenditure. The variation in shares across income quartiles is lower for rural areas. This is evidenced by the fact that the proportion of income spent on essential expenses is still at 41% for rural households in the upper quartile. However, the difference between the proportion of expenses in the upper and lower quartile in both regions is similar (15%).

To further investigate the difference in the shares of essential expenditure, I decompose the variable by region and income quartile. As seen in Figure 2 Panel A, there are differences in the share of income spent on energy (fuel and transport) between urban and rural households as rural households spend more on energy. This is important as energy prices have been a key driver of inflationary shocks in Europe in recent months (Byrne and Zekaite, 2021). The shares of other essential products are nearly the same in both rural and urban households.

Figure 2 Panel B shows the constituents of essential expenditure by income quartile. Considerable differences exist here, as households in the lowest income quartile spend a greater proportion of their income on fuel and transport as compared to the top income quartile. We also see spending on miscellaneous goods by households in the top quartile exceeds that of the bottom quartile by 16%. Given the nature of items in this category, households in the top quartile may be better placed to reduce their expenditure in this category in response to a price shock and thus more effectively mitigate any risk to their mortgage repayment capacity.

**Figure 1: Share of Essential Expenditure by region and income quartile**

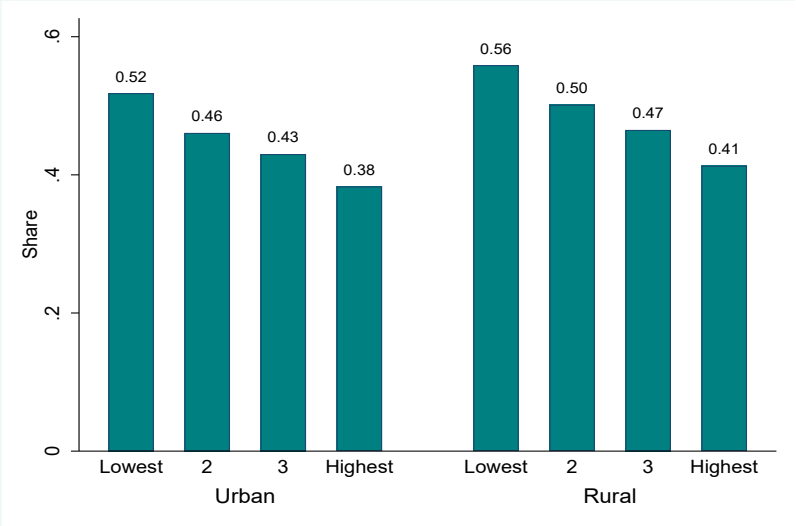
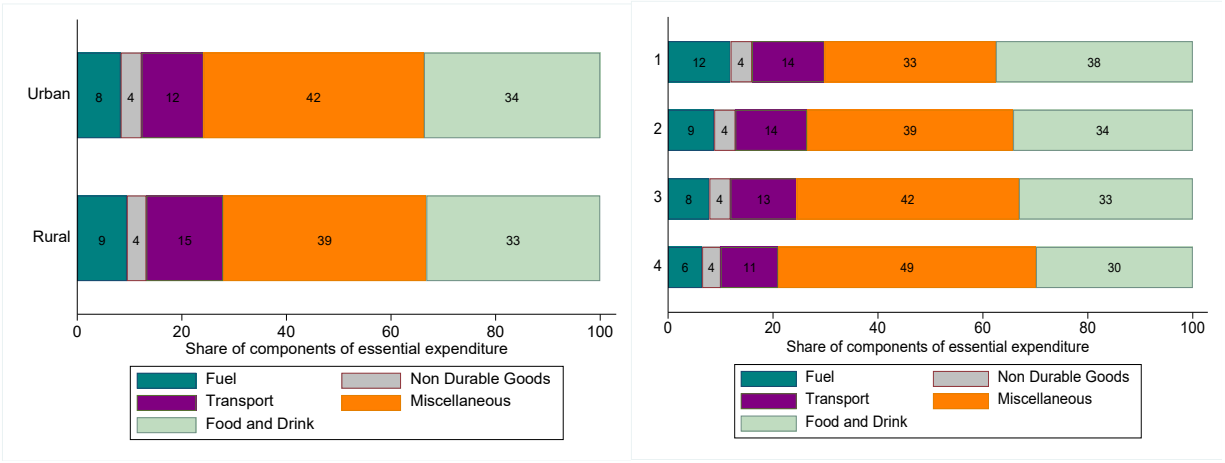



**Figure 2: What is essential expenditure made up of?**




Panel A (By region) Panel B (By income quartile)

Given the characteristic-specific spending pattern of households, I simulate a number of inflationary scenarios and analyse the changes in the proportion of households at risk. I define a household to be "at-risk" if:

$$\frac{Mortgage\ Payment}{Income - Essential\ Expenses} > 1.1$$

The choice of a 10% buffer was informed by eligibility conditions for assistance set out by the Insolvency Service of Ireland[4]. As an additional cross-check, the expenditure on essential basket of goods was calibrated to match the level of households in distress at the starting point to the December mortgage arrears rate in 2016 of 8 per cent (Mortgage Arrears and Repossessions, Central Bank of Ireland, December 2016).

I then simulate two scenarios. The baseline scenario assumes an annual rate of inflation of 7.8% in 2022 and nominal wage growth of 3.3% (Table 1, Quarterly Bulletin, July 2022). The downside scenario considers 9.1% inflation and 3.3% wage growth (Box A, Quarterly Bulletin, July 2022)[5]. Household expenditure in 2021 is inflated using item-specific change in Consumer Price Index provided by the CSO (CPI, December 2021) rather than the headline inflation rate, to better account for the energy-driven nature of recent inflationary conditions. To account for changes in spending patterns as a result of increase in prices, we consider the elasticity of each type of expenditure in the essential basket of goods.[6] This approach allows for absorption of some of the

[4] Further information can be obtained at https://www.isi.gov.ie/en/ISI/RLEs_Background_Information_29_April_2022.pdf/Files/RLEs_Background_Information_29_April_2022.pdf

[5] For more information on the assumptions made in calibrating the downside scenario please refer to Box A in the Quarterly Bulletin of July 2022.

[6] Elasticity is the percentage change in quantity demanded due to percentage change in price.

impact of the increase in prices on household total expenditure through reduction in volumes purchased, although due to the nature of the expenditure and the short time frame of this analysis, these elasticities tend to be small.[7]

## 3 Assessing the impact of inflation on mortgaged-households at risk

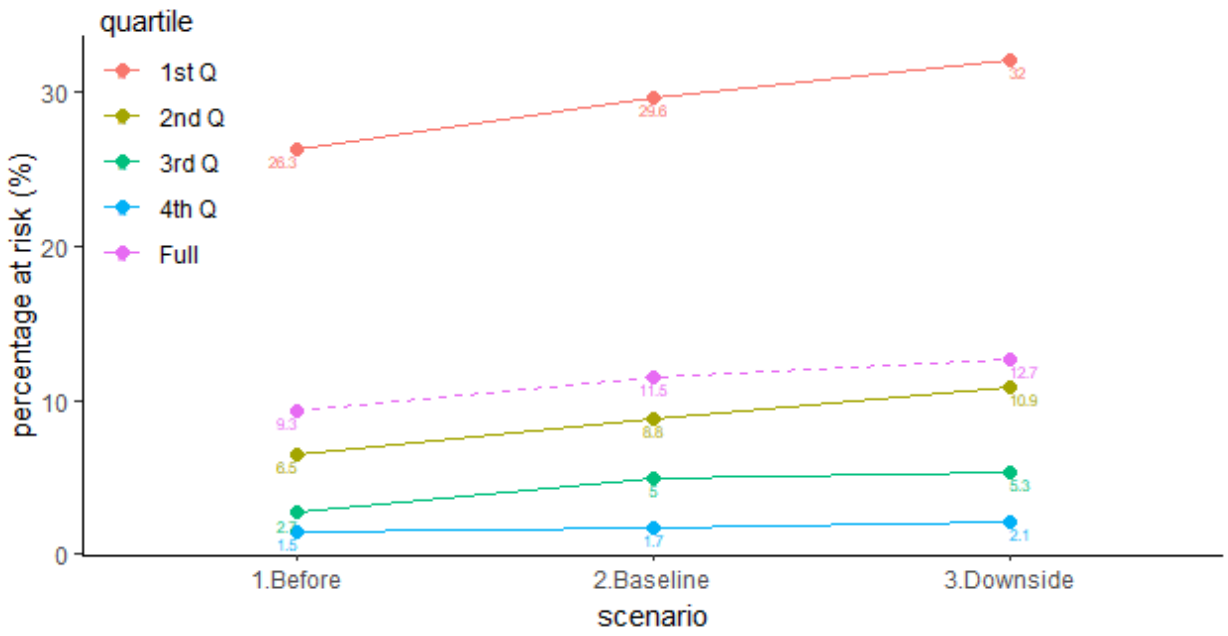
Chart 1 shows the proportion of households at risk for the "Baseline" and "Downside" inflationary scenarios. This is done first for the full sample and then for the four quartiles of income.

We see that households in the lowest quartile disproportionately make up "at-risk" households and also show the largest increase in risk-build up between the two scenarios. Risks to the bottom three quartiles of households increase in the baseline scenario, but the increase in income and the composition of spending in the basket of essential goods absorbs some of this increase for households in the second and third income quartiles. Households in the top quartile of income are largely unaffected by the inflationary shocks. In each scenario, we see declining increases in risk as one moves up the income distribution.

This analysis illustrates the importance of incorporating the current income and expenditure of households when making assessments of financial stability risks relating to debt service capacity. Consistent with other work, it highlights the distributional effects of the current inflationary episode, which has implications for the broader policy approach to providing targeted support to those on lower incomes. Further, these findings can act as impetus for lenders to ensure that pre-arrears support and engagement is readily available for those borrowers more likely to need in the event of an adverse scenario materialising. This analysis demonstrates that mortgage repayment burdens change as borrowers' residual income changes. Having up-to-date estimates of current residual incomes would allow for early identification of borrowers that may experience mortgage repayment difficulties.

[7] Information on the elasticities of demand used for each expenditure type can be found in Appendix A.

**Figure 1: Borrowers at risk before and after inflationary shock, by income**




Source: Own calculations using HBS (2015/16) data.

Note: "Households at risk" is defined as borrowers whose residual income is less than 10% of the value of their mortgage payment after paying for essential non-housing items. Inflation in 2022 is assumed to be 7.8% and 9.1% in the baseline and downside scenario, respectively. Income growth is assumed to be 3.3% in 2022 which both scenario assume (Quarterly Bulletin, July 2022).

Table 2 looks at proportions of at-risk borrowers by region. We see some evidence of greater concentration of risk for borrowers residing in rural and non-Dublin regions.

**Table 2: Borrowers at risk before and after inflationary shock, by borrower region**

| | Dublin | Non-Dublin | Urban | Rural |
|---|---|---|---|---|
| Before | 7% | 10% | 8% | 12% |
| Baseline Scenario | 9% | 12% | 10% | 14% |
| Downside Scenario | 10% | 14% | 11% | 16% |

Source: Own calculations using HBS (2015/16) data.

Note: "Households at risk" is defined as borrowers whose residual income is less than 10% of the value of their mortgage payment after paying for essential non-housing items. Inflation in 2022 is assumed to be 7.8% and 9.1% in the baseline and downside scenario, respectively. Income growth is assumed to be 3.3% in 2022 which both scenarios assume (Quarterly Bulletin, July 2022).

Table 3 repeats the exercise by the borrower age category. We find significant differences in the age categories with the over 55 category showing disproportionately larger shares of vulnerable borrowers both before and after the inflationary shock.

**Table 3: Borrowers at risk before and after inflationary shock, by borrower age**

| | Up to 34 | 34-55 | 55+ |
|---|---|---|---|
| Before | 6% | 8% | 18% |
| Baseline Scenario | 6% | 10% | 22% |
| Downside Scenario | 7% | 11% | 24% |

Note: Own calculations based on HBS (2015/16). Age categories 1 and 2 comprise of 12% and 73% households respectively.

# 4 Conclusion

This *Note* measures the effect of general expenditure inflation on households' mortgage repayment capacity. I develop an approach to assess the availability of income after essential expenditure that remains to service mortgage payments, before and after an inflationary scenario.

The approach highlights the importance of taking current real income into account in the risk assessment of mortgaged households. In many studies, real income is unavailable because data sets do not contain information on expenditures such as those available in this study. My study illustrates a particularly important channel through which the ongoing economic environment may lead to mortgage repayment difficulties. Additionally, it shows how risk that may arise from mortgage repayment difficulties could be distributed across various demographic groups.

Households in the bottom 25 per cent of incomes show disproportionately higher risk to the current inflationary shock. The large shares of energy and food in the spending basket of these households makes them especially vulnerable to energy and food inflation, which characterises current conditions. Households in rural areas and those with fixed incomes (for example, those households with older mortgage owners) also show larger changes in mortgage related risks. From the perspective of the economy as a whole, it is important to understand, analyse and monitor this heterogeneity as it can also potentially be a channel of transmission of risk to lenders.

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# Appendix A

## What *is essential expenditure* comprised of?

The purpose of the household budget survey is to provide information on spending patterns of households, to be used as an input in the construction of the Consumer Price Index. The survey consists of detailed information of weekly income and expenditure of households. Each household keeps a detailed expenses diary over a two week period. For more information on the HBS survey please see the methodological documents provided by the CSO here.

As the survey is a snapshot in time, for some households, it may include large once-off expenses. Examples include expenses on durables, foreign holidays, legal expenses, funerals amongst others. Often household may foot these bills using savings or cash buffers built up in other periods. Thus, it is possible that include these may overstate the typical level of a household's expenditure.

This *Note* includes the following expenditure in its essential expenditure basket:

Essential Expenditure = Food and Drink+ Electricity + Gas+ Routine Medical Care (No hospitalisation expenses) + Communication services + Personal services and grooming + Childcare and Elderly care + Household goods

## Elasticity of Demand

It is possible that households may change their intensity of consumption in retaliation to change in prices. Although we believe this to be small due to the essential nature of the expenditure and the short time period under consideration (consumption habits are more elastic in the long run), we still account for this using estimates in Lyons, Mayer, & Tol (2009) and Labandeira, X., Labeaga, J. M., & López-Otero, X. (2017).

| Item | Elasticity |
|---|---|
| Food | -0.40 |
| Fuel | -0.2 |
| Non Durables | -1.5 |
| Transport | -0.10 |
| Doctor | -1.0 |