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Boris Chafwehé, Mattia Ricci, Daniel Stöhlker

European Commission, Joint Research Centre
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Introduction

▶ The 2022 inflationary shock affected households through consumption, income and wealth.
▶ Moreover the inflationary shock was met with a strong monetary and fiscal policy response.

Our contribution:

1. Provide a comprehensive framework to assess various channels of inflation shocks and policy response.
2. Quantify size of various channels across households groups for EA countries.
Recent contributions

▶ Amores, Basso, Bischl, De Agostini, Poli, Dicarlo, Flevotomou, Freier, Maier, García-Miralles, et al., 2023
  ▶ study the impact of inflation via income and consumption in the EA, and
  ▶ analyse the cushioning effect of fiscal policy using EUROMOD

▶ Cardoso, Ferreira, Leiva, Nuño, Ortiz, Rodrigo, and Vazquez, 2022
  ▶ study the impact of inflation in ES via consumption, income and wealth
  ▶ use BBVA proprietary dataset (don’t consider policy response).

▶ Pallotti, Paz-Pardo, Slacalek, Tristani, and Violante, 2023
  ▶ study the impact of inflation via consumption, income and wealth
  ▶ use HFCS data for DE, FR, IT and ES and account for fiscal policy.

▶ Many other Studies, mostly focusing on heterogeneous consumption
  ▶ Battistini, Di Nino, Dossche, Kolndrekaj (2022), Menyhert (2022) etc
The household budget constraint

\[
\sum_k P_{k,t}c_{j,k,t} = P_t y_{j,t} + B_{j,t-1}^{(t)} + P_t b_{j,t-1}^{(t)} + \sum_{s \geq 1} Q_t^{(t+s)} (B_{j,t-1}^{(t+s)} - B_{j,t}^{(t+s)}) + \sum_{s \geq 1} q_t^{(t+s)} P_{t+s} (B_{j,t-1}^{(t+s)} - B_{j,t}^{(t+s)}) - P_t \tau(y_{j,t}; \{c_{j,k,t}\}_k)_1
\]

where:

- \(B_{j,t}^{(t+s)}\) are zero-coupon nominal bonds maturing in \(t + s\)
- \(b_{j,t}^{(t+s)}\) are zero-coupon real assets maturing in \(t + s\)
- \(\tau(y_{j,t}; \{c_{j,k,t}\}_k)\) are taxes, benefits and subsidy.
- \(c_{j,k,t}\) is consumption of good \(k\) by household \(j\)
- \(y_{j,t}\) is net income
Main assumption

Following Auclert (2019), we analyse the impact of an unexpected temporary increase in inflation at time $t$:

**A1:** The shock is unexpected and one-period. In all others, inflation is as expected and normalised to $\bar{\pi}$:

$$\tilde{\pi}_t = \begin{cases} \bar{\pi} & \text{at } \tilde{t} \neq t \\ \bar{\pi} + d\pi & \text{at } \tilde{t} = t \end{cases}$$

and $E_t\pi_{t+1} = \bar{\pi}$ for all $t$.

**A2:** The monetary authority responds to the inflationary shock by increasing interest rates at time $t$ by $dR$ moving all bond prices $dQ/Q = -dR/R$.

**A3:** Nominal incomes are indexed to inflation by a share, $\lambda$. 
The impact of inflation

The first-order impact of inflation will then read:

\[
\Delta a_{j,t}^{(\pi)} = - \begin{bmatrix}
NNP_{j,t} \\
(1 - \lambda_{j,t})y_{j,t-1} \\
\left(\frac{d\pi_j}{d\pi} - 1\right)c_{j,t}
\end{bmatrix} d\pi \quad (2)
\]

where:

- **Fisher effect** is the devaluation of nominal assets and liabilities.
- **Nominal income** is the devaluation of nominal income.
- **Relative consumption** is the relative inflation rate.
The impact of fiscal and monetary policy

The first-order impact of fiscal policy via income and price measures:

\[ da^{(\tau)}_{j,t} = - \left[ d_{\tau y} (y_{j,t}) + d_{\tau c} \left( \{c_{j,k,t}\}_{k} \right) \right] \]

(3)

and the impact of monetary policy via the interest rate increase:

\[ da^{(R)}_{j,t} = URE_{j,t} \ dR \]

(4)

where \( URE_{j,t} = \frac{B_{t-1}^{(t)}}{P_t} + b_{t-1}^{(t)} + y_{j,t} - \tau (y_{j,t} ; \{c_{j,k,t}\}_{k}) - \sum_k \frac{P_k}{P_t} c_{j,k,t} \) is the difference between maturing assets and maturing liabilities.
Empirical strategy

We combine data from different sources:

▶ Data on household (gross) income and consumption, wealth and its composition are obtained from the third wave of HFCS.

▶ Info on households consumption baskets is obtained from the 2015 HBS.

▶ Fiscal effects are from Amores, Basso, Bischl, De Agostini, Poli, Dicarlo, Flevotomou, Freier, Maier, García-Miralles, et al., 2023 estimates based on EUROMOD and its Indirect Tax Tool (ITT) extension.
Impact of inflation across EA income groups

- Fisher effect
- Nom. income channel
- Rel. consumption channel

Inflationary impact of disposable income across Income Deciles.
Impact of monetary policy response
Impact of fiscal policy response

![Graph showing income distribution across different income deciles and % of disposable income for income-side and price-side measures.](image)
Total impact: inflation and policy response

![Diagram showing the impact of inflation and policy responses across different income deciles. The diagram compares Fisher effect, nominal income channel, relative consumption channel, fiscal measures, monetary measures, and total effect. The y-axis represents the impact in % of disposable income, ranging from -15 to 20. The x-axis represents income decile from 1 to 10.](image)
Mortgagees win, pensioners loose..

-10 -5 0 5 10 15

-10 -5 0 5 10 15

-10 -5 0 5 10 15

-10 -5 0 5 10 15

-10 -5 0 5 10 15

16-34 35-44 45-60 61-74 75+

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Conclusions

▶ We propose a simple framework, based on publicly available household balance sheet data, to study the heterogeneous impact of a shock and the policy response to it.

▶ Applied to the 2022 inflation shock, we find a pronounced regressive pattern with lower income households more negatively affected.

▶ Households with mortgage debt, in particular with fixed interest rates, are among the winners of the inflation surge, while older individuals with large nominal net savings positions have lost most.


Thank you
Appendix
HH characteristics along income distribution

**Age groups**

- 0-16 years
- 16-34 years
- 35-44 years
- 45-60 years
- 61-74 years
- 75+ years

**Income and Wealth Deciles**

- Wealth dec. 1
- Wealth dec. 2
- Wealth dec. 3
- Wealth dec. 4
- Wealth dec. 5
- Wealth dec. 6
- Wealth dec. 7
- Wealth dec. 8
- Wealth dec. 9
- Wealth dec. 10

**Home ownership + mortgages**

- Non-Homeowner
- Homeowner without mortgage
- Homeowner with mortgage

**Consumption basket**

- COICOP groups 1, 4, 7
- Other COICOP groups
Impact of inflation across countries

- FRA
- GER
- GRE
- ITA
- ESP
- POR
Impact of monetary policy across countries
Total impact across countries

FRA

GER

GRE

ITA

ESP

GRE