



EUROPEAN CENTRAL BANK

EUROSYSTEM

## **Inflation, fiscal policy and inequality: The distributional impact of fiscal measures to compensate consumer inflation**

Joint expert team of the European Commission's Joint Research Centre and the ESCB Working Group on Public Finance

2nd Banca d'Italia Workshop on  
Microsimulation modelling  
16<sup>th</sup> June 2023

Antonio F. Amores, Henrique S. Basso, Simeon Bischl, Paola De Agostini, Silvia De Poli, Emanuele Dicarolo, Maria Flevotomou, Maximilian Freier, Sofia Maier, Esteban García Miralles, Myroslav Pidkuyko, Mattia Ricci, Sara Riscado



- Euro area **inflation rose to 8.4% in 2022**, currently expected to decline towards the ECB target of around 2% by 2025
- Large array of **government measures to cushion the impact of the current inflationary shock** for on households and firms.
- In the euro area, fiscal measures estimated to amount to close to **2% of GDP in 2022 and 2023**.
  - A bit more than ½ of support aiming at directly containing price increases (“**price measures**”), including indirect tax cuts and tax and electricity price caps
  - A bit less than ½ of measures directed at supporting income of households and firms (“**income measures**”), e.g. public transfers with indirect and lagged effects on inflation via aggregate demand

## Questions and approach

- What is the impact of the **inflationary shock** and the **fiscal policy response** on the 2022 **household disposable income distribution** in the euro area?
- Uses tax-benefit microsimulation model for EU countries (**EUROMOD**)
- First systematic cross-country assessment of the **joint effect of income-side measures and price-side measures** in response to the inflationary shock, making use of the EUROMOD Indirect Tax Tool (ITTv4) extension
- Simulations for **six countries**: Germany, Greece, Spain, France, Italy and Portugal (euro area proxy)

# Main findings

1. Purchasing power of **lower-income households more severely affected** by the 2022 inflation surge than that of high-income households
  - higher weight of energy intensive goods in consumption basket
  - higher share of income spent on consumption (negative savings)
2. Fiscal measures significantly **contributed to compensating for the loss in purchasing power**, though with large country differences
  - Purchasing-power gap almost completely closed in France, Greece, Portugal, and mostly closed in Italy
3. Most fiscal measures were **not particularly targeted to low-income households**, implying a high fiscal burden
  - income measures more targeted and efficient in reducing inequality gap than price measures

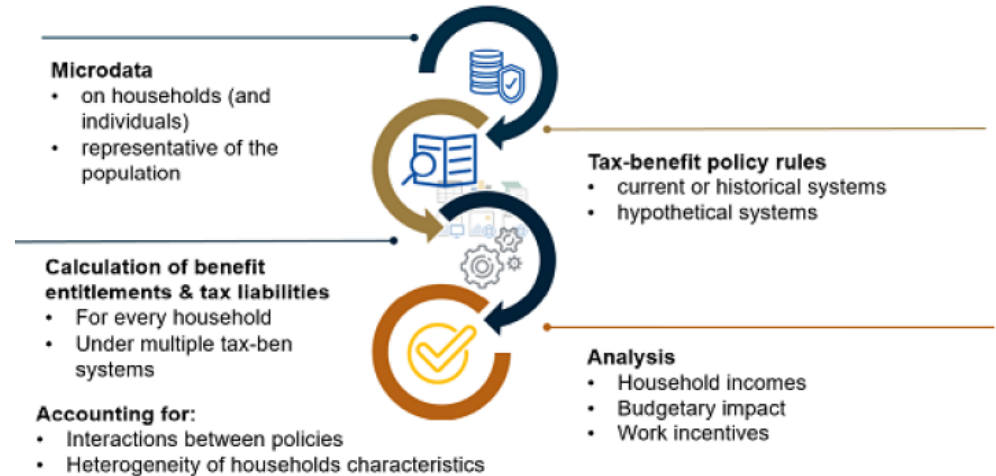
# Overview

- 1 Method and data
- 2 Simulation results
- 3 Fiscal cost and impact on equality

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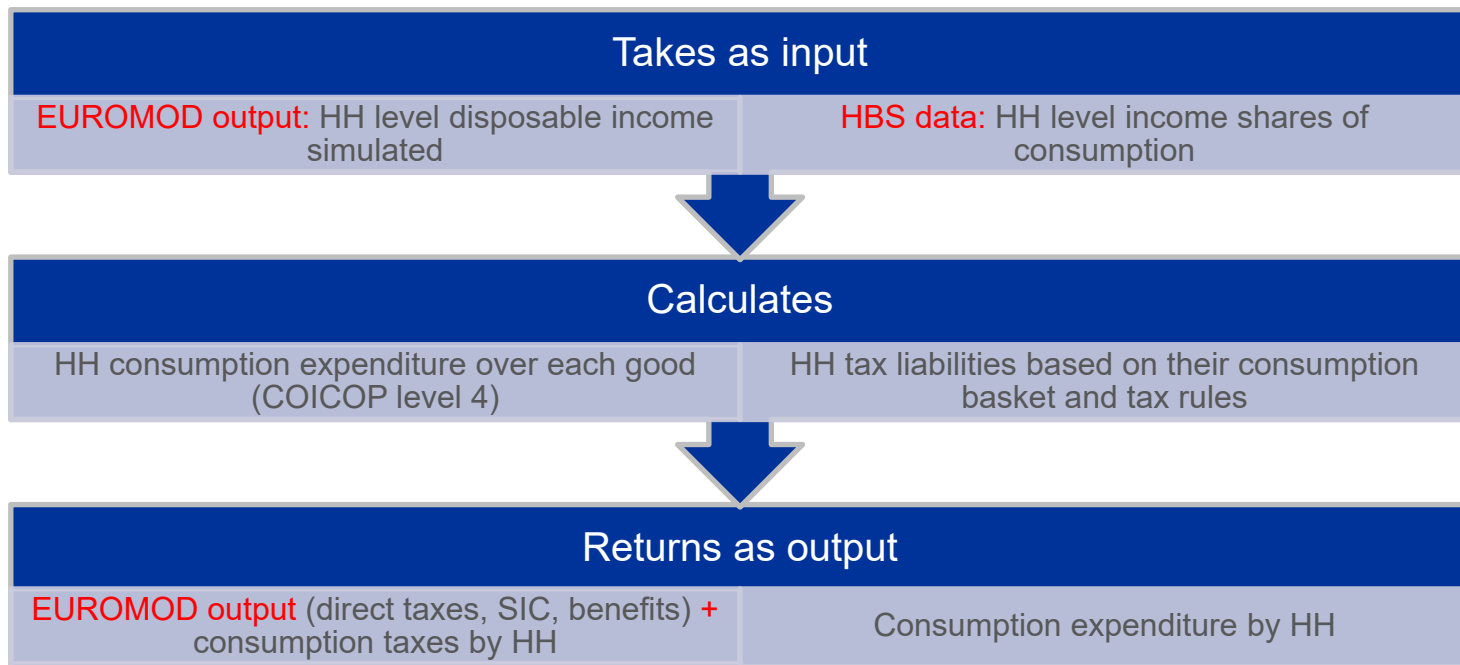
- Uses micro data with information on different sources of income, household composition and individual socioeconomic characteristics to simulate the impact of the tax and benefit system on disposable income for every individual and household included in the input dataset.
- EUROMOD is a strictly *ceteris paribus*, i.e. it does not account for behavioral effects in labour and consumption (“morning after” effects).



- Problem: **EUROMOD only allows to simulate income measures** (i.e. fiscal measure that impact disposable impact of households)
- **How to simulate the impact of price measures** on the real disposable income of households?
  - **Simple approach:** allocate price measures across income quintiles or deciles according to their energy exposure in their consumption baskets
  - **Sophisticated approach:** Use the Indirect Tax Tool (ITT) extension to EUROMOD; only available as a pilot
- To use ITT tool, close cooperation with the EUROMOD team in the **European Commission's Joint Research Centre** (JRC in Sevilla)
  - **JRC advanced launch** of the EUROMOD-ITT for six euro area countries
  - **JRC provided training and technical support** on the modelling of 2022 price measures
  - **Eurosystem experts run EUROMOD-ITT** for the six euro area countries



- ITT extends EUROMOD with the **consumption side of households**
  - allows the simulation of **indirect tax liabilities** and of **indirect tax reforms**
  - allows also the simulation of the impact of **price developments** on real household consumption
- Model: EUROMOD by including **structure of indirect tax system** at a disaggregated level of consumption (in most cases at the commodity level, e.g. "Rice")
- Input data: **Combination of income and expenditure survey datasets**, namely (i) European Union Statistics on Income and Living Conditions (EU-SILC) and the Household Budget Surveys (HBS)
- Caveat: analysis is partial and does not account for likely **substitution effects** in consumption away from energy or energy-intensive products
- JRC will include the indirect tax tool in the EUROMOD **public release** starting from 2024



Source: European Commission.



## Upgraded to 2021/2022

- yearly cross-sectional survey of households on income, poverty, social exclusion, and living conditions
- latest available input data from 2019

## Tax and benefit system updated to 2021/2022

## Upgraded to 2021/2022

- survey conducted every five years on household's expenditure on goods and services
- 2010 data matched with EU-SILC data from 2019

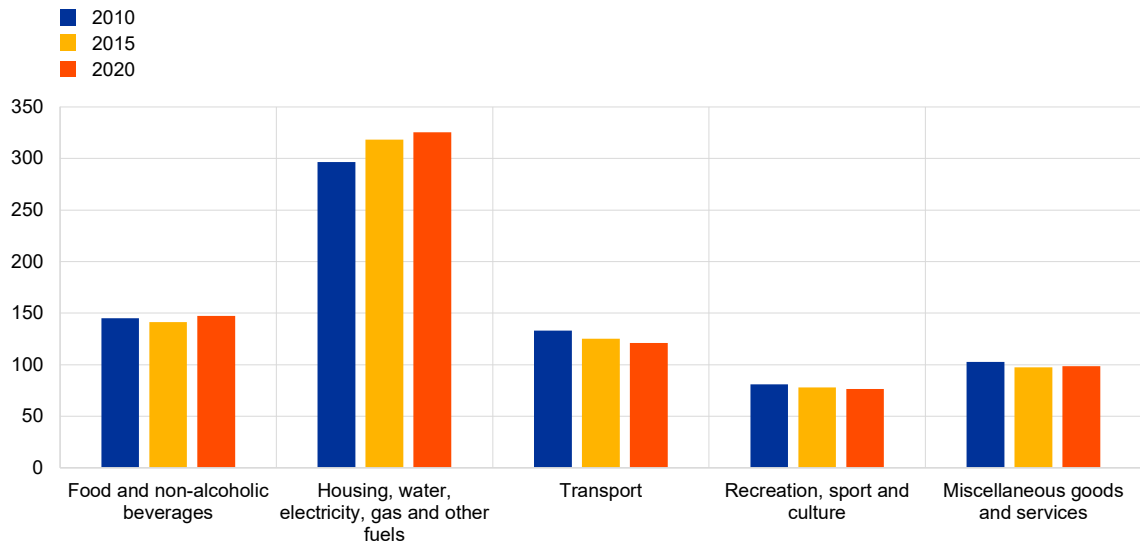
## Upgrading mechanism for wages and earnings (2021 to 2022)

	Germany	Greece	Spain	France	Italy	Portugal
<b>Wages/Earnings</b>	Gross income: + 8.7%	Employment earnings: 1.8% for private sector  0% for public sector	Wage cost, private sector: 2.1%	Net full-time salary: +3.9%	Salary index, private sector: +0.8%	Average wages of dependent employees: +2.0% for private sector and 1% for public sector
<b>Source</b>	German national statistical office	Estimates using Eurostat data	Spanish National Statistics Institute	French National Institute of Statistics	Italian National Institute of Statistics	Portuguese State Budget
<b>Differentiation of income groups in upgrading</b>	Sector specific upgrading	Separate upgrading for public/private sector	Separate upgrading for public/private sector	Quartile specific upgrading	Separate upgrading for public/private sector	Separate upgrading for public/private sector

Source: Data collected from EUROMOD country reports and model files.

Notes: The usual sources and figures of the upgrading in EUROMOD may have been changed for this exercise. In many cases it is approximated by central banks and AMECO forecasts, in a first stage, and then corrected according to the available information.

## Expenditure share of top five COICOP expenditure categories (permille of total expenditure)



Source: Own calculations based on Eurostat's HBS

Notes: The five categories shown are the COICOP categories with the highest share of total expenditure. The expenditure shares are in permille of total expenditure and correspond, from left to right, to COICOP categories CP01, CP04, C07, CP09 and CP12. The bars show the EA approximation used in this paper, consisting of GDP-weighted average of Germany, France, Italy, Portugal, and Greece. Data source are the 2010, 2015 and 2020 waves of the HBS.

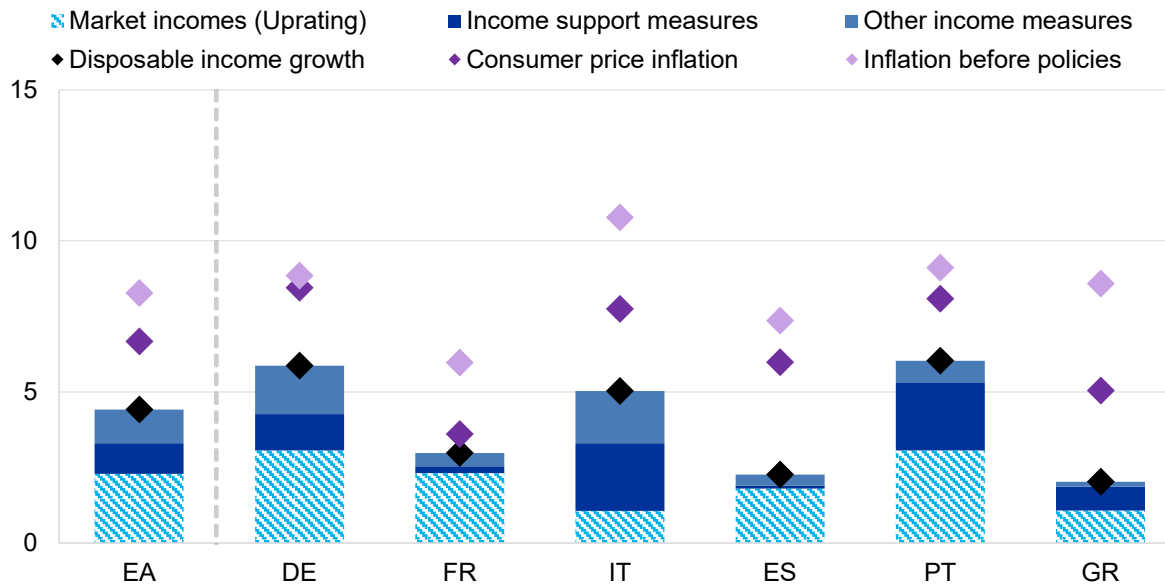
## Measures modelled by type

Type	Sub-type	Germany	Greece	Spain	France	Italy	Portugal	Gra
Income	Direct taxes by households	2	-	-	1	-	-	3
	Social security contributions	-	-	-	-	1	-	1
	Old age pensions	-	-	-	-	1	1	2
	Unemployment benefits	-	1	-	-	-	-	1
	Social transfers in kind	-	-	-	2	-	-	2
	Other social benefits other than in kind	5	5	2	1	3	3	19
Income subtotal		7	6	2	4	5	4	28
Price	VAT	1	2	2	-	1	1	7
	Excise	1	1	1	1	1	1	6
	Price cap	-	-	1	2	-	-	3
	Reimbursement	1	1	-	-	-	1	3
	Discount/Subsidy	-	4	1	1	1	-	7
	Social transfers in kind	-	1	-	-	-	-	1
Price subtotal		3	9	5	4	3	3	27
Total		10	15	7	8	8	7	55

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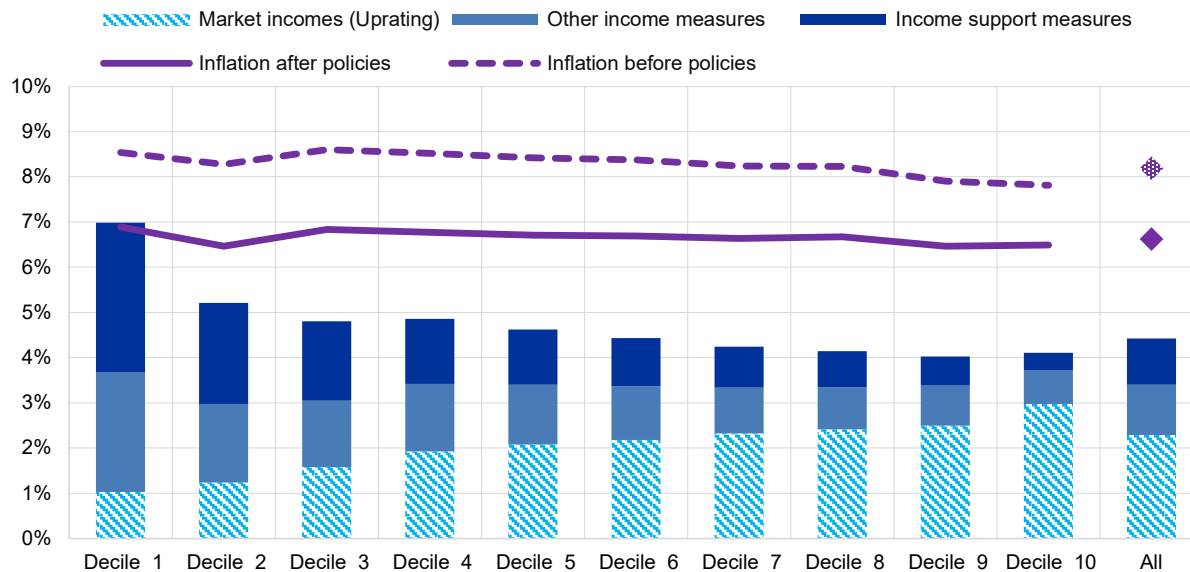
## Disposable income growth and consumer inflation in the euro area and euro area countries (percentage, 2021-2022)



Notes: Results from microsimulations based on EUROMOD and EU-SILC/HBS. Euro area proxied as weighted average of Germany, Greece, Spain, France, Italy and Portugal.

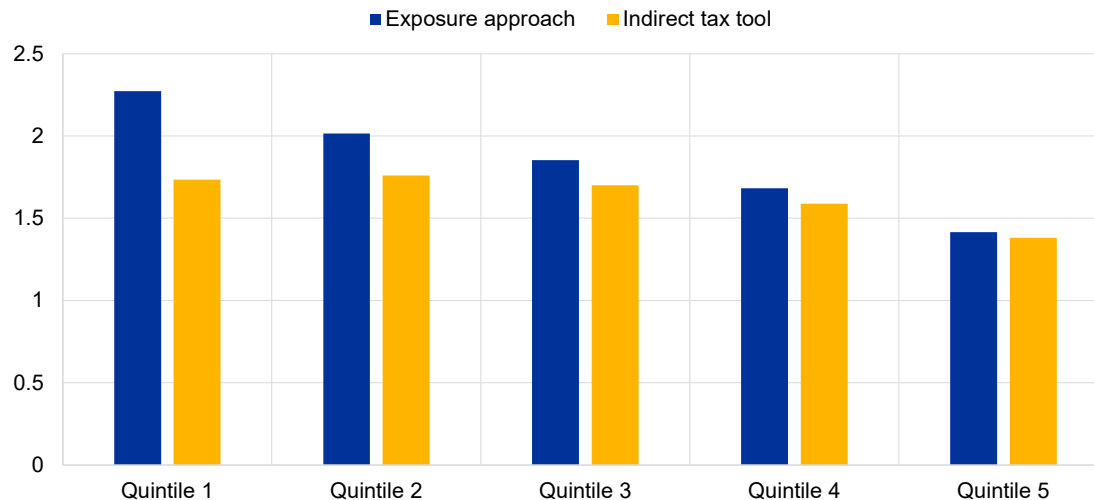


## Distribution of disposable income growth and consumer inflation in the euro area (percentage, 2021-2022)



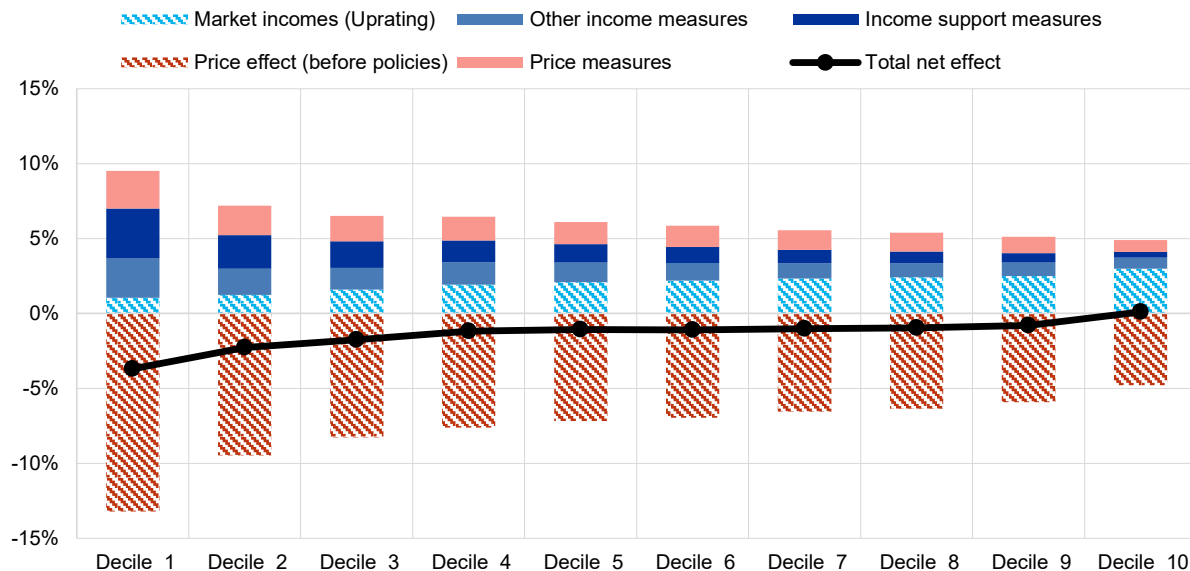
Notes: Results from microsimulations based on EUROMOD and EU-SILC/HBS. Euro area proxied as weighted average of Germany, Greece, Spain, France, Italy and Portugal.

## Policy effect of price measures according to ITT and simplified exposure approach for euro area (percentage, 2021-2022)



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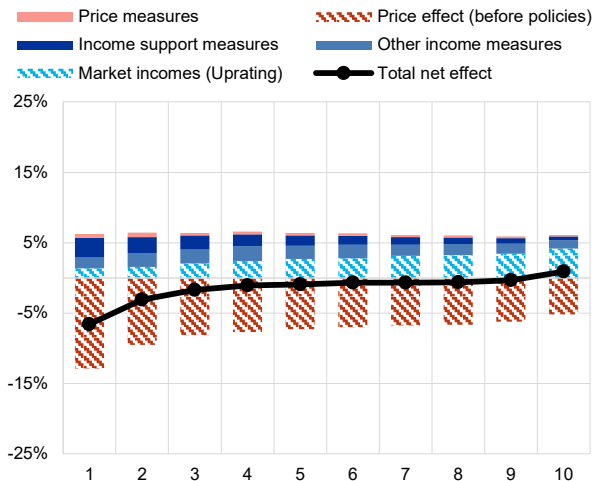
## Distribution of change in consumption basket-weighted disposal income (percentage, 2021-2022)



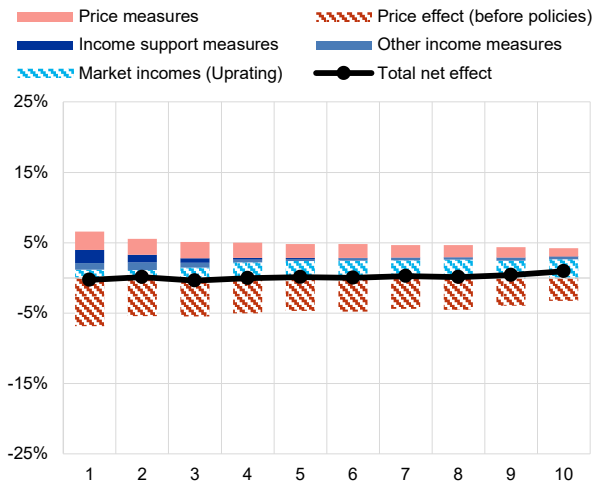
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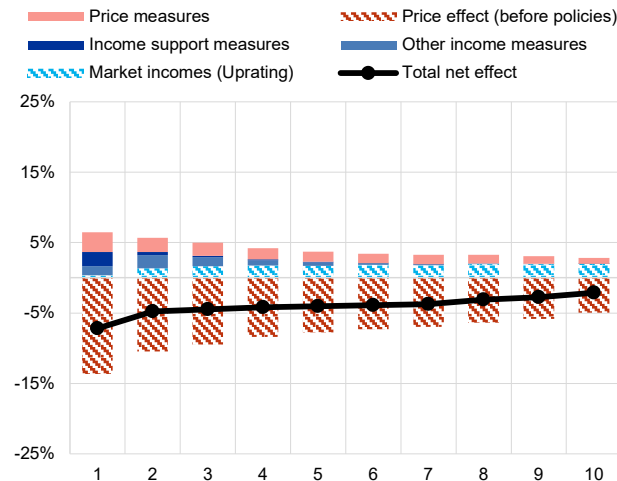
### Germany



### France



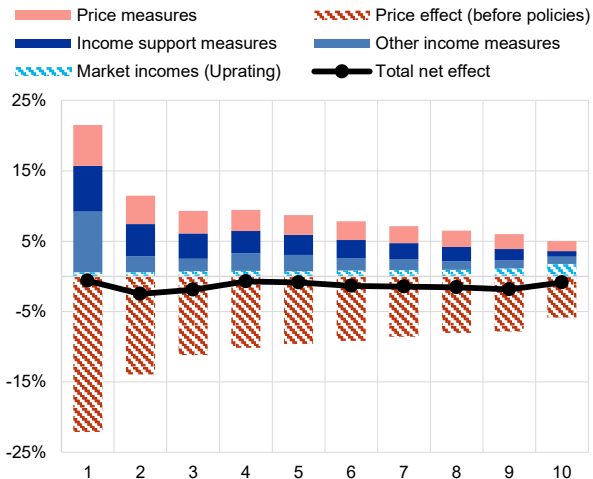
### Spain



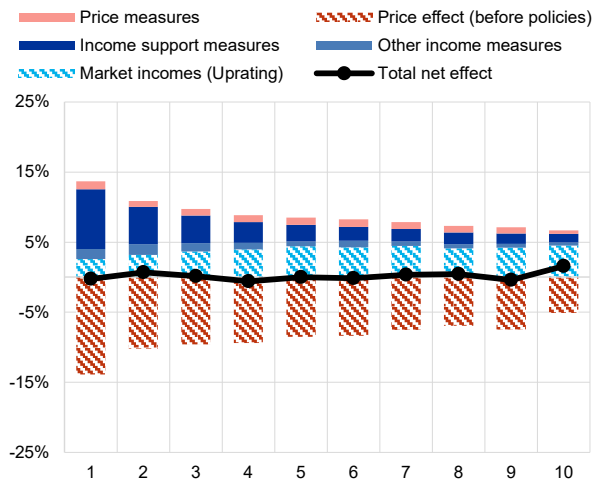
Notes: Results from microsimulations based on EUROMOD and EU-SILC/HBS.

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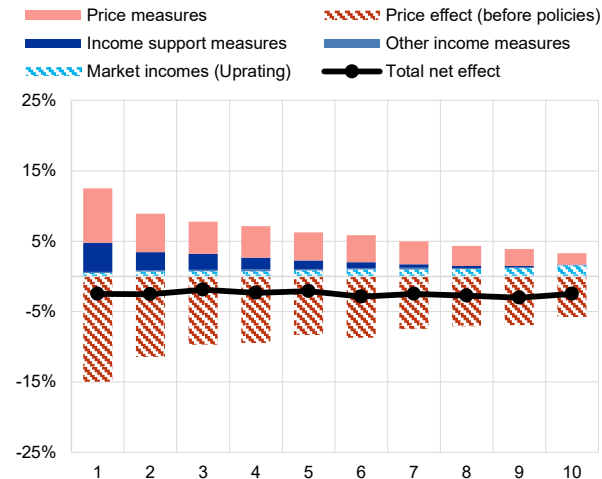
### Italy



### Portugal



### Greece

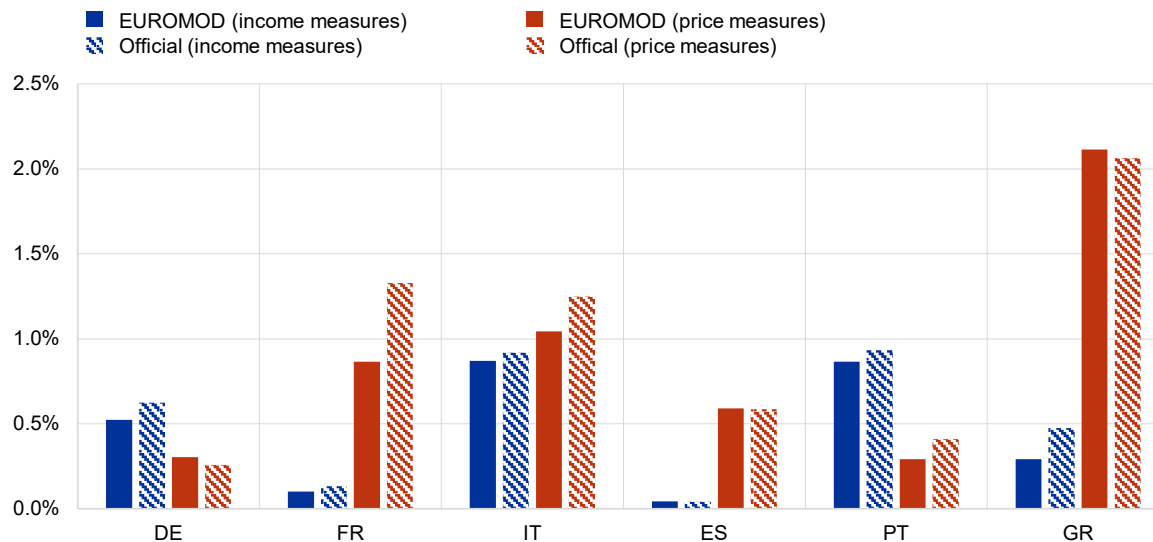


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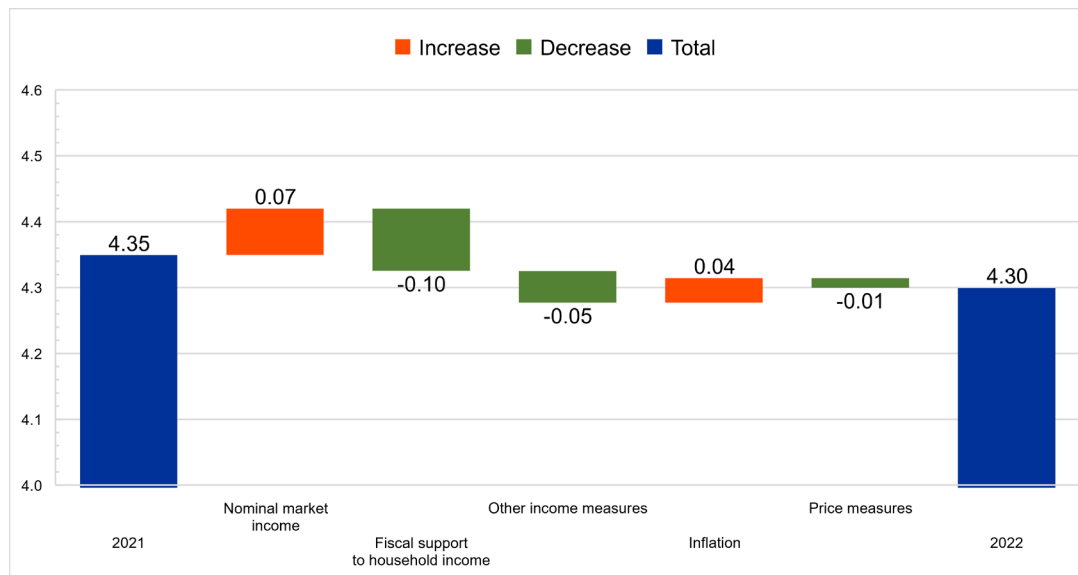
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## Comparison of EUROMOD cost estimates with government estimates (percentage of GDP)



Notes: Results from microsimulations based on EUROMOD and EU-SILC/HBS. Official estimates according to government sources.

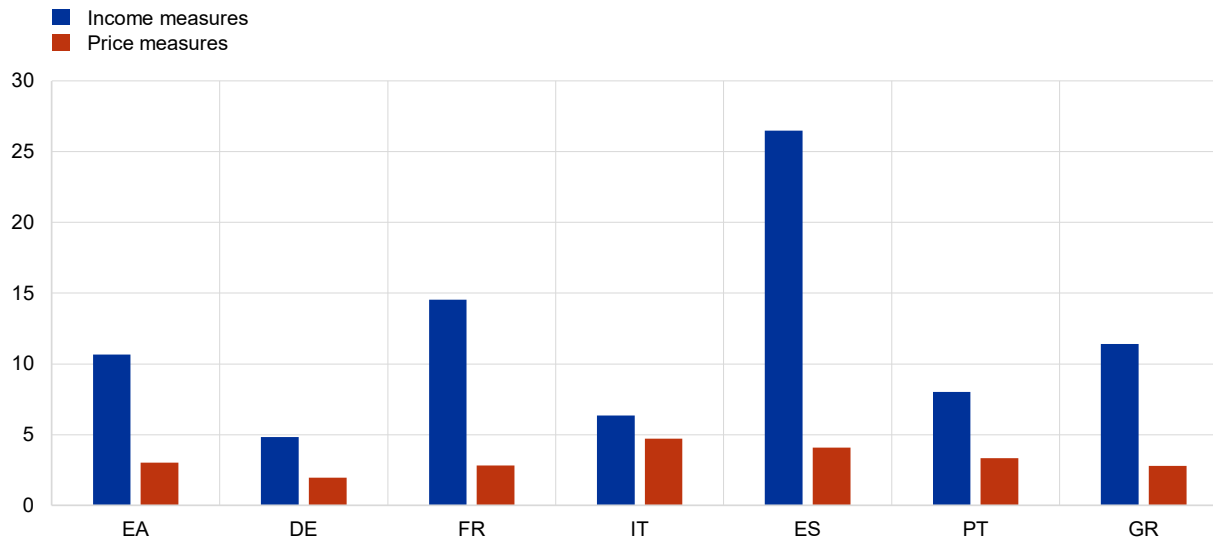
## Decomposition of changes in 80/20 inequality measure (percentage change, 2021-2022)



Notes: Results from microsimulations based on EUROMOD and EU-SILC/HBS.



## Change in disposable income of first quintile per euro spent (% of GDP, 2021-2022)



Notes: Results from microsimulations based on EUROMOD with data from EU-SILC and the HBS. The bars show the change in disposable income of the bottom 20% of the income distribution (first quintile) divided by the cost of the price and income measures in % of GDP.