INTERNATIONAL MONETARY FUND

The Cost-of-Living Crisis: Impact and Policy Support to Households, Evidence from Micro-Level Data

Greece

Shiqing Hua and Wei Shi

SIP/2024/007

IMF Selected Issues Papers are prepared by IMF staff as background documentation for periodic consultations with member countries. It is based on the information available at the time it was completed on December 15, 2023. This paper is also published separately as IMF Country Report No 24/24.

2024
FEB

SELECTED ISSUES PAPER

© 2024 International Monetary Fund SIP/2024/007

IMF Selected Issues Paper
European Department

The Cost-of-Living Crisis: Impact and Policy Support to Households, Evidence from Micro-Level Data, Greece

Prepared by Shiqing Hua and Wei Shi

Authorized for distribution by Joong Shik Kang
February 2024

***IMF Selected Issues Papers* are prepared by IMF staff as background documentation for periodic consultations with member countries.** It is based on the information available at the time it was completed on December 15, 2023. This paper is also published separately as IMF Country Report No 24/24.

ABSTRACT: The Greek government has provided substantial support to households to cope with the high cost of living in 2022–2023. This paper leverages on the rich micro-level data on household consumption in the Household Budget Survey to study the distributional impact of price increases. Policy simulations suggest that targeted support measures tailored to the recipients' needs remain the most effective way to mitigate the vulnerable households' income loss.

RECOMMENDED CITATION: Hua, Shiqing, and Wei Shi. The Cost-of-Living Crisis: Impact and Policy Support to Households, Evidence from Micro-Level Data, Greece. IMF Selected Issues Paper (SIP/2024/007). Washington, D.C.: International Monetary Fund.

JEL Classification Numbers:	D12, D31, E31, H20
Keywords:	Inflation, distributional impact, fiscal policy
Author's E-Mail Address:	shua@imf.org; wshi@imf.org.

SELECTED ISSUES PAPERS

The Cost-of-Living Crisis: Impact and Policy Support to Households, Evidence from Micro-Level Data

Greece

Prepared by Shiqing Hua, and Wei Shi [1]

Contents

THE COST-OF-LIVING CRISIS: IMPACT AND POLICY SUPPORT TO HOUSEHOLDS, EVIDENCE FROM MICRO-LEVEL DATA[1]

The Greek government has provided substantial support to households and enterprises to cope with the high cost of living in 2022—2023. This paper leverages on the rich micro-level data on household consumption in Household Budget Survey to study the distributional impact of price increases. It finds that low-income households and households living in sparsely populated areas and/or relying more on secondary source of income (e.g., non-wage income) have faced higher loss of purchasing power, despite significant heterogeneity even within narrowly defined household groups. Policy simulations suggest that targeted support measures tailored to the recipients' needs would effectively mitigate the vulnerable households' income loss. Categorical programs that aim at a certain group of households without income criteria could also alleviate the cost-of-living pressures, but less effectively.

A. Motivation

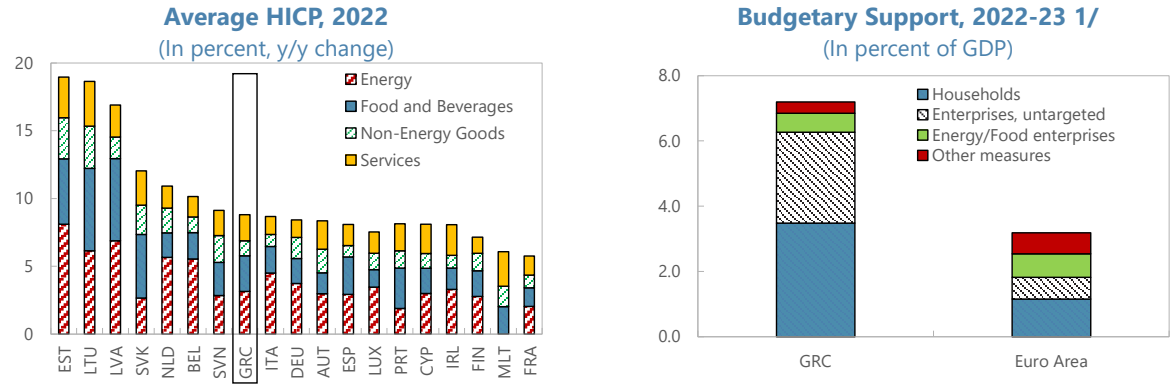
1. The sharp rise in energy bills and food prices spurred high inflation in Greece and led to substantial government support in 2022–23. Average inflation shot up to almost 10 percent in 2022 from a marginally positive rate in 2021, with two thirds of the price increase accounted for by food, beverage, and energy. In reaction, the government provided significant subsidies on electricity differentiated by usage, along with other budgetary measures to alleviate the skyrocketing living and operating costs facing households and enterprises. Most of the measures are expected to be withdrawn by end-2023 as energy prices and the headline inflation normalize, except for some electricity subsidies for small users. Given the record high inflation and sizable government support programs, it would be of interest for policymakers to gauge the impact of price increases on individual households and how government interventions effectively reach the vulnerable. This paper uses the rich household consumption data in the annual Household Budget Survey (HBS) to study these policy relevant questions.

2. There is substantial heterogeneity in households' consumption patterns across different income groups. As expected, households allocate a smaller share of their total consumption on basic goods such as food and utilities as the total household income increases. Notably, households in the bottom income quintile spend over 20 percent of their total expenditure on housing, water, electricity, gas, and other fuels, more than double the corresponding share for households in the top income quintile. In contrast, services such as transport and accommodation and restaurants are more prominent in the consumption baskets for well-off households. The COVID-19 pandemic triggered some behavior changes as households substituted services involving

[1] Prepared by Shiqing Hua and Wei Shi. The paper has benefited from comments, discussions, and additional references provided by the Greek authorities.

close human interactions (travel, hotel, restaurants) for goods in 2020, but 2021 saw signs of households reverting to their old consumption patterns with rising share of services at the cost of lower consumption in foods and utilities. This trend could be checked in 2022 when food and energy prices jumped up.

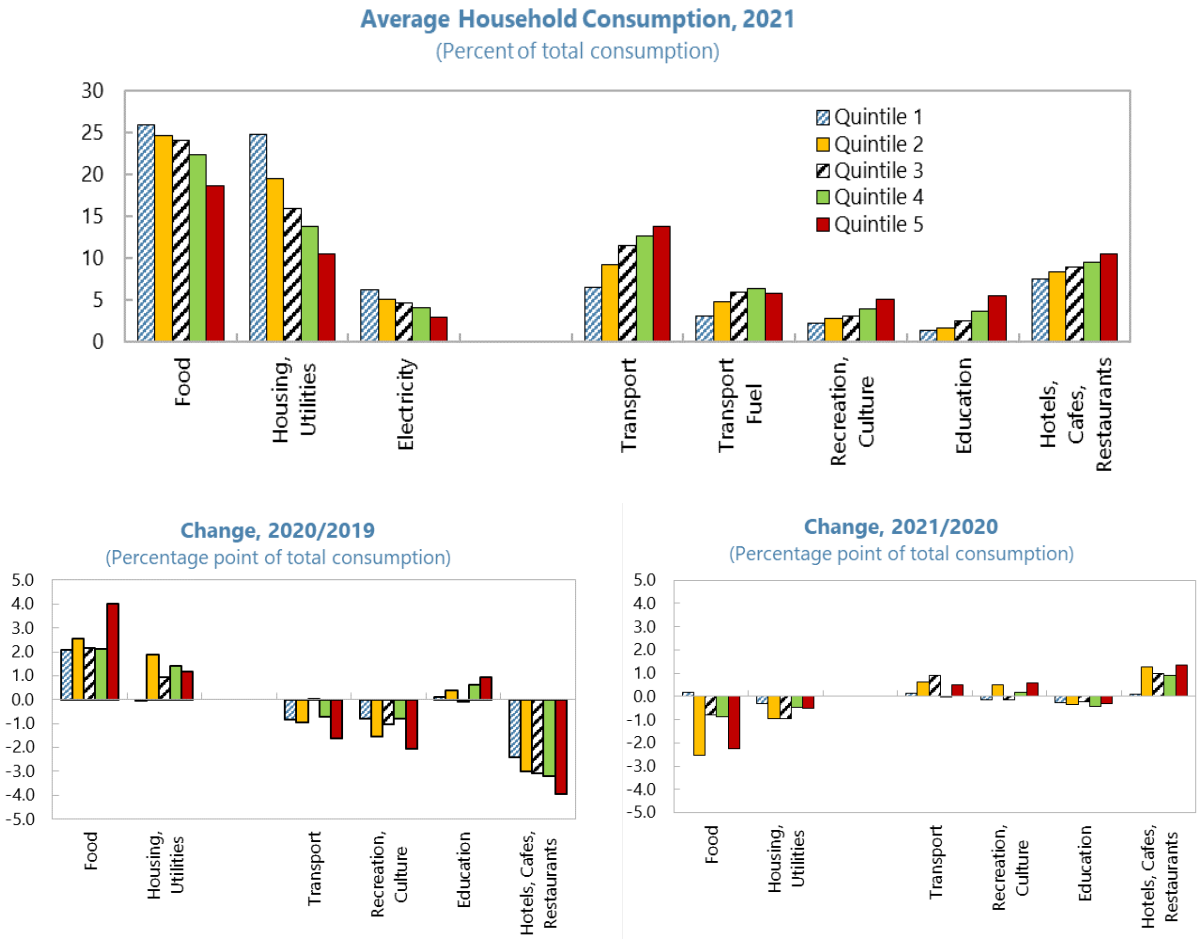
Figure 1. Greece: Cost of Living and Fiscal Support, 2022–23



Sources: Eurostat; Haver Analytics; Updated results of the DEFPA IMF Country Desk Survey from Amaglobeli and others (2023); and IMF staff calculation.
1/ refers to estimated cost of relevant budgetary spending. The net budgetary impact is much smaller given the sizable windfall revenue from the energy sector.

3. The impact of inflation on households' cost of living is highly uneven as price increases are not uniform across consumption categories. The differentiated impact of the recent energy price surge across household income distribution has been noted in a few working papers (Ari and others (2022), Arregui and others (2022), Charalampakis and others (2022)). Causa and others (2022) focuses on the impact of the general price rises by calculating the loss of household purchasing power as a result of higher prices (the compensating variation) and correlates it with household characteristics (e.g., income, place of residence). This paper applies a similar approach to Greece. It constructs the change in households' purchasing power induced by price increases for a detailed basket of goods and services that the Greek households consume (Section B). To demonstrate the added value of granular information in policy-making, it also presents policy simulations to illustrate the distributional impact of various policy instruments that could be used to support vulnerable households (Section C). Further discussions on the methodology, data, and robust checks are given in the appendix.

Figure 2. Greece: Selected Household Consumption Indicators



Sources: Hellenic Statistical Authority (ELSTAT), Household Budget Survey (HBS); and IMF staff calculations.
Notes: Quintiles are calculated based on total household income in HBS. The imputed rentals for housing (HE042) are excluded from households' consumption basket as it is not included in the Harmonized Index of Consumer Prices (HICP).

B. Distributional Impact of Inflation

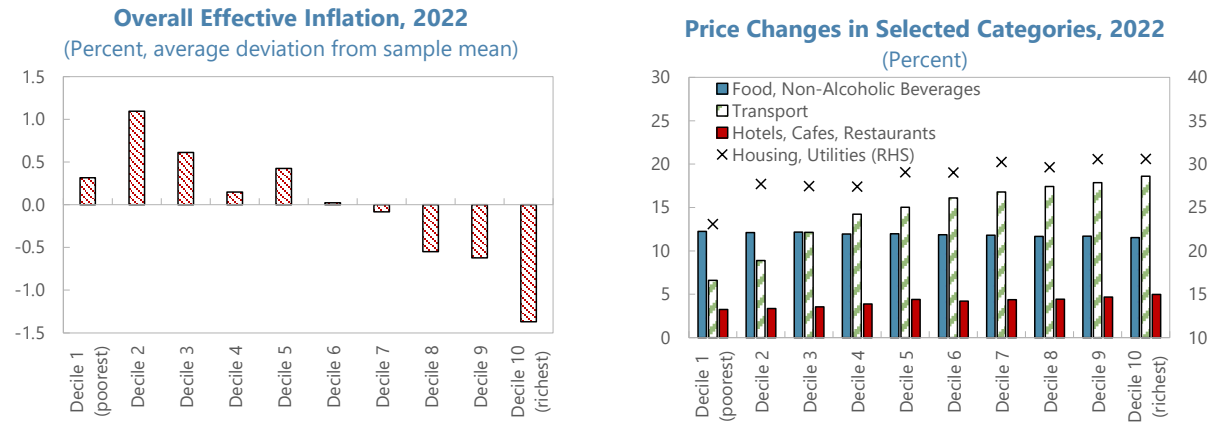
4. This paper analyzes the distributional impact of the recent price surge using a micro-based granular indicator of the effective inflation facing each household. We follow the framework originally proposed by Deaton (1989) and look at how much the household needs to be compensated so that it can avoid a deterioration of welfare. In practice, we approximate the needed compensation expressed as a share of household expenditure by the weighted sum of price changes for goods and services the household consumes, taking as weights their expenditure shares in the old consumption bundle (proxied by consumption patterns as in the 2021 HBS).[2] Without such an increment to the household budget, the household will have to abandon its old consumption basket and settle with a less costly and probably less desirable consumption bundle. Thus, the indicator can be interpreted as a measure of the loss in purchasing power induced by the

[2] See the formula, illustrative examples, and further discussions in the appendix.

price increases. To get as close as possible to households' consumption baskets, instead of sticking to major consumption categories as done in recent IMF working papers, we construct the indicator using detailed goods and services to the extent that their prices are separately observed in the HICP, and their expenditure shares can be calculated for each household in the HBS. Henceforth, we will refer to this indicator as the effective inflation.

5. The effective inflation shows substantial variations among households, with lower-income households having experienced a greater loss of purchasing power. On average, the effective inflation for households in the top three income deciles is 1½ percentage points below that for households in the bottom three income deciles, confirming that poorer households are indeed hit harder by the negative income shock during the inflation episode. The excess of effective inflation faced by poorer households mainly stems from the compositional factor—compared to their total expenditure, these households consume disproportionally more consumption items that saw large price increases (food, utilities). While restricted to major consumption categories, richer households have experienced in most cases higher increases of the costs of their bundles, especially in utilities and transport which are heavily influenced by international energy prices. The exceptions are in food and non-alcoholic beverages, and health, where the cost increases during 2022 are marginally higher for poorer households.

Figure 3. Greece: Effective Price Changes by Income Decile



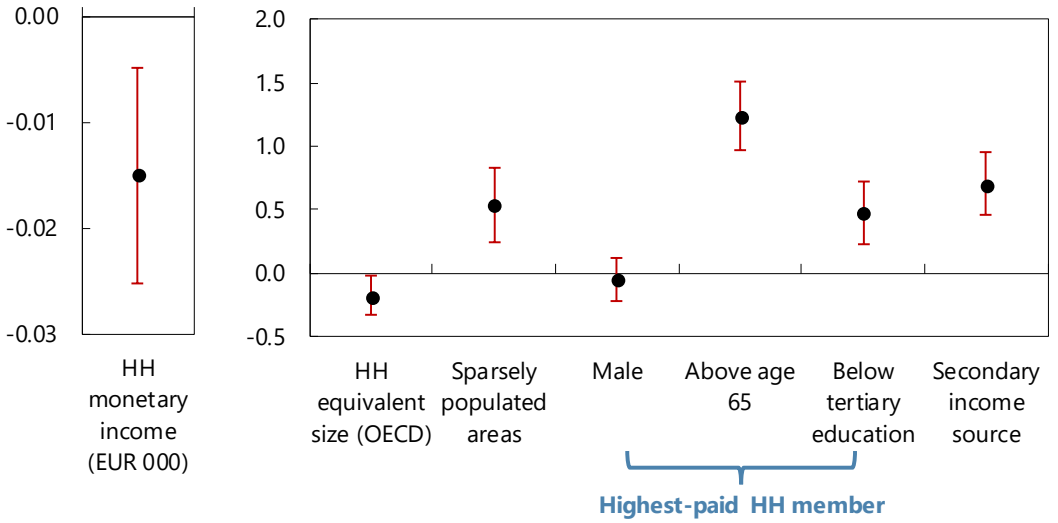
Sources: ELSTAT, HBS; Eurostat; Haver Analytics; and IMF staff calculation.
Note: The effective inflation shown on the left is the deviation from the estimated sample mean.

6. The effective inflation is also correlated with other household characteristics.[3] Large households on average spend a smaller share of their income on utilities, which leads to a less sharp increase in their effective inflation. In contrast, households whose major bread-earners are around the retirement age (above age 65) or less educated spend more on utilities and food, and therefore would see a more sizable increase of their living expenses associated with their old consumption baskets. This also holds for households which declare their main income source to be

[3] We isolate these correlations in a multi-variate regression setting controlling for household income and regional dummies. See the appendix for the regression table.

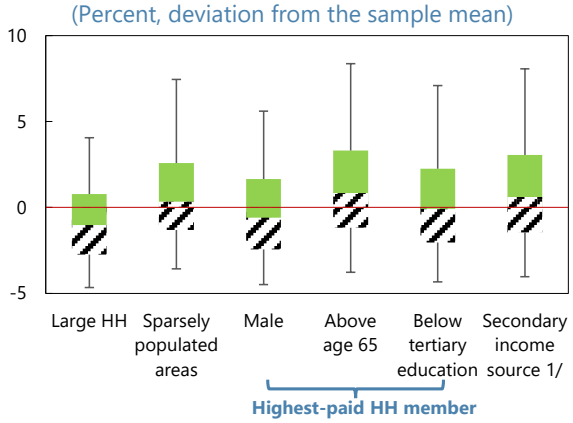
secondary, i.e., from pensions, unemployment benefits, or other non-wage, non-property income. There is no statistically significant difference in the correlation identified regarding the gender of the major bread-earner: among items that have seen fast price increases, female-headed households tend to spend more on food, utilities, and health, while male-headed households tend to spend more on alcoholic beverages and tobacco, transport, and restaurants and hotels. Lastly, due to the higher share of their budget allocated to food and to a lesser extent utilities, households living in sparsely populated areas are found to be facing a higher effective inflation.

Figure 4. Greece: Effective Inflation vs. Household Characteristics 1/



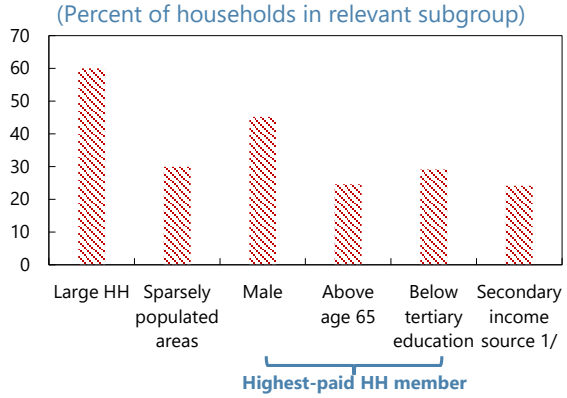
Effective Inflation among Households 2/

(Percent, deviation from the sample mean)



Share of Households with Above Average Income

(Percent of households in relevant subgroup)



Sources: ELSTAT, HBS; Eurostat; Haver Analytics; and IMF staff calculation.
1/ Secondary income in HBS is defined as income from pensions, unemployment benefits, and other non-salary, non-property income. The red bars denote the 95-percent confidence intervals around the point estimates. The underlying regression results are presented in Appendix Table 3, 1st column.
2/ The green box denotes the range of effective inflation between 50th to 75th percentiles, the black dashed box shows the range of effective inflation between the 25th to 50th percentiles. The whiskers extend to the 95th percentile of the effective inflation above and 5th percentile below. The large household category refers to households whose OECD equivalent sizes are above the sample median.

7. There are still significant differences even within narrowly defined household groups, suggesting the importance of granular information for effective policy support. For instance, among groups that have been identified above as facing on average higher effective inflation, there are still a significant share of households experiencing below-average effective inflation. The share is close to 50 percent for households living in sparsely populated areas or with the highest-paid member having an education below tertiary, and around 40 percent for households relying on secondary income sources or with the highest-paid member above age 65. These households also differ in their income endowment, which is another crucial factor to be considered when deciding on extending government support. Though the aforementioned four groups are indeed more likely to have below-average income, there is nonetheless a critical mass of around 30 percent of households with above-average income within each group. In short, the granular information regarding household-level income and effective inflation could help identify vulnerabilities and guide effective policy interventions. We illustrate the possible benefit in the next section through policy simulations.

C. Policy Simulations

8. Greece has provided subsidies and income transfers to support households, while refraining from imposing price controls during the energy price surge. Due to data limitation, simulations presented in this section are not able to replicate the actual government interventions undertaken during 2022–23.[4] Rather, we design hypothetical scenarios that capture basic properties of subsidies and transfers in the absence of income-targeting and show how targeting enabled by household-level knowledge could better alleviate the cost-of-living pressures for the vulnerable. In the simulations, subsidies are defined as the additional cash each recipient household receives proportional to its consumption of the subsidized products,[5] while categorical transfers are the cash payments to households belonging to certain categories. Under the assumption that household income is not observed or cannot be verified, all eligible households are assumed to receive an equal amount of transfer, or in the case of child benefits, all children below age 16 are entitled to an equal amount of transfer. It is worth reiterating that the simplified scenarios are used to demonstrate the distributional impact of pre- and post-intervention effective inflation among households and to empirically illustrate whether these instruments are more capable of reaching the vulnerable. Their sizes and specific designs in the simulations are not intended to be taken at face value as policy recommendations.

9. As a benchmark, we simulate the impact of a hypothetical "targeted transfer" with respect to household income. Under the targeted transfer scenario, all households in the bottom three income deciles that have experienced above-average effective inflation are given cash so that

[4] For instance, for energy subsidies, the HBS has only information on households' energy bills, but the actual interventions are based on households' usage of electricity/natural gas which have been found in a recent ECB paper as largely closing the gap of welfare loss across the household income distribution in Greece. See Antonio F. Amores and others, *Inflation, Fiscal Policy and Inequality the Distributional Impact of Fiscal Measures to Compensate for Consumer Inflation*, ECB Occasional Paper Series, No. 330.

[5] In particular, energy subsidies in the simulation are implemented against HBS category 045 (electricity, gas, and other fuels), while food subsidies are implemented against HBS category 011 (food).

their loss of purchasing power is reduced to the rate of average (pre-intervention) effective inflation. After the intervention, the mean effective inflation within the bottom three deciles will be brought down to around 1½–2 percentage points below its original levels, or 1½ percentage points below the original sample average, comparable to the level of the top decile.[6] Such intervention will not affect the top seven deciles and has a fairly modest policy objective for the bottom three deciles—the affected households continue to face a loss of their purchasing power equal to the sample average (around 10 percent)—and thus has a moderate fiscal cost (0.1 percent of GDP). To ensure comparability among different simulated scenarios, we calibrate the subsidies and categorical transfers so that the overall fiscal envelope is equal to the fiscal cost of the targeted transfer scenario. In reality, however, policymakers should calibrate the magnitude of the policy interventions according to the available fiscal space, other competing budgetary spending needs, and social-economic conditions of households.

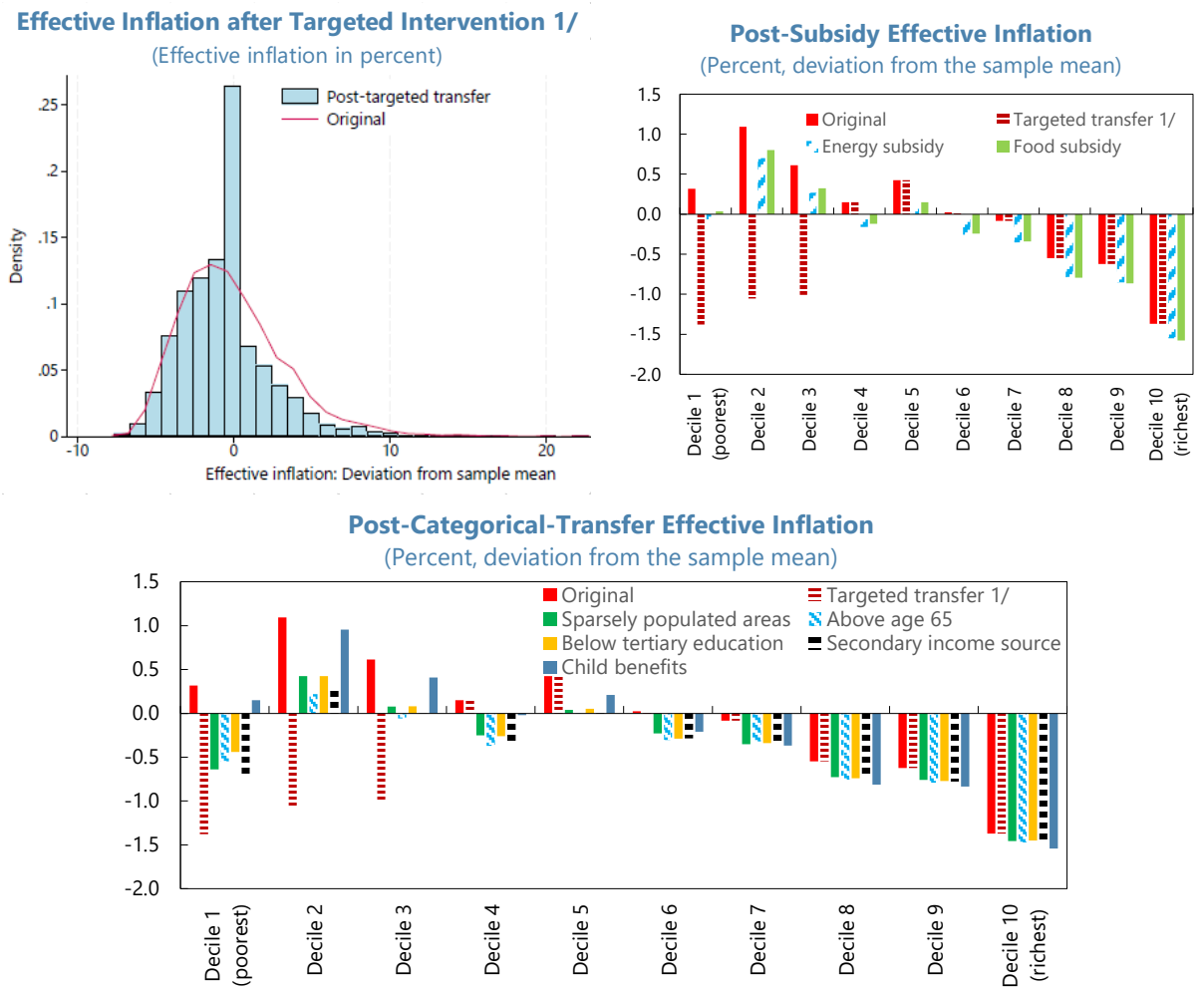
10. Both subsidies and categorical transfers to households help reduce the effective inflation facing low-income households to varying degrees. All instruments other than the targeted transfers benefit to some extent households in upper income deciles. Subsidies are known to be regressive as their benefits are proportional to the consumption of the subsidized goods/services, and the rich are more likely to consume more. Hence, the effective inflation for the bottom three deciles only sees a limited reduction after the policy intervention as a significant share of benefits (75 percent for energy subsidies and 80 percent for food subsidies) are received by higher-income households. Categorical transfers in a few cases are more effective in reaching the vulnerable than subsidies. Micro-level information in HBS suggests that living in sparsely populated areas, relying on secondary income sources, and major bread-earner being around retirement age or of less than tertiary education, are reasonably well correlated with both lower household income and consumption patterns that give rise to higher effective inflation during the inflation episodes as observed in 2022. However, even with these instruments, the ability to support the poor and vulnerable compare less favorably with a targeted transfer. To illustrate, against a pre-intervention share of 51.5 percent of households in bottom three deciles facing above-average effective inflation, the share drops to zero by design in the targeted transfer scenario, while it remains elevated (above 40 percent) for all simulated categorical transfers. The lower effectiveness of categorical transfers is again due to the linkage of benefits to households with higher income: Out of all benefits provided, around 60 percent would be received by households in the top seven deciles, which presents a notable improvement relative to subsidies but still leaves ample room for further enhancement.

11. The hypothetical policy simulations suggest that targeted policy support would be the most effective way to alleviate the high cost of living for the vulnerable households. This is particularly the case under a fixed fiscal envelope as the less benefits leak to other groups, the more resources can be directed to those that the policy intervention aims to protect. However, if income is at high risk of being mis-reported by households, income-targeted support becomes less effective. In practice, the actual interventions of electricity subsidies have a quasi-targeting element that reduces

[6] The top-left panel of Figure 5 illustrates how the distribution of effective inflation changes after imposing the targeted transfers to the bottom three deciles. The dash red bars next to the solid red bars in the top-right panel and the bottom panel show the average effective inflation within each decile after the targeted transfers.

the unit-subsidy for large users (presumably richer households), and thus should have a more progressive distributional impact among households than the simulated energy subsidy scenario. Similarly, the food program ("Market pass") also incorporates some income criteria and would be more effective to support low-income households than in the simulation. Nonetheless, the simple simulations have demonstrated the importance to recognize household heterogeneity and the value to incorporate it into policy design and implementation. Going forward, more efforts are warranted to continue build capacity to implement targeted programs via establishing a centralized registry of beneficiaries, improving reporting and verification of beneficiaries' income leveraging on available third-party information, and addressing gaps in coverage and benefit levels of existing targeted programs such as the Guaranteed Minimum Income.

Figure 5. Greece: Simulations of Support to Households



Sources: ELSTAT, HBS; Eurostat; Haver Analytics; and IMF staff calculation.
1/ The targeted transfers are designed to compensate households originally in the bottom three income deciles for the excess loss of real income benchmarked by the average effective inflation over the whole sample. The distributional impact after policy interventions is calculated using the original income deciles, and the deviations presented in the figure are calculated relative to the pre-intervention sample mean.

Appendix I. Description of Methodology, Data, and Robustness Checks

Methodology and Data

1. As in Causa and others (2022), this paper quantifies the impact of price changes on households' consumption by calculating the compensating variation. For household i with consumption bundle $\{c_0^{i,j}\}$ over a basket of goods and services indexed by j, when prices change from $\{p_0^j\}$ to $\{p_1^j\}$, the compensating variation is calculated as

$\mathrm{CV}_{0,1}^{\mathrm{i}} = \Sigma_j s_0^{i,j} \cdot \pi_{0,1}^{\mathrm{j}}$, where the share $s_0^{i,j} = \frac{c_0^{i,j} p_0^j}{\Sigma_k c_0^{i,k} p_0^k}$, and the price increase $\pi_{0,1}^j = 100 \cdot \left(\frac{p_1^j}{p_0^j} - 1\right)$.

Source: ELSTAT, Household Budget Survey (HBS); and IMF staff.

It measures the minimal change in household expenditure—expressed as a share of total expenditure under old prices $\{p_0^j\}$—that is needed to make the old consumption bundle $\{c_0^{i,j}\}$ affordable under new prices $\{p_1^j\}$. In the case of a general price increase, thus calculated compensating variation will be positive, meaning that the household's old consumption bundle becomes more expensive. In other words, the compensating variation indicates the extent that the household's purchasing power shrinks due to the price increases, and therefore can be viewed as a measure of the effective inflation facing the household.[1]

Appendix I. Table 1. Greece: Major Consumption Categories in HBS

01	Food and Non-Alcoholic Beverages
02	Alcoholic Beverages, Tobacco, and Narcotics
03	Clothing and Footwear
04	Housing, Water, Electricity, Gas and Other Fuels
05	Furnishings, Household Equipment and Routine Household Maintenance
06	Health
07	Transport
08	Communication
09	Recreation and Culture
10	Education
11	Restaurants and Hotels
12	Miscellaneous Goods and Services

Source: ELSTAT, Household Budget Survey (HBS); and IMF staff.

[1] If the household re-minimizes the cost under new prices $\{p_1^j\}$ subject to that its utility is at least the same as offered by the old bundle $\{c_0^{i,j}\}$—which now costs $\left(1 + CV_{0,1}^i\right)$ times the initial spending—the optimal bundle could be less costly. Hence, the household could manage to achieve the same utility with a smaller increase in its consumption expenditure, thus the compensating variation indicates an upper bound of the real income drop felt by the household following the given price increases.

2. Calculating the compensating variation requires two pieces of information: the share of a given consumption category in the total household budget and the change of its price (average 2022 over 2021). The consumption share is computed from the 2021 Household Budget Survey (HBS), which records in monetary units the surveyed household's spending on twelve major categories of goods and services (coded with two digits, see Appendix I. Table 1.), as well as a more detailed breakdown into subcategories (coded with three-to-five digits, see examples in Appendix I. Table 2). These consumption categories can largely be mapped into goods and services used to compile the Harmonized Index of Consumer Prices (HICP), which provides information on price changes. [2]

Appendix I. Table 2. Greece: Illustrative Examples

- 111 — Catering services
  - 1111 — Restaurants, cafes, and the like
    - 11111 — Restaurants, cafes, and dancing establishments
    - 11112 — Fast food and take-away food services

    Finest categories
  - 1112 — Canteens
- 0432 — Services for the maintenance and repair of dwelling
  - 04321 — Services of plumbers
  - 04332 — Services of electricians
  - 04323 — Maintenance services for heating system
  - 04324 — Services of painters
  - 04325 — Services of carpenters
  - 04329 — Other services

  Non-HICP categories. Price changes are calculated as the weighted (by HICP weights) average inflation of 04321–04323

Sources: ELSTAT and IMF staff.

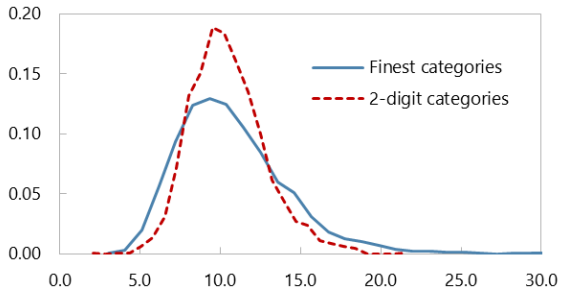
3. We construct the household-specific compensating variation to mimic the aggregate HICP while trying to go as granularly as possible with respect to consumption categories. To illustrate, for catering services (111, under major category 11 "Restaurants and Hotels") shown in Appendix I. Table 2., we skip 1111 ("Restaurants, cafes, and the like"), and include its two finer subcategories 11111 ("Restaurants, cafes, and dancing establishments") and 11112 ("Fast food and take-away food services") in the calculation instead. On the other hand, the parallel subcategory 1112 ("Canteens") is already the finest classification and thus is included directly in the calculation. Since the mapping between the HBS categories and the HICP categories are not perfect, adjustments are made to align the calculated compensating variation more closely to the HICP concept. These include (i) excluding the imputed rentals for housing (042) when calculating the HBS consumption share as the imputed rentals are not part of the HICP; (ii) for those goods and services surveyed in the HBS but not covered in the HICP (e.g., 04324–04325 and 04329 under 0432 "Services for the Maintenance and Repair of Dwelling" in Appendix I. Table 2.), extrapolating their

[2] Based on Eurostat and Haver Analytics. It should be noted that the consumption basket underlying the HICP differs from the one underlying the domestic consumer price index (CPI), which could be more relevant for households.

price changes as the weighted average of price changes for goods/services classified under a common overarching category (e.g., 04321–04323 which are also under 0432) using the HICP weights.

4. The granular approach with respect to consumption categories helps capture vulnerabilities arising from the diverse consumption behaviors at the household level. Households could have consumption baskets highly skewed towards particular goods or services whose price increases outpaced the aggregated price indices. As can be seen from Appendix I. Figure 1., the empirical distribution of household-specific inflation calculated from the finest categories of goods and services (in blue) has fatter tails compared to the one calculated using only the twelve major categories (in red), though the two distributions have similar means and modes. Households located on the right tail are potentially more vulnerable to the inflation shock, especially for those with relatively modest income.

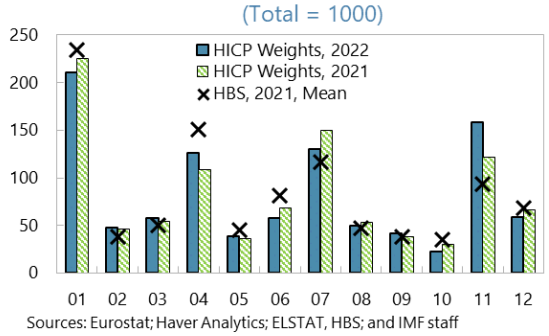
Appendix I. Figure 1. Greece: Empirical Density Functions of Calculated CVs



Source: IMF staff calculation.
Note: Gaussian kernel is used, and the probability weight is approximated by the frequency weight.

5. It should be noted that the granular approach comes with some costs and caveats. The rounding errors of HICP weights and year-on-year changes of indices accumulate and become nontrivial. The bottom-up approach to reconstruct the HICP from 355 major and minor categories of goods and services yields an average inflation of 9.5 percent versus the official number of 9.3 percent. The accumulated rounding errors are particularly pronounced for utilities (04) which experienced the sharpest increases in prices, but also for other high-inflation categories such as food (01) and transport (07). Moreover, the average consumption shares in the HBS do not correspond to the HICP weights (Appendix I. Figure 2.), with notably higher average shares for food, housing and utilities, and health in 2021. As a result, the calculated compensating variation averages 10.3 percent in 2022, exceeding the average HICP inflation (9.3 percent, corresponding to the 32th percentile of the calculated compensating variation).[3]

Appendix I. Figure 2. Greece: Average HBS Share vs. HICP Weights
(Total = 1000)



Sources: Eurostat; Haver Analytics; ELSTAT, HBS; and IMF staff calculations.

[3] It may be worth stressing that though the compensating variation is constructed based on the same consumption bundle as the HICP, its goal is to capture the changing costs of living associated with price changes for individual households. Hence, the weights used to construct the compensating variation are intended to reflect the households' hypothetically desirable consumption bundles, rather than those underlying the actual aggregate price changes. In this sense, the two concepts are not comparable.

Robustness Checks

6. The empirical correlations identified between the effective inflation and household characteristics are robust to alternative specifications. The first column of Appendix I. Table 3. shows the baseline regression results quoted in Section B which take into account the sampling design features, i.e., the strata, sampling units, and sample weights. The coefficients are found to be robust to assuming random sampling among households (Column 2, the ordinary least square), alternative measures of the key variables (Column 3 with total income instead of monetary income, OECD modified scale for household size, and characteristics of the reference person as defined by the HBS rather than the highest-paid household member), breaking down of detailed income sources (Column 4 with reference to income sources from self-employment, pension, and unemployment benefits considered separately), and the inclusion of additional household characteristics (Column 5 with the marital status and if the highest-paid member is below age 25, works full-time or in the public sector, or has a permanent contract).

Appendix I. Table 3. Greece: Effective Inflation vs. Household Characteristics 1/

VARIABLES	(1) Baseline	(2) OLS	(3)	(4)	(5)
Dummy: Sparsely populated areas	0.5414***	0.4906***	0.5676***	0.4930***	0.5199***
	(0.1489)	(0.1058)	(0.1492)	(0.1486)	(0.1493)
Household monetary income (EUR 000)	-0.0150***	-0.0159***		-0.0164***	-0.0160***
	(0.0052)	(0.0039)		(0.0057)	(0.0059)
Household total income (EUR 000) 2/			-0.0078**		
			(0.0038)		
Household equivalent size (OECD)	-0.1750**	-0.3019***		-0.1857**	-0.2701***
	(0.0808)	(0.0704)		(0.0837)	(0.0874)
Household equivalent size, modified (OECD)			-0.2783**		
			(0.1102)		
Dummy: Highest-paid household member is					
Male	-0.0477	-0.0759		-0.0633	-0.1252
	(0.0868)	(0.0895)		(0.0860)	(0.0962)
Above age 65	1.2321***	1.1878***		0.9591***	1.1622***
	(0.1370)	(0.1188)		(0.1415)	(0.1401)
Below tertiary education	0.4767***	0.4954***		0.4789***	0.5166***
	(0.1279)	(0.1049)		(0.1325)	(0.1314)
Below age 25 3/					-1.0728***
					(0.3716)
Dummy: Reference household member is			-0.0109		
Male			(0.0953)		
			1.2641***		
Above age 65			(0.1421)		
			0.3036***		
Below tertiary education			(0.1023)		
Dummy: Main source of income is secondary	0.7035***	0.6203***	0.7555***		0.8628***
	(0.1270)	(0.1212)	(0.1271)		(0.1760)
Dummy: Main source of income is					
Self employment 3/				0.2713**	
				(0.1347)	
Pension				1.0585***	
				(0.1405)	
Unemployment benefits 3/				0.9479**	
				(0.4719)	
Dummy: In a marriage					0.2459*
					(0.1311)
Observations	6,047	6,047	6,055	6,047	6,047
R-squared	0.2039	0.2057	0.1992	0.2080	0.2071
Constant	YES	YES	YES	YES	YES
Regional dummies	YES	YES	YES	YES	YES
Sampling design features	YES	NO	YES	YES	YES
Additional household characteristics	NO	NO	NO	NO	YES 4/

Source: ELSTAT, HBS; and IMF staff calculation.

1/ Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Income taxes are excluded from household monetary income. Secondary income source refers to pensions, unemployment benefits, and other current benefits or income.

2/ Including both monetary and non-monetary income. There are 8 households reporting no monetary income.

3/ Relatively few observations in HBS.

4/ These additional characteristics are that the highest-paid member works full-time, or has a permanent contract, or works in the public sector. Among these, only the permenant contract indicator has a marginally significant coefficient (0.32).

References

Ari, Anil, Nicolas Arregui, Simon Black, Oya Celasun, Dora Iakova, Aiko Mineshima, Victor Mylonas, Ian Parry, Iulia Teodoru, and Karlygash Zhunussova. 2022. Surging Energy Prices in Europe in the Aftermath of the War: How to Support the Vulnerable and Speed up the Transition Away from Fossil Fuels. IMF Working Paper WP/22/152.

Arregui, Nicolas, Oya Celasun, Dora Iakova, Aiko Mineshima, Victor Mylonas, Frederik Toscani, Yu Ching Wong, Li Zeng, and Jing Zhou. 2022. Targeted, Implementable, and Practical Energy Relief Measures for Households in Europe. IMF Working Paper WP/22/262.

Causa, Orsetta, Emilia Soldani, Nhung Luu, and Chiara Soriolo. 2022. A Cost-of-Living Squeeze? Distributional Impact of Rising Inflation. OECD Economics Department Working Papers No. 1744.

Charalampakis, Evangelos, Bruno Fagandini, Lukas Henkel, and Chiara Osbat. 2022. The Impact of Recent Rise in Inflation on Low-Income Households. European Central Bank, *Economic Bulletin*, Issue 7/2022, Box 4.

Deaton, Angus. 1989. Price Prices and Income Distribution in Thailand: A Non-Parametric Analysis. The Economic Journal, 99, 1–37.

Kpodar, Kangni, and Boya Liu. 2021. The Distributional Implications of the Impact of Fuel Price Increases on Inflation. IMF Working Paper WP/21/121.

Updated results of the DEFPA IMF Country Desk Survey from Amaglobeli, D., M. Gu, E. Hanedar, G. Hong, C. Thévenot, 2023, “Policy Responses to High Energy and Food Prices”, IMF Working Paper 23/74