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Distributional Inflation Effect on Household Balance Sheet*

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*The views expressed in this paper are those of the authors and do not necessarily represent the official views of the Bank of Lithuania or the Eurosystem.

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ABSTRACT

The recent surge in inflation hit Lithuania with a 20 percent increase in 2022, affecting many households. This paper examines the heterogeneous wealth effects of the recent inflation surge in Lithuania. Specifically, I consider different channels – wealth, income, and consumption – but also the monetary and fiscal policy responses to the inflationary shock. I quantify these channels by using data from the Household Finance and Consumption Survey (HFCS). The results show that the consumption channel affected all households similarly, while the income channel disproportionately affected low-income and elderly households. Moreover, the impact of inflation was closely related to households' net nominal wealth position. The wealth channel significantly eroded the wealth of older households but had a positive impact on younger households, especially those with mortgages. Fiscal policy adjustments partially mitigated the impact of inflation on the most vulnerable households. Meanwhile, the monetary policy response helped offset losses for households with substantial nominal asset holdings. In addition, all these channels influenced changes in wealth inequality in the country. While aggregate wealth inequality remained broadly unchanged, distributional effects showed a decrease in inequality measures for renters and a slight increase for homeowners and mortgage holders.

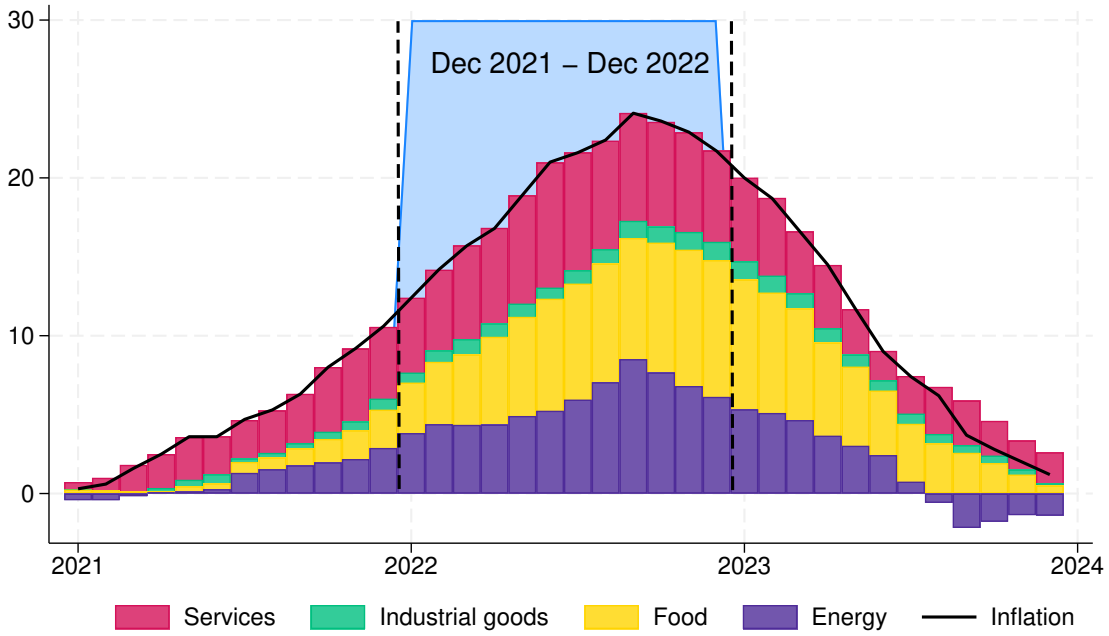
JEL Classification: D15, E21, E5, G51

Keywords: household balance sheet; inflation; fiscal policy; interest rates; household consumption

1 Introduction

The past few years has seen a sustained global discussion on the inflation that unexpectedly hit many countries. In the Lithuanian case, the country faced 20% annual inflation in 2022, one of the highest inflation rates across Europe and the Euro area. The dynamics and composition of this inflation surge is broadly summarized in Figure 1.1. As can be seen from Figure 1.1, this inflationary period had a sector-wide effect. The majority of overall inflation was concentrated across services, food, and energy, with the industrial sector contributing very little to it. Ultimately, inflation decreased quickly among energy products, and remained for a bit longer among the food and services sectors.

One distinguishing characteristic of inflation is that it affects everyone, albeit not in the same way. Differences in wealth composition, salary and consumption patterns may lead to different outcomes for different households. This paper aims to examine the different channels through which inflation affects wealth inequality among households. I seek to quantify these effects in Lithuania and show how the recent inflation shock shaped wealth inequality in the country.



Note: The figure presents Lithuania HICP general inflation, as well as the inflation of its main components, from January 2021 up to December 2023. The area between the dashed lines corresponds to the period January - December 2022.

Figure 1.1: Evolution of HICP inflation in Lithuania: general and main components

One of the highlights of this paper is the unexpected nature of the 2021 surge in aggregate inflation in Lithuania and the rest of Euro area, as well as the broad perception of its short-lived dynamics. I thus analytically characterize how a shock to inflation impacts an individual's wealth in the short run. I follow the recent literature and derive an analytical expression decomposing the impact of inflation on individual wealth into three different channels – wealth (Fisher), income, and consumption channels – following Auclert, 2019. To this end, I consider a surprise one-off increase

in the prices of goods and services, which is heterogeneous across sectors but does not trigger a reaction in asset prices. I complement this analysis with a fiscal and monetary policy adjustment that follows this inflationary shock and also adjusts the household balance sheet.

1.1 Related Studies

Recently, the heterogeneous effects of inflation on household balance sheets have attracted attention, with a growing interest in how inflation influences wealth distribution and financial well-being. Various factors such as income level, asset composition, consumption patterns, and debt structures cause inflation to impact households differently. The current literature highlights key channels through which inflation affects different households and the broader economic implications of these effects.

Nominal Assets, Liabilities, and the Fisher Effect

One of the most prominent channels through which inflation affects household wealth is that of nominal assets and liabilities. Inflation reduces the real value of nominal assets like cash, savings, and bonds, while it erodes the real burden of nominal liabilities, such as mortgages and consumer debt. This channel – the *Fisher effect* – has been studied in the literature by Doepke and Schneider (2006); Meh et al. (2010); Adam and Zhu (2016); Auclert (2019); Pallotti (2022); Ferreira et al. (2023); Pallotti et al. (2024); Cao et al. (2021). These papers argue that households with nominal debt benefit from unexpected inflation because it reduces the real value of their obligations, whereas savers and those holding nominal assets suffer losses. Moreover, debtors, especially those with long-term fixed-rate debt, become better off during inflationary periods. By contrast, savers and retirees – who rely heavily on nominal assets – experience a decline in wealth, making inflation a regressive force for these groups. From the monetary policy point of view, Gornemann et al. (2012) extended this analysis with a quantitative model and demonstrated that a contractionary monetary policy shock increases income and wealth of the wealthiest households, while the remaining parts of the wealth distribution experience lower income and wealth. Furthermore, the negative effect of a contractionary monetary policy shock to social welfare is larger if heterogeneity of households is taken into account.

Income Channel

Another channel through which inflation affects households is income. Inflation diminishes the purchasing power of nominal wages, fixed incomes (e.g. pensions) and social benefits, hitting low-income and fixed-income households particularly hard. Coibion et al. (2017) examine how inflation disproportionately affects households with lower incomes, less education, and fixed incomes, hitting them harder and leading to a significant decline in real income for these households, exacerbating wealth inequality. Recent studies have also shown that changes in income and income inequality are well mirrored by the consumption inequality that happens across households (Aguiar and Bils (2015)). These dynamics between income and consumption inequalities have significant effects on aggregate economic performance.

The income channel also plays a crucial role in influencing labour market dynamics. Wage adjustments tend to lag behind inflation, meaning that households face real wage cuts during periods of rising prices. Attanasio et al. (2014) discuss this in more detail by analyzing US data and highlight that households dependent on wages are disproportionately affected by inflation compared to those with diversified income streams, such as rental income or dividends from real assets.

Consumption Channel

Inflation also affects households through differences in consumption patterns. Households whose consumption baskets are heavily weighted towards goods with higher inflation suffer more, as they have to allocate more resources to maintain their standard of living. For example, Coibion et al. (2017) provide empirical evidence of inflation heterogeneity, showing that lower-income households face higher effective inflation because a larger share of their consumption is spent on necessities such as food and energy, which tend to experience higher price increases during inflationary periods. This was particularly the case in Lithuania during the recent inflation spike, as energy and food prices rose sharply. In another study, Hobijn and Lagakos (2005) show that cost of living increases in U.S. were generally higher for the elderly, mostly because of their health care expenditures, and the cost of living of poor households is most sensitive to the fluctuations in gasoline prices.

In addition, Weber (2022) suggest that inflation can disproportionately harm households that consume a higher proportion of goods whose prices rise faster than average. This "*relative consumption channel*" means that inflation redistributes wealth from those consuming high-inflation goods to those consuming lower-inflation goods, further exacerbating wealth inequality.

Finally, from their analysis of U.S. households, Kaplan and Schulhofer-Wohl (2017) demonstrate that most of the heterogeneity and differential inflation from consumption comes not from variation in broadly defined consumption bundles but from variation in prices paid for the same types of goods. In other words, differences in household consumption are mostly due not to differences in consumption baskets but to the fact that lower-income households buy lower-priced goods while higher-income households buy similar but more expensive goods. Once inflation takes hold, low-income households have no chance to adjust their consumption, while higher-income households can mitigate the inflationary effect by buying the same but cheaper products.

Inflation Expectations and Asset Prices

Another area of interest is the relationship between inflation expectations and household behaviour. If households expect inflation to be temporary, they may not adjust their consumption or saving behaviour significantly. However, if they expect inflation to be persistent, they may change their portfolio allocation, shifting from nominal assets to real assets such as real estate or equities. Coibion et al. (2015) explore these dynamics and show that inflation expectations shape households' decisions about saving and asset purchases, which in turn affect the overall wealth distribution. However, such changes in the overall wealth portfolio of households are a longer-term process and harder to capture in a short, specific period.

Leombroni et al. (2020) also emphasise that inflation expectations affect asset prices differently across households. For example, households that hold more real assets (such as housing or equities)

tend to benefit from inflation as these asset prices tend to rise during inflationary periods. This creates a wealth gap between households with more real assets and those relying on nominal financial assets, further contributing to inequality. As such, the real effect on inequality strongly depends on the overall wealth portfolio composition in a specific country.

Policy Implications and Distributional Consequences

The heterogeneity of the impact of inflation on household balance sheets has important policy implications, particularly for monetary policy. Central banks need to consider the redistributive effects of inflation, as a uniform inflation target may have unequal effects across different segments of society. For example, low-income households may require targeted social policies to offset the regressive effects of inflation, especially if wage growth does not keep pace with rising prices. A study from Estonia (Merikull and Rottner (2024)) shows that monetary policy shocks have a significant impact on labor income inequality during periods of high inflation. Moreover, monetary policy disproportionately affects low-income individuals when inflation is high. These findings and household heterogeneity should be taken into account when discussing monetary policy decisions.

Gornemann et al. (2016) argue that optimal monetary policy should take into account the unequal effects of inflation on welfare. They suggest that policies aimed at stabilising inflation should also consider the distributional consequences for households with different levels of exposure to nominal assets and liabilities. Similarly, Coibion et al. (2017) suggest that progressive taxation and social transfers can mitigate the regressive effects of inflation on low-income households, especially those whose consumption patterns expose them to higher personal inflation.

The literature on the heterogeneous impact of inflation on household balance sheets indicates that inflation affects different groups of households disproportionately, depending on their income levels, asset composition and consumption patterns. Households with nominal liabilities benefit from inflation, while those with nominal assets and fixed incomes are adversely affected. Moreover, inflation tends to hit lower-income households harder due to their consumption of high-inflation goods, further exacerbating wealth inequality. Policymakers need to take these heterogeneous effects into account when designing monetary policies and interventions to ensure that inflation does not disproportionately harm vulnerable groups. In this paper, I will quantify these inflationary effects on the balance sheets of households in Lithuania. In addition, I will highlight the role and importance of homeownership rates in Lithuania, which are among the highest in Europe.

The remainder of this paper is organized as follows. I open my empirical analysis with a short discussion of existing theoretical models, outlining the specific channels by which household balance sheets are affected by inflation, in Section 2. I translate the main ideas into the empirical framework and conduct data-explanatory analysis in Section 3. Section 4 concentrates on the empirical findings and compares them with the current literature. Subsection 4.3 discusses extensions of the baseline results and the homeownership dimension, whereas Section 5 covers a policy discussion and results interpretation. Finally, Section 6 concludes and offers directions for future research, while the separate Online Appendix collects supporting evidence and more technical details.

2 Theoretical framework to quantify inflation effect on household balance sheet

The theoretical framework of this paper is in line with the papers of Ferreira et al. (2023) and Chafwehé et al. (2024), and highlights similar inflationary channels that affect household balance sheets. It sheds light on the wealth, income, and consumption channels, as well as adjusting for fiscal and monetary policy changes to capture a full picture of changes in household wealth in 2022.

From the theoretical point of view, this paper refers to Auclert (2019) and analyzes the overall inflationary effect as the sum of wealth, income, and consumption effects.

Assumptions. This paper follows a few key assumptions that are in line with the related literature. First, the inflation shock is unexpected and lasts only one period. Furthermore, expectations about the future inflation rates are not affected by the inflation surge in the current period. Second, the monetary authority responds contemporaneously to the inflationary shock by increasing interest rates at time t, before reverting interest rates to their previous, constant value thereafter.

However, differently from Ferreira et al. (2023) and Chafwehé et al. (2024), this paper also follows the assumption that wages are adjusted once a year and it captures the typical situation in Lithuania. Moreover, wages are adjusted on the sectoral level and heterogeneity between different households is presented. While wages in some sectors increased by almost 20 percent, fully compensating for the losses due to the inflationary surge, other sectors saw a much smaller increase (7-8 percent). At the same time, social payments and pensions are also adjusted once a year, the usual practice when a new governmental budget and spending are discussed every year.

Channels. Under these assumptions, the effect of inflation on an individual's wealth is described through the three main channels – *wealth*, *income*, and *consumption*.

First, there is the standard *wealth (Fisher) channel*, by which inflation redistributes wealth from creditors of nominal assets to debtors. In this case, I use the concept presented in Auclert (2019) or Ferreira et al. (2023), who argue that given the temporary expected nature of inflation, this channel only operates through the product of the Net Nominal Position (NNP) at the end of period t times inflation at $t+1$. This contrasts with the analysis carried out by Doepke and Schneider (2006), for instance, who consider how changes in the future path of inflation affect the NNP of wealth through asset prices.

Second, there is an *income channel*, where inflation diminishes the real value of nominal income flows. For instance, while the results from Statistics Lithuania (the State Data Agency) show that on average nominal wages in Lithuania increased by approximately 11% in 2021, inflation averaged 20% during the same period (see in the Appendix Table A.2). A similar pattern is observed with unemployment benefits and pensions. This means that inflation eroded the purchasing power of both workers and pensioners. Although the Fisher effect benefits debtors and disadvantages creditors, the income channel negatively impacts all households with labor incomes, with the effect being more significant for those with higher incomes. However, sectoral differences remain an important feature as some sectors experienced a much higher wage growth than others.

Third, there is a *relative consumption channel*. The basket of goods consumed by different

individuals may vary from the average basket used to calculate aggregate inflation. If all prices increased at the same rate, this difference would be insignificant. However, if inflation is asymmetric, meaning some goods experience higher price increases than others, individuals who consume more of these higher-inflation goods will need to allocate a larger portion of their resources to maintain the same consumption basket. Consequently, individuals facing higher personal inflation rates compared to the average, $\bar{\pi}_{t+1} < \pi_{j,t+1}$, will need to spend more to sustain their consumption patterns, while those with below-average personal inflation, $\bar{\pi}_{t+1} > \pi_{j,t+1}$, will spend less. Therefore, the impact of this mechanism will be proportional to the individual's total consumption expenditure.

The combination of these three channels, namely wealth, income and consumption, determine the total impact of surprise inflation on a person's wealth. However, fiscal and monetary policy adjustments are also introduced in times of inflation surges to reduce inflationary effects for different household groups.

Many euro area countries have implemented different fiscal strategies to cushion households from the cost-of-living crisis. Thus, all the different adjustments can be categorized as income-side adjustments (e.g. social benefits and support programs for low-income households) or price-side adjustments (e.g. VAT reductions or other tax cuts). VAT reductions have been discussed in Lithuania, as they have been implemented in neighboring Poland, putting additional pressure on local sellers. However, in Lithuania, no real-time measures were taken and no real VAT reduction was implemented. At the same time, income-side benefits were implemented to offset part of the inflationary effect. The largest positive contributions to the incomes of the lower income deciles were provided by additional indexations and changes in public pensions. In addition, social contributions were increased in order to increase the disposable income of households in the lowest income quintiles.

Finally, monetary policy was implemented in order to suppress high inflation. An increase in the interest rate has a direct effect on the interest income flows received or paid by households. I account for this effect in order to capture a full picture of inflationary effect and the fiscal/monetary adjustments that followed inflation. Monetary policy adjustments are based on the framework outlined by Auclert (2019) and are defined as the difference between maturity assets and liabilities at a given point in time. Maturity assets include households' net income, while maturity liabilities include their current consumption. In net terms, this represents the flow of resources available for households to save or borrow over a given period, subject to prevailing interest rate changes. It is crucial to consider the maturity of each asset and liability, as longer maturities provide partial protection against temporary interest rate fluctuations, such as mortgage contracts with fixed interest payments. However, in Lithuania the majority of mortgage contracts (more than 95%) have flexible interest payments and follow interest rate increases very quickly.

3 Description of the data

HFCS data. In order to estimate the possible effects of each of the channels mentioned in the previous section, I will analyze individual household level data on assets, liabilities, labour income and consumption expenditure, which can also be complemented with additional socio-demographic

characteristics. In this paper, I build the analysis using the Household Finance and Consumption Survey (HFCS), which covers all of the above data at the individual (household) level. [1] The HFCS survey is a representative survey that collects detailed information on households' balance sheets, and provides information on different sources of income (wages, pension payments, unemployment benefits) as well as some parts of consumption (food at home and outside, services, holidays). Supplementing this data with information on consumption weights according to the 12 European Classification of Individual Consumption by Purpose (ECOICOP) enables the capture of differences in consumption baskets across households. This means that food expenditures (from the HFCS survey) are taken and weighted based on the household's position in the income distribution to capture a full consumption basket. A similar approach is widely used in the literature (see the studies on consumption baskets), but it has some limitations. It could be that some parts of the consumption basket (other non-essential goods, but not food) are adjusted more than others in events such as the inflation shock in 2022. Hence, the overall composition and weights of the basket could change. However, it is difficult to account for such constraints with the data used. The HFCS is the Lithuanian and European counterpart to the U.S. Survey of Consumer Finance (SCF), with the advantage of having a rotating panel component. The fieldwork of the last wave of HFCS was conducted at the end of 2021, covering the household financial situation just before the unexpected inflation shock hit.

For constructing net nominal positions, I consider: (i) on the asset side, current accounts, deposits and other type of financial instruments (stocks, bonds, funds and etc.); (ii) on the liability side, consumer loans, mortgages, and credit card balances. This allows the full construction of households' net nominal position at the end of 2021. Income effect is analyzed by capturing changes in total household income that can come from various sources – wages, pension payments, unemployment payments, and other social payments. Finally, the effect from the consumption channel is captured by building different consumption baskets for households, based on their revealed expenditures in the survey as well as their position in the income distribution. For different income quintiles, separate consumption weights are used.

4 Inflation impact on households' balance sheet

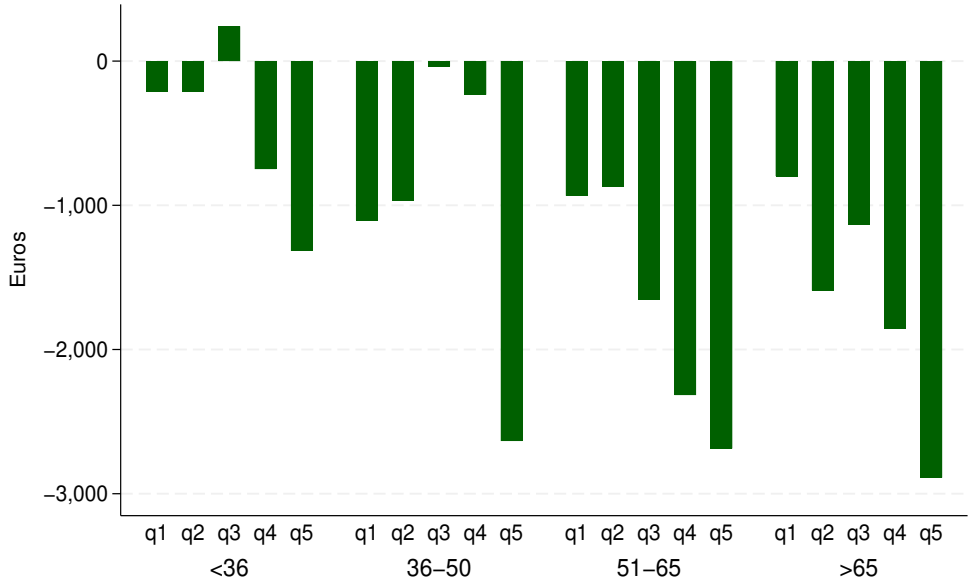
4.1 Total effect

In this section, I estimate the channels through which households' balance sheets are affected. Figure 4.1 summarizes the total effects estimated for different households according to their age and position in the income distribution. It shows the average amount (in euro) of the inflationary effect experienced by each subgroup of households in 2022.

Several interesting stylized facts emerge from Figure 4.1. First, unsurprisingly, the average total inflation effect is negative for almost all the household groups. It varies from zero to almost 3 000 €

[1] A possible disadvantage of HFCS data is its low frequency. Each new wave of data comes every 2-3 years. However, a recent comparison of similar data from the Spanish survey and more frequent bank data showed only minor differences in the results, which do not affect the main messages of the survey (Ferreira et al. (2023)).These results support the idea that similar datasets on the household balance sheet with a lower frequency are suitable to use for an analysis, since the different parts of the household balance sheet change slowly over time.

for older and high-earning households. Second, the average total effect increases across income quintiles for older households. More specifically, the average inflationary effect varies between zero and 1 000 € for households at the bottom of the income distribution, while at the top of the income distribution, the average effect varies between 1 500 € and 3 000 €.

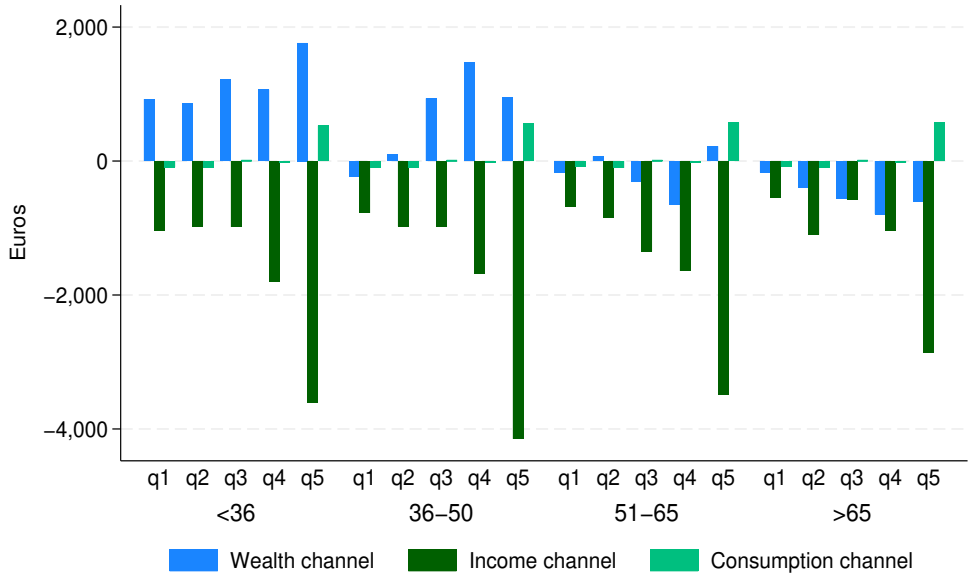


Note: The figure shows the total impact of general HICP inflation in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and household income quintiles in the country.

Figure 4.1: Total effect of HICP inflation in Lithuania in 2022

Since the total inflationary effect is the product of three main channels – net nominal position (NNP), income and relative consumption – Figure 4.2 estimates the results separately for each of these channels. Firstly, the NNP (wealth) effect is dominant among the youngest households and generates a positive effect. Similar positive trends were found for households aged 36 to 50, but the effect itself was much smaller. At the same time, the oldest households were negatively affected through the wealth channel. This is not a big surprise as the NNP effect is mainly driven by financial assets, savings and credit. In line with this, the household balance sheet in Lithuania is mainly driven by the value of real estate and financial assets in deposits or current accounts (Bielskis and Ciginas (2020)). The oldest households are no exception, as most of their financial wealth is highly concentrated in deposits or current accounts, which are also strongly affected by inflation. As an alternative, households could improve their balance of net wealth with the value of their loans, which were deflated during the period of high inflation. However, only slightly more than 10 per cent of households in Lithuania have a mortgage loan (Bielskis and Ciginas (2020)), and this positive effect transfers mainly to the younger households and improves the value of their nominal net wealth position. The combination of these facts explains why the wealth channel was so dominant and concentrated among the youngest households in Lithuania.

Figure 4.2 also shows that the relative consumption channel is more evenly spread across household groups than the other channels of inflation. This means that low-income households are



Note: The figure shows the impact of general HICP inflation by different sub-components in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and household income quintiles in the country.

Figure 4.2: Total effect of HICP inflation by components in Lithuania in 2022

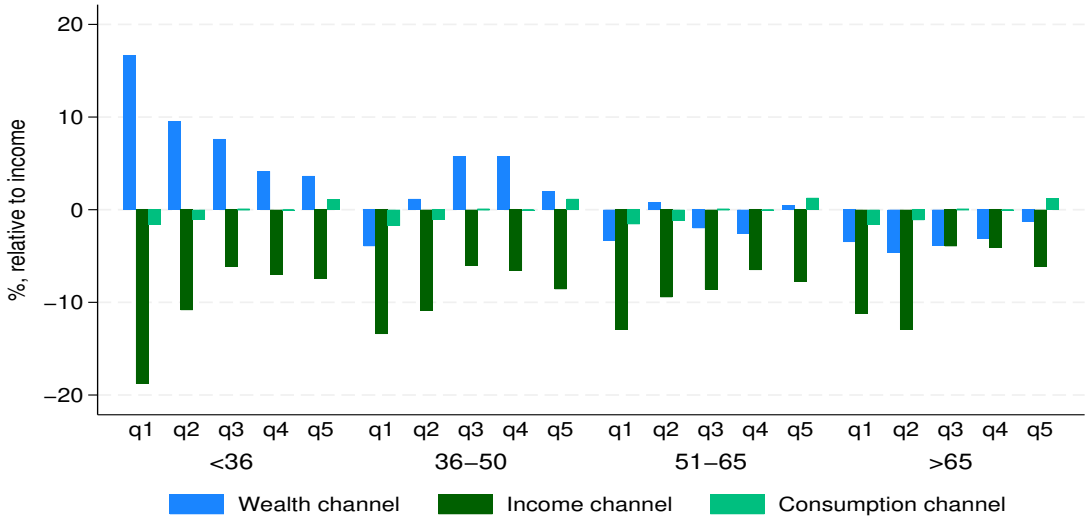
relatively more affected by the consumption channel than high-income households. In this case, high-income households experienced lower inflation compared to the aggregate inflation, resulting in a smaller decline in their cost of living and thus a positive consumption effect. In addition, the relative consumption channel shows a quite small additional effect on household balance sheets in comparison to the wealth or income channels.

The third channel, income, shown in Figure 4.2, has a similar dynamic to the wealth channel. In other words, the impact of real inflation on income increases across the income distribution and affects higher-income households more. The key difference is that, unlike the wealth channel, the income channel negatively affects all the subgroups. At the same time, Figure 4.2 shows that the income effect has very similar dynamics across the age cohorts. For all of the age cohorts, it increases over the income distribution. It also increases slightly with age up to the age of about 50 and then decreases for the older households. This fact is consistent with the life-cycle theory and the idea that personal income rises up to a certain age and then declines (Deaton and Paxson (1998)).

Overall, the results of this section are partly similar to those found by Doepke and Schneider (2006) for the U.S., using aggregate data. Unexpected inflation affects the overall wealth distribution in Lithuania, redistributing wealth from older to younger households through the wealth channel. Moreover, the negative effect is even stronger for individuals in higher income quintiles, which can be easily explained by the composition of their financial wealth. Older households have accumulated more wealth in the form of savings and other financial assets, and their debt is also much lower than that of younger households, or even fully repaid. The combination of these two factors explains why the overall inflationary effect was higher for older households in Lithuania.

4.2 Relative effect

An alternative approach to analyzing the impact of inflationary shocks involves examining the relative effect on annual household income. The average relative effects by age and income quintile are summarized in Figure 4.3. It shows that the relative impact of inflation is quite heterogeneous across households and suggests some important stylized facts. First, most households from the younger cohorts have experienced a positive effect on their wealth relative to income. This is mainly due to the fact that they hold most of the loans that have lost some of their value due to high inflation. Second, the relative consumption channel was the most negative among the lower-income households and increased over the income distribution. However, the relative consumption effect was still smaller than the wealth or income effects. In line with this, the relative income channel was also much stronger among low-income households. In addition, the relative effects show that the overall inflationary effect hit low-income households harder than wealthier households. Overall, taking all channels into account, low-income households lost about 20 percent of their annual income, while the relative total loss for high-income households was only 5-8 percent of their annual income.



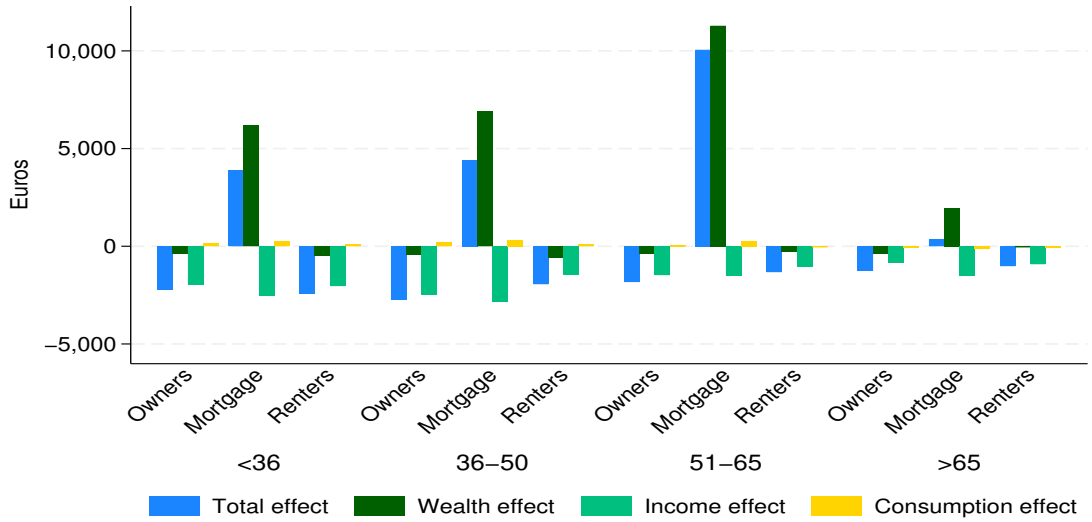
Note: The figure shows the impact of total HICP inflation in Lithuania on the household balance sheet in 2022. Effects from all the channels are relative to the household annual income. Household subgroups are taken by age cohorts and household income quintiles in the country.

Figure 4.3: Total effects (by channels) relative to income

4.3 The role and effect of housing status

The literature on life-cycle consumption, income and wealth suggests analyzing the effects across age and income components. However, the depth of the Household Finance and Consumption data allows the analysis of the additional component of housing status (homeownership), which divides households into very different positions in terms of the composition of their wealth portfolio. Mortgage owners concentrate their wealth in real assets, but also hold a mortgage, which makes their net wealth position relatively lower. Homeowners without a mortgage also hold a significant part of their wealth in real assets, but also keep more shares in financial assets. At the same time,

they have no mortgage debt, which makes their net wealth position relatively higher. Finally, renters on average do not concentrate their wealth in real estate assets, nor do they have a mortgage. Most of their wealth is held in various forms of financial assets. It is therefore interesting to analyze the impact of high inflation on these groups, which are very different in terms of their wealth portfolio positions.



Note: The figure shows the impact of general HICP inflation by different sub-components in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and housing status in the country.

Figure 4.4: Total effect and effects from channels, based on age and tenure status

Figure 4.4 summarizes the overall effect and the different component results by household age and tenure status. Overall, the negative effect of high inflation was the strongest for owners, as it reduced the value of their financial assets, but also had a significant impact through the income and consumption channels. At the same time, the average total effect for renters was slightly smaller than for owners, but also negative. In contrast, mortgage holders were positively affected, mainly through the wealth effect – which even outweighed the negative effects from income and consumption, making the total effect positive for mortgage owners. As mentioned above, this is mainly due to the deflation of the loans held by these households. In addition, the consumption effect was similar for all three groups, with a slightly higher negative effect for the oldest households. Finally, the income effect was stronger for mortgage holders than for owners or tenants in Lithuania. This is because mortgage holders in Lithuania tend to have higher incomes on average than renters or owners (Bielskis and Ciginas (2020)).

From an age perspective, the overall inflationary effect was stronger for younger mortgage holders, peaking for mortgage holders in the 51-65 age cohort and declining significantly for retirees. This is mainly because the portfolio of mortgage holders was determined by the lack of financial assets (which lost some value against the high inflation) and the relatively high amount of liabilities (which were deflated during the inflation period). Figure 4.4 also suggests that the relative consumption channel affected all households similarly, while a slightly higher (negative) effect was

captured among the oldest households. Finally, the income effect appeared to be negatively higher for the younger cohorts and also for the mortgage holders.

Finally, the relative inflation effects to income are summarized in Figure A.1. It shows that in all cases, mortgage holders were gaining from the inflationary period relative to their income. The effect is similar among the different age groups. However, the situation was different for owners and renters, affecting both of them negatively. The relative total effect on income was similar (negative) for both owners and renters, and for all age groups (see Figure A.1).

All of these effects were similarly captured by running simple regressions at the household level on the effect of inflation on their wealth. The results are summarized in Table A.4 and show the importance of age and housing status in explaining the loss or gain in household wealth. The first regression shows that the overall effect on wealth was positive across all age cohorts. In other words, older households experienced a positive overall effect on their wealth in euros, or a lower inflation effect, compared to younger households. In terms of the relative effect on household income, the age variable shows a negative relationship. This means that the relative effect of inflation was statistically significant and higher for the older households. The results from Table A.4 also highlight the importance of housing status. Mortgage holders have increased their wealth during the inflationary period, while owners and renters lost some of it. In relative terms, all households lost some wealth, but mortgage holders lost significantly less than others. Overall, the results highlight significant differences in how the inflationary period affected households based on their tenure status.

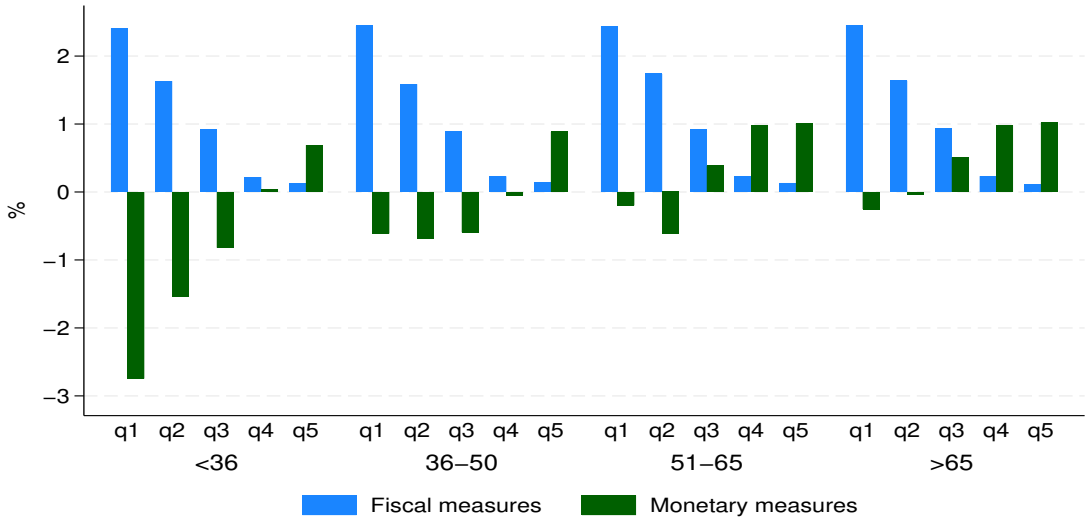
5 Extensions and Discussion

5.1 Fiscal and Monetary Policy Responses

To address the inflationary shock, Eurozone governments implemented measures to respond to rising prices, particularly for energy consumption. These actions included the introduction of price caps, subsidies, and tax cuts on goods and services. Additionally, they tried to protect households' disposable income more directly through income support initiatives such as transfers or tax credits. In the case of Lithuania, very little consideration was given to price adjustment measures. While some countries introduced some permanent reductions in VAT taxes, Lithuania did not introduce anything similar. At the same time, income-adjustment policies (e.g. higher indexation of pensions or social benefits) were implemented to address high inflation. To account for these fiscal measures, I use EUROMOD data showing that the fiscal adjustment for households in the bottom quintile was about 3 percent of income and only about 0.15 percent for households in the top quintile of the income distribution.

In parallel with fiscal policy, the European Central Bank also acted to increase interest rates from 0 to 2.5% in 2022. Therefore, the increased interest rate also had a quantitative importance in accounting for inflation and its impact on household wealth. To account for the effect of monetary policy, I follow the approach in Auclert (2019) to check how much household wealth is exposed to changes in the real interest rate. This exposure is given by the difference between maturing assets (which yield interest payments) and liabilities (which require interest payments). In other

words, such an exercise shows how effective monetary policy has been in smoothing out unequal inflationary effects across households.



Note: The figure shows the impact of fiscal policy and interest rate adjustments in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and housing status in the country. Results of effects are relative to household annual income.

Figure 5.1: Fiscal and monetary policy adjustments, based on age and income quintiles

The effects of fiscal and monetary measures are summarized in Figure 5.1, which shows quantitatively the adjustments made to household wealth. From a fiscal perspective, the results show a positive impact on all subgroups of households. Moreover, the results follow the pattern that the wealth of the poorest households improved much more than that of the richest. The fiscal adjustment increased the relative wealth of the poorest households by more than 2% of their annual income. At the same time, the effect was close to zero for the richest households in all age cohorts.

Monetary policy adjustments captured a different and more heterogeneous situation. Figure 5.1 shows that monetary policy had a positive effect on older households, which have few liabilities, a higher share of their wealth concentrated in deposits, and large asset balances that are positively exposed to higher interest rates. The opposite situation is captured for young households, whose wealth is closely related to the liabilities they have and who were negatively affected by higher interest rates. Moreover, Figure 5.1 shows that the youngest households from the bottom income quintile lost an additional almost 3% of their annual income due to monetary policy changes. At the same time, many households in the top income quintile gained an additional 1% of their annual income due to higher interest rates.

Overall, the results show that the combination of both – fiscal and monetary – policy adjustments in 2022 positively affected most households, offsetting part of the inflationary effect. While the youngest households experienced almost none of the combined effect of fiscal and monetary policy, other age cohorts, from 36 years and older, felt a positive impact on their wealth.

Since the importance of homeownership was highlighted earlier, I repeat the same analysis of fiscal and monetary adjustments for households based on their different tenure status. The results

from Figure A.2 show that fiscal policy had a positive effect on all households, and the effect was similar for different tenure statuses. However, monetary policy acted differently, negatively affecting only mortgage holders by increasing interest rates for them as well as their monthly payments. At the same time, the owners of younger households were the ones most positively affected by monetary policy.

5.2 Total Effects

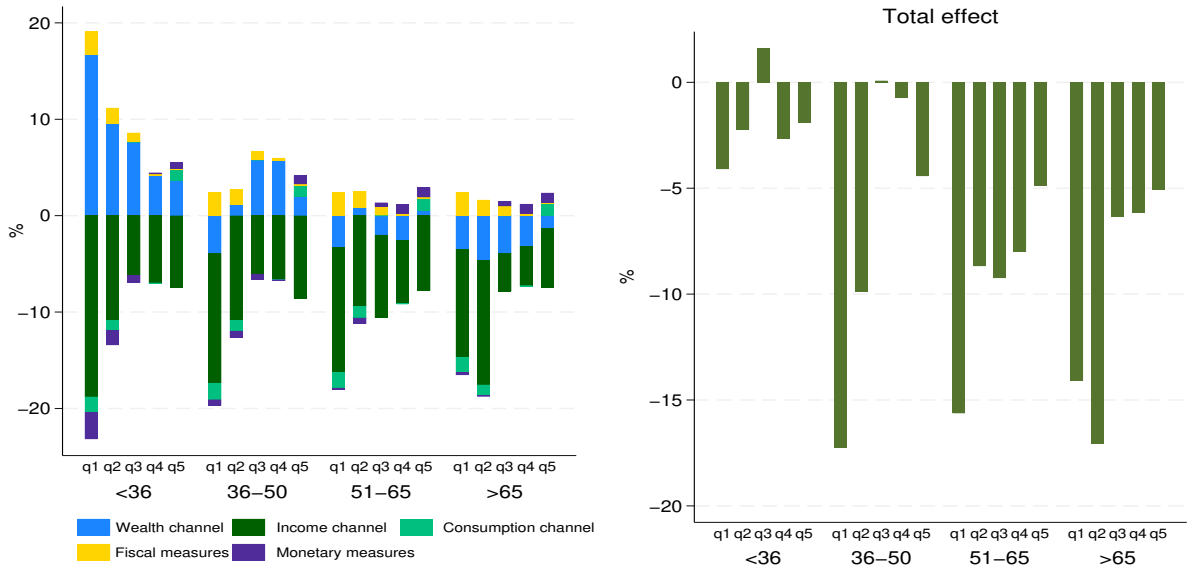
In this section, the analysis of the direct effects of inflation and the effects of fiscal and monetary policy responses are combined to assess the overall impact of the inflationary period in 2022 on Lithuanian households. The combined results are shown in Figure 5.2, both disaggregated for different channels and for the overall effect.

The results from the left graph suggest that the wealth channel was strongest and positively affected younger households. At the same time, the income channel was negative for all household groups. However, it had the strongest negative impact on low-income households relative to their annual income. The consumption effect was also negative for lower-income and positive for high-income households. Overall, these effects strongly affected the purchasing power of households and relatively more those from the lower income quintiles. To counteract these inflationary effects, different fiscal and monetary policies were implemented. The fiscal policy was more targeted to lower income households and slightly adjusted the negative effect for them. However, this adjustment was still much lower than the negative impact of inflation. Monetary policy also made some small adjustments by positively affecting higher-income and older households, while also creating additional negative effects for low-income households. Therefore, the monetary adjustments were also quite small compared to the overall inflationary effect.

The sum of all the effects mentioned above results in the overall effect shown on the right in Figure 5.2. The overall inflationary effect was moderated somewhat by fiscal and monetary policy, but it still hit lower-income households relatively harder than others. In terms of age, older households were slightly more affected than younger ones, but the dynamics across income quintiles remained similar. The situation is different when tenure status is taken into account. The results in Figure A.3 show that mortgage holders were positively affected during the recent inflation and even benefited from this situation due to the inflationary effect on their liabilities. In contrast, the other tenure groups and the oldest households lost a significant part of their annual income due to inflation.

5.3 Wealth inequality

Since the inflation shock affected households' balance sheets differently, it remains important to analyze and discuss how it was reflected in the dynamics of wealth inequality. Although much attention has been paid to the consequences of inflation on income inequality, little has been documented on wealth inequality. Results from the Distributional Wealth Accounts statistics in Europe shows very heterogeneous dynamics across countries over the last 4 years. Figure 5.3 shows that the overall wealth inequality in the Euro area dropped during the peak of inflation in 2022 and



Note: The figure shows the impact of general HICP inflation, fiscal policy and interest rate adjustments by different channels in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and income quintiles in the country. Results are relative to household annual income.

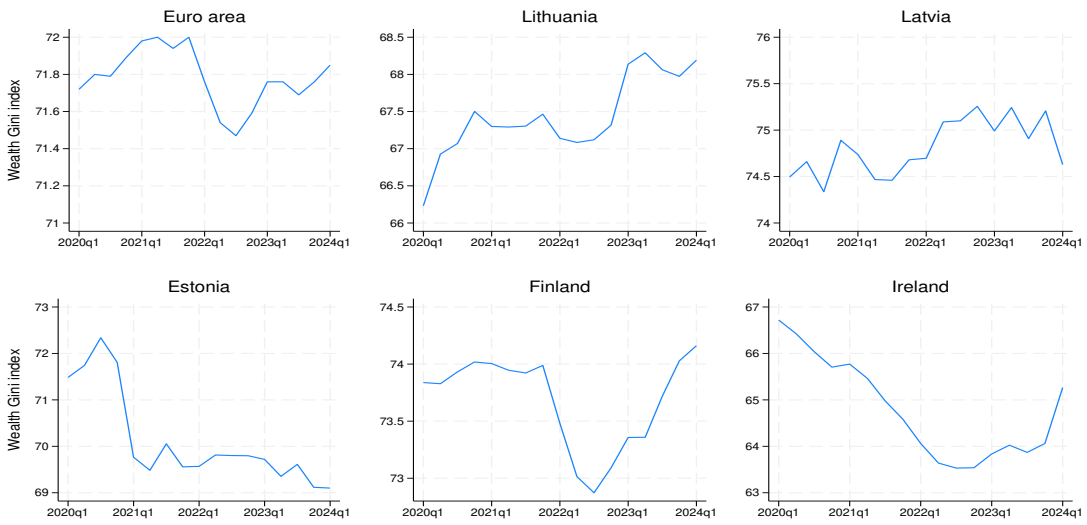
Figure 5.2: Total effect and effects from channels, based on age and income quintiles

started recovering afterwards. However, the reactions and dynamics of Gini indexes on wealth were different across countries. For example, Lithuania was considered to have had a small drop in the Gini indexes in the beginning of 2022, which was supported by a significant recovery in later periods. This means that the wealth inequality dropped for a few quarters during the peak of inflation and got worse over the last few years.

In comparison, other Baltic countries did not face any significant drops in the Gini index on wealth during the inflation period in 2022. Inequality measures remained stable (in Estonia) or even increased (in Latvia) during this period. However, this was not the case in many of the Euro area countries, such as Finland and Ireland. During the inflationary period in 2022, Finland faced a significant drop in Gini index, while in Ireland the drop in Gini index on wealth started even before and continued during 2022. In both cases, inequality measures recovered and then got worse over the last years.

5.4 Distributional effects on inequality

As previously discussed, various channels have affected Lithuanian households differently. Some have been more impacted by the wealth channel, some by the income or consumption channels, and others have even gained wealth during the inflation. In line with this, the aggregate Gini index on wealth has increased in Lithuania during the inflationary period (see Figure 5.3). In general, the dynamics of wealth inequality in Lithuania are similar to those found in the related literature. Kim and Lin (2024) found a U-curve effect among the top wealth holders during inflation, while the bottom wealth holders exhibited an inverted U-curve process. Aggregate data indicates a decline in wealth during the inflationary peak, followed by an increase in inequality.



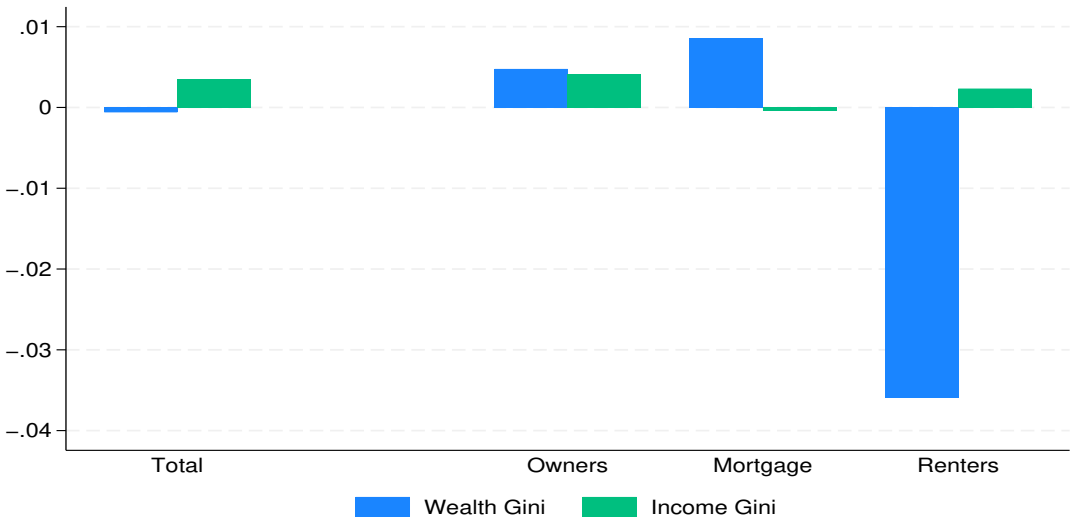
Note: Distributional wealth account (DWA) data is used for calculations and graphs.

Figure 5.3: Wealth Gini index dynamics in Europe, 2020-2024

To expand the analysis and examine the distributional changes in wealth and income inequalities, this paper used HFCS micro data to compute new wealth and income Gini indexes. The fundamental assumption employed in this exercise is that asset prices remain constant and were not affected during the inflationary period of 2022. Consequently, the observed changes in the wealth and income Gini indexes are attributed exclusively to the previously discussed channels (wealth, income, and consumption) and policy (fiscal and monetary) adjustments. The results of this analytical exercise are outlined in Figure 5.4, which demonstrates that wealth inequality remained similar, at least with regard to the inflationary channels examined in this paper. At the same time, the distributional impacts on specific household subgroups diverged from the aggregate outcomes.

To support this, I first discuss the distributional changes in wealth inequality that occurred between the different tenure groups – owners, mortgage holders, and renters. Since they hold very different wealth portfolios, inflation affected them differently (see Figure 5.4). Wealth inequality among owners, the group with the largest share of the population in Lithuania, increased by almost 0.005. This is mainly due to the fact that their wealth portfolios are relatively similar and highly concentrated in housing and much less concentrated in financial assets. The majority of these households were similarly affected by the recent inflationary shock. Wealth inequality also increased among mortgage holders. This is related to the fact that a significant share of their wealth is concentrated in housing and mortgages. On the other hand, wealth inequality among renters was more affected and decreased by almost 0.04 in 2022. In other words, renters were unevenly affected by the recent inflationary shock. This could be due to the fact that some households concentrated their wealth portfolio more in financial assets than others and were more affected by the recent inflationary period. The overall effect was a significant reduction in wealth inequality among renters.

However, in line with the changes in wealth inequality, Figure 5.4 also shows changes in income inequality in 2022. In the longer term, this could also affect the saving and investment behavior of households and change the wealth portfolio. As Figure 5.4 shows, income inequality increased



Note: The figure shows the changes in wealth and income Gini indexes during 2022. Household subgroups are taken by housing status.

Figure 5.4: Changes in Gini indexes by tenure status, 2022-2023

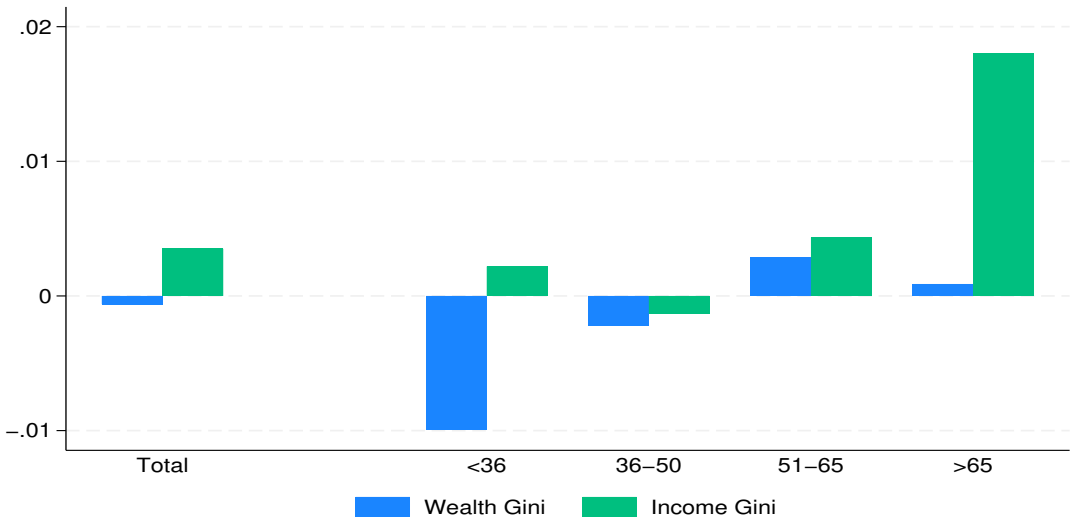
by about 0.003 for the total population in 2022. However, the distributional effects were different for households with different tenure status. Income inequality slightly decreased among mortgage holders in 2022, while at the same time it increased among owners and renters. The results show that the dynamics of income inequality were in line with those of wealth inequality, as they both increased during the recent inflationary shock in 2022.

At the same time, not only the tenure status but also the age of the household is an important factor in differentiating the wealth portfolios of households. This leads to different inequality dynamics across age cohorts. Figure 5.5 summarizes the effects and shows that middle-aged households in the 51-65 age cohort faced the largest increase in wealth inequality in 2022. Other age cohorts faced smaller changes, and only the youngest age cohort faced a large decrease in wealth inequality.

Age becomes an even more important variable when income inequality is discussed, producing very heterogeneous results across households. Figure 5.5 shows that only the oldest households experienced a large increase in income inequality during the inflation shock. Other age cohorts faced almost no significant change or a small increase in income inequality.

Finally, it is important to say a few words not only about the dynamics of inequalities between different households, but also about the different levels. Table A.5 shows that wealth inequality is much higher among renters than among owners. At the same time, owners without a mortgage have the lowest level of wealth inequality among all groups. With respect to age, wealth inequality decreases across the age distribution – the highest wealth inequality is captured among the youngest cohorts and the lowest among the oldest.

Similar differences are recorded for income inequality. Table A.5 shows that the lowest income inequality is captured among owners with a mortgage, while the highest income inequality is associated with owners without a mortgage. With respect to age, Table A.5 shows inverted U-shaped



Note: The figure shows the changes in wealth and income Gini indexes during 2022. Household subgroups are taken by age cohorts.

Figure 5.5: Changes in Gini indexes by age cohorts, 2022-2023

dynamics. The lowest income inequality is captured among the youngest and oldest households, while it increases among the other age cohorts (aged 36-65).

6 Conclusions

I build on the recent literature that identifies three main channels through which inflation affects household balance sheets – income, consumption and Fisher (wealth) channels. The first, the income channel, affected Lithuanian households in such a way that the top income quintiles lost most of their wealth (in real terms) through this channel. In relative (to income) terms, the income effect was stronger among low-income and younger households. In terms of tenure status, mortgage holders absorbed a slightly higher inflationary impact on their income than others.

Second, the consumption channel had a smaller impact on household wealth. Low-income households were affected negatively, while the high-income households faced a small but positive effect from the consumption channel. However, there are some limitations to the method and data used, as only consumption bundles were analyzed in this paper. The study by Kaplan and Schulhofer-Wohl (2017) shows that most of the heterogeneity across households comes from variation in prices paid for the same types of goods. It is thus possible that the prices of the cheapest products increased more relative to the same products that are higher positioned and more expensive. Such a scenario is consistent with the results and leads to the higher overall inflation for low-income households that comes from the consumption channel.

The third channel, the Fisher (wealth) channel, also affected the wealth of households in Lithuania. The results showed that the recent inflationary period and the wealth channel had the strongest positive impact on young households and those from the lowest income quintiles. The Fisher effect was also strongly positive for the wealth of mortgage holders. This was mainly due to the fact that

the liabilities of mortgage holders were deflated during this period.

In addition, fiscal and monetary policy adjustments were analyzed to account for changes in household balance sheets. The results showed that monetary adjustments had a negative impact on young households, while fiscal adjustments were mostly targeted at lower-income households and had a positive impact on them. However, fiscal and monetary adjustments were relatively small compared to the overall effect of inflation.

The overall effect of inflation on household wealth in Lithuania reduced the value by around 6-9% of annual income. These results are higher and somewhat different from similar studies on other euro countries, which found the following effects of inflation on household wealth: about 2.5% in France, 3.5% in Spain, 7% in Germany, and 9% in Italy (Ferreira et al. (2023); Pallotti et al. (2024); Chafwehé et al. (2024)). Such heterogeneities across countries highlight the importance of portfolio composition, income distribution and nominal net positions held by households in Lithuania and the rest of Europe. In the case of Lithuania, the household portfolio is highly concentrated in real assets and only a relatively small part of the population has more significant liabilities.

Different overall effects have been recorded not only between different countries, but also between different groups of households in Lithuania. The recent inflationary period affected the top income quintiles more than the other groups. However, in relative terms, low-income households were more affected as they lost more wealth relative to their income than the other groups. Similar trends were observed for renters and homeowners, as they lost much more relative to their income than mortgage holders.

Finally, I examined the overall impact on wealth and income inequality. The results showed that wealth inequality increased slightly during the inflationary period, while income inequality increased somewhat more. *In terms of tenure status*, owners and mortgage owners have faced an increase in wealth inequality, while a significant decrease in wealth inequality was associated with the renters. With regard to income inequality, it decreased slightly for mortgage holders, but increased for owners and renters. *With regard to the age of the household*, wealth inequality increased mainly for households in the 51-65 age cohort. At the same time, income inequality decreased somewhat for other cohorts and decreased significantly for the youngest households.

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A Online Appendix

Table A.1: Inflation expectations for the next 12 months

Inflation expectation indicators		2022 Jan Mean	2022 Jan Median
Consumer expectations Survey (CES)	Inflation in EU	4.5	3
Household Finance and Consumption Survey (HFCS)	Inflation in LT	4.48	4.5

CES survey analyzes inflation expectations for all EU, while HFCS asks only about inflation expectations in LT.

Table A.2: Annual inflation and weights by ECOICOP group - December 2022

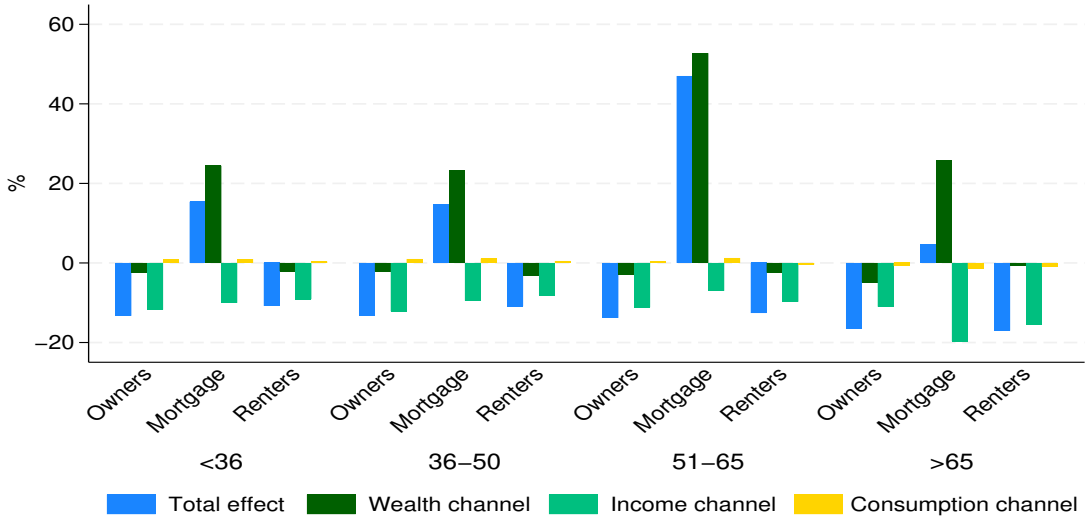
Components of consumption basket	Inflation	Weights
General	20	
Food and non-alcoholic beverages	33.3	20.72
Alcoholic beverages and tobacco	12.3	6.59
Clothing and footwear	5.8	6.21
Housing and energy	42.8	11.95
Furniture and household equipment	12.8	8.23
Health	9.1	7.03
Transport	13.1	14.08
Communications	4	2.91
Recreation and culture	11.4	7.93
Education	6.7	1.20
Hotels, cafes and restaurants	20.5	5.05
Others	13.8	8.11

Values are in pp. Source: ECB data warehouse. General inflation is computed using the inflation rates for each COICOP group and the spending weights.

Table A.3: Income quintile based inflation and weights by ECOICOP group - December 2022

Components of consumption basket	Q1	Q2	Q3	Q4	Q5
General inflation	24.72	24.48	23.86	23.97	22.40
Weights					
Food and non-alcoholic beverages	24.46	22.46	22.26	22.46	21.01
Alcoholic beverages and tobacco	4.94	4.29	4.49	4.29	4.39
Clothing and footwear	5.11	5.31	5.66	5.31	5.71
Housing and energy	25.28	25.88	23.73	23.78	19.38
Furniture and household equipment	5.66	6.16	6.41	6.21	6.76
Health	6.62	6.72	6.22	5.97	5.77
Transport	9.59	10.54	11.19	11.24	13.49
Communications	3.25	3.15	3.20	3.25	3.20
Recreation and culture	5.26	5.56	5.51	5.71	6.51
Education	0.65	0.70	0.85	0.85	1.25
Hotels, cafes and restaurants	3.47	3.47	4.42	4.82	5.92
Others	5.70	5.75	6.05	6.10	6.60

Values are in pp. Sources: ECB data warehouse and Household Budget Survey (HBS). General inflation is computed using the inflation rates for each COICOP group and the spending weights (ECB) on different groups and consumption basket weights (HBS) on different income quintiles.



Note: The figure shows the impact of general HICP inflation by different channels in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and housing status in the country. Results of effects are relative to household annual income.

Figure A.1: Total effect and effects from channels, based on age and tenure status

Table A.4: Total wealth effect regressed on the age cohorts and homeownership characteristics

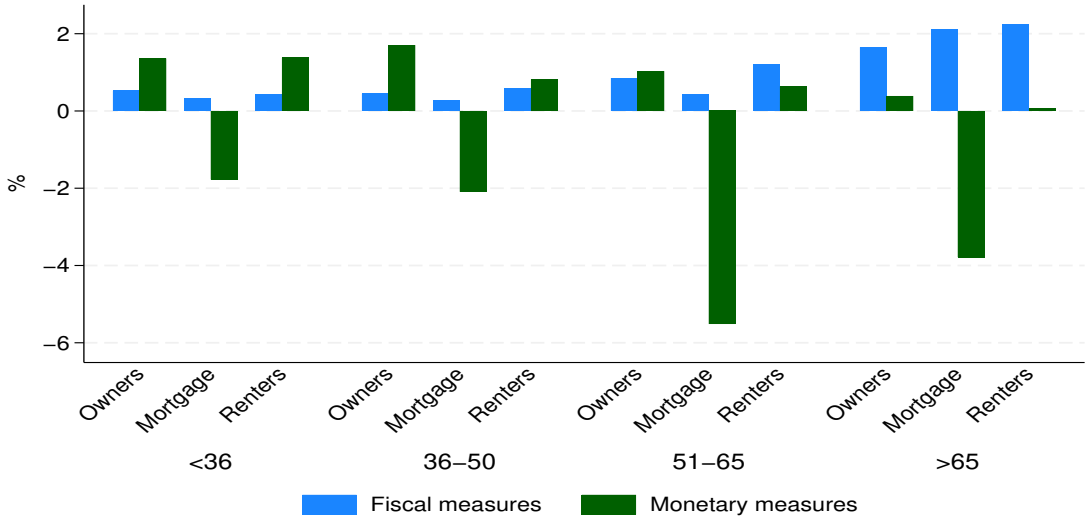
	Total effect	Relative effect
Age	345.33***	-4.24***
	(70.41)	(.11)
Owners	-363.25*	.41
	(220.50)	(.38)
Mortgage	5355.87***	.78*
	(1263.94)	(.41)
Const (Renters)	-2355.52***	3.55***
	(262.35)	(.38)
Observations	1676	1676
R^2	0.096	0.513

Household level characteristics and changes in wealth were used in the regression. Robust standard errors were also used in the regressions. The *total effect* shows the results in euros, while the *relative effect* is estimated relative to household income.

Table A.5: Wealth and income Gini indexes by homeownership and age groups

Groups	Wealth Gini		Income Gini	
	2022	2023	2022	2023
All	0.562	0.561	0.445	0.448
Owners	0.527	0.532	0.445	0.449
Mortgage	0.629	0.638	0.351	0.350
Renters	0.701	0.665	0.389	0.391
0-35	0.630	0.620	0.352	0.354
36-50	0.635	0.633	0.389	0.388
51-65	0.486	0.489	0.386	0.390
65+	0.404	0.405	0.326	0.344

Calculations of Gini indexes are based on HFCS results.



Note: The figure shows the impact of fiscal policy and interest rate adjustments in Lithuania on the household balance sheet in 2022. Household subgroups are taken by age cohorts and housing status in the country. Results of effects are relative to household annual income.

Figure A.2: Fiscal and monetary policy adjustments, based on age and tenure status

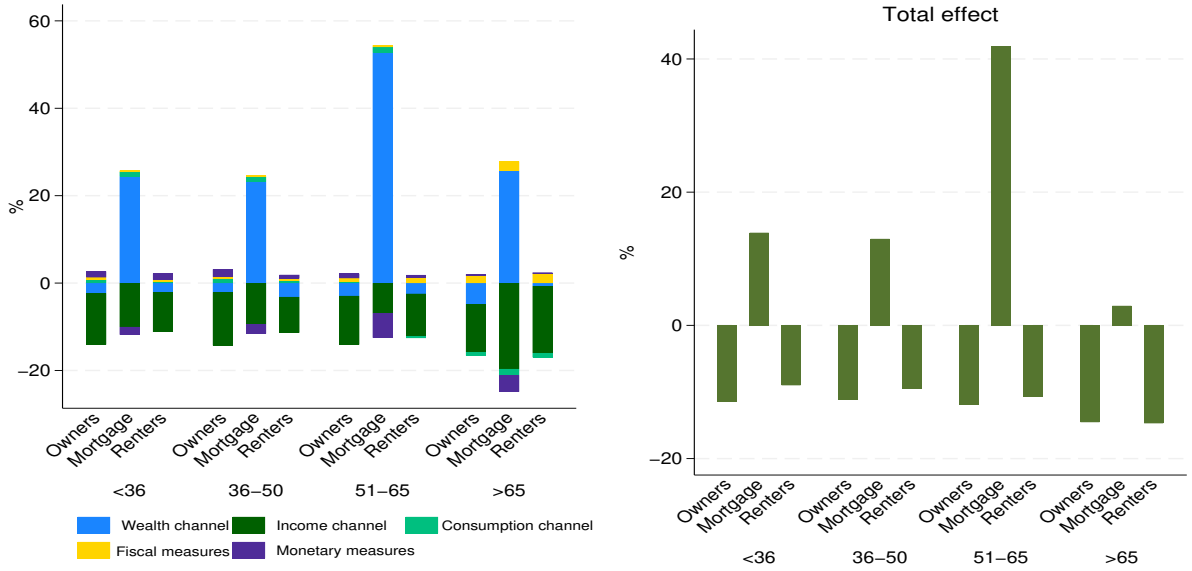


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Figure A.3: Total effect and effects by channels, based on age and tenure status