“The social effects of inflation and rising energy prices in the EU”

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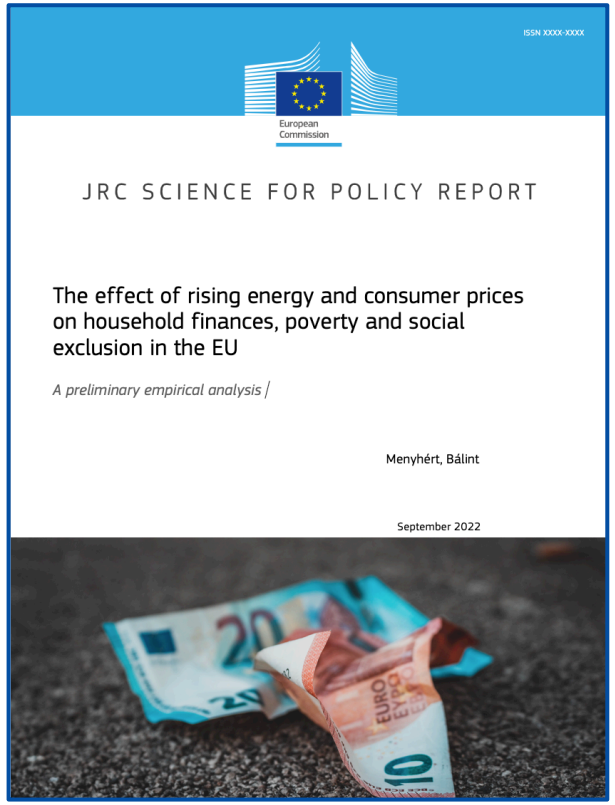
Joint Research Centre

JRC Science for Policy Report on the social effects of inflation



Empirical analysis and modelling based on
- Eurostat data on energy prices and annual HICP inflation as of August 2022,
- microdata from the 2015 wave of the EU-HBS and the 2019 wave of the EU-SILC.

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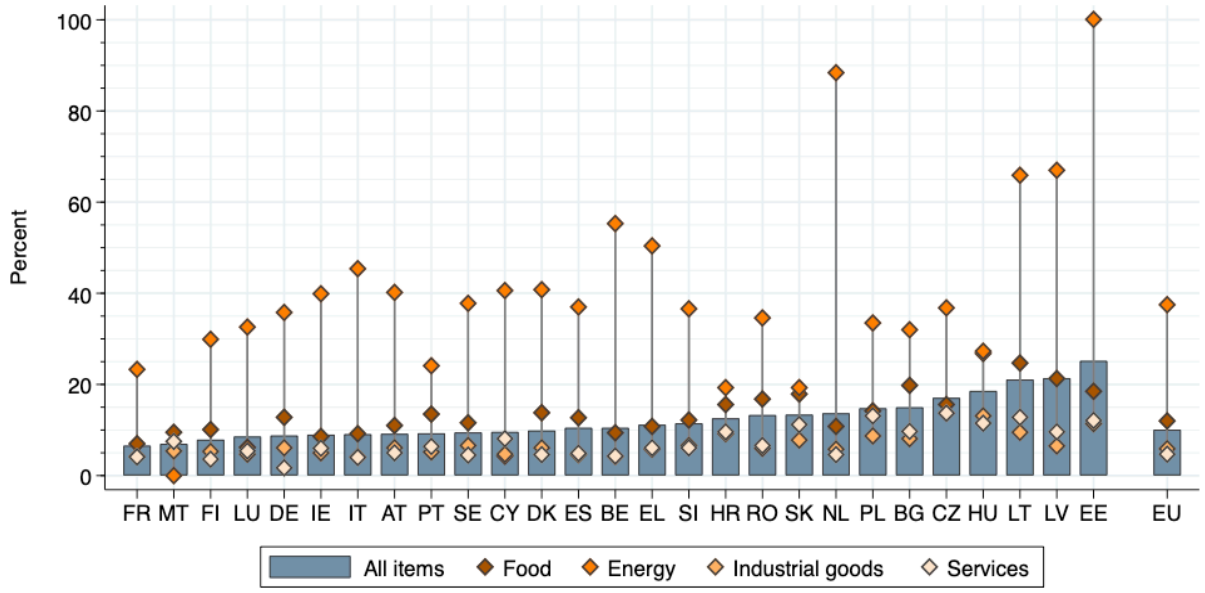
Main patterns of inflation across the EU



- HICP inflation between August 2021 – August 2022 is 10.1% at the EU level and range between 6.6% (FR) and 25.2% (EE)
- Energy prices are the main driver of inflation and have increased by 37.5% at the EU level

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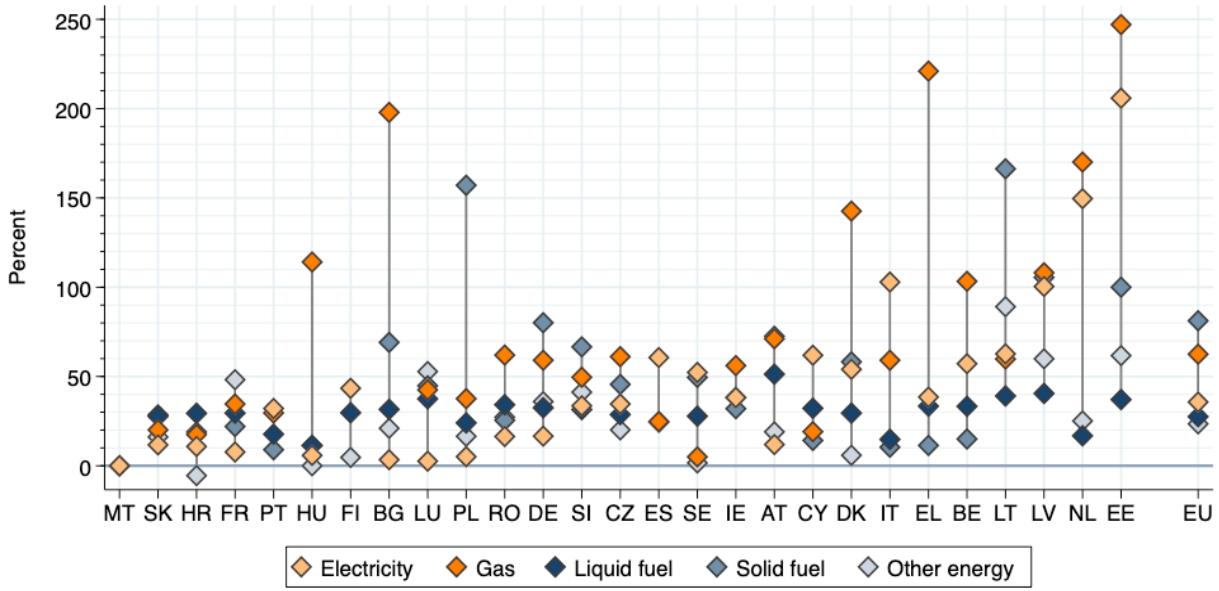
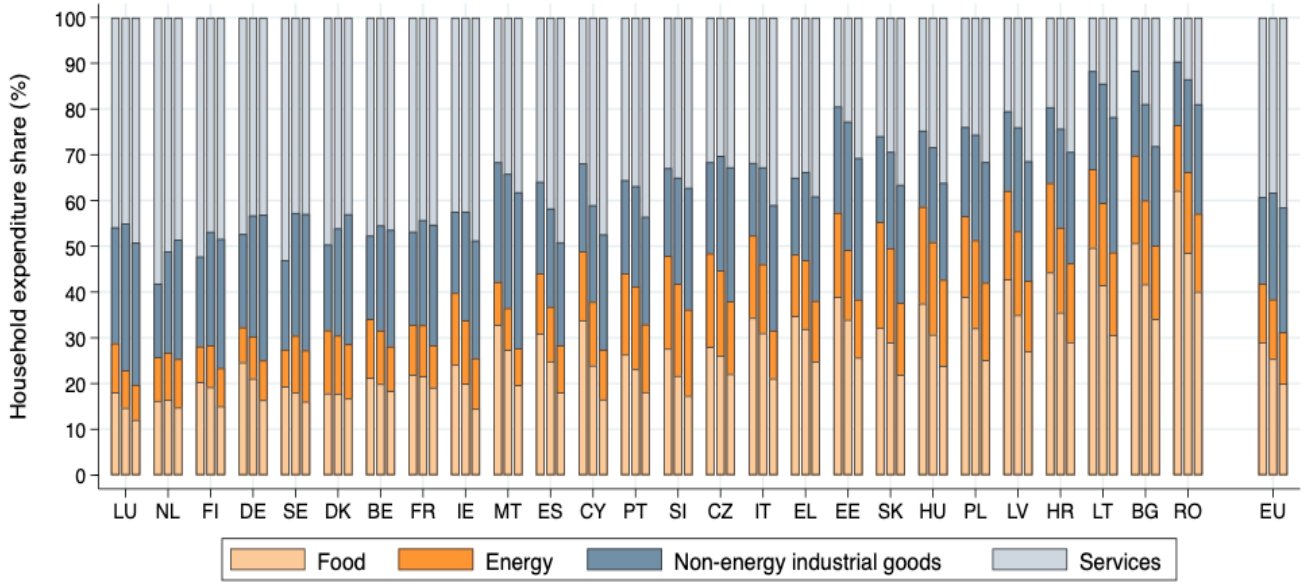
Divergent energy price trends



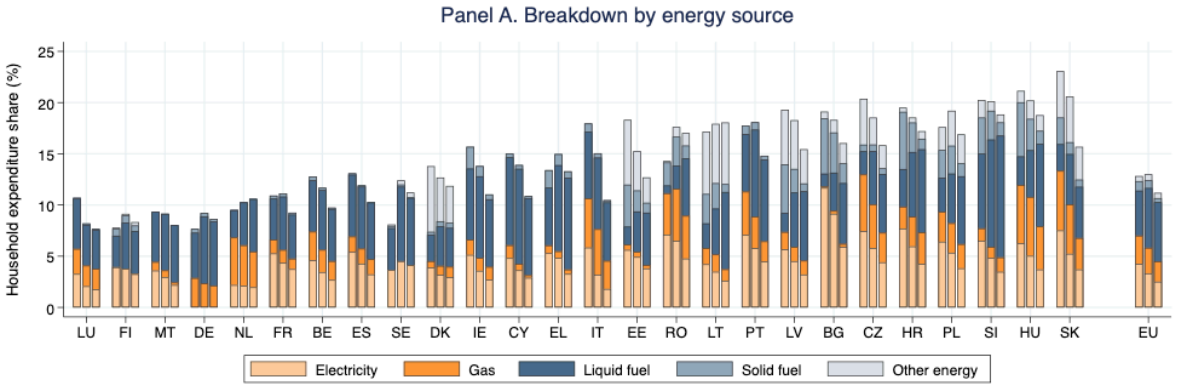
- The price of energy products has increasing at different rates both between and within countries
- At the EU level, the price of natural gas (64.9%) and solid fuel (81.2%) has increased the most
- Both the change and the level of energy prices are highly divergent across MSs

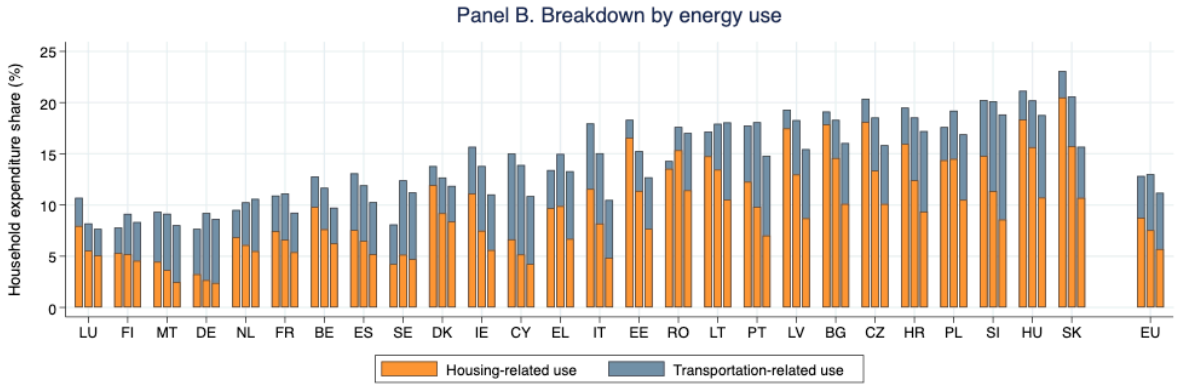
Structure of HH expenditures by country and income quintile



- At the EU level, HHs devote 25.4% / 13.0% / 23.3% / 38.3% of their total spending to food / energy / industrial goods / services
- Large cross-country variations - combined food and energy (F&E) expenditure share ranges between 23% (LU) and 66% (RO)
- Large within-country variations – Q1/Q5 gaps in F&E are 8.4% in EU15 countries and 16.9% in non-EU15 countries

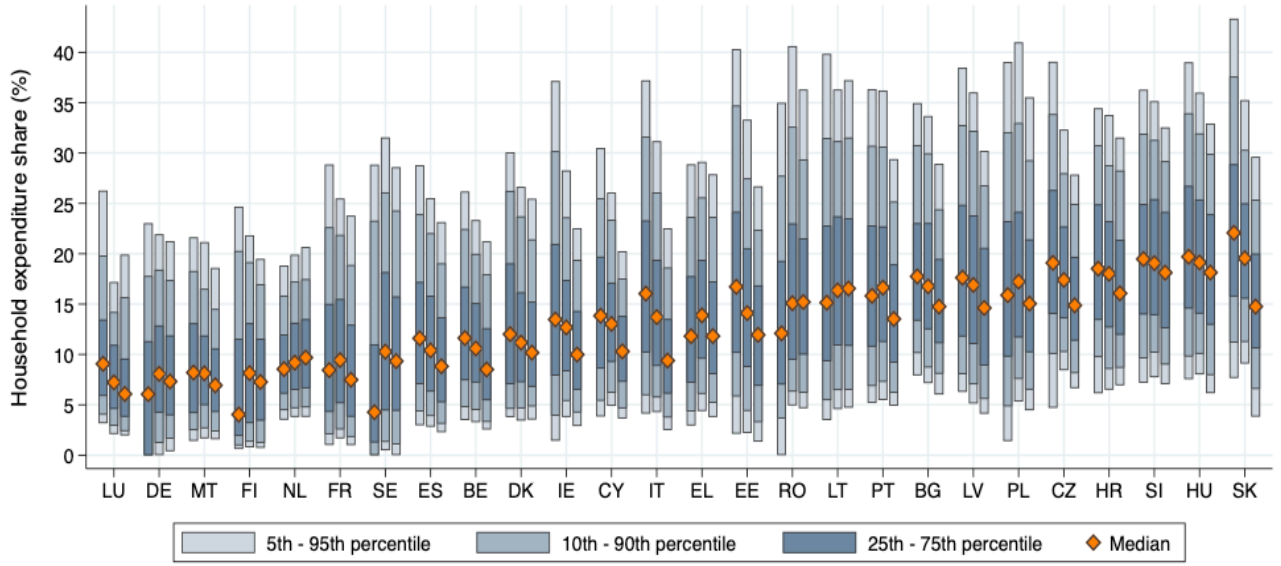
Breakdown of HHs' energy expenditures





- HHs' energy expenditure share varies equally across countries and income quintiles
- Q1/Q5 gaps are relatively minor but can be substantial in selected MSs (e.g. IT, SK) and even negative at times (e.g. RO, SE)
- The composition by energy source and energy use also exhibits strong cross-sectional variation

Heterogeneity in energy consumption & spending



- Large systematic and idiosyncratic variation in HHs' energy spending that is unrelated to income
- Focusing on income or measures of central tendency likely understates the true financial and social risks associated with inflation

Calculating the change in HHs' living costs

- Taking the cross-product of inflation and expenditure profiles, one can calculate the change in HHs' living costs and purchasing power in a customised manner (i.e. re-weighted aggregate inflation)

- Standard approach to studying inflation inequality based on two crucial implicit assumptions
  - Inflation data adequately capture the change in consumer prices for all population segments – rather unlikely

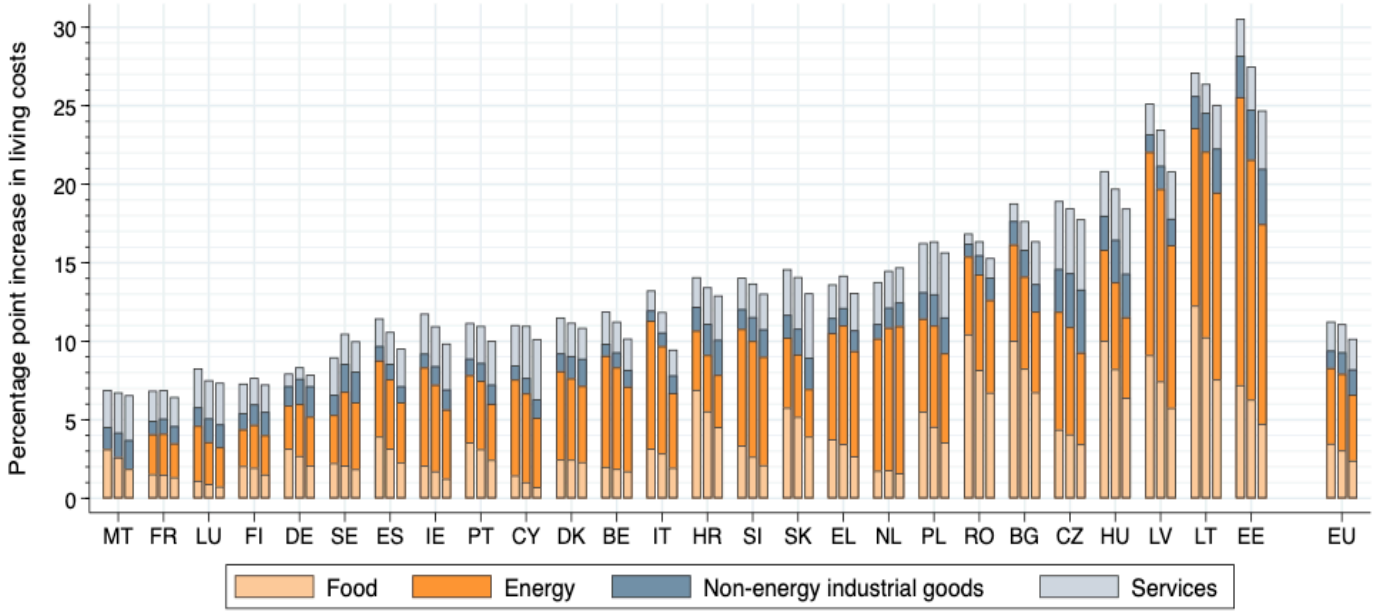
    (Menyhert et al., 2021; Sheremirov, 2020; Kaplan and Schulhofer-Wohl, 2017)

  - Substitution effects and energy saving is negligible, and HHs' demand and consumption structure remains the same – rather unlikely

    (Manser and McDonald, 1988; Knetsch et al, 2021; Nickel et al., 2021)

- Note that the validity of these assumptions may change with households socio-economic status, but also across MSs

Cost of living adjustments due to inflation



- Between August 2021 - August 2022, HHs' living costs have increased by 11.1% at the EU level
- Energy is most important but not the only driver of increases in living costs (43.9% at the EU level and 62.6% in the Netherlands)
- The Q1/Q5 gap in living cost adjustments is around 1 p.p. at the EU level but may reach 3-5 p.p. in selected MSs (e.g. EE, IT, LV)
- Observed living cost changes are broadly in line with inflation for middle-income HHs

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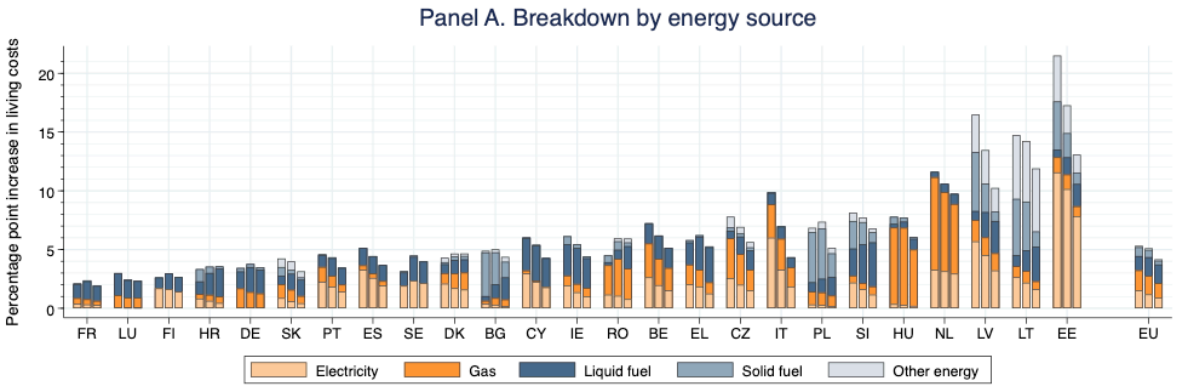
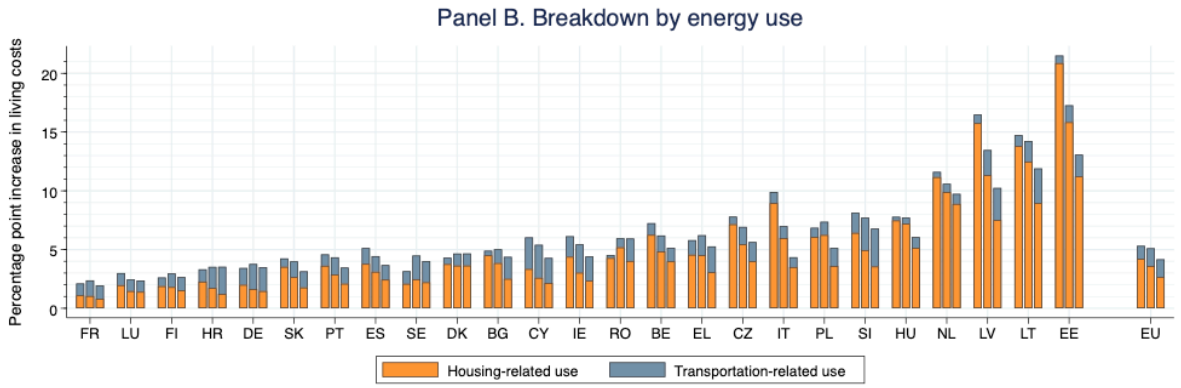
Contribution of energy components to increases in the cost of living





- Large cross-country divergence in the contribution of energy components to rising living costs
- Electricity, liquid fuel and natural gas have been the main drivers of HHs' increasing energy bills
- Poorer (richer) households are affected predominantly by increasing housing-related (transport-related) costs

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Potential effects of inflation on poverty and social exclusion

- Despite detailed information on real income effects, it is not easy assess the social consequences
  - Main reason: leading social policy indicators are often non-monetary / not directly affected by changes in HHs' real income
  - Consider the headline AROPE indicator
    - AROP is based on the national median (equivalised) income and is independent of purchasing power considerations
    - MSD is non-monetary but related to changes in purchasing power but in a complicated and non-functional
    - LWI is an indicator of labour force participation in the fist place
  - Strong case to be made for
    - absolute monetary poverty indicators
    - thematic indicators of particular socio-economic domains
- Current analysis quantifies the partial effect of inflation on
  - Material and social deprivation (MSD)
  - Absolute monetary poverty (ABSPO)
  - Energy poverty

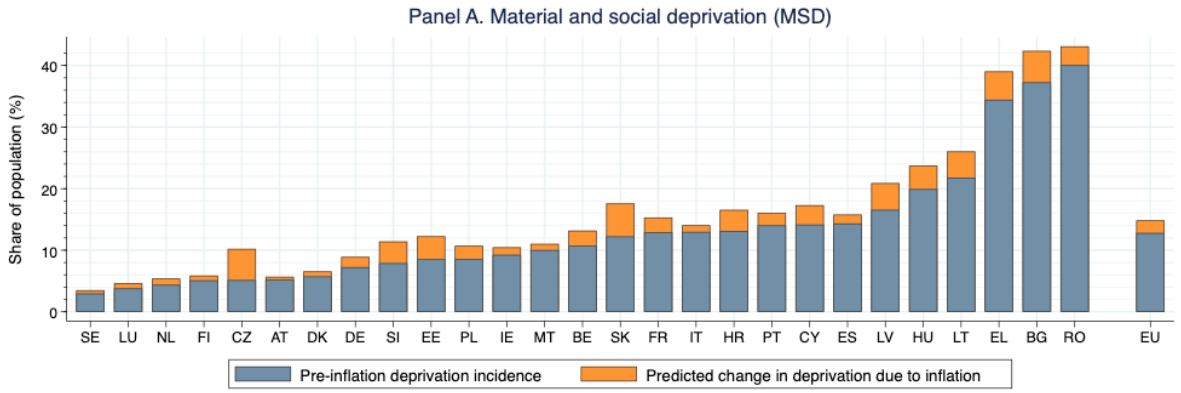
Potential inflation effects on material and social deprivation

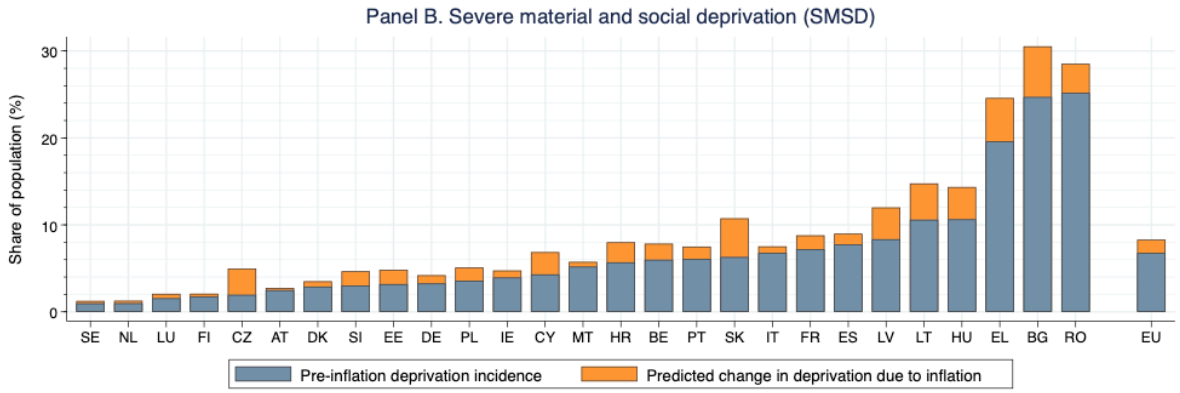
- Empirical research shows strong and robust relationship btw. HH income and MSD incidence in the SILC cross-section (Menyhert et al. 2021)
- Identification strategy - use this (between-HH) relationship to predict the (within-HH) income elasticity of MSD incidence over time
  - Main advantage : differences in nominal and real income are one and the same in the cross-section
  - Potential alternative of using longitudinal data has its limitations
- Identifying assumptions
  - (conditional) deprivation incidence depends only on contemporaneous (real) income
  - conditional on (real) HH income, changes in relative prices do not have an effect on deprivation incidence
  - institutional framework (e.g. government regulations, social security systems, provision of essential services) has remained stable
- Estimation method - OLS regression of MSD status on income and HH characteristics

$$y_{ih} = \alpha + \beta \log(income_h) + \gamma^T X_h + \varepsilon_{ih}$$

  - with $y_{ih} \equiv \mathrm{I}(MSD_h)$ on the LHS, and total equiv. disposable HH income and X_h vector of HH-level characteristics (HH size, composition, settlement type) on the RHS
  - estimated separately on the sub-sample of HHs with below-median (equivalised) income by country using microdata from the 2019 wave of the EU-SILC

Potential inflation effects on material and social deprivation





- OLS regression of HHs' deprivation status on income and HH characteristics yields the (real) income elasticity of MSD / SMSD status
- Estimated elasticities are rather low - 0.18 for MSD and 0.13 for SMSD on average across MSs
- The predicted inflation effects on deprivation are 2 p.p. on average for MSD (1.5 p.p. for SMSD), but up to 6 p.p. in selected MSs

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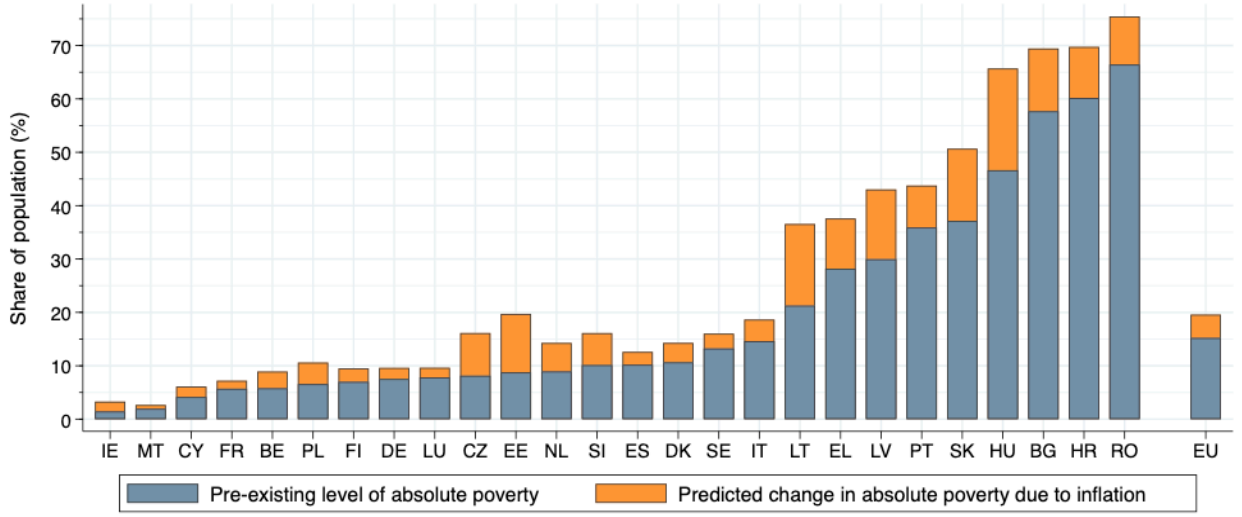
Potential inflation effects on needs-based absolute poverty

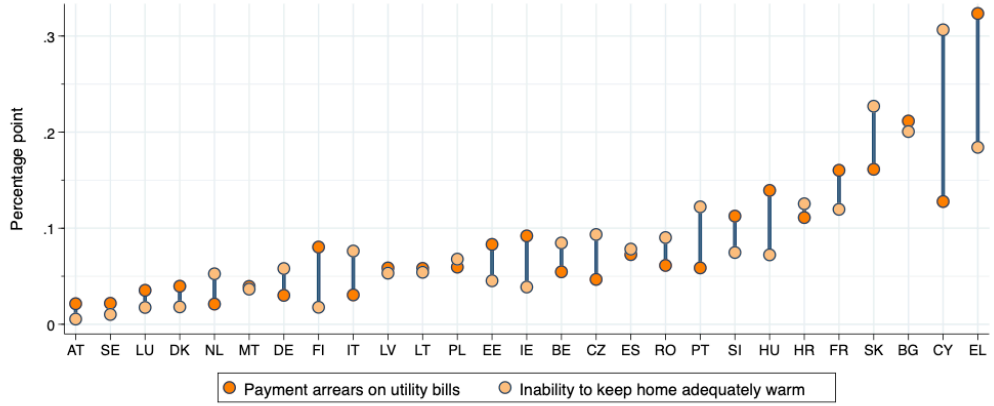


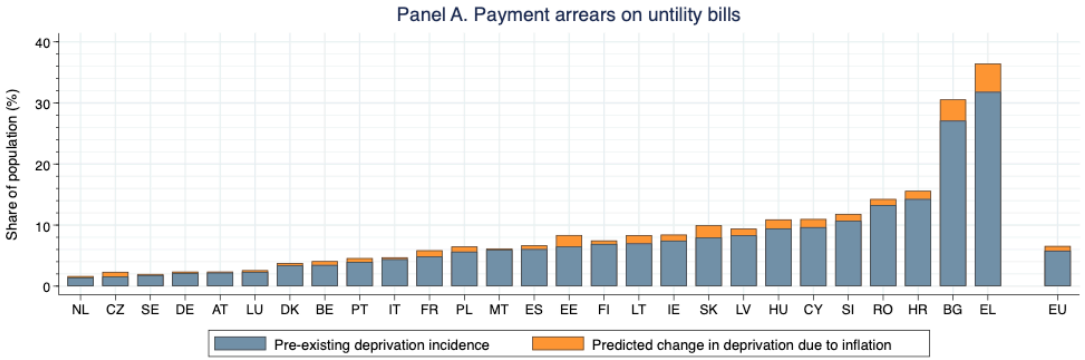
- The recent EMPL – JRC pilot project "Measurement and monitoring of absolute poverty (ABSPO)" produced cross-country comparable needs-based absolute poverty thresholds for all EU countries (except for Austria)
- To capture the partial effects of inflation, one can easily update the ABSPO thresholds and re-calculate the poverty rate with EU-SILC data
- The predicted increase in absolute poverty is 4.4 p.p. at the EU level, and range between 0.7 p.p. (MT) and 19.1 p.p. (HU) in MSs

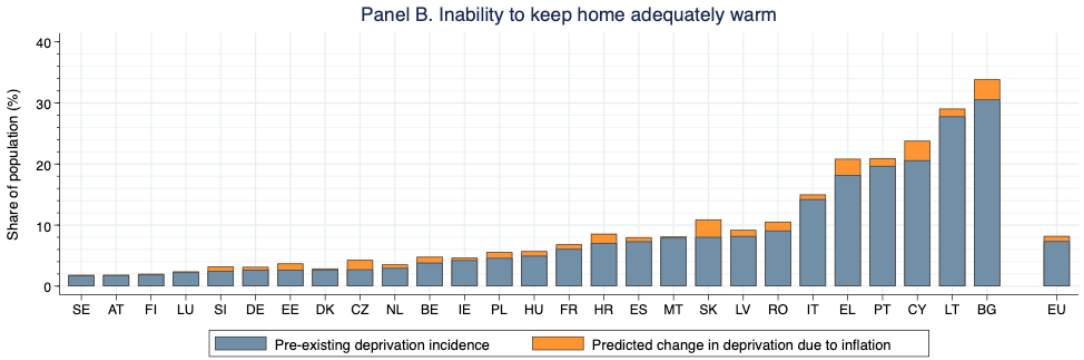
Potential inflation effects on energy poverty

- Energy poverty is defined as a situation in which HHs are unable to access essential energy services
- The Commission's Recommendation on energy poverty (EU 2020/1563) provides guidance on definitions and indicators
- The proposed indicators may be divided into four different groups:
  - indicators based on energy spending ratios,
  - indicators based on self-assessment,
  - indicators based on direct measurement,
  - indirect indicators
- To quantify the potential effects of rising prices on energy poverty, I focus on two different indicator types
  - subjective deprivation-related indicators based on the EU-SILC,
  - objective indicators centred on the relationship between energy expenditure and income based on the EU-HBS

Deprivation-related indicators of energy poverty

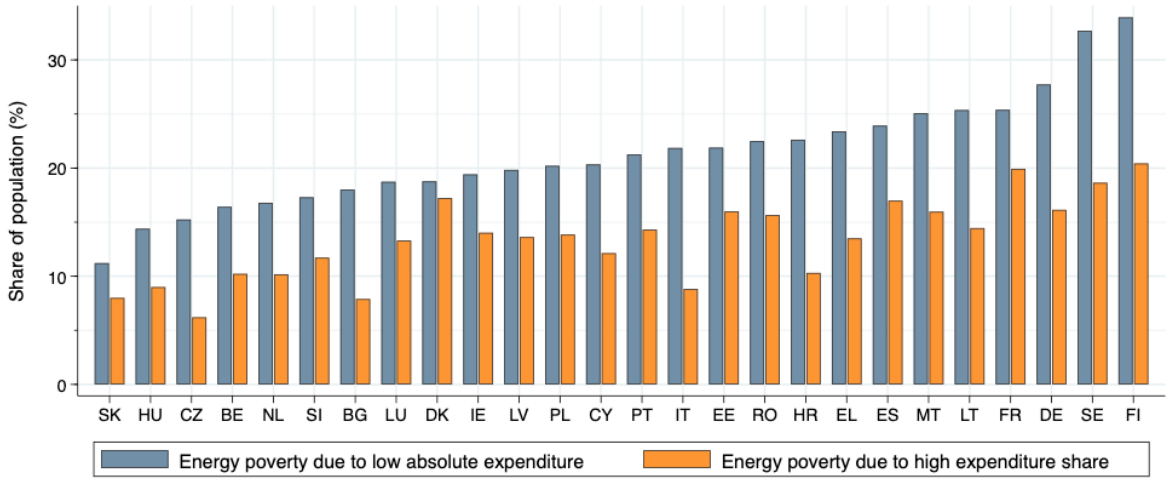


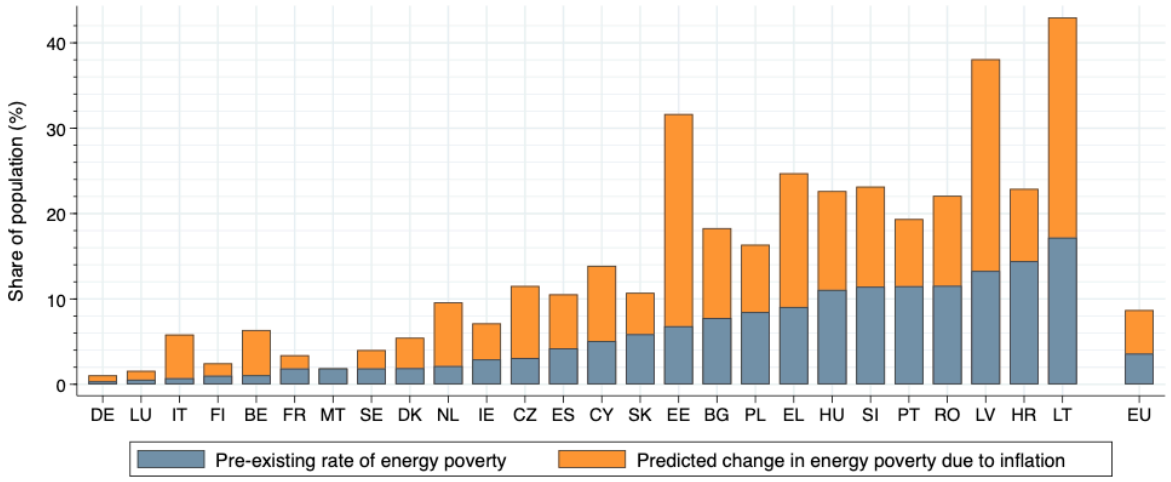




- Using EU-SILC questions on enforced inability, elasticity-based methods used in relation to MSD can be equally applied
- Given the low estimated elasticities (below 0.1 on average), the implied poverty effects are small (below 1 p.p. at the EU level)
- Due to restrictive assumptions (i.e. no relative price effects), these should be considered as lower-bound estimates

Expenditure-based indicators of energy poverty





- Measuring energy poverty through HHs' energy expenditures appears more straightforward
- Most common indicators focus either on low (i.e. below-median) absolute expenditures or high (above-median) expenditure share - they are ill-suited to capture the social or distributional effects of rising living costs in a forward-looking manner **[LEFT PANEL]**
- For predictive purposes, applying a fixed expenditure share threshold (e.g. 30%) and assuming full pass-through works better – this yields large increases in energy poverty (i.e. 5 p.p. at the EU level and above 20 p.p. in selected MSs) **[RIGHT PANEL]**
- Due to restrictive assumptions (i.e. no energy saving), these should be considered as upper-bound estimates

Policy conclusions and data recommendations

- The social situation is rather alarming and calls for a strong and coordinated policy response
  - without mitigation, MSD may increase by 2 p.p. while absolute poverty and energy poverty by 5 p.p. at the EU level
  - strong predicted inequalities in the social costs of inflation that widen existing gaps in poverty and social exclusion across the EU
- Potential policy recommendations include
  - short-term emergency measures aimed at offsetting the direct consequences of price increases
  - strengthening the redistributive capacity of fiscal policy and ensuring the effectiveness of social protection systems
  - aligning protective measures with the strategic EU priorities of the twin transitions based on the EU's climate and social agenda
- Improved data collection and indicator development could support sound evidence-based policy-making
  - ongoing harmonisation for timely and integrated European household survey data as stipulated by the IESS regulation (2019/1700)
  - collection of new disaggregated information on HHs' self-perceived basic needs / preferences / living conditions / consumption patterns
  - subsequent improvements in social indicators and measurement in the domains of energy poverty, affordable housing, essential services

Follow-up work

- Some areas where more research is definitely needed
  - Inflation expectations, inflation persistence, inflation propagation across product categories
  - Pass-through of inflation onto expenditures, substitution effects, saving decisions and broader behavioural responses
  - Second-round effects of inflation (e.g. wage and interest rate adjustments) and their effect on HHs' expenditures, income and wealth
  - Analysis of household (financial) wealth and its potential role in offsetting the negative social effects of inflation

Thank you for the attention!

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