

Distributional Impacts of Inflation Accounting for Behavioral Effects and Real Assets

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Prepared by Kardelen Cicek, Julieth Pico Mejia, Marcos Poplawski-Ribeiro, Alberto Tumino

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ABSTRACT: This paper analyzes the redistributive effects of inflation across 18 European economies from 2021:Q3 to 2022:Q2, using unique micro-datasets for this country sample. We estimate inflation's impact on household welfare through the consumption basket, income, and wealth channels. Our main contribution is incorporating real assets into the wealth channel and accounting for behavioral responses to inflation in both the income and wealth channels. These factors significantly alter inflation's distributional effects compared to previous literature. The inflation shock is estimated to have caused an average welfare loss equivalent to 18.5 percent of annual household income across our sample, with households in the poorest income quintiles suffering the largest losses. Cross-country differences also widen when real assets are incorporated, with a few economies even showing welfare gains for some or all quintiles because house prices rose faster than inflation.

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WORKING PAPERS

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Glossary

BEL	Belgium
CYP	Cyprus
COICOP	Classification of Individual Consumption by Purpose
ECB	European Central Bank
ESP	Spain
EST	Estonia
EMDE	Emerging Markets and Developing Economies
FIN	Finland
FRA	France
HRV	Croatia
GRC	Greece
HBS	Household Budget Survey
HFCS	Household Finance and Consumption Survey
HICP	Harmonised Index of Consumer Prices
IMF	International Monetary Fund
ITA	Italy
IRL	Ireland
LTU	Lithuania
LVA	Latvia
LUX	Luxembourg
MLT	Malta
NLD	Netherlands
OECD	Organisation for Economic Cooperation and Development
PRT	Portugal
SVK	Slovak Republic
SVN	Slovenia

I. Introduction

The global inflationary cycle that began in 2021 resulted in the highest price level increases in over three decades, affecting fiscal accounts and the distribution of household welfare. This paper estimates the distributional effects of the inflationary surge from 2021:Q3 to 2022:Q2 across 18 European economies, where the year-on-year harmonized index of consumer prices (HICP) inflation averaged 12 percent (Figure 1).¹

By combining multiple household-level datasets that capture information on incomes, consumption, and wealth, we analyze the quantitative effects of inflation on household well-being through a set of sufficient statistics that can be readily measured from microdata.² These are the three welfare channels identified in the literature when inflation is assumed to be temporary: (i) the *consumption basket channel*; (ii) the *income channel*; and (iii) the *wealth channel*.³

Our research contributes three key innovations to existing literature. First, we expand the definition of household wealth used by Cardoso and others (2022) to analyze this inflationary episode to include the effects of inflation on real assets (see also Adam and Tzamourani, 2016), as described by the diagram in Figure 2. With this expanded wealth definition, we are able to show that the effects of inflation on real assets are key to understanding households' wealth (also known as *Fisherian*) effect. Second, we incorporate behavioral effects on both the income and wealth channels. Third, we analyze a substantial and unique set of 18 European economies, significantly larger than country samples of previous studies, and that also includes a group of emerging European markets.⁴

These innovations are motivated by the importance of real assets to households' wealth and welfare (Guren and others, 2021), and how inflation can impact them. Housing prices may adjust relatively quickly in response to inflationary pressures. As noted by Bolhuis and others (2024), such adjustment could contribute not only to a change in permanent income but also affect a vital source of consumer spending and financing. Moreover, the diverse behavioral responses of households to inflation, along with relative price changes, can lead to significantly different income and wealth effects that have not been fully analyzed in the literature.

Accordingly, our paper is particularly related to the literature on the distributional effects of inflation. Yet, most of this literature either focuses on a subset of the channels through which inflation affects household welfare,⁵ or examines fewer economies. The paper also connects to prior research on the effects of inflation on poverty (Cardoso, 1992) and inequality (Bulir, 2001), demonstrating that inflation can have heterogeneous effects on inequality (Easterly and Fischer, 2001; Süßmuth and Wieschemeyer, 2022; and Ferreira and others, 2023).

¹ The 18 European economies analyzed are: Belgium, Croatia, Cyprus, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Spain. They are selected due to their data availability for the different analyses performed in the paper.

² See Fagereng and others (2024) for an example of paper in the intersection of macroeconomics and finance that also produces a sufficient welfare statistic from a theoretical model that can be readily measured from microdata.

³ Pallotti and others (2024) provide a micro founded model that derives those three components, linking them to households' welfare.

⁴ Cardoso (2022) analyze the distributional effect of inflation on households' welfare for Spain, whereas Pallotti and others (2024) investigate that effect for other four European economies: Germany, France, Italy, and Spain.

⁵ Baez Ramirez, Inan, and Nebiler (2021) focus on the estimation of the *consumption basket* channel via food prices and housing costs. Doepke and Schneider (2006) indicate that the borrowing/lender status of households largely drives the impact of inflation through the wealth channel favoring net borrowers. Ferreira and others (2023), in turn, estimates the effects of inflation through the three channels, but do not include real assets in their analyses and only financial wealth. These latter authors suggest that aged households are the ones impacted by the real value of their financial resources, largely due to losses in the real value of their financial wealth.

Another strand of research relevant to our paper concerns the distributional effects of monetary policy on income inequality. Using a large cross-country panel, Furceri, Loungani, and Zdzienicka (2018) show that contractionary monetary policy shocks tend to increase income inequality, mainly through labor-income and unemployment channels, with stronger effects in countries with weaker automatic stabilizers. Consistent with these findings, Coibion and others (2017) for the United States and Mumtaz and Theophilopoulou (2017) for the United Kingdom document that monetary tightening raises income inequality due to heterogeneous labor-market responses across skill and income groups. Related to our wealth channel, Adam and Tzamourani (2016) find that conventional monetary policy affects euro-area households primarily through asset-price revaluation, with wealthier households benefiting disproportionately from expansions because of their larger exposure to equities and housing.⁶

Our results indicate that the average welfare loss associated with the inflation surge during the sample period amounts to 18.5 percent of the annual household income across the 18 European economies analyzed—a magnitude larger than previous estimates in the literature. These losses can be decomposed into three sufficient statistics related to each of the channels: the *consumption basket channel* at -0.04 percent, the *income channel* at -6.1 percent, and the *wealth channel* at -12.4 percent of average household annual income. Hence, the *wealth channel* emerges as the predominant factor influencing these outcomes, offering new insights into how changes in net assets can significantly alter the financial landscape for households. Notably, these effects vary significantly across income quintiles, with welfare losses for households in the lowest income quintile averaging 26.7 percent of their annual income—more than double the average losses experienced by households in the richest quintile.

The variation of the quantitative results and of the importance of each transmission channel across income quintiles underscores the complex nature of inflation's impact on different income groups. Lower-income households are more heavily affected by both the *consumption basket* and *wealth effect channels*, reflecting their greater vulnerability to rising prices and economic fluctuations. In contrast, higher-income households experience less impact from the *consumption basket* and *income channels*, indicating a more resilient financial position. This differentiation highlights the need for targeted policy responses that address the unique challenges faced by various income groups during inflationary periods.

Importantly, when real assets are incorporated, cross country differences in welfare effects become substantial. In 13 of the 18 economies, welfare losses remain negative across all income quintiles because increases in net financial and real assets were insufficient to offset the inflation surge. Italy illustrates this pattern clearly, with an average welfare loss of about 72 percent of annual household income even after accounting for real assets. By contrast, 5 countries exhibit positive welfare effects for at least some quintiles, and in Ireland, Slovakia, and Slovenia all quintiles recorded net welfare gains during the inflationary spike. Luxembourg and the Netherlands also show gains for their richest households; in the Netherlands, average welfare effects range from a small loss for the poorest quintile to a gain exceeding 50 percent of annual household income for the richest quintile. In these 5 countries, house prices rose more than inflation, reflecting specific features of local housing markets that amplified real asset revaluation.

Such local housing and credit market characteristics, when accounted through their effects on real assets, also lead to different results compared to the literature concerning the redistribution from lenders to borrowers. In our estimations for the full sample, households in the poorer quintiles tend to experience higher welfare losses than those in higher income quintiles, which complicate the narrative surrounding intergenerational distributional effects. These findings suggest that established conclusions in recent literature regarding a clear

⁶ Using household-level microdata, Ampudia and others (2018) find that unconventional monetary easing increases asset prices, which tends to raise wealth inequality, but also improves labor-market outcomes for lower-income households, thereby partially offsetting these effects.

redistribution from older, wealthier households, to younger, poorer, ones due to inflation may require more in-depth research.

As a main caveat to our analysis, we acknowledge the challenges in disentangling the effects of inflation from other potential market forces that may have occurred simultaneously during our sample period. For instance, house prices may have been influenced by factors other than inflation (see also Annex A). Nevertheless, our statistical analysis suggests that these other potential drivers were likely subdued during the inflationary spike, given the substantial movements in inflation and the correlation of certain analyzed prices (e.g., house prices) with inflation trends (see Table B.1 in Annex B).

Our paper further abstracts from general-equilibrium effects, which lie beyond the scope of our analysis. Therefore, we cannot identify which agents gain from the welfare losses borne by households, nor whether aggregate economic welfare has declined. In principle, household losses could accrue to other sectors—such as the central bank, government, firms, or the rest of the world—or reflect outright wealth destruction. For example, central banks⁷ have captured a small share through the inflation-induced erosion of the real value of money, while governments have benefited temporarily from the surprise reduction in public debt (Garcia-Macia, 2023). Hansen, Toscani, and Zhou (2023) also show that, during a similar period, import prices and domestic profits accounted for much of the increase in the consumption deflator, particularly due to large relative-price movements in energy and grains. Moreover, in countries where house prices rose less than inflation, real-asset valuation losses imply that part of the decline in household welfare may correspond to genuine wealth destruction.

The remainder of the paper is structured as follows: Section II introduces the methodology, including the channels through which inflation affects distribution and the data sources. Section III presents findings for the *consumption basket channel*, while Section IV covers the *income channel*, and Section V details the *wealth channel*, including analyses with real assets. Section VI combines the outcomes of the three channels to report our main findings. Finally, Section VII concludes the paper.

II. Methodology, Channels, and Data

This section outlines the methodology and data employed in the estimations. First, the section defines and characterizes the three channels through which inflation may affect households' well-being⁸ cumulatively. Second, the section describes the datasets and empirical assumptions used to quantify the impact of inflation.

A. Channels description and methodology of the analysis

Our analysis assumes that inflation impacts households' well-being (or welfare) through the following three channels:

Consumption basket channel – This channel captures the differential impact of price changes across goods, given variations in household consumption patterns. If the prices of certain goods rise more than others, households with a higher share of those goods in their consumption baskets will experience greater welfare losses. For instance, a surge in food prices disproportionately affects lower-income households, as food

⁷ Croatia joined the European Monetary Union in January 2023.

⁸ In this paper we use interchangeably the terms well-being and welfare. That is particularly the case given that our model does not provide utility-based welfare estimations nor account for endogenous behavioral responses of the households. Again, for a demonstration of the link between the channels and welfare, see Pallotti and others (2024).

represents a larger share of their total consumption expenditure (Baez Ramirez, Inan, and Nebiler, 2021). Conversely, if inflation is uniform across goods and services, these differential effects become negligible.

Income channel – This channel reflects the impact of inflation on real household income. If nominal wages, pensions, and other transfers do not keep pace with inflation, households experience an erosion of purchasing power. The magnitude and distribution of this effect depend, for example, on labor market structures, and on indexation rules of wages, pensions, and transfers (Süssmuth and Wieschemeyer 2022; and Balasundharam, Kayastha, and Poplawski-Ribeiro, 2023), as well as on the source of inflationary pressures. For example, in some historical episodes in which inflation resulted from wage-push dynamics, real wages did rise. Moreover, if price and wage changes stem from the sudden emergence of imbalances in demand and supply for certain sectors or skills, some workers may benefit (or be harmed) disproportionately.

Wealth channel – This channel captures the impact of inflation on household well-being through its impact on the real value of their initial stock of assets and liabilities (or their initial balance sheet). Inflation typically erodes the real value of households' initial liabilities, benefiting net borrowers while harming net lenders (Doepke and Schneider 2006). In countries featuring developed financial and credit markets, these wealth effects are relevant. Changes in relative asset prices further imply that households' balance sheet and their portfolio composition play a critical role in determining their exposure to inflationary shocks. Households holding cash as their primary asset tend to suffer the most (Albanesi 2007), likewise those with significant holdings of bank deposits and fixed-rate government bonds also incur real losses.

In this paper, we use two distinct measures of household wealth to measure the effects on their well-being through the wealth channel. The first measure, used in recent papers in the literature, considers only household financial wealth, restricting the portfolio of assets to liquid and financial assets. The second measure, which constitutes one of our main contributions to the literature, considers the total wealth of households, including real assets, such as dwellings. Accounting for changes in the real value of real assets is important, as they constitute the largest asset component for most households and could contribute significantly to changes in household permanent income.

B. Analytical Representation of the Channels

The three channels described above can be formally represented in a household-level analytical framework that generates sufficient statistics to analyze household's welfare. Let C_0^h , Y_0^h denote the consumption (C) and income (Y) of a household (h) at time $t = 0$. Assuming, for simplicity, that the household carries a stock of net assets or wealth (W) from the previous period (W_{-1}^h), its wealth in period 0 will be given by how much she earns and consumes in that period plus the wealth endowment:

$$W_0^h = Y_0^h - C_0^h + W_{-1}^h. \quad (1)$$

In the subsequent period ($t = 1$), in absence of any inflationary shock (i.e., $\pi = 0$), the real wealth of the household evolves as follows:

$$W_{1,\pi=0}^h = Y_{1,\pi=0}^h - C_{1,\pi=0}^h + W_0^h(1 + \beta_{\pi=0}) = Y_0^h(1 + \alpha_{\pi=0}^h) - C_0^h + W_0^h(1 + \beta_{\pi=0}^h). \quad (2)$$

Equation (2) shows that the household wealth stock is determined by three key factors: (i) nominal consumption, (ii) the nominal income adjustment, and (iii) the nominal value changes in wealth stock. Here, α represents the nominal income adjustment rate, capturing changes in household income, while β denotes the wealth stock adjustment rate, where $\beta > 0$ indicates wealth gains, and $\beta < 0$ represents wealth losses. For

simplicity, we assume households do not alter their consumption basket between periods 0 and 1 (i.e., $C_1^h = C_0^h$) in this scenario of no price changes ($\pi = 0$).

When we consider the scenario in which the economy experiences a positive inflationary shock ($\pi > 0$), the real values of consumption and income must be discounted by inflation to accurately compute the real stock of net assets.⁹ Since households consume different basket of goods and services, their household-specific inflation (π_h) may differ from the average inflation rate in the economy π . Under this scenario, the real stock of household wealth is given by:

$$W_{1,\pi>0}^h = \frac{Y_{1,\pi>0}^h}{1+\pi} - \frac{C_{1,\pi>0}^h}{1+\pi} + \frac{W_0^h(1+\beta_{\pi>0}^h)}{1+\pi} = \frac{Y_0^h(1+\alpha_{\pi>0}^h)}{1+\pi} - \frac{C_0^h(1+\pi^h)}{1+\pi} + \frac{W_0^h(1+\beta_{\pi>0}^h)}{1+\pi} \quad (3)$$

Combining (2) and (3), we can decompose the effect of inflation on the real stock of the household net assets or wealth, which in our setting also captures changes in household welfare, into three distinct components:

$$W_{1,\pi>0}^h - W_{1,\pi=0}^h = \left[\frac{Y_0^h(1+\alpha_{\pi>0}^h)}{1+\pi} - Y_0^h(1+\alpha_{\pi=0}^h) \right] - \left[\frac{C_0^h(1+\pi^h)}{1+\pi} - C_0^h \right] + \left[\frac{W_0^h(1+\beta_{\pi>0}^h)}{1+\pi} - W_0^h(1+\beta_{\pi=0}^h) \right] \quad \leftrightarrow$$

$$W_{1,\pi>0}^h - W_{1,\pi=0}^h = \left[\frac{C_0^h(\pi - \pi^h)}{1+\pi} \right] + \left[\frac{Y_0^h(\alpha_{\pi>0}^h - \alpha_{\pi=0}^h - \pi(1+\alpha_{\pi=0}^h))}{1+\pi} \right] + \left[\frac{W_0^h(\beta_{\pi>0}^h - \beta_{\pi=0}^h - \pi(1+\beta_{\pi=0}^h))}{1+\pi} \right] \quad (4)$$

Assuming, for simplicity, no growth in the nominal values of household income and wealth in absence of inflation ($\alpha_{\pi=0}^h = \beta_{\pi=0}^h = 0$),¹⁰ we obtain the next Equation (5), which formally expresses the impact of inflation on the household net assets as the sum of the three channels discussed above: the *consumption basket channel*, the *income channel*, and the *wealth channel*.

$$W_{1,\pi>0}^h - W_{1,\pi=0}^h = \left[\frac{C_0^h(\pi - \pi^h)}{1+\pi} \right] + \left[\frac{Y_0^h(\alpha_{\pi>0}^h - \pi)}{1+\pi} \right] + \left[\frac{W_0^h(\beta_{\pi>0}^h - \pi)}{1+\pi} \right] \quad (5)$$

Each component is captured by each of the brackets in the equation's right-hand side:

- The *consumption basket channel*—represented by the first bracket—captures the differential impact of household-specific inflation due to variations in consumption patterns. This effect is negative when the household's-specific inflation (π^h) exceeds the headline inflation rate (π), implying that the specific

⁹ One caveat of the theoretical framework is that when inflation is positive, the rate of nominal adjustment could be state-dependent on the past level of inflation (Burststein, 2006), which is not a characteristic modeled on this framework.

¹⁰ This assumption follows Cardoso and others (2022). As a topic for future research, one could assume that, in the absence of inflation, growth in the nominal values of household income and wealth equals real GDP growth. Such an assumption would capture the real effects of valuation beyond inflation, more explicitly disentangling the quantification of the two different valuation effects.

composition of the household consumption basket exposes the household to higher-than-average price increases.

- The *income channel*—represented by the second bracket—depends on the extent to which nominal adjustment in household income outpaces headline inflation. Specifically, if the nominal income increase exceeds headline inflation (π), the income effect will be positive, indicating an improvement in real household income. Conversely, if income adjustments fail to keep pace with inflation, the income channel effect will be negative, leading to an erosion of the household's purchasing power.
- The *wealth channel*—represented by the third bracket—depends on both the household's initial net asset position (W_0^h) and the rate of the changes in the nominal value of wealth relative to inflation. If a household is a net creditor ($W_0^h > 0$), the wealth channel will be positive if the nominal value of its assets appreciates at a rate exceeding inflation. In contrast, if asset appreciation is lower than the inflation rate, the wealth effect will be negative, exacerbating real wealth losses. Conversely, for net debtor households ($W_0^h < 0$), the wealth channel will be positive for those holding liabilities constant in nominal terms, as inflation erodes the real value of their outstanding debt.

Using this analytical framework, we study the impacts in our country sample of the inflation episode occurring between the beginning of 2021:Q3 and the end of 2022:Q2. Two distinct estimations are considered.

The first set of estimates identifies the *mechanical* effect, assuming that the households' income level and financial resources remain constant in nominal terms. This assumption implies no adjustments to income or net assets in response to inflation, which can be formally represented as $\alpha_{\pi>0} = 0$ and $\beta_{\pi>0} = 0$. This first estimation provides an assessment of a surprise inflationary shock at impact (or “day after effect”), capturing the mechanical effect before economic agents adjust their financial positions. By holding income and net assets fixed at their observed nominal values, this setting allows us to evaluate the pure inflationary erosion of purchasing power in the absences of adaptive responses.

Under such conditions, Equation (5) can be re-written as:

$$W_{1,\pi>0}^h - W_{1,\pi=0}^h = \left[\frac{C_0^h(\pi - \pi^h)}{1 + \pi} \right] + \left[-\frac{Y_0^h\pi}{1 + \pi} \right] + \left[-\frac{W_0^h\pi}{1 + \pi} \right],$$

which can be normalized for yearly household income Y_0^h to become:

$$\frac{W_{1,\pi>0}^h - W_{1,\pi=0}^h}{Y_0^h} = \left[\frac{C_0^h(\pi - \pi^h)}{Y_0^h(1 + \pi)} \right] + \left[-\frac{\pi}{1 + \pi} \right] + \left[-\frac{W_0^h\pi}{Y_0^h(1 + \pi)} \right]. \quad (6)$$

The second estimation relaxes the assumption of constant nominal income and financial resources, introducing adjustments to both variables. The level of adjustment varies across countries and will not necessarily offset the effects of inflation. By allowing for heterogeneity in income and net assets growth, this estimation captures the dynamic responses of households to inflationary pressures.

Formally, this is represented by the conditions that $\alpha_{\pi>0}^h \neq 0, \beta_{\pi>0}^h \neq 0$.

Under these assumptions, Equation (5) can be normalized for yearly household income (Y_0^h) to become:

$$\frac{W_{1,\pi>0}^h - W_{1,\pi=0}^h}{Y_0^h} = \left[\frac{C_0^h(\pi - \pi^h)}{Y_0^h(1 + \pi)} \right] + \left[\frac{(\alpha_{\pi>0}^h - \pi)}{1 + \pi} \right] + \left[\frac{W_0^h(\beta_{\pi>0}^h - \pi)}{Y_0^h(1 + \pi)} \right]. \quad (7)$$

The second estimation allows for a more realistic assessment of inflation's impact on household wealth during the 4-quarters time horizon investigated. It captures the interplay between nominal adjustments and inflation-induced distortions. By comparing the results across both estimations, we can identify the role of behavioral effects in either amplifying or mitigating the initial real income and wealth erosion caused by inflation.

In the reminder of the analysis, the results are presented for each channel as a share of annual household disposable income. Again, to account for variations in household asset composition, we conduct estimations under two definitions of wealth: a standard definition, which includes only liquid financial assets; and a new definition, which incorporates real assets as part of the household wealth stock. This distinction allows us to capture the differential exposure of households to inflation and to assess the role of real assets in buffering or amplifying inflationary pressures.

C. Data Sources and Assumptions

The analysis focuses on the inflationary surge observed between the third quarter of 2021 (2021:Q3) to the second quarter of 2022 (2022:Q2), a period marked by sharp increases in prices following the COVID-19 pandemic (Figure 1). The estimation of the distributional effects of inflation through the three identified channels relies on a combination of macro-level data and household surveys data. Specifically:

Inflation. The OECD price change data, classified according to the Classification of Individual Consumption by Purpose (COICOP) serves as the primary source for capturing inflationary trends across different consumption categories.

Household income. The 2019 European Statistics on Income and Living Conditions (EU-SILC)¹¹ provides information on household incomes and socioeconomic circumstances for a representative sample of households in each European country. Household income components include labor income, pensions, direct taxation, social security contributions, and social benefits. One household-level dataset is derived for each country. To obtain information on household disposable income and its component for the year 2021, the 2019 EU-SILC data are used in combination with the EUROMOD tax-benefit microsimulation model.¹² Accordingly, EUROMOD uprates incomes using specific uprating factors. Real income changes are captured by the difference between rate of growth of nominal income and inflation.

Household consumption. The 2015 EU Household Budget Survey (HBS)¹³ provides information on household consumption levels and expenditure patterns in each country part of our sample. To ensure comparability over time, nominal consumption values are adjusted to 2021 values using observed inflation rates between 2015 and 2021. This adjustment holds consumption constant in real terms and it assumes that, despite the inflationary pressures of 2021:Q3-2022:Q2, the relative composition of household consumption remained

¹¹ See <https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions>.

¹² For more details on the EUROMOD model, see also Sutherland and Figari (2013).

¹³ See <https://ec.europa.eu/eurostat/web/microdata/household-budget-survey>.

stable between 2015 and 2021.¹⁴ The data are used to derive for each country the average household expenditure in each COICOP category by disposable income quintile. The data are subsequently merged to the household income datasets based on the country and disposable income quintile group.

Household wealth. The 2021 Household Finance and Consumption Survey (HFCS)¹⁵ serves as the primary data source for household wealth, with information on both financial wealth and real assets—i.e., all types of households' tangible assets. Wealth information is reported at household level for each country in our sample, joint with other socio-economic characteristics. We derive wealth variables as share of household gross income, and we average them by gross income quintile. The data are subsequently merged with the household income datasets based on the country and gross income quintile group. The monetary value of household wealth is hence recomputed using the gross income values reported in the household income datasets and the wealth variables as share of household gross income derived from the HFCS.

Behavioral effects for the income and wealth channel. To account for changes in household disposable income between 2021 and 2022, the analysis incorporates EUROMOD annual simulations for the calendar year 2022,¹⁶ which reflect variations in income components including those induced by fiscal policy. The information is added to the country specific household income datasets at household level. Additionally, financial data from the European Central Bank's Distributional Wealth Accounts (Blatnik and others, 2024) are used to capture fluctuations in household wealth (financial and real assets) between 2021 and 2022. Given that these statistics are reported by wealth quintile, a matrix from the EUROSTAT's experimental statistics database is employed to align income and wealth distributions.¹⁷

As a result of the process, we obtain for each country a household level dataset based on EU-SILC 2019 augmented with EUROMOD simulations for incomes for the years 2021 and 2022, average consumption by COICOP (by disposable income quintile), and household wealth for 2021 and 2022 (by gross income quintile). The information is averaged by country and disposable income quintile to derive the final dataset used for the analysis.

With such database, we then use the stock values of financial assets, real assets, and financial liabilities coming from the HFCS database to estimate the behavioral effects of the wealth channel. That is done by calculating the change in their respective stock value between 2021:Q1 and 2022:Q2.

¹⁴ The latest EU HBS was conducted in 2020 during the acute phase of the COVID-19 pandemic, which may introduce significant bias due to pandemic restrictions and temporary changes in consumption habits (see, for example, McGregor, Suphaphiphat, and Toscani, 2022; and Loko, Nembot, and Poplawski-Ribeiro for a European and a more global perspective on these habits and their effects on savings and consumption, respectively). Therefore, future research could use more recent HBS surveys as a robustness check against the one used in this paper, as they may better reflect consumption habits from mid-2021 through mid-2022. Note that we do not expect significant changes in the results given the small effects of the consumption basket channel on the overall welfare analysis, as will be demonstrated in the following sections.

¹⁵ See: https://www.ecb.europa.eu/stats/ecb_surveys/hfcs/html/index.en.html.

¹⁶ EUROMOD simulations are based on rules and policies in place as of June of each year.

¹⁷ The variable used refer to the [share of households and economic resources by income, consumption and wealth quantiles - experimental statistics](#) available at: [Distributional Wealth Accounts - DWA | ECB Data Portal](#).

III. Consumption Basket Channel

Using the data and assumptions described above, we move to the estimates of the three channels. This first section presents the estimates and findings for the *consumption basket channel* in the 18-euro area economies selected for the analysis.

A. Inflation composition

We begin by examining the composition and incidence of inflation between 2021:Q3 and 2022:Q2 (i.e., the *year-on-year* inflation in that period) across the selected euro area economies. General inflation varied significantly, ranging from 5.9 percent in Malta to 23.3 percent in Estonia (Figure 1). In most economies, rising fuel and energy prices were the primary driver of inflation (Figure 3). Housing and utilities costs surged by as much as 66 percent in Estonia, while transport-related prices, including fuels, rose by more than 30 percent in Estonia, Latvia, Lithuania, and Luxembourg. The transport category, which includes expenses in diesel and gasoline, experienced the largest price increase among the four consumption categories analyzed for Croatia, Portugal, Spain, but particularly for Finland, France, Luxembourg, and Slovakia. Food inflation also played a significant role, surpassing 10 percent in most countries and reaching 28 percent in Lithuania.

Household expenditure shares for different consumption categories vary across countries, though the income gradients of budget shares are remarkably homogenous across countries. Figure 4 presents Engel curves for the COICOP categories “Food and Non-Alcoholic Beverages”, “Transport”, “Housing, water, electricity, gas and other fuels” and the residual “Other Consumption Category”. Food budget shares range from 33 percent in Lithuania to 12 percent in Luxembourg, exhibiting a consistently declining pattern across the income distribution in all countries except the Netherlands. The importance of housing and utilities related expenditures in the household budget are the highest in Slovakia at 22 percent and the lowest in Malta at 9 percent, following a downward trend relative to households’ income, which is similar to the one observed for food expenditures. Transport expenditures, by contrast, are positively associated with income, with Sweden recording the highest budget share at 20 percent, and Lithuania the lowest at 10 percent. The incidence of the residual category of “Other consumption” increases with income, with the wealthiest households allocating nearly half of their budgets to these goods. However, this spending pattern varies widely across countries; wealthier households in Cyprus, Luxembourg, and Malta exhibit high expenditures in this category, while in Croatia and Slovakia, even high-income households exhibit more constrained spending for that category.

By combining information summarized in Figures 3 and 4, we estimate household-specific inflation rates across different income quintiles (Figure 5). The analysis reveals that household-level inflation rates are relatively uniform across income groups in Luxembourg, Slovakia, Finland, and France, while the remaining countries exhibit higher inflation for lower-income quintiles, driven primarily by the larger impact of rising food and housing and utilities prices (Figure 6). Estonia and Lithuania exhibit the largest gap in inflation between households at the top and at the bottom of the income distribution, with a differential of approximately 3 percentage points. This trend underscores the regressive nature of inflation for the *consumption basket channel*, with lower-income households disproportionately affected due to their higher sensitivity to price changes in essential goods and services. The sharp increase in energy prices in the inflationary episode analyzed played a significant role, with its impact being felt across income groups. The effect happens through different mechanisms, though: households at the bottom 20 percent of the income distribution are primarily

affected via higher utilities prices, whereas those at the top 20 percent experience the impact mainly through transportation prices, including fuel.¹⁸

B. Well-Being Effect from the *Consumption Basket Channel*

Table 1 presents the estimated welfare changes attributable to the *consumption basket channel*. In all countries, except for Finland and Luxembourg, inflation reduced welfare of households in the lowest income quintiles, with its effects becoming progressively positive as income increases. The largest welfare losses occurred among the poorest households in Belgium, where inflation eroded approximately 2 percent of their annual income. Conversely, the top 20 percent in Italy experienced the greatest welfare gains, amounting to 0.9 percent of their annual income. On average, households at the bottom of the income distribution experienced a welfare loss equivalent to 0.6 percent of their annual disposable income due to inflation transmitted through the *consumption basket channel*, while the wealthiest (top quintile) households registered an average welfare gain of 0.3 percent of their annual income.

These findings are consistent with the well-documented regressive nature of inflation, as lower-income households tend to allocate a larger share of their budget to goods and services that experienced above-average price increases. In contrast, higher-income households, which spent relatively more on goods and services with below-average price inflation, benefitted from a net welfare gain.

IV. Income Channel

While much of the existing literature has focused on the *consumption basket channel*,¹⁹ the income channel often exerts an even greater influence on household well-being.

This section presents the results of the *income channel* using the two estimations described in the methodology section. The first estimation presents the results when we assume nominal incomes to remain constant, capturing the mechanical welfare losses (or *mechanical effects*) from an unexpected inflationary shock. The second estimation incorporates changes in nominal income, including wages, pensions, and other income sources, such as social transfers, allowing for an assessment of *behavioral effects* and the extent to which income dynamics mitigated or amplified the initial welfare losses.

A. Mechanical Effect

Under the estimation analyzing the mechanical effect of inflation, in which nominal incomes remain constant in nominal terms, the price increase is found to have led to well-being losses that are uniform across the income distribution. These losses, caused by an erosion in real purchasing power, are calculated through the expression $-\frac{\pi}{1+\pi}$ of Equation (5), quantifying the decline in real income due to inflation.

¹⁸ Whereas energy used for utilities in these countries is a larger share of consumption for lower-income households, the share of transportation in total consumption rises with household income (see Hellebrandt and Mauro 2015 for international evidence).

¹⁹ See, for example, OECD (2022b) for Organisation for Economic Co-operation and Development economies; Charalampakis and others (2022), Claey's and Guetta-Jeanrenaud (2022), and Mohrle and Wollmershauser (2021) for European countries; and Autor, Dube, and McGrew (forthcoming), Jaravel (2022), and US CBO (2022c) for the United States, for example.

The magnitude of these losses varies significantly across countries albeit, by construction, it remains the same across income quintiles in each country (see Table 2, Columns “1st round”). Estonia exhibits the highest welfare loss through the income channel, equivalent to 19.4 percent of the household annual income. Malta, in turn, exhibited the lowest well-being loss at 5.7 percent. On average welfare losses amounted to 10.7 percent of annual household income. Notably, the *income channel* generates substantially larger well-being losses than those observed through the *consumption basket channel*, underscoring the important role of income erosion in determining household welfare during inflationary episodes.

B. Behavioral Effects

The second estimation accounts for changes in household income between 2021 and 2022 using the tax benefit microsimulation model EUROMOD.²⁰ This simulation incorporates changes in wages, direct taxes, pensions, and social benefits during the sampled period.²¹

Although, on aggregate, household disposable income did not fully keep pace with inflation, incorporating these changes significantly dampened the welfare losses attributable to the *income channel* (see Table 2, Columns “Behavioral”). On average, welfare losses declined from 10.7 percent to 5.4 percent of the annual household income at the bottom of the income distribution, and to 6.4 percent at the top.

Cross-country heterogeneity is significant, though. Estonian households continued to exhibit the largest losses through the income channel; however, these losses fell by 12.9 to 11.6 percentage points of the household annual income when accounting for income adjustments. In Malta, the increase in household income nearly offsets the adverse effects of inflation across all quintiles.

Such heterogeneity comes from the degree of changes in market remuneration and from the level of social protection offered to the most vulnerable populations; this latter a function to the different degrees of social protection across Europe (Amores and others, 2025). For instance, for some economies, such as Ireland, Portugal, and Slovakia the *income channel* adjustment was relatively uniform across different quintiles. In contrast, in Cyprus, households in the lowest quintile experienced a larger reduction than other quintiles in the welfare losses when accounting for behavioral effects, primarily due to the increase on public transfers.

These findings underscore the key role of changes in remunerations, given a particular labor market situation, as well as fiscal policy—through public transfers or inflation indexation (Balasundharam, Kayastha, and Poplawski-Ribeiro, 2023)—in shaping the distributional consequences of inflation. While targeted transfers and progressive income adjustments can provide meaningful relief to low-income households, their effectiveness depends on both the magnitude and timing of interventions.²²

²⁰ EUROMOD simulates tax-benefit rules in place as of June 30th of each year.

²¹ We are agnostic on the causality of the changes to income observed during the inflation surge incorporated to our analysis. In many countries, this approach has no caveat, given that wages have not grown much in recent years in those economies. But that is not the case in all our sample of countries—in particular, in the Baltic countries—constituting a caveat to our analysis. A potential robustness check to the outcomes of this approach would be to assume that wage grows in tandem with the real GDP natural growth rate, instead of zero, which is our current assumption.

²² Although not investigated in this paper, some other characteristics may also play a role on the type of public intervention and difference in behavioral effects, such as the gender of the head of the household (Mao, 2022).

V. Wealth Channel

The *wealth channel*, also called “Fisher effect” (Fisher, 1930) is the third channel shaping the distributional consequences of inflation. We estimate this last channel under two definitions: (i) liquid financial assets, which include cash and other readily accessible financial instruments; and (ii) total assets, which encompass both liquid financial assets and real assets, offering a more comprehensive assessment of wealth accumulation and its distributional implications. Section A presents the results of the estimations of the impact of inflation on liquid financial assets and liabilities, while Section B extends the analysis to incorporate real assets.

In both definitions, the type of behavioral effects assumed further matters for the overall well-being effect. In this baseline section, we assume that the behavioral effects include changes in values and volumes—i.e., sales or purchases of assets, and/or contraction or liquidation of liabilities. Appendix A, in turn, shows behavioral effects when only prices of assets and liabilities are assumed to move. The comparison of the analysis below with Appendix A shows that the well-being effects change significantly, depending on those assumptions regarding the behavioral effects.

A. Wealth Channel Including Financial Wealth Only

In order to quantify the *wealth channel* including financial wealth different assumptions can be made on how to update the prices and quantities by household of these assets and liabilities when performing the calculation of the behavioral effects. In this section, we present the baseline results with our preferred assumption presented in Section II.C.²³

A.1. Mechanical Effect

We start our analysis by calculating the mechanical effect of inflation on households’ well-being through the financial wealth channel. For that, we assume no adjustments to assets and liabilities beyond the direct inflationary shock. The results are displayed in the Columns “*Mechanical*” of Table 3. In this scenario, households experience changes in their real financial wealth solely due to the erosion of the real value of nominal assets and liabilities. This effect is particularly pronounced in economies with high levels of financial wealth concentration, as well as in those where households hold substantial financial liabilities,²⁴ with the net effects depending on household’s average balance sheet for each income quintile in each economy.

The results indicate negative wealth effects in most countries, particularly among lower-income households. For instance, in Estonia, households in the first income quintile experienced a pronounced welfare loss of -22.3 percent of their annual income. In Malta, households belonging to the second income quintile faced an average decline of -14.2 percent of annual income. Nevertheless, in Cyprus and the Netherlands, where households are net debtors, inflation-induced debt devaluation resulted in marked net positive wealth effects.²⁵ On average, households in the fourth income quintile benefited from this mechanism, as inflation eroded the real value of their outstanding liabilities, leading to a net gain. In contrast, the wealthiest households (Q5) experienced losses of a similar magnitude to those in the poorest quintile (Q1), averaging -3.4 percent of annual household

²³ Section VII applies a different set of assumptions to the behavioral and market price effects of wealth to test the sensitivity of our results to alternative hypotheses.

²⁴ See, for example, Eurostat annual data on households’ financial balance sheet, available at: https://ec.europa.eu/eurostat/databrowser/view/nasa_10_f_bs/default/table?lang=en.

²⁵ For this analysis, we consider interest rates fixed and determined at the time the loan is contracted. Accordingly, loan terms are not adjusted for, nor indexed to, inflation.

income. Importantly, these mechanical effects reveal a nonlinear pattern in the *wealth channel*, with the fourth income quintile being the only exhibiting on average a welfare gain from inflation.

A.2. Behavioral Effects

The behavioral effects incorporate changes in values of financial assets and liabilities and household behavioral responses. For that, financial data from the European Central Bank's Distributional Wealth Accounts (Blatnik and others, 2024) are used to capture fluctuations in household wealth (financial and real assets) between 2021 and 2022, as also discussed in Section II.C.

When incorporating behavioral effects, the wealth loss caused by inflation tends to decline. Our previous examination of mechanical effects above showed that several countries faced significant negative impacts, particularly among lower-income households. In comparison, the investigation of behavioral effects indicates a softening of wealth loss, with more countries experiencing positive net outcomes. This ultimately leads to an average annual income loss of 0.9 percent for households.

In examining the distribution of behavioral effects across income quintiles, households in the poorest quintile (first quintile) saw a reversal of the mechanical negative impact of -3.4 percent on their annual income, resulting in a net positive effect of 3 percent (see Table 3). For middle-income households (in quintiles 2 and 3), the negative effects persisted, with the second quintile improving from -2.9 percent to -1.8 percent of their annual income. Conversely, higher-income households (in quintiles 4 and 5) faced increasingly negative repercussions. A hypothesis for this outcome is that households in the fourth quintile most likely redirected resources toward debt repayment to avoid rising interest costs or reallocated assets to financial instruments with more favorable returns. Meanwhile, the negative financial wealth effect for the wealthiest households (in the fifth quintile) worsened from -3.4 percent of their average annual income to -4.8 percent, indicating significant variability in financial strategies within this income group.

The behavioral effects show significant cross-country variation, influenced by differences in household debt composition, asset structures, and institutional frameworks.²⁶ In countries like Belgium, Cyprus, and the Netherlands, households across all income quintiles experienced net positive behavioral effects, indicating that financial adjustments played a crucial role in mitigating the initial impact of inflation. Notably, in Cyprus and the Netherlands, households are primarily net borrowers, gaining from inflation-induced reductions in the real value of their liabilities.

The findings of this section highlight the critical role of country-specific macroeconomic conditions and institutional frameworks in influencing household responses to inflation and its effects on wealth channels. These behavioral effects lead to significantly different wealth and welfare effects across income quintiles. Next section will show, in turn, that the wealth effects vary even more significantly when real assets are added to the household balance sheet in the analysis.

B. Wealth Channel Including Real Assets

A.1. Mechanical Effect

Building on the previous analysis, this section incorporates real assets into the households' financial balance sheet. As noted earlier, real assets are a significant component of household wealth. Figure 7 illustrates that, in

²⁶ As Annex A shows, when these behavioral effects—including sales or purchases of assets, and contraction or liquidation of liabilities—are not included in the analyses, the welfare effects differ quantitatively and even qualitatively sometimes.

several economies, real assets account for more than ten times the average annual income of households,²⁷ highlighting their central role in household balance sheets.

Across different income quintiles, as for the richest quintiles, real assets also constitute in most of the sampled economies a substantial share of total wealth for households in the lowest income quintile—e.g., Croatia, Ireland, Lithuania, Malta, Portugal, and Slovenia. This outcome can largely be attributed to a base effect: lower-income households tend to have a higher real asset-to-income ratio due to relatively low earnings, with housing being their primary asset (Moura, Poplawski-Ribeiro, and Piza, 2014; Guren and others, 2021). The concentration of real assets within both the poorest and richest income quintiles, expressed as a share of annual income, across most countries results in a U-shaped distribution of average net wealth among households. This distribution reveals that net wealth is relatively lower for middle-income families compared to those in the extreme income quintiles.

The mechanical effect of the wealth channel when incorporating real assets results in significantly greater welfare losses compared to the prior analysis that focused solely on financial assets. As previously mentioned, this mechanical effect operates under the assumption that the nominal value of real assets remains unchanged, thereby leading to complete depreciation by inflation in real terms. Table 4 (Columns “Mechanical”) indicates that, in certain countries and income quintiles, welfare losses can exceed 200 percent of household income, culminating in an average welfare loss of 94.1 percent of the average annual household income across the full sample. This value compares to only -2.2 percent of the household average annual income when financial assets and liabilities are the sole households’ wealth items accounted for.

Wealth losses are, on average, more pronounced for the poorest households. For the lowest income quintile, the wealth loss is approximately -135 percent of the average annual income for families within this group. Lithuania experiences the most significant negative impact, with wealth loss reaching -271 percent of the annual household income for families in its first income quintile.

Furthermore, the wealth losses resulting from mechanical effects are non-positive across all countries and income quintiles in the sample, exhibiting a non-linear decay that follows a U-shaped pattern as income quintiles increase. Notably, households in the fourth quintile face the lowest average wealth loss, which amounts to -75 percent of the average annual household income for families within that income bracket.

A.2. Behavioral Effects

For the behavioral effects, the inflation’s impact on the household’s wealth depends on the relative growth of real assets’ values compared to inflation,²⁸ as well as household’s behavioral responses aimed at preserving their wealth. In economies where real assets’ valuation exceeds inflation, households experienced net wealth gains. Conversely, in countries where real assets’ valuation is lower than inflation, households faced real wealth erosion.

Utilizing the data and assumptions outlined in Section II.C, we estimate an average wealth loss for the full sample with behavioral effects, which, when including real assets, is significantly lower than the average mechanical wealth loss. However, it remains greater than the wealth loss calculated solely based on

²⁷ In Malta, for instance, real assets for some income quintiles can exceed 25 times the annual income of households.

²⁸ A caveat to this analysis is whether fluctuations in real asset prices and other behavioral effects occur due to the inflationary shock or are driven by other market forces. For instance, house prices may be influenced by factors beyond inflation. While isolating the sole effect of inflation on housing prices is challenging, the descriptive statistics in Table A.1 in Annex B indicate that the interquartile range of changes in house prices closely aligns with inflation, suggesting that in most analyzed countries, other demand or supply shocks may play a secondary role in explaining variations in house prices.

households' financial balance sheets. The average value for the “Behavioral” column in Table 4 reflects a loss of -12.4 percent of the average household's annual income.

The distributional implications of these dynamics vary significantly across economies. In Luxembourg and Slovakia, the inclusion of real assets reverses the sign of the wealth channel effect compared to the results based solely on financial wealth. This shift occurs because real assets appreciated substantially during the sample period in these countries, resulting in net positive wealth outcomes. Conversely, in Cyprus, household wealth deteriorated markedly. The negative impact for the highest income quintile remained notably high, averaging -93.8 percent of their annual income. In Finland, France, Italy, and Spain, for instance, the inclusion of real assets further emphasizes a U-shaped distributional pattern, with the lowest and highest income quintiles experiencing the most significant changes.

These findings highlight the crucial role of the wealth (or Fisher) channel in influencing the distribution of household welfare (or well-being) and demonstrate the importance of incorporating real assets when assessing the redistributive effects of inflation among households. Considering the elasticity of these real assets to consumption (Guren and others, 2021), the resulting wealth effects have significant implications for welfare and must be taken into account.

VI. Distributional Effects Combining the Three Channels

With all three channels quantified, we can now proceed to the analysis of the total welfare effect for the households and the consequent distributional impacts when combining the three channels. As in the calculation of the *wealth channel* above, we do that in two ways. First, we investigate the welfare effects when only financial assets are included in the *wealth channel*. Second, we calculate the welfare effects and distributional impacts when our new measure of *wealth channel* including real assets is used.²⁹

A. Distributional Effects Considering Financial Wealth Only

The combined effects of the *consumption basket*, *income*, and *wealth channels* exhibit significant heterogeneity across countries and income groups. Among the three channels, the *consumption basket channel* had the smallest relative impact, whereas the *income* and the *wealth channels* played a more dominant role in shaping distributional outcomes (Table 5). Most of the cross-country variation comes from the *wealth channel*, whereas the *income channel* (as shown in Table 2) is more constant across quintiles.

For the mechanical effect, as anticipated, Table 5 indicates that welfare losses are more pronounced at 12.9 percent of household annual income compared to 7 percent when behavioral effects are included. The quintiles experiencing the same highest welfare losses are the first and second poorest quintiles (Quintiles 1 and 2, respectively) illustrating how the poorest are the most impacted by the inflationary shock. Across countries, the findings demonstrate considerable variation. Households in Estonia face the largest well-being losses across most quintiles, with losses diminishing as income quintiles increase. In contrast, households in Cyprus, and the Netherlands fluctuate between losses and gains across different quintiles. Notably, due to their low but positive net worth, households in the first (poorest) quintile experience welfare gains, while those in the fifth (richest) quintile endure welfare losses.

²⁹ Annex A also brings the same distributional analysis with the assumptions and results presented in the annex.

The analysis that incorporates behavioral effects while focusing exclusively on financial assets clearly reveals the redistribution effect of inflation from net creditor households to net borrower households. Table 5 indicates that, on average across all countries in our sample, households in the richest income quintile are the most adversely affected by inflation, experiencing a welfare loss of 10.9 percent of their average annual income. Households in the second income quintile face the second-largest negative impact, with a welfare loss averaging 7.9 percent of their annual income.

This redistribution of welfare from net creditors to net borrowers is particularly pronounced in Cyprus and the Netherlands. In these countries, households across all income quintiles, except for the richest, experience welfare gains.³⁰ This is attributed to a significant and positive wealth channel effect that offsets income losses across all quintiles. Most households in these nations are net borrowers, and the reduction in the real value of their debt more than compensates for the erosion of purchasing power caused by inflation. Only net-creditor households in the richest quintile experience welfare losses when simulations are restricted to financial assets. Conversely, in countries such as Italy, and Portugal, the well-being effect demonstrates a U-shaped pattern, with the most pronounced impacts observed at both the lowest and highest ends of the income distribution.^{31,32}

These findings already underscore the central role of the *wealth channel* in shaping distributional outcomes and highlight its significance in determining whether households emerge as net winners or losers from inflationary episodes. While the *income channel* dominated in some contexts, the *wealth channel* introduced substantial variation both across and within countries, emphasizing the importance of accounting for wealth composition in assessments of inflation's redistributive effects and the welfare redistribution from net creditors when only financial assets and liabilities are accounted in the wealth channel.

B. Distributional Effects When Accounting for Real Assets

Incorporating real assets into the analysis significantly alters the welfare results for households, with the poorest households experiencing the largest negative impacts and the previously observed U-shaped distributional pattern disappearing in some of the countries (Figure 8). The inclusion of real assets also introduces additional cross-country heterogeneity, underscoring the role of real estate in shaping welfare and distributional effects for households.

When real assets are added to the wealth channel and only mechanical effects are considered, average welfare losses across countries and quintiles are dominated by this channel, declining monotonically as household income quintiles increase (Table 6). On average, the welfare loss exceeds 104 percent of household annual income for our full sample. However, the well-being loss is now greater for households in the lowest income quintile (averaging -146 percent of their annual income) and lower for households in the fourth, second richest, income quintile (averaging -85.5 percent). The poorest households in Lithuania are the most affected, with a loss of 290.4 percent of their average annual income, while poorest households in Finland experience the smallest impact at -45.1 percent of their average annual income.

³⁰ Moreover, in half of our sample (e.g., Finland, France, Spain), the wealthiest households experienced the most significant negative impacts, primarily due to the wealth channel's effect on financial wealth.

³¹ See, for example, the results for the poorest income quintile in Estonia, Ireland, Lithuania, and Slovenia, in which the poorest households bear the greatest welfare loss.

³² Such a non-linear pattern in total welfare is consistent with broader empirical findings in the literature regarding the non-linear relationship between inflation and income inequality (Galli and van der Hoeven, 2001; Bulíř, 2001; and Hu and others, 2024).

The key finding of our paper emerges when analyzing welfare in which the wealth channel includes real assets and accounts for behavioral effects (Column “Behavioral” in Table 6). On average across all countries, our main simulation indicates that the poorest households are now the most affected, sustaining the largest average welfare loss from the inflation shock. For the full sample, the average welfare effect across countries and income quintiles amounts to -18.5 percent of annual household income. Households in the first income quintile experience an average loss of 26.7 percent of their annual income, while households in the highest income quintile see a slightly moderated loss of 13.3 percent. This consistent reduction in welfare loss is observed in seven countries in our sample (e.g., Croatia, Estonia, Luxembourg, and the Netherlands). In contrast, for other countries, the effects fluctuate nonlinearly across different quintiles. In Finland and Spain, for example, the average welfare loss due to inflation is greater for the richest quintile than for the poorest quintile.

These results highlight the importance of accurately reflecting assets and liabilities in household balance sheets to fully grasp the impact of inflation on welfare and understand diverging welfare effects across countries. A more comprehensive balance sheet provides a clearer picture of household net worth and better captures the effects of inflation on their total assets.

Indeed, when accounting for real assets, the difference in welfare effects across countries is highly significant. In 13 countries of our sample the wealth and overall welfare effects of inflation remain negative for all quintiles (see Figure 8 and Table 6). That is because the changes in net financial assets and real assets values are smaller relative to the inflation level. For example, in Italy, the average welfare loss across all income quintiles when including real assets is equal to 72 percent of the household income, from a loss of 83 percent of the household income to those families in the poorest income quintile to a loss of 63.5 percent of the household income to families in the second richest income quintile (Quintile 4).

Conversely, in 5 economies, the welfare effect is positive for some or all income quintiles. In Ireland, Slovakia, and Slovenia, households in all income quintile(s) experienced net welfare gains during the inflationary spike rather than negative effects. For example, in Ireland, the average welfare again across all income quintiles is equal to 37.5 percent of the household income, from 28 percent of household income to those families in the second poorest income quintile to a gain of more than 53 percent of the household income to families in the richest income quintile.

Moreover, in Luxembourg and the Netherlands, households in the richest quintile(s) also experienced welfare gains rather than negative effects. In the Netherlands, the average welfare again across all income quintiles is equal to 24 percent of the household income, moving from an average loss of 2 percent of household income to families in the poorest income quintile to a gain of 52.5 percent of the household income to families in the richest income quintile. Particularly for these two, house prices increased significantly more than inflation during the sample period, partly owing to specific characteristics of their housing markets.

Historically, the search for real assets has been a common strategy for hedging against inflation. For instance, Wolff (1979) analyzed data from over 60,000 households in the United States during the inflationary period from 1969 to 1975 through the net wealth channel. His findings indicated that homeowners gained relative to renters, middle-aged households gained relative to both younger and older demographics, married couples benefited relative to singles, and Whites gained relative to non-Whites. The most significant beneficiaries were

homeowners with substantial mortgages, and low-income households also gained if they had a mortgage. Consequently, wealth inequality declined as lower-wealth groups had higher debt-to-asset ratios.³³

Overall, our results show a significant larger welfare loss (on average of 18.5 percent of household annual income) than the previous literature. For example, Pallotti and others (2024) find a diverse but smaller average negative welfare effect in the four European countries they analyzed—e.g., 8 percent in Italy and 3 percent in France.

VII. Conclusion

This paper explores the redistributive consequences of the 2021:Q3–2022:Q2 inflation surge for a broad sample of 18 European economies. We decompose the impact of inflation on agents' welfare on three channels (*consumption basket*, *income*, and *wealth*). As main innovation, we augment that standard decomposition in the literature for this inflationary episode to include real assets into household wealth and to account for behavioral effects.

Our findings highlight that welfare losses from inflationary shocks are significantly greater when real assets are incorporated into the analysis of the wealth channel. Understanding how inflation influences real assets—including through behavioral effects—is essential for accurately estimating the wealth (or Fisherian) impact on welfare (see also Adam and Tzamourani, 2016). This empirical contribution is significant across the diverse economies studied.³⁴

In terms of quantitative effects, our estimations show that poor households are hit the hardest, facing significant challenges as their real incomes diminish. For our country and period sample, our estimated average loss in welfare—18.5 percent of the average household annual income across the full sample—is larger than the estimations reported in the existing literature. Such welfare loss can be decomposed into the *consumption basket channel*, the *income channel*, and the *wealth effect channel*, contributing respectively at -0.04, -6.1, and -12.4 percent of the average household annual income.

However, these effects varied significantly across both income quintiles and countries. For households in the lowest income quintile, the values for the full country sample average -0.6, -5.4, and -20.8 percent of household annual income, totaling -26.7 percent. In contrast, households in the highest income quintile experience these channels at approximately +0.3, -6.4, and -7.2 percent of their household income, for a total welfare loss of 13.3 percent.

Welfare effects also differ markedly across countries once real assets are incorporated. In 13 of the 18 economies, welfare losses remain negative across all income quintiles because increases in net financial and real assets did not keep pace with inflation—Italy being a clear case, with an average loss of about 72 percent

³³ However, the inflation protection afforded by homeownership can be undermined, at least in part, by government policies such as rent control or taxation, as seen in France and Germany after World War I. During inflationary periods, net holders of nominal assets were hit hardest, but homeowners were not immune. For example, severe rent control in France during both world wars led to rents falling to one-tenth of their real value between 1913 and 1950 (Piketty 2003). Similarly, in Germany, real estate lost one-fifth of its value between 1913 and 1927, due to a combination of rent regulation and taxation (Albers, Bartels, and Schularick 2022). The only asset that appreciated in value was land, revealing a pronounced rural-urban divide in the effects of inflation.

³⁴ This finding on the critical role of real assets in the wealth channel raises an important question on why real asset values and holdings respond so strongly to inflationary pressures, which could be a topic for further research.

of annual household income. By contrast, five economies recorded gains for some or all quintiles—most notably Ireland, Slovakia, and Slovenia, as well as the richest households in Luxembourg and the Netherlands—where house prices rose faster than inflation, amplifying real-asset revaluation.

These results underscore how strongly the quantitative welfare effects of inflation depend on assumptions about behavioral responses and the types of assets included. As shown in Figure 9, different assumptions yield notably different patterns across income quintiles, with the wealth channel emerging as the dominant driver once real assets are incorporated. This sensitivity further challenges the common view that inflation's distributional effects are predominantly U-shaped and instead suggests a more nuanced pattern, particularly for lower-income households. Omitting real assets and behavioral adjustments, therefore, risks understating the welfare losses faced by vulnerable groups and oversimplifying the redistribution mechanisms at play—especially those shaped by local housing and credit market conditions.

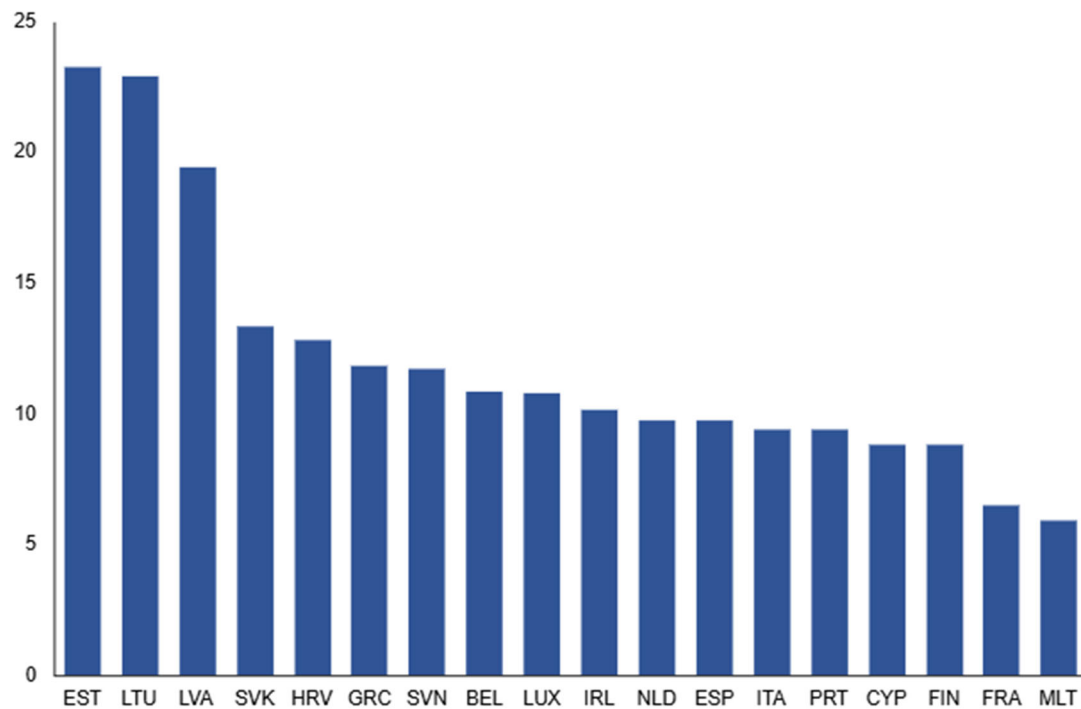
Important policy implications emerge from our analysis. First, policymakers need to recognize that pronounced inflation spikes produce significant redistributive effects across household groups, with the poorest quintile bearing the largest welfare losses in most of the economies analyzed. Policy measures—particularly social benefit programs to support households facing rising living costs—should therefore prioritize these vulnerable households and account for inflation's effects on real as well as financial assets. Because real assets and behavioral responses substantially shape household welfare, they can also carry broader consequences for aggregate consumption and investment decisions in the economy.

Several avenues for further research warrant exploration. For instance, one could assume that, in the absence of inflation, the growth in nominal household income and wealth equals real GDP growth, allowing for isolation of the real valuation effects beyond inflation. This assumption would help better disentangle the quantification of inflation impacts from other valuation changes. Future studies could also deepen the understanding of inflation's distributional effects by incorporating real assets and accounting for behavioral effects, particularly in emerging markets and developing economies. Additionally, it could be relevant to analyze how these results may shift in scenarios of persistently high inflation or hyperinflation, in which households and the financial sector must adapt to an economy characterized by severely distorted relative prices.

Figures and Tables

Figure 1. HCPI Inflation for Sampled European Economies, 2021:Q3–2022:Q2

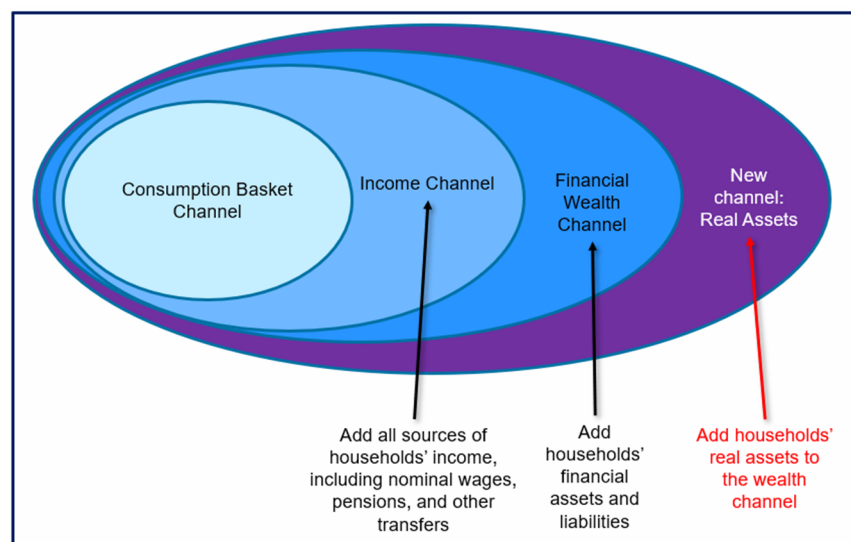
(Percent; year-on-year inflation)



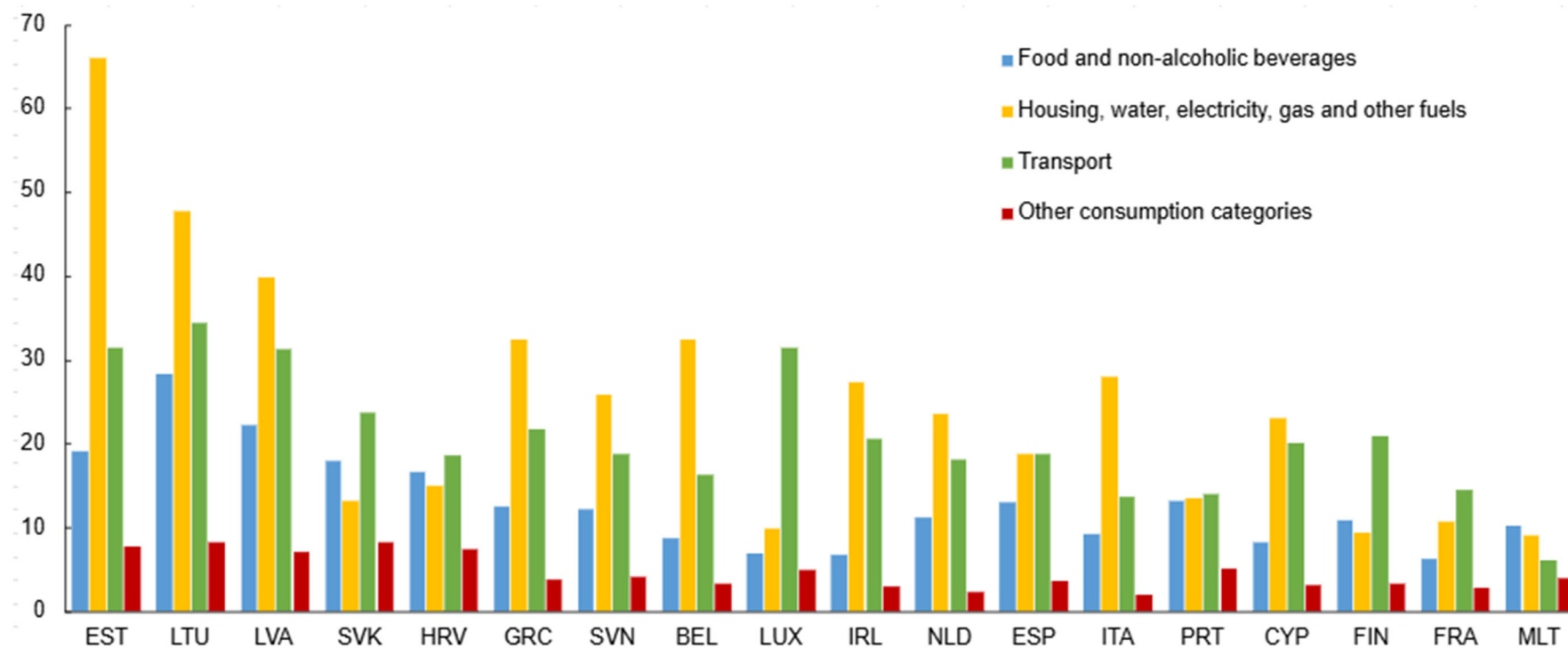
Source: Eurostat database; and authors' calculation.

Note: The chart shows the average monthly inflation during July 2021 and June 2022.

Figure 2. Channels Through Which Inflation Affects Households' Welfare



Source: Authors' analysis.

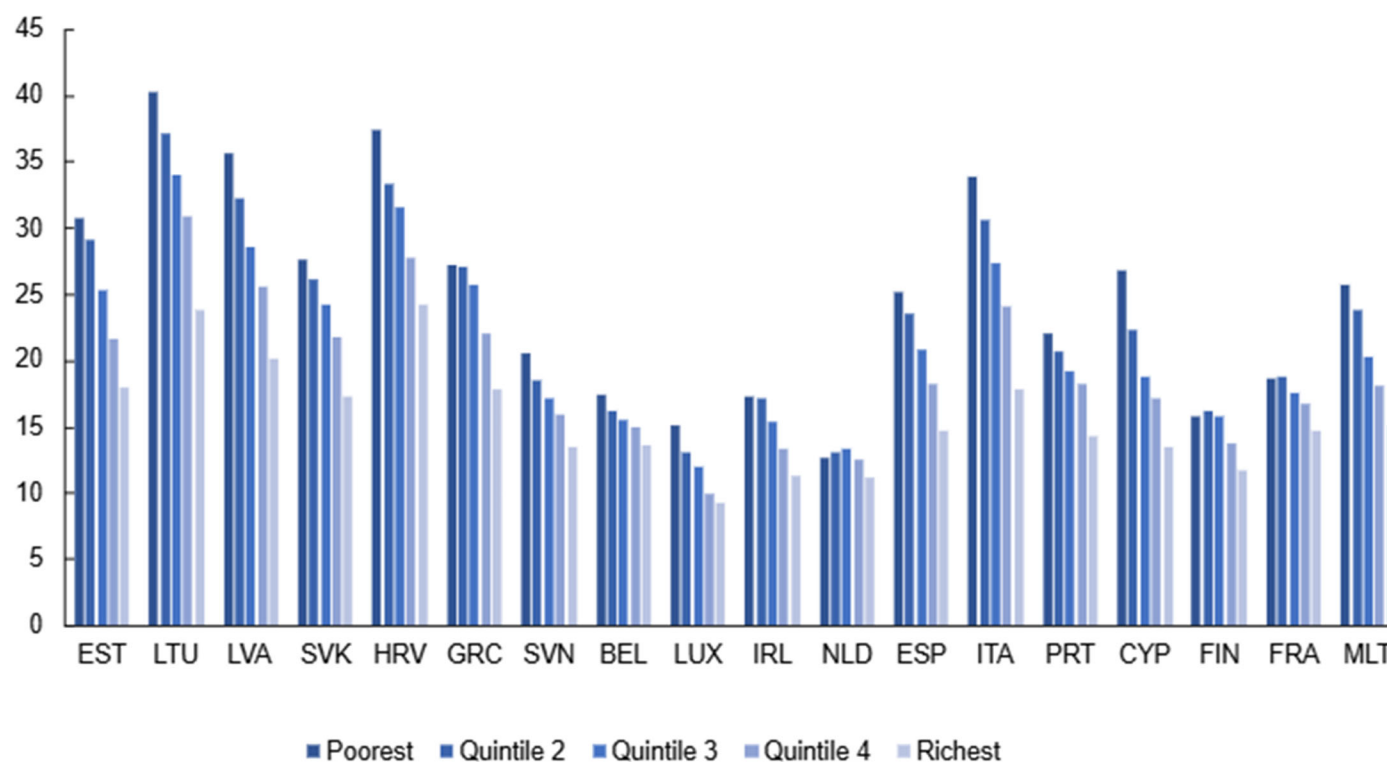
Figure 3. Changes in Prices Across 18 European Economies, 2021:Q3–2022:Q2

Source: Eurostat, Authors' calculations.

Note: The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

Figure 4. Budget Share in Microdata for 18 European Economies, 2021:Q3–2022:Q2

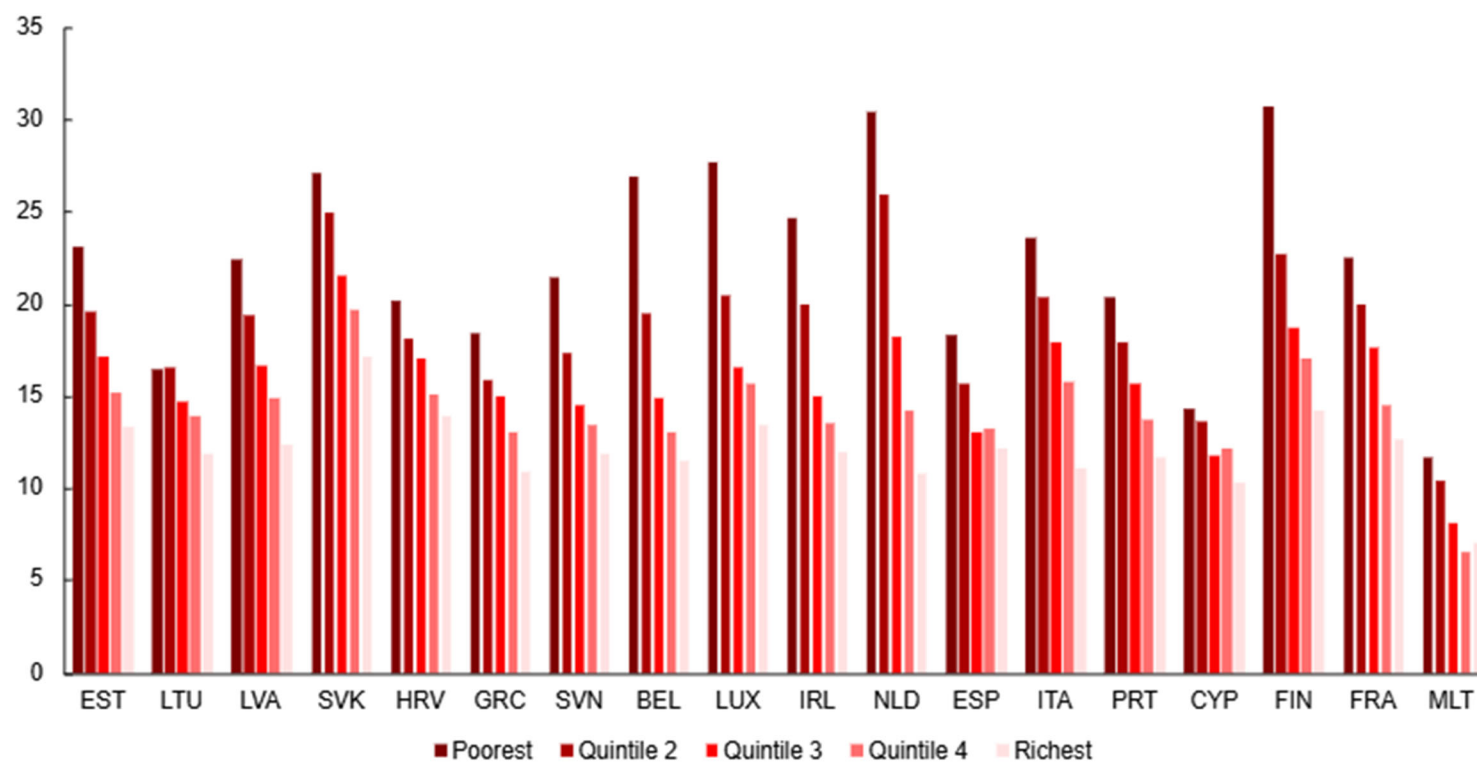
a. Food and non-alcoholic beverages (percent)



Source: Eurostat; authors' calculations.

Note: The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

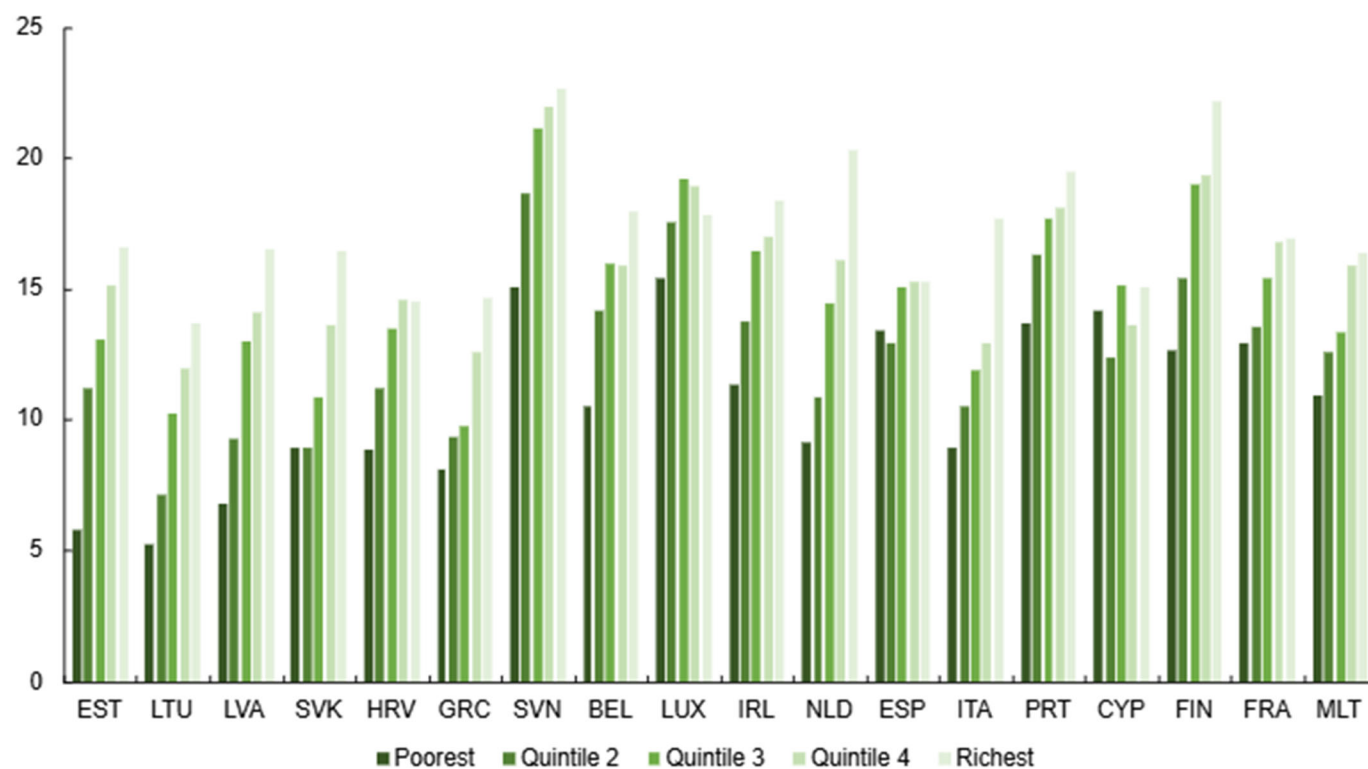
b. Housing, water, electricity, gas, and other fuels



Source: Eurostat; authors' calculations.

Note: The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

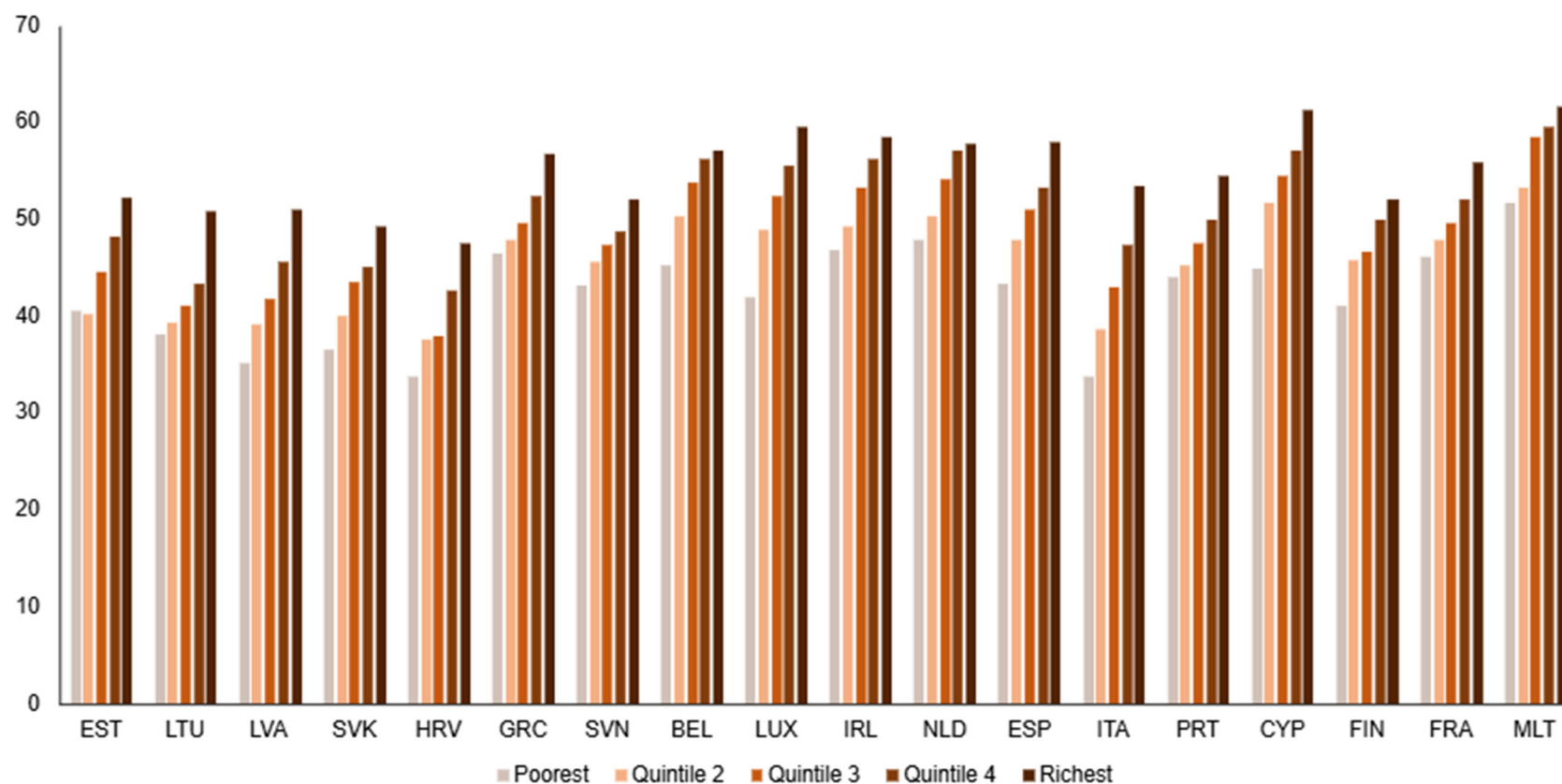
c. Transport



Source: Eurostat; authors' calculations.

Note: The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

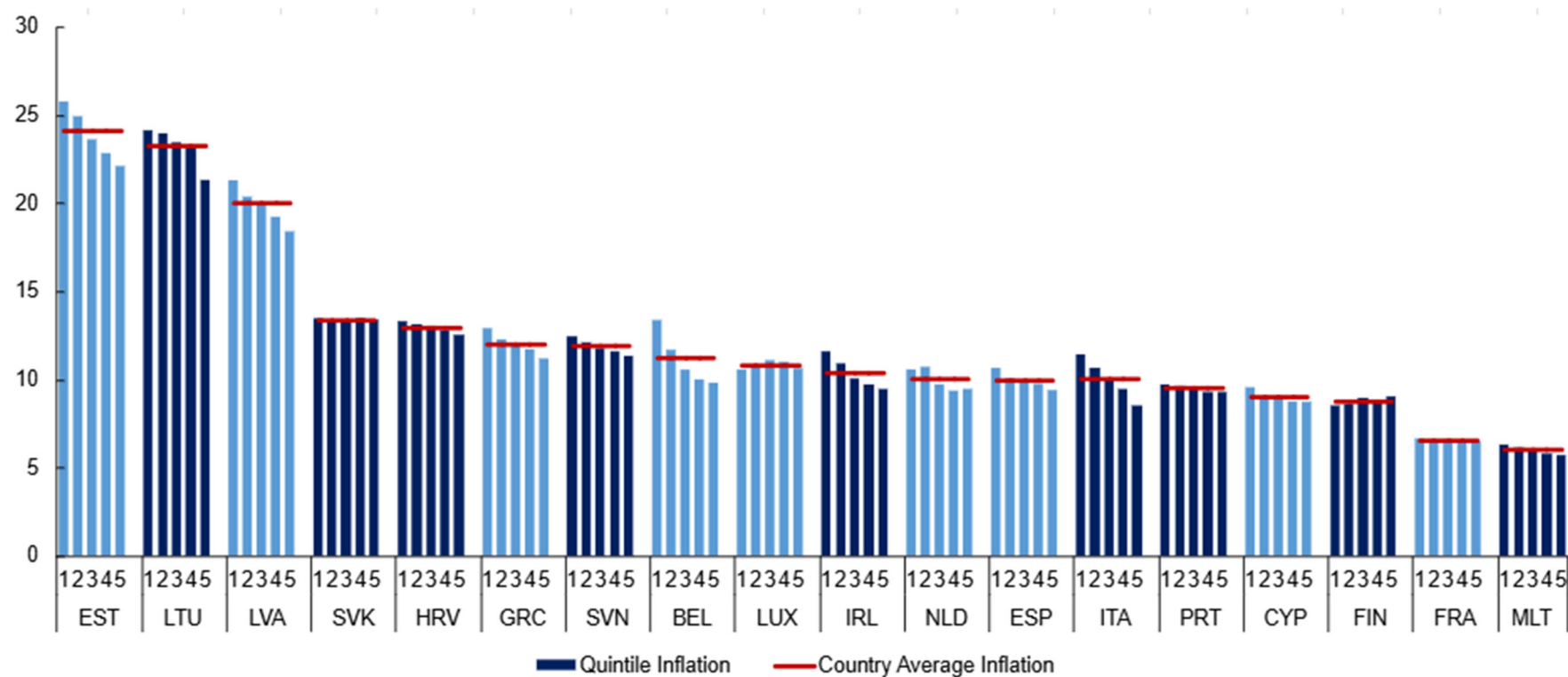
d. Other consumption categories



Source: Eurostat; authors' calculations.

Note: The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

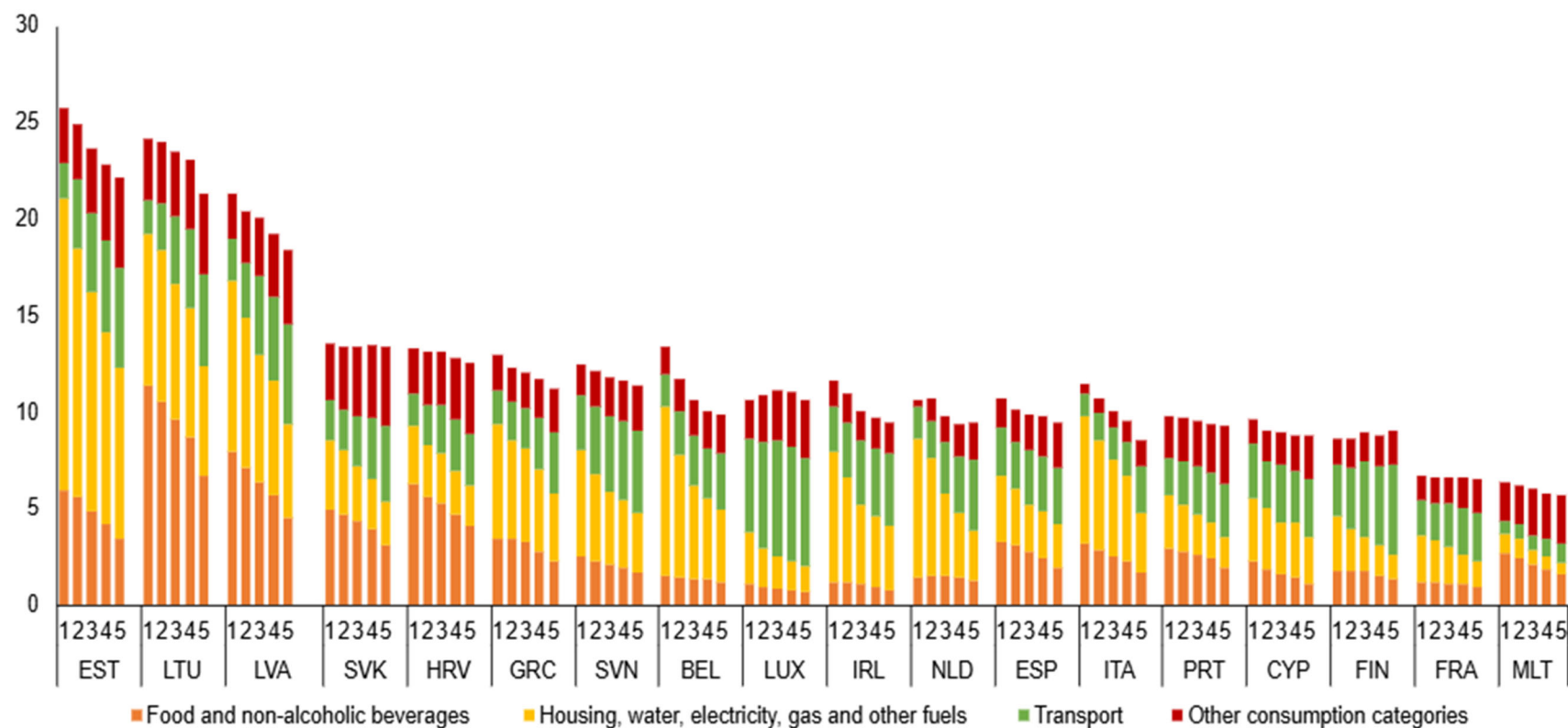
Figure 5. Household-Specific Levels of Inflation per Quintile, 2021:Q3–2022:Q2
(Percent)



Source: Eurostat, Authors' calculations.

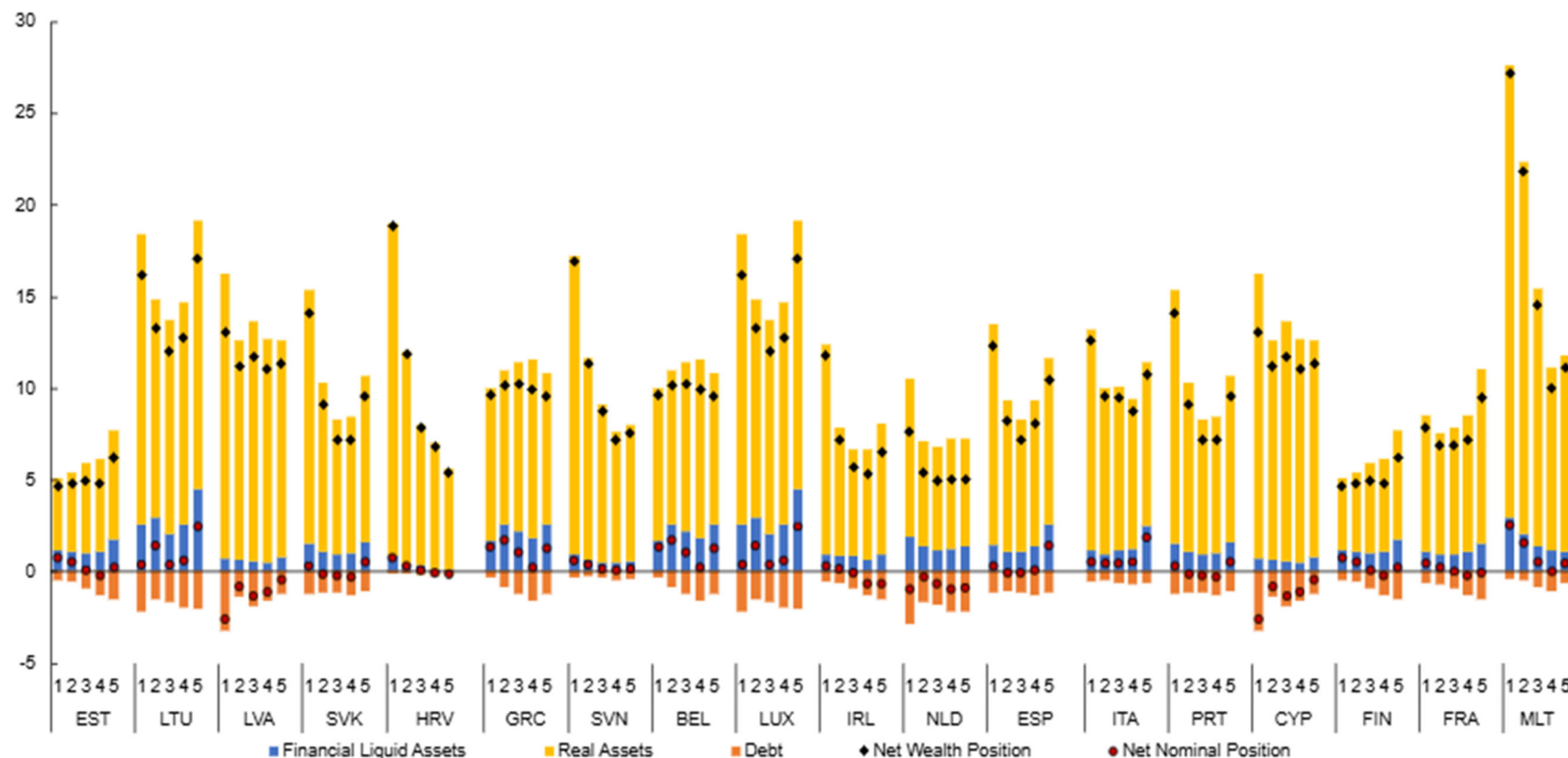
Note: The number in the horizontal axis represents the different income quintiles in each country from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

Figure 6. Household-Specific Levels of Inflation and Contributions by Consumption Goods per Quintile, 2021:Q3–2022:Q2 (Percent)



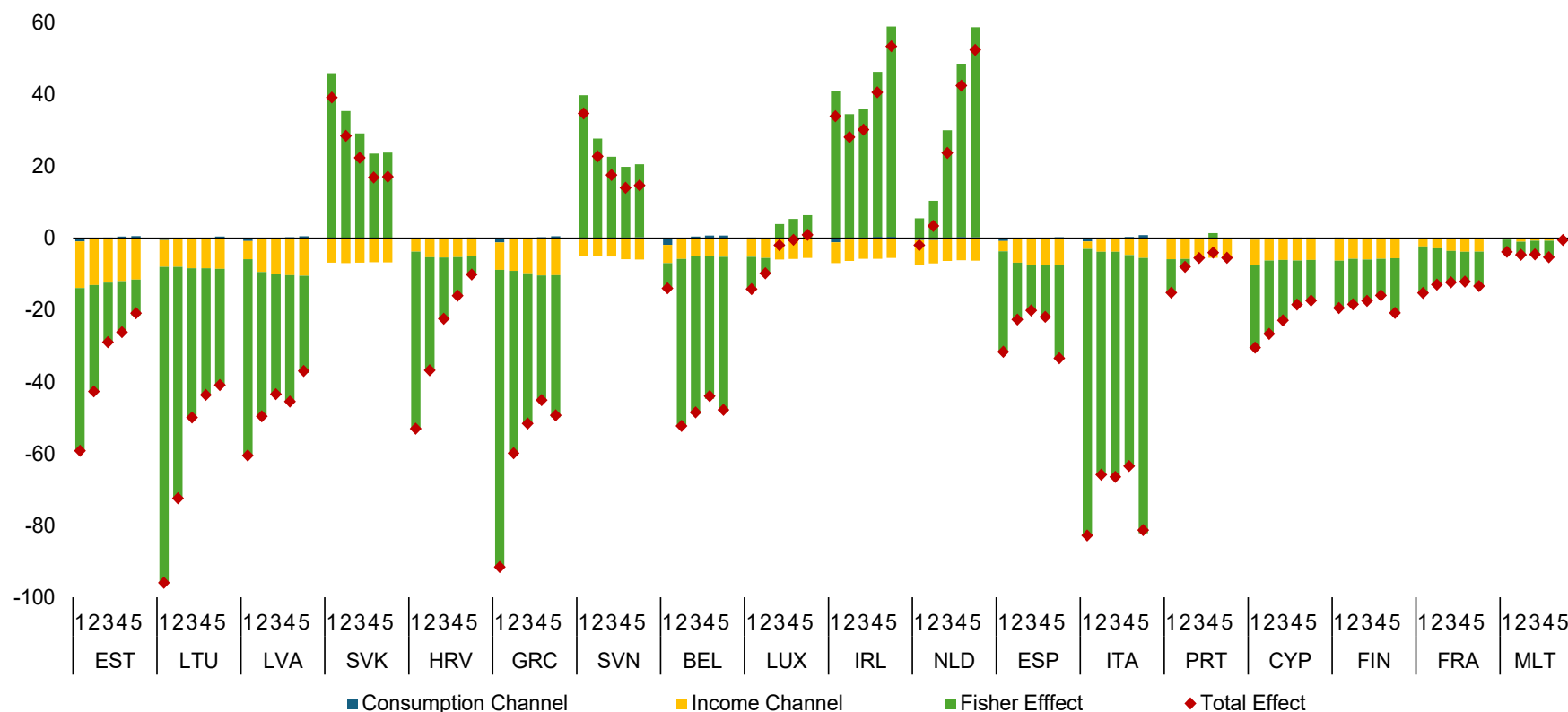
Source: Eurostat, Authors' calculations.

Note: The number in the horizontal axis represents the different income quintiles in each country from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

Figure 7. Wealth Contribution of Different Classes of Assets and Liabilities, 2021*(Ratio to annual household income)*

Source: Eurostat, Authors' calculations.

Note: The number in the horizontal axis represents the different income quintiles in each country from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

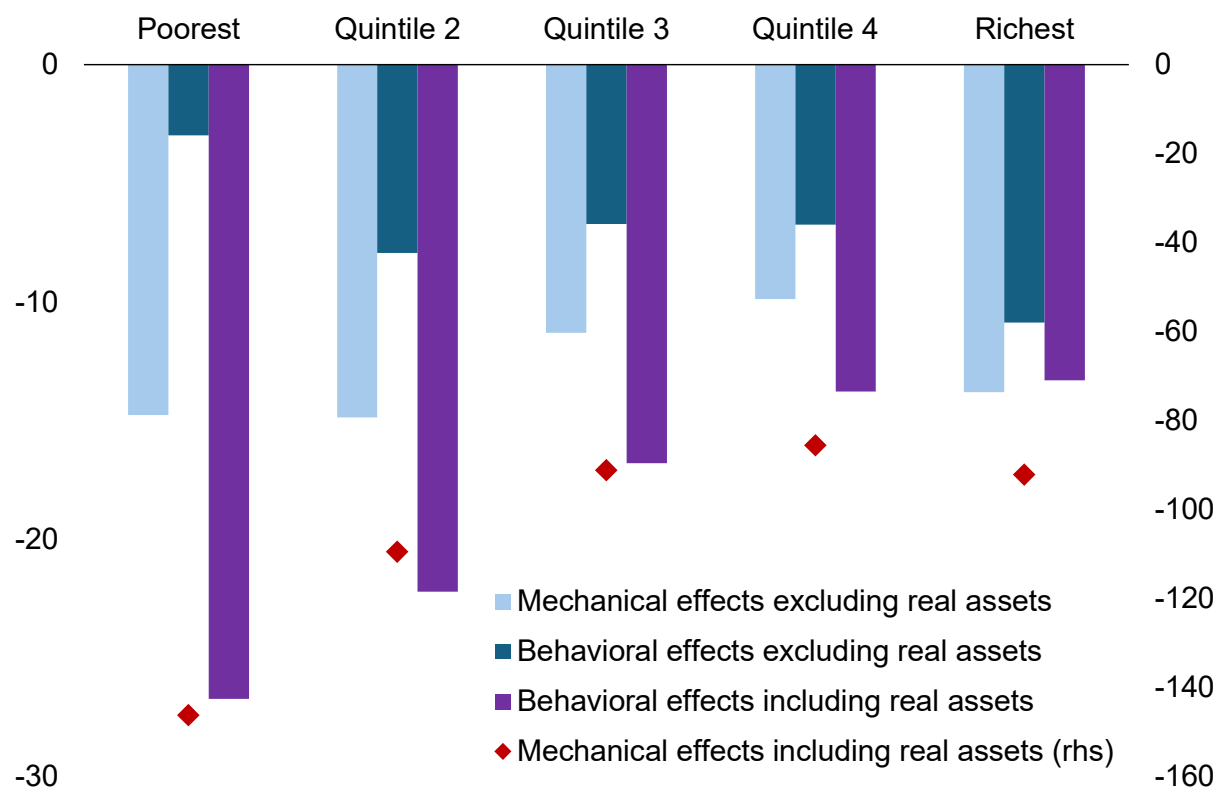
Figure 8. Combined Effect of the Different Channels, 2021:Q3–2022:Q2*(Percent of household income)*

Source: Eurostat, Authors' calculations.

Note: The number in the horizontal axis represents the different income quintiles in each country from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in accord with the level of inflation during the period sample. For the description of the country names' abbreviation in the horizontal axis, see the paper's glossary.

Figure 9. Combined Welfare Results for Average 18 EU economies With Different Assumptions Regarding Second-Round Effects and Wealth Definition, 2021:Q3–2022:Q2

(Percent of household income)



Source: Eurostat, Authors' calculations.

Note: The horizontal axis is measured by income quintiles.

Table 1. Changes in Well-Being Owing to the Consumption Basket Channel per Quintile, 2021:Q3–2022:Q2*(Percent of household income)*

Quintiles	1	2	3	4	5
Estonia	-1.0	-0.4	0.2	0.5	0.6
Lithuania	-0.5	-0.3	-0.1	0.1	0.5
Latvia	-0.9	-0.2	0.0	0.3	0.6
Slovakia	-0.1	0.0	0.0	0.0	0.0
Croatia	-0.3	-0.1	0.0	0.1	0.2
Greece	-1.2	-0.3	0.0	0.2	0.5
Slovenia	-0.5	-0.1	0.1	0.2	0.3
Belgium	-2.0	-0.3	0.5	0.8	0.8
Luxembourg	0.2	0.0	-0.2	-0.1	0.1
Ireland	-1.2	-0.4	0.2	0.4	0.4
Netherlands	-0.5	-0.5	0.2	0.4	0.2
Spain	-0.8	-0.1	0.1	0.1	0.3
Italy	-1.0	-0.4	0.0	0.3	0.9
Portugal	-0.2	-0.1	0.0	0.1	0.1
Cyprus	-0.5	0.0	0.1	0.2	0.2
Finland	0.2	0.1	-0.1	0.0	-0.2
France	-0.1	0.0	0.0	0.0	0.1
Malta	-0.3	-0.1	0.0	0.1	0.1
Mean	-0.6	-0.2	0.0	0.2	0.3
Median	-0.5	-0.1	0.0	0.2	0.3
St. Dev. ^a	0.6	0.2	0.1	0.2	0.3
Minimum	-2.0	-0.5	-0.2	-0.1	-0.2
Maximum	0.2	0.1	0.5	0.8	0.9

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. ^a St. Dev. = standard deviation.

Table 2. Changes in Well-Being Owing to the Income Channel per Quintile, 2021:Q3–2022:Q2*(Percent of household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral
Estonia	-19.4	-12.9	-19.4	-12.7	-19.4	-12.4	-19.4	-12.0	-19.4	-11.6
Lithuania	-18.9	-7.5	-18.9	-7.7	-18.9	-8.3	-18.9	-8.4	-18.9	-8.5
Latvia	-16.7	-5.1	-16.7	-9.3	-16.7	-10.0	-16.7	-10.3	-16.7	-10.4
Slovakia	-11.8	-6.7	-11.8	-6.9	-11.8	-6.8	-11.8	-6.7	-11.8	-6.7
Croatia	-11.5	-3.4	-11.5	-5.2	-11.5	-5.3	-11.5	-5.3	-11.5	-5.0
Greece	-10.7	-7.6	-10.7	-8.8	-10.7	-9.7	-10.7	-10.4	-10.7	-10.3
Slovenia	-10.6	-4.6	-10.6	-4.8	-10.6	-5.1	-10.6	-5.8	-10.6	-5.9
Belgium	-10.1	-5.1	-10.1	-5.4	-10.1	-5.0	-10.1	-4.9	-10.1	-5.1
Luxembourg	-9.8	-5.2	-9.8	-5.5	-9.8	-5.7	-9.8	-5.7	-9.8	-5.5
Ireland	-9.4	-5.8	-9.4	-6.0	-9.4	-5.7	-9.4	-5.7	-9.4	-5.5
Netherlands	-9.1	-6.9	-9.1	-6.5	-9.1	-6.3	-9.1	-6.1	-9.1	-6.3
Spain	-9.0	-2.9	-9.0	-6.7	-9.0	-7.3	-9.0	-7.4	-9.0	-7.5
Italy	-9.1	-2.1	-9.1	-3.4	-9.1	-3.8	-9.1	-4.7	-9.1	-5.5
Portugal	-8.7	-5.6	-8.7	-5.7	-8.7	-5.4	-8.7	-5.4	-8.7	-5.4
Cyprus	-8.3	-7.0	-8.3	-6.2	-8.3	-6.1	-8.3	-6.2	-8.3	-6.1
Finland	-8.0	-6.2	-8.0	-5.7	-8.0	-5.8	-8.0	-5.7	-8.0	-5.4
France	-6.2	-2.2	-6.2	-2.8	-6.2	-3.5	-6.2	-3.8	-6.2	-3.8
Malta	-5.7	0.0	-5.7	-0.9	-5.7	-0.7	-5.7	-0.7	-5.7	-0.5
Mean	-10.7	-5.4	-10.7	-6.1	-10.1	-6.3	-10.7	-6.4	-10.7	-6.4
Median	-9.6	-5.4	-9.6	-5.9	-9.6	-5.8	-9.6	-5.8	-9.6	-5.7
St. Dev. ^a	3.9	2.8	3.9	2.6	4.9	2.6	3.9	2.6	3.9	2.6
Minimum	-19.4	-12.9	-19.4	-12.7	-19.4	-12.4	-19.4	-12.0	-19.4	-11.6
Maximum	-5.7	0.0	-5.7	-0.9	2.2	-0.7	-5.7	-0.7	-5.7	-0.5

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. ^a St. Dev. = standard deviation. ^b The *behavioral* effects for the income channel uses changes in remunerations as explained in Section II.C.

Table 3. Changes in Well-Being Owing to the Wealth Channel Including Only Financial Assets per Income Quintile, 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral
Estonia	-22.3	-21.9	-18.3	-16.8	-5.2	-6.0	-4.6	-5.5	-2.2	-2.8
Lithuania	-2.3	-2.7	-2.0	-2.6	-0.3	-1.5	2.7	-0.5	3.5	-0.1
Latvia	-1.6	-0.6	-2.9	-0.8	-3.5	-1.1	-5.4	-1.3	-2.4	0.8
Slovakia	0.4	-3.0	0.5	-2.9	2.6	-2.8	2.3	-3.0	2.9	-2.7
Croatia	-8.6	4.5	-3.0	-1.8	-0.9	-0.7	1.3	0.7	1.7	0.7
Greece	0.5	2.8	-2.8	-1.8	-1.9	-1.2	-1.1	-1.0	-6.5	-6.5
Slovenia	-6.3	-1.5	-3.7	-0.3	-1.7	0.4	-0.5	1.3	-1.8	0.7
Belgium	-13.2	21.2	-17.2	-18.4	-10.1	-13.3	-2.0	-7.8	-13.0	-17.1
Luxembourg	-3.3	3.0	-13.6	-6.3	-3.7	-4.3	-5.9	-7.8	-23.5	-26.9
Ireland	-2.8	5.2	-1.4	5.7	1.0	8.9	6.3	13.9	6.1	12.6
Netherlands	8.9	27.2	3.1	12.3	6.1	10.1	8.9	8.0	8.0	2.6
Spain	-2.6	2.7	0.4	3.3	1.0	3.3	-0.7	1.2	-13.0	-11.3
Italy	-5.0	-5.7	-4.1	-4.9	-4.3	-5.7	-4.7	-6.6	-16.7	-19.3
Portugal	-2.7	2.6	1.1	3.1	2.2	3.0	2.4	2.7	-4.2	-1.3
Cyprus	21.3	22.2	6.7	6.6	11.2	9.7	9.2	6.5	3.5	1.8
Finland	-5.7	-4.3	-4.2	-4.0	-0.7	-2.1	1.9	-1.6	-1.5	-7.3
France	-2.5	-2.4	-1.1	-2.4	0.0	-3.2	1.6	-4.6	0.3	-9.2
Malta	-14.2	4.3	-9.0	2.5	-3.0	-2.1	0.0	-4.0	-2.5	-0.6
Mean	-3.4	3.0	-4.0	-1.6	-0.6	-0.5	0.7	-0.5	-3.4	-4.8
Median	-2.7	2.7	-2.9	-1.8	-0.8	-1.4	0.7	-1.2	-2.0	-2.0
St. Dev.	9.1	11.3	6.6	7.4	4.6	5.9	4.4	5.7	8.3	9.3
Minimum	-22.3	-21.9	-18.3	-18.4	-10.1	-13.3	-5.9	-7.8	-23.5	-26.9
Maximum	21.3	27.2	6.7	12.3	11.2	10.1	9.2	13.9	8.0	12.6

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section II.C. St. Dev. = standard deviation.

Table 4. Changes in Well-Being Owing to the Wealth Channel per Quintile (including real assets), 2021:Q3–2022:Q2
(Percent of annual household income)

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral
Estonia	-219.6	-45.3	-146.1	-29.6	-112.8	-16.8	-108.7	-14.6	-116.4	-9.9
Lithuania	-271.0	-88.0	-202.5	-64.5	-127.2	-41.6	-108.9	-35.3	-101.8	-32.8
Latvia	-125.7	-54.6	-91.0	-40.1	-76.3	-33.4	-82.9	-35.5	-65.4	-27.1
Slovakia	-140.1	46.0	-105.5	35.4	-83.3	29.2	-69.1	23.6	-66.8	23.8
Croatia	-216.3	-49.3	-136.0	-31.5	-89.4	-17.1	-77.8	-10.8	-61.5	-5.2
Greece	-145.1	-82.8	-87.9	-50.9	-73.1	-41.9	-62.3	-34.9	-69.5	-39.6
Slovenia	-179.1	39.8	-120.5	27.8	-92.9	22.6	-76.1	19.7	-80.1	20.4
Belgium	-97.2	-7.0	-102.3	-46.5	-103.4	-43.9	-100.4	-39.8	-96.4	-43.4
Luxembourg	-157.7	-9.1	-129.4	-4.3	-117.1	3.9	-123.9	5.4	-166.3	6.3
Ireland	-110.8	40.9	-67.6	34.5	-53.4	35.8	-50.0	46.0	-61.3	58.6
Netherlands	-69.1	5.5	-49.1	10.4	-45.1	29.9	-45.5	48.3	-45.7	58.5
Spain	-111.2	-28.0	-73.9	-15.9	-64.5	-12.9	-72.6	-14.6	-94.2	-26.2
Italy	-114.6	-79.8	-86.8	-62.1	-86.0	-62.7	-79.2	-59.1	-97.9	-76.7
Portugal	-122.3	-9.3	-78.7	-2.2	-62.2	0.0	-62.1	1.3	-83.0	-0.2
Cyprus	-107.4	-23.0	-92.6	-20.5	-96.5	-16.9	-91.3	-12.4	-93.8	-11.4
Finland	-37.2	-13.4	-38.7	-12.8	-39.8	-11.5	-38.8	-10.2	-49.6	-15.2
France	-48.2	-13.0	-42.1	-10.1	-42.5	-8.8	-44.3	-8.3	-58.1	-9.7
Malta	-153.9	-3.4	-123.6	-3.7	-82.4	-3.8	-56.5	-4.7	-63.0	-0.1
Mean	-134.8	-20.8	-98.6	-15.9	-80.4	-10.5	-75.0	-7.6	-81.7	-7.2
Median	-124.0	-13.2	-91.8	-14.3	-82.8	-12.2	-74.3	-10.5	-74.8	-9.8
St. Dev.	59.7	40.6	40.7	30.7	25.9	27.9	24.4	28.8	28.9	33.7
Minimum	-271.0	-88.0	-202.5	-64.5	-127.2	-62.7	-123.9	-59.1	-166.3	-76.7
Maximum	-37.2	46.0	-38.7	35.4	-39.8	35.8	-38.8	48.3	-45.7	58.6

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section II.C. St. Dev. = standard deviation.

Table 5. Total changes in Well-Being per Quintile (including only financial assets), 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral
Estonia	-42.7	-35.8	-38.0	-29.8	-24.4	-18.2	-23.5	-17.0	-20.9	-13.7
Lithuania	-21.7	-10.7	-21.2	-10.5	-19.3	-9.9	-16.1	-8.8	-14.9	-8.2
Latvia	-19.2	-6.4	-19.8	-10.3	-20.2	-11.1	-21.7	-11.4	-18.5	-9.1
Slovakia	-11.4	-9.8	-11.2	-9.8	-9.1	-9.6	-9.5	-9.7	-8.9	-9.5
Croatia	-20.4	0.8	-14.5	-7.1	-12.5	-6.1	-10.0	-4.5	-9.6	-4.1
Greece	-11.5	-6.0	-13.7	-10.8	-12.6	-11.0	-11.5	-11.1	-16.7	-16.2
Slovenia	-17.4	-6.5	-14.4	-5.2	-12.2	-4.6	-11.0	-4.3	-12.1	-5.0
Belgium	-25.3	14.3	-27.6	-24.1	-19.7	-17.8	-11.3	-12.0	-22.3	-21.5
Luxembourg	-12.9	-2.0	-23.4	-11.8	-13.6	-10.2	-15.7	-13.7	-33.2	-32.3
Ireland	-13.4	-1.7	-11.2	-0.7	-8.2	3.4	-2.7	8.6	-2.9	7.4
Netherlands	-0.7	19.7	-6.5	5.3	-2.8	3.9	0.2	2.3	-0.9	-3.5
Spain	-12.4	-0.9	-8.7	-3.5	-8.0	-4.0	-9.6	-6.1	-21.8	-18.5
Italy	-15.1	-8.7	-13.6	-8.7	-13.4	-9.4	-13.5	-10.9	-24.8	-23.9
Portugal	-11.6	-3.2	-7.7	-2.7	-6.5	-2.4	-6.2	-2.6	-12.7	-6.6
Cyprus	12.6	14.8	-1.6	0.5	3.0	3.7	1.1	0.4	-4.6	-4.1
Finland	-13.5	-10.4	-12.1	-9.5	-8.9	-8.0	-6.2	-7.3	-9.7	-12.8
France	-8.8	-4.7	-7.3	-5.2	-6.2	-6.7	-4.6	-8.4	-5.8	-12.9
Malta	-20.2	4.0	-14.8	1.6	-8.6	-2.7	-5.5	-4.6	-8.0	-1.0
Mean	-14.8	-3.0	-14.8	-7.9	-11.3	-6.7	-9.9	-6.7	-13.8	-10.9
Median	-13.5	-4.0	-13.7	-7.9	-10.7	-7.4	-9.8	-7.8	-12.4	-9.3
St. Dev.	11.0	12.1	8.6	8.5	6.7	6.4	6.7	6.2	8.6	9.4
Minimum	-42.7	-35.8	-38.0	-29.8	-24.4	-18.2	-23.5	-17.0	-33.2	-32.3
Maximum	12.6	19.7	-1.6	5.3	3.0	3.9	1.1	8.6	-0.9	7.4

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section II.C. St. Dev. = standard deviation.

Table 6. Total changes in Well-Being per Quintile (including real assets), 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral	Mechanical	Behavioral
Estonia	-240.0	-59.2	-165.9	-42.7	-132.0	-29.0	-127.6	-26.1	-135.2	-20.9
Lithuania	-290.4	-95.9	-221.7	-72.4	-146.1	-50.0	-127.8	-43.6	-120.2	-40.9
Latvia	-143.3	-60.5	-107.8	-49.6	-92.9	-43.4	-99.3	-45.5	-81.5	-37.0
Slovakia	-151.9	39.2	-117.2	28.5	-95.1	22.4	-80.9	16.9	-78.6	17.1
Croatia	-228.1	-53.0	-147.6	-36.8	-101.0	-22.4	-89.2	-16.0	-72.8	-10.1
Greece	-157.1	-91.6	-98.8	-59.9	-83.8	-51.6	-72.8	-45.0	-79.7	-49.3
Slovenia	-190.2	34.8	-131.3	22.8	-103.5	17.6	-86.5	14.1	-90.5	14.7
Belgium	-109.3	-14.0	-112.7	-52.2	-113.0	-48.5	-109.7	-44.0	-105.7	-47.8
Luxembourg	-167.3	-14.1	-139.2	-9.8	-127.1	-2.0	-133.7	-0.4	-176.0	0.9
Ireland	-121.4	34.0	-77.3	28.2	-62.6	30.3	-59.0	40.7	-70.3	53.4
Netherlands	-78.7	-1.9	-58.7	3.4	-54.0	23.8	-54.2	42.5	-54.6	52.5
Spain	-121.0	-31.6	-83.1	-22.7	-73.5	-20.1	-81.5	-21.9	-103.0	-33.4
Italy	-124.7	-82.8	-96.3	-65.8	-95.1	-66.5	-87.9	-63.5	-106.0	-81.3
Portugal	-131.2	-15.2	-87.5	-8.0	-70.9	-5.5	-70.7	-4.0	-91.5	-5.4
Cyprus	-116.1	-30.4	-100.8	-26.6	-104.7	-22.9	-99.4	-18.5	-101.9	-17.4
Finland	-45.1	-19.4	-46.6	-18.4	-48.0	-17.4	-46.9	-16.0	-57.8	-20.8
France	-54.4	-15.3	-48.3	-12.9	-48.7	-12.3	-50.4	-12.1	-64.3	-13.4
Malta	-159.9	-3.8	-129.4	-4.6	-88.0	-4.5	-62.1	-5.3	-68.5	-0.5
Mean	-146.1	-26.7	-109.5	-22.2	-91.1	-16.8	-85.5	-13.8	-92.1	-13.3
Median	-137.2	-17.3	-104.3	-20.5	-94.0	-18.8	-84.0	-16.0	-86.0	-15.4
St. Dev.	62.5	41.1	43.3	31.3	28.3	28.5	26.8	29.4	30.2	34.2
Minimum	-290.4	-95.9	-221.7	-72.4	-146.1	-66.5	-133.7	-63.5	-176.0	-81.3
Maximum	-45.1	39.2	-46.6	28.5	-48.0	30.3	-46.9	42.5	-54.6	53.4

Source: Eurostat, Authors' calculations.

Note: The different income quintiles in each country are represented from 1 (poorest quintile) to 5 (richest quintile). The list of countries is presented in descending order of level of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section II.C. St. Dev. = standard deviation.

Annex A. Alternative Scenario with Market Price Adjustments Only

A.1. Alternative Assumption Including Only Market Price Effects on the *Wealth Channel*

To examine how welfare outcomes differ from the baseline scenario that includes behavioral effects, this section analyzes the wealth channel and household welfare under the assumption that only market price adjustments occur on financial assets, real assets, and liabilities. This scenario excludes behavioral responses on real assets and liability contraction or liquidation. For financial assets, we use returns across Europe as opposed to focusing on individual countries.

By comparing this simplified scenario to our main estimations, we can isolate how the behavioral effects of our main estimations modify the sole impact of market price adjustments on assets and liabilities. In principle, these behavioral responses may either amplify or dampen the effects of market price changes examined on this annex.

For changes in market prices of financial assets, we utilize the average change in deposits at the country level, drawn from the European Central Bank's MIR-MFI Interest Rate Statistics. Specifically, we focus on the variable: *Euro-denominated deposits with an agreed maturity of more than one year from euro area households (percentages per annum, rates on new business)*.¹ Changes in financial asset values related to stocks are based on average returns from European financial markets, operating under the assumption that households can freely reallocate their financial assets to maximize returns across integrated financial markets without significant barriers to cross-border investment. This index applies to all financial assets except deposits and is sourced from Bloomberg.

On the liability side, we account for changes in interest rates at the country's level between the beginning and the end of the sample period. Additionally, we assume that households do not acquire new debt or engage in early repayment of existing liabilities as a strategy to adjust to inflationary shocks.

For real assets, the valuation of the initial stock of real assets—retrieved from the Eurosystem HFCFS dataset—is calculated using the quarterly available Housing Price Index from the European Central Bank.² The valuation in house prices is determined by the change in the quarterly average value of that index between 2021:Q3 and 2022:Q2, discounted for inflation in a manner consistent with the last term of Equation 7 introduced in Section II.B.³

Tables A1 to A4 present the results of these alternative analyses for the wealth channel and total welfare, by either excluding or including real assets.

¹ This dataset is available at:

<https://data.ecb.europa.eu/data/datasets/MIR?dataset%5B0%5D=MFI%20Interest%20Rate%20Statistics%20%28MIR%29&filterSequence=dataset&advFilterDataset%5B0%5D=MFI%20Interest%20Rate%20Statistics%20%28MIR%29>.

² The dataset can be obtained at <https://data.ecb.europa.eu/data/data-categories/prices-macroeconomic-and-sectoral-statistics/other-prices-and-costs/property-prices/residential-property-prices>.

³ To make a precise parallel with Equation 7, the term $\beta_{\pi>0}^h$ is assumed to be equal to 1 in our calculations in this section.

A.2. Wealth Channel and Combined Well-Being Effect with Financial Assets Under Market Price Adjustments Only

When considering only financial assets, the average wealth and welfare losses are slightly lower under this alternative assumption compared to the baseline estimation. Table A1 illustrates the wealth effect of the inflationary spike when analyzing financial assets and liabilities across all countries and income quintiles. The average wealth loss reported in this table is 0.7 percentage points lower than the average loss observed in the baseline scenario. This reduction can be attributed to the less restrictive assumptions regarding returns across Europe (as opposed to focusing on individual countries) and the fact that interest rates on liabilities are not adjusted for inflation.

However, this overall average conceals significant heterogeneity in outcomes. In 8 countries within the sample (e.g., Ireland, Latvia, and the Netherlands), where the valuation of stock prices is higher than the European average, the average wealth loss across quintiles is lower in the baseline simulation than in this alternative scenario.

Furthermore, the baseline scenario generally results in a less negative wealth effect for lower income quintiles, while higher quintiles tend to benefit relatively more under the alternative model. This discrepancy arises because households in the lower quintiles are typically net creditors and therefore carry limited debt. As a result, they are less impacted by the inflation adjustment of liabilities in the baseline scenario compared to the corrections made in this alternative analysis. Additionally, these households may experience greater asset adjustments when using country-specific data on stock markets rather than the aggregated European values applied here.

Given the magnitude of these wealth effects, particularly when focusing on the market effects, we observe similar trends for overall well-being (or welfare) effects (Table A2). The primary distinction in overall welfare outcomes is that, with the inclusion of predominantly negative income and consumption basket effects across countries and quintiles, total welfare results in an average loss across the income quintiles for most countries, with the exceptions of Cyprus and the Netherlands. Under this alternative assumption, the average welfare effect across countries and quintiles exhibits an inverted U-shape when only financial assets are considered in the household balance sheet. Moreover, regarding overall impacts across countries and quintiles, due to the wealth channel, the average welfare loss is lower under this assumption (-6.4 percent of annual household income) compared to the baseline (-7 percent of annual household income).

The next section will present the same results while incorporating real assets into the analysis.

A.3. Combined Well-Being Effect Including Real Assets Under Market Price Adjustments Only

Wealth and welfare effects are again less negative than in the baseline estimations when analyzing the outcomes of the alternative scenario that includes real assets. While the mechanical effects in Table A3 remain consistent with those in Table 4, the market price effects are significantly less negative across income quintiles. For the full sample (across countries and quintiles), the average wealth channel effect under these alternative assumptions results in a wealth loss of only 1.2 percent of annual household income, compared to a loss of 12.4 percent in the baseline estimation. The adjustment in real assets, particularly through house prices, leads to an average wealth gain for households in the poorest income quintile, thereby improving their wealth effects relative to scenarios that include only financial assets.

In terms of welfare quantification under this alternative scenario with real assets, the results are again less negative than those in the baseline scenario. Table A4 reveals an average well-being loss of 7.4 percent of annual household income, which aligns more closely with other estimates found in the literature (see, for example, Pallotti and others, 2024). This outcome is linked to a reduced welfare loss stemming from both financial and real asset wealth. Under the alternative assumptions, the second and third quintiles are the most affected by inflation, rather than the poorest quintile.

On average, across all countries, welfare effects display a non-linear oscillation between different income quintiles. In this alternative scenario with real assets, only four countries (Croatia, France, Lithuania, and Slovakia) show a monotonic decrease in welfare losses for higher quintiles, indicating that the poorest households are not consistently the most impacted by inflation. In fact, in seven countries within our sample, the poorest income quintile experiences either a lower welfare loss or a higher welfare gain than the richest quintile. In this scenario, with the assumptions regarding financial assets and liabilities and the adjustments to real assets based on house price valuations, five countries (Ireland, Luxembourg, the Netherlands, Portugal, and Slovenia) report positive welfare gains across all income quintiles in response to the inflationary spike.

The results derived from these alternative assumptions further highlight the sensitivity of households' welfare effects to the assumptions and adjustments made when accounting for wealth behavioral and/or market price effects, including through real assets. While the welfare effects of the inflation spike remain negative, they may be less severe than the baseline estimation of -18.5 percent of annual household income, depending on the specific assumptions and the impacts of inflation on wealth.

This sensitivity and variability suggest that economic conclusions—such as “inflation implies a redistribution from older households (net creditors) to younger households (net borrowers)” or “the poorest are typically the most affected by inflation”—must be substantially qualified, necessitating a detailed analysis of each country's specific context.

Table A1. Changes in the Wealth Channel per Quintile (including only financial assets) With Market Prices Adjustment, 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price
Estonia	-22.3	-20.1	-18.3	-15.8	-5.2	-4.1	-4.6	-2.0	-2.2	0.2
Lithuania	-2.3	-1.9	-2.0	-1.7	-0.3	-0.1	2.7	2.7	3.5	3.6
Latvia	-1.6	-1.5	-2.9	-2.7	-3.5	-3.3	-5.4	-4.5	-2.4	-1.7
Slovakia	0.4	0.5	0.5	0.6	2.6	2.7	2.3	2.4	2.9	3.0
Croatia	-8.6	-7.9	-3.0	-2.6	-0.9	-0.5	1.3	1.4	1.7	1.6
Greece	0.5	0.7	-2.8	-2.7	-1.9	-1.8	-1.1	-0.9	-6.5	-5.9
Slovenia	-6.3	-5.4	-3.7	-3.2	-1.7	-1.2	-0.5	0.3	-1.8	-0.8
Belgium	-13.2	-8.5	-17.2	-10.8	-10.1	-4.5	-2.0	2.3	-13.0	-5.4
Luxembourg	-3.3	2.7	-13.6	-6.8	-3.7	0.2	-5.9	1.0	-23.5	-8.5
Ireland	-2.8	-2.2	-1.4	-0.7	1.0	1.9	6.3	6.8	6.1	7.3
Netherlands	8.9	9.7	3.1	3.6	6.1	6.5	8.9	9.6	8.0	9.1
Spain	-2.6	0.1	0.4	1.8	1.0	2.3	-0.7	1.8	-13.0	-4.3
Italy	-5.0	-3.3	-4.1	-2.7	-4.3	-2.3	-4.7	-2.1	-16.7	-9.2
Portugal	-2.7	-2.3	1.1	1.4	2.2	2.5	2.4	2.8	-4.2	-2.3
Cyprus	21.3	21.3	6.7	6.8	11.2	11.1	9.2	9.1	3.5	3.9
Finland	-5.7	-3.1	-4.2	-1.4	-0.7	2.4	1.9	6.0	-1.5	8.1
France	-2.5	-1.8	-1.1	-0.6	0.0	0.6	1.6	2.6	0.3	3.6
Malta	-14.2	-9.2	-9.0	-4.8	-3.0	-0.7	0.0	1.6	-2.5	0.6
Mean	-3.4	-1.8	-4.0	-2.3	-0.6	0.6	0.7	2.3	-3.4	0.2
Median	-2.7	-2.0	-2.9	-2.2	-0.8	0.0	0.7	2.1	-2.0	0.4
St. Dev. ^a	9.1	8.4	6.6	5.1	4.6	3.8	4.4	3.7	8.3	5.4
Minimum	-22.3	-20.1	-18.3	-15.8	-10.1	-4.5	-5.9	-4.5	-23.5	-9.2
Maximum	21.3	21.3	6.7	6.8	11.2	11.1	9.2	9.6	8.0	9.1

Source: Eurostat, Authors' calculations.

Note: The list of countries is presented in descending order of level of inflation size during the period sample. The calculations for the *behavioral* effects are explained in Section VII.A.

Table A2. Total changes in Well-Being per Quintile (including only financial assets) With Market Price Adjustment, 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price
Estonia	-42.7	-33.9	-38.0	-28.9	-24.4	-16.3	-23.5	-13.5	-20.9	-10.7
Lithuania	-21.7	-9.9	-21.2	-9.7	-19.3	-8.5	-16.1	-5.6	-14.9	-4.5
Latvia	-19.2	-7.3	-19.8	-12.2	-20.2	-13.3	-21.7	-14.5	-18.5	-11.5
Slovakia	-11.4	-6.3	-11.2	-6.3	-9.1	-4.1	-9.5	-4.3	-8.9	-3.7
Croatia	-20.4	-11.6	-14.5	-7.9	-12.5	-5.9	-10.0	-3.8	-9.6	-3.2
Greece	-11.5	-8.1	-13.7	-11.7	-12.6	-11.6	-11.5	-11.1	-16.7	-15.7
Slovenia	-17.4	-10.5	-14.4	-8.1	-12.2	-6.2	-11.0	-5.4	-12.1	-6.5
Belgium	-25.3	-15.4	-27.6	-16.5	-19.7	-9.1	-11.3	-1.8	-22.3	-9.8
Luxembourg	-12.9	-2.3	-23.4	-12.3	-13.6	-5.7	-15.7	-4.8	-33.2	-13.9
Ireland	-13.4	-9.1	-11.2	-7.1	-8.2	-3.6	-2.7	1.4	-2.9	2.2
Netherlands	-0.7	2.3	-6.5	-3.4	-2.8	0.4	0.2	3.8	-0.9	3.0
Spain	-12.4	-3.6	-8.7	-5.0	-8.0	-5.0	-9.6	-5.5	-21.8	-11.5
Italy	-15.1	-6.3	-13.6	-6.5	-13.4	-6.1	-13.5	-6.5	-24.8	-13.8
Portugal	-11.6	-8.2	-7.7	-4.4	-6.5	-2.9	-6.2	-2.5	-12.7	-7.5
Cyprus	12.6	13.8	-1.6	0.6	3.0	5.1	1.1	3.1	-4.6	-2.0
Finland	-13.5	-9.1	-12.1	-7.0	-8.9	-3.6	-6.2	0.3	-9.7	2.5
France	-8.8	-4.0	-7.3	-3.4	-6.2	-2.9	-4.6	-1.1	-5.8	-0.1
Malta	-20.2	-9.5	-14.8	-5.8	-8.6	-1.4	-5.5	1.1	-8.0	0.3
Mean	-14.8	-7.7	-14.8	-8.6	-11.3	-5.6	-9.9	-3.9	-13.8	-5.9
Median	-13.5	-8.1	-13.7	-7.0	-10.7	-5.3	-9.8	-4.0	-12.4	-5.5
St. Dev. ^a	11.0	9.1	8.6	6.4	6.7	5.0	6.7	5.2	8.6	6.2
Minimum	-42.7	-33.9	-38.0	-28.9	-24.4	-16.3	-23.5	-14.5	-33.2	-15.7
Maximum	12.6	13.8	-1.6	0.6	3.0	5.1	1.1	3.8	-0.9	3.0

Source: Eurostat, Authors' calculations.

Note: The list of countries is presented in descending order of levels of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section VII.A.

Table A3. Changes in Well-Being Owing to the Wealth Channel per Quintile (including real assets) With Market Price Adjustment, 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price
Estonia	-219.6	25.5	-146.1	13.6	-112.8	20.6	-108.7	21.8	-116.4	26.2
Lithuania	-271.0	-15.0	-202.5	-11.5	-127.2	-6.4	-108.9	-2.8	-101.8	-1.6
Latvia	-125.7	-17.9	-91.0	-14.9	-76.3	-13.4	-82.9	-15.4	-65.4	-10.5
Slovakia	-140.1	-3.4	-105.5	-2.3	-83.3	0.3	-69.1	0.4	-66.8	1.1
Croatia	-216.3	-7.3	-136.0	-2.3	-89.4	-0.2	-77.8	1.6	-61.5	1.8
Greece	-145.1	-22.9	-87.9	-16.6	-73.1	-13.6	-62.3	-11.1	-69.5	-16.4
Slovenia	-179.1	50.8	-120.5	35.0	-92.9	28.7	-76.1	25.2	-80.1	25.0
Belgium	-97.2	-45.6	-102.3	-48.6	-103.4	-45.8	-100.4	-41.1	-96.4	-42.3
Luxembourg	-157.7	32.5	-129.4	15.6	-117.1	22.2	-123.9	24.0	-166.3	19.2
Ireland	-110.8	54.1	-67.6	33.9	-53.4	30.2	-50.0	36.0	-61.3	42.4
Netherlands	-69.1	70.6	-49.1	44.2	-45.1	46.2	-45.5	51.7	-45.7	50.7
Spain	-111.2	-19.7	-73.9	-12.3	-64.5	-10.2	-72.6	-11.9	-94.2	-19.9
Italy	-114.6	-64.5	-86.8	-49.5	-86.0	-48.8	-79.2	-44.9	-97.9	-56.2
Portugal	-122.3	64.9	-78.7	46.2	-62.2	38.6	-62.1	38.9	-83.0	41.9
Cyprus	-107.4	-63.5	-92.6	-58.0	-96.5	-59.2	-91.3	-56.5	-93.8	-59.5
Finland	-37.2	-27.0	-38.7	-27.5	-39.8	-27.2	-38.8	-24.6	-49.6	-28.1
France	-48.2	1.1	-42.1	2.0	-42.5	3.3	-44.3	5.6	-58.1	7.4
Malta	-153.9	-9.3	-123.6	-4.9	-82.4	-0.8	-56.5	1.6	-63.0	0.6
Mean	-134.8	0.2	-98.6	-3.2	-80.4	-2.0	-75.0	-0.1	-81.7	-1.0
Median	-124.0	-8.3	-91.8	-3.6	-82.8	-0.5	-74.3	1.0	-74.8	0.8
St. Dev. ^a	59.7	41.3	40.7	31.1	25.9	30.1	24.4	29.9	28.9	32.4
Minimum	-271.0	-64.5	-202.5	-58.0	-127.2	-59.2	-123.9	-56.5	-166.3	-59.5
Maximum	-37.2	70.6	-38.7	46.2	-39.8	46.2	-38.8	51.7	-45.7	50.7

Source: Eurostat, Authors' calculations.

Note: The list of countries is presented in descending order of levels of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section VII.A.

Table A4. Total changes in Well-Being per Quintile (including real assets) With Market Price Adjustment, 2021:Q3–2022:Q2*(Percent of annual household income)*

Quintiles	1		2		3		4		5	
Simulation	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price	Mechanical	Market Price
Estonia	-240.0	11.6	-165.9	0.6	-132.0	8.4	-127.6	10.3	-135.2	15.2
Lithuania	-290.4	-23.0	-221.7	-19.5	-146.1	-14.7	-127.8	-11.1	-120.2	-9.6
Latvia	-143.3	-23.7	-107.8	-24.4	-92.9	-23.4	-99.3	-25.4	-81.5	-20.4
Slovakia	-151.9	-10.2	-117.2	-9.2	-95.1	-6.5	-80.9	-6.2	-78.6	-5.7
Croatia	-228.1	-11.0	-147.6	-7.6	-101.0	-5.6	-89.2	-3.6	-72.8	-3.1
Greece	-157.1	-31.7	-98.8	-25.6	-83.8	-23.3	-72.8	-21.3	-79.7	-26.2
Slovenia	-190.2	45.8	-131.3	30.0	-103.5	23.7	-86.5	19.5	-90.5	19.4
Belgium	-109.3	-52.6	-112.7	-54.4	-113.0	-50.4	-109.7	-45.3	-105.7	-46.7
Luxembourg	-167.3	27.5	-139.2	10.2	-127.1	16.4	-133.7	18.2	-176.0	13.8
Ireland	-121.4	47.2	-77.3	27.5	-62.6	24.7	-59.0	30.7	-70.3	37.2
Netherlands	-78.7	63.1	-58.7	37.1	-54.0	40.1	-54.2	45.9	-54.6	44.6
Spain	-121.0	-23.4	-83.1	-19.1	-73.5	-17.5	-81.5	-19.3	-103.0	-27.1
Italy	-124.7	-67.5	-96.3	-53.3	-95.1	-52.5	-87.9	-49.2	-106.0	-60.8
Portugal	-131.2	59.0	-87.5	40.4	-70.9	33.2	-70.7	33.6	-91.5	36.6
Cyprus	-116.1	-70.9	-100.8	-64.2	-104.7	-65.2	-99.4	-62.6	-101.9	-65.4
Finland	-45.1	-33.1	-46.6	-33.1	-48.0	-33.1	-46.9	-30.3	-57.8	-33.6
France	-54.4	-1.1	-48.3	-0.8	-48.7	-0.2	-50.4	1.8	-64.3	3.7
Malta	-159.9	-9.6	-129.4	-5.9	-88.0	-1.5	-62.1	1.0	-68.5	0.3
Mean	-146.1	-5.8	-109.5	-9.5	-91.1	-8.2	-85.5	-6.3	-92.1	-7.1
Median	-137.2	-10.6	-104.3	-8.4	-94.0	-6.0	-84.0	-4.9	-86.0	-4.4
St. Dev. ^a	62.5	40.9	43.3	31.0	28.3	30.0	26.8	29.9	30.2	32.4
Minimum	-290.4	-70.9	-221.7	-64.2	-146.1	-65.2	-133.7	-62.6	-176.0	-65.4
Maximum	-45.1	63.1	-46.6	40.4	-48.0	40.1	-46.9	45.9	-54.6	44.6

Source: Eurostat, Authors' calculations.

Note: The list of countries is presented in descending order of levels of inflation during the period sample. The calculations for the *behavioral* effects are explained in Section VII.A.

Annex B. Descriptive Statistics

Table B1. Descriptive Statistics. 2021:Q3–2022:Q2

Variables	Unit	Quintile	Mean	Median	Standard Deviation	25th Percentile	75th Percentile	Minimum	Maximum	Observ.	
Inflation measure, percent											
Aggregate inflation	Percent	--	9.8	8.53	3.98	7.76	10.23	4.36	18.68	18	
Food and non-alcoholic beverages		--	12.95	11.64	5.86	8.84	15.81	6.27	28.83	18	
Housing, water, electricity, gas, and other fuels		--	24.74	23.28	15.13	13.27	31.28	9.03	66.01	18	
Transport		--	20.76	19.39	7.36	16.73	23.16	6.03	34.30	18	
Other consumption categories		--	4.66	3.86	2.10	3.17	6.54	2.04	8.20	18	
Share of consumption category in the household total basket											
Food and non-alcoholic beverages	Percent of household's total consumption basket	Overall	20.8	18.6	7.1	15.3	25.6	9.2	40.2	90	
		Quintile 1	24.9	25.4	8.2	17.4	30.7	12.6	40.2	18	
		Quintile 2	23.3	22.9	7.2	17.1	29.1	13.1	37.1	18	
		Quintile 3	21.2	19.7	6.4	15.7	25.6	11.9	34.0	18	
		Quintile 4	19.0	5.6	5.6	14.9	21.9	10.0	30.8	18	
Quintile 5		15.6	14.7	4.1	13.4	17.8	9.2	24.2	18		
Housing, water, electricity, gas, and other fuels		Overall	16.6	15.7	4.9	13.2	19.6	6.5	30.7	90	
		Quintile 1	22.2	22.5	5.2	18.4	26.9	11.7	30.7	18	
		Quintile 2	18.8	19.4	3.7	16.5	20.4	10.4	25.9	18	
		Quintile 3	15.8	16.1	2.9	14.7	17.6	8.1	21.5	18	
		Quintile 4	14.1	14.1	2.6	13.2	15.1	6.5	19.7	18	
Quintile 5		12.1	11.9	2.0	11.1	13.3	7.0	17.1	18		
Transport		Overall	14.2	14.3	3.7	11.9	16.5	5.2	22.6	90	
		Quintile 1	10.7	10.7	3.1	8.9	13.4	5.2	15.4	18	
		Quintile 2	12.5	12.5	3.1	10.5	14.1	7.1	18.7	18	
		Quintile 3	14.7	14.7	3.2	13.0	16.5	9.8	21.1	18	
		Quintile 4	15.8	15.6	2.6	13.6	17.0	12.0	22.0	18	
Quintile 5		17.3	16.7	2.5	15.3	18.3	13.7	22.6	18		
Other consumption categories		Overall	48.4	48.4	6.6	43.5	53.2	33.7	61.6	90	
		Quintile 1	42.2	43.2	5.1	38.1	46.0	33.7	51.6	18	
		Quintile 2	45.4	46.7	5.0	40.0	49.2	37.5	53.2	18	
		Quintile 3	48.3	48.5	5.6	43.5	53.2	37.9	58.4	18	
		Quintile 4	51.1	51.0	5.2	47.3	56.1	42.7	59.5	18	
Quintile 5		54.9	55.1	4.1	52.0	57.9	47.4	61.6	18		
Income variables, initial values											
Wages	Percent of household annual income	Overall	65.2	68.0	17.3	53.9	79.2	23.3	91.0	90	
		Quintile 1	38.7	37.4	9.4	32.9	46.6	23.3	53.9	18	
		Quintile 2	57.6	59.7	6.7	51.7	61.8	45.2	68.6	18	
		Quintile 3	71.0	73.9	7.9	66.1	77.5	56.9	82.1	18	
		Quintile 4	78.1	80.4	7.2	71.9	83.8	65.9	89.0	18	
Quintile 5		80.7	82.7	7.0	75.8	85.3	64.1	91.0	18		
Pensions		Overall	23.0	21.4	12.3	13.4	31.6	2.0	55.4	90	
		Quintile 1	36.0	34.4	12.7	27.3	49.2	17.7	55.4	18	
		Quintile 2	30.5	30.2	6.9	25.9	33.5	19.8	43.5	18	
		Quintile 3	21.2	19.9	7.9	14.2	26.3	10.3	34.2	18	
		Quintile 4	15.8	15.0	7.0	9.6	22.4	5.2	27.8	18	
Quintile 5		11.7	10.4	6.8	5.3	17.4	2.0	24.9	18		
Other income, including social transfers		Overall	11.8	8.9	9.3	6.2	13.2	1.8	55.0	90	
		Quintile 1	25.3	21.4	12.4	16.5	32.4	11.4	55.0	18	
		Quintile 2	12.0	11.4	4.5	9.7	13.8	6.1	23.9	18	
		Quintile 3	7.8	7.5	2.1	6.7	9.9	4.2	11.6	18	
		Quintile 4	6.1	5.9	1.7	5.2	6.9	3.0	9.7	18	
Quintile 5		7.6	6.7	3.5	5.6	10.8	1.8	13.6	18		
Wealth variables, initial values or change in prices											
Financial liquid assets (bank deposits)		Percent of household annual income	Overall	1079.9	949.5	699.0	553.4	1345.5	74.9	3474.0	90
			Quintile 1	1357.4	1188.6	768.8	900.5	1688.0	289.8843	3270.141	18
			Quintile 2	1121.4	951.8	750.6	577.2	1345.5	314.6	2941.1	18
			Quintile 3	896.6	874.3	494.6	517.2	1156.4	250.2	1927.3	18
			Quintile 4	878.0	890.9	512.5	509.8	1182.6	133.8	2230.4	18
Quintile 5			1145.8	926.7	854.0	474.3	1365.7	74.9	3474.0	18	
Real asset values (dwellings)	Overall		8931.7	7850.7	4311.8	5756.8	10912.4	3353.1	27697.6	90	
	Quintile 1		13651.4	13622.3	5340.2	9363.7	16235.9	4183.3	27697.6	18	
	Quintile 2		9556.3	8937.2	3904.8	7312.0	10581.4	4182.2	22026.9	18	
	Quintile 3		7783.3	7299.9	2871.0	5796.1	8107.4	4251.0	14676.7	18	
	Quintile 4		6957.5	6466.6	2241.1	5574.1	7884.8	4349.8	12653.9	18	
Quintile 5	6710.0		5824.2	2356.8	5061.9	8055.9	3353.1	11495.0	18		
Household debt	Overall		888.0	716.4	642.4	348.1	1222.9	115.6	3634.3	90	
	Quintile 1		993.4	661.7	996.2	348.1	1293.5	130.6	3634.3	18	
	Quintile 2		740.0	584.5	524.8	301.5	1194.0	115.6	1849.2	18	
	Quintile 3		872.9	860.2	552.9	364.8	1157.7	213.6	2058.6	18	
	Quintile 4		982.9	1136.0	548.8	399.6	1290.6	248.9	2110.1	18	
Quintile 5	850.7		799.9	489.6	338.8	1222.9	209.6	1860.0	18		
Net nominal position	Overall		191.9	139.1	745.7	-115.0	490.9	-2887.4	2822.1	90	
	Quintile 1		363.9	359.4	1127.9	110.5	750.4	-2887.4	2822.1	18	
	Quintile 2		381.4	226.8	684.5	-46.1	504.3	-879.1	1724.7	18	
	Quintile 3		23.8	79.4	503.7	-110.8	279.1	-1450.6	875.3	18	
	Quintile 4		-104.9	-54.9	443.2	-242.1	160.7	-1159.5	523.8	18	
Quintile 5	295.1		131.8	718.9	-143.5	550.4	-731.3	1863.4	18		
Net wealth	Overall		9321.8	8287.3	4562.8	5887.2	11407.3	3543.7	30541.7	90	
	Quintile 1	14202.2	13929.5	5670.6	11107.7	15894.1	5111.6	30541.7	18		
	Quintile 2	10121.4	9553.0	4185.2	8159.6	11061.0	4842.1	23938.6	18		
	Quintile 3	7990.6	7330.9	2880.8	6095.0	9250.7	4500.0	15390.9	18		
	Quintile 4	7050.0	6488.8	2282.8	5215.5	8344.3	4337.3	11681.2	18		
Quintile 5	7244.9	6053.807	2829.9	5068.7	9724.3	3543.7	13669.8	18			
Change in real state prices between 2021 and 2022	Percent		17	13	28	6.3	16.8	2	161	18	

Source: Eurostat; and authors' calculations.

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