



Energy Inflation and Consumption Inequality

INCOME AND WEALTH INEQUALITY: DRIVERS & CONSEQUENCES

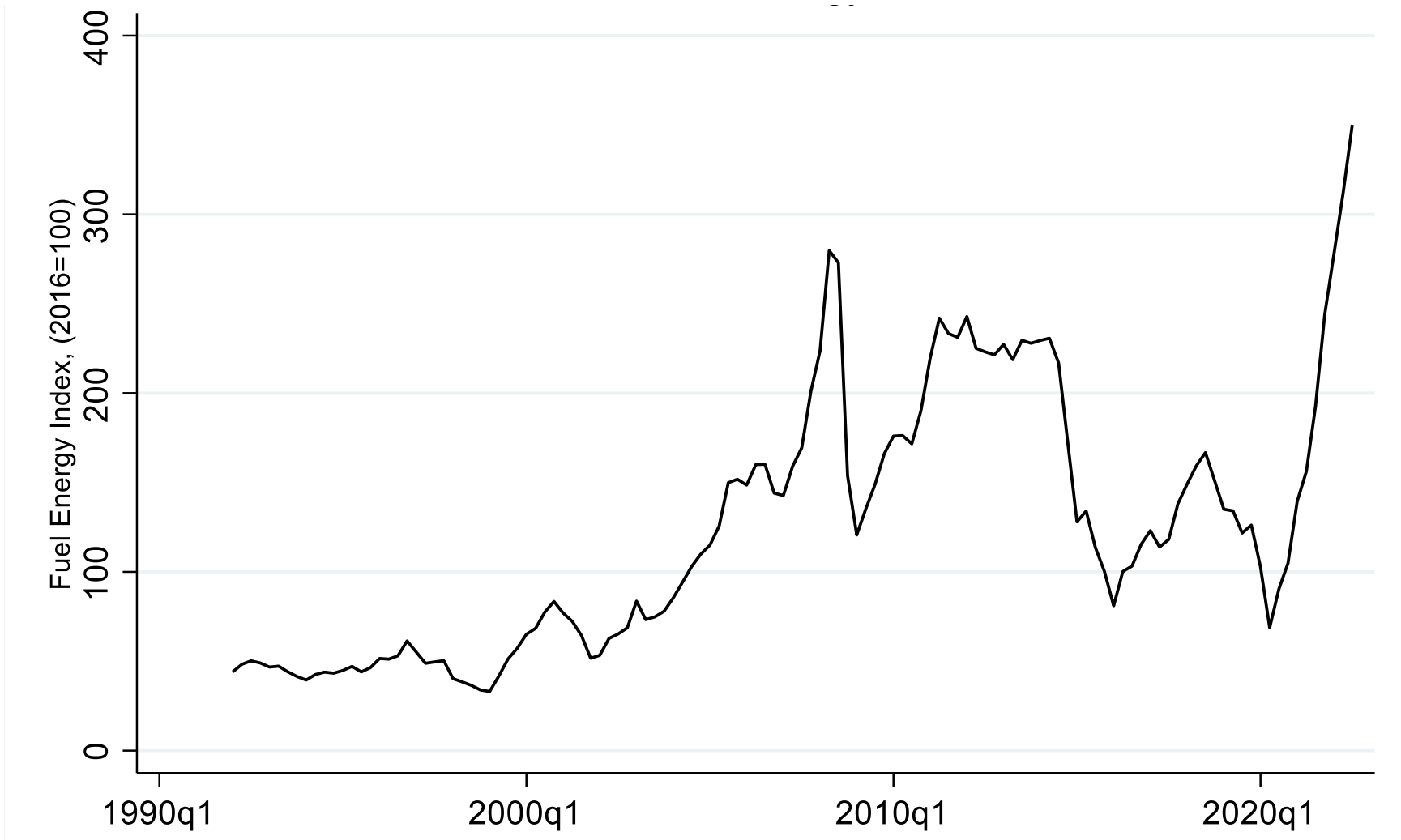
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The views expressed in this presentation are those of the authors and do not necessarily represent the views of the IMF, World Banks, their Executive Board, or Management.

Motivation

Evolution of global energy prices



Source: Primary Commodity Price System (International Monetary Fund).
Note: Fuel Energy Index includes Crude oil, Natural Gas, Coal Price, and Propane Indices.

Energy Inflation and Consumption Inequality

Theoretical channels

- ❑ Direct: the share of income spent on energy-intensive consumption is larger for the poor; lower saving to buffer real income shocks
- ❑ Indirect: loss in real income, declines in real rates, aggregate demand with less skill workers more affected (same channel of inflation affecting income/wealth and consumption inequality)

Evidence mostly based on the US and selected EU countries

What we do

- Use novel consumption inequality data to assess the effect of energy inflation on several measures of consumption inequality for a large set of countries
- How large are the effects? Are they different from those associated with inflation (income inequality)?
- How do they vary across countries?
- How are they shaped by economic conditions?
- What is the role of (fiscal) policy?

What we find

- ❑ Energy inflation leads to sizeable and persistent increase on consumption inequality:
 - through a reduction in the consumption shares of the bottom deciles and a corresponding increase in the shares of the top deciles
- ❑ Larger effects than for CPI inflation (and on income inequality)
- ❑ Significant heterogeneity:
 - Across countries: larger effects in EMDEs, limited financial access and inclusions, stronger monetary policy frameworks
 - Over time: during periods of slack and limited government transfers

Data

☐ Sample

- Country coverage: 129 advanced and developing economies
- Time coverage: 1970-2013 (unbalanced)

☐ Consumption distributional data:

- Global Consumption Dataset (GCD)—part of UN-WIDER Global Consumption and Income Project
- Dataset constructed by merging several national accounts databases and surveys and then standardized to make it comparable across countries
- Measures: Gini, Palma ratio, income deciles

☐ Main independent variable:

- Energy inflation (Jongrim et. al. 2021)

Empirical approach

Local projections (Jordà, 2005):

$$y_{i,t+k} - y_{i,t-1} = \alpha_i^k + \gamma_t^k + \beta^k E_{f,t-1} + \delta^k X_{i,t-l} + \varepsilon_{i,t+k}; \quad \text{with } k=0, \dots, 5 \text{ years}$$

$y_{i,t+k}$: measure of consumption inequality (Gini, Top/Bottom 10(20), Palma ratio, Bottom 10,..)

E : energy inflation

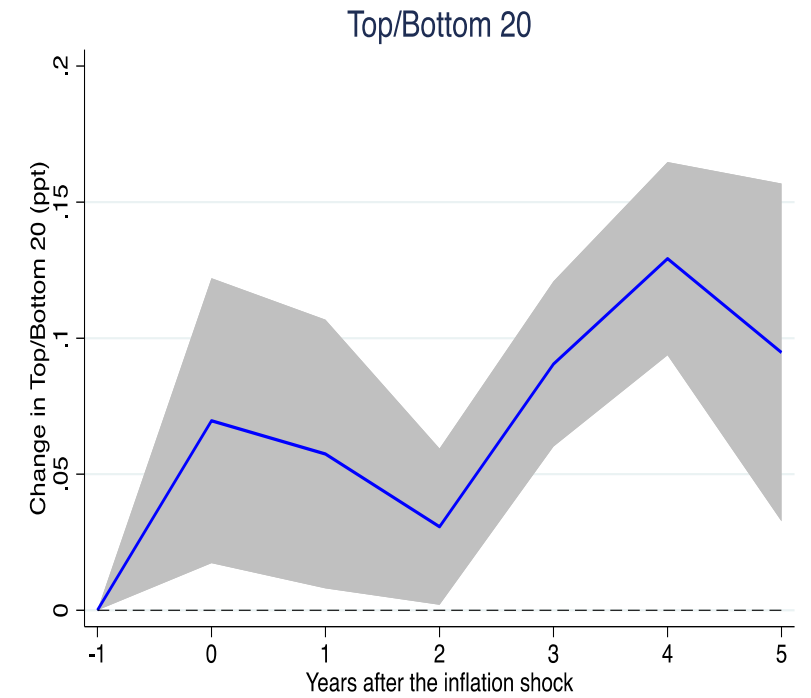
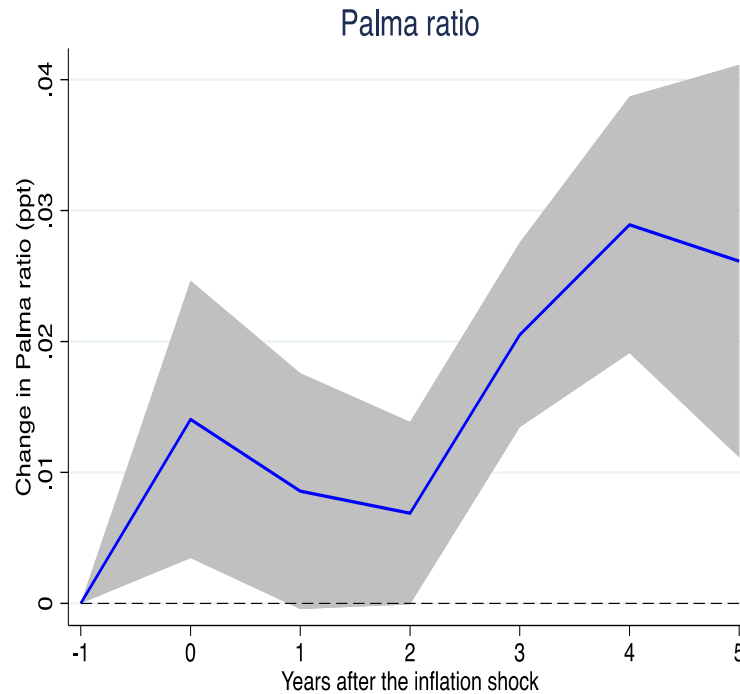
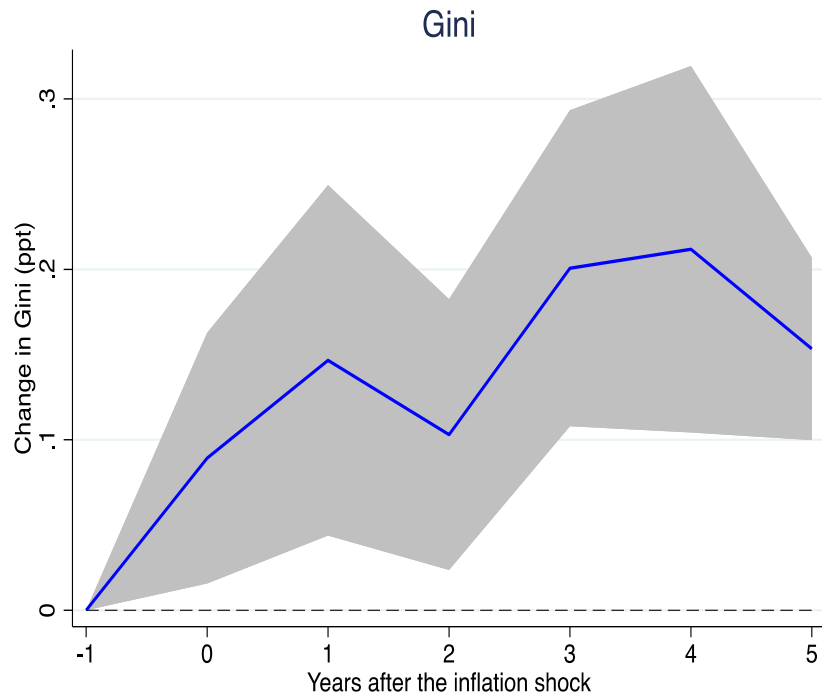
α_i^k and γ_t^k : country and time fixed effects, respectively

$X_{f,t-l}$: lags of dep variable; lags and leads of E , GDP per capita (and squared term), relative price of investment, KOF measure of globalization

OLS estimates with Driscoll and Kraay (1998) standard errors

Energy inflation leads to high consumption inequality...

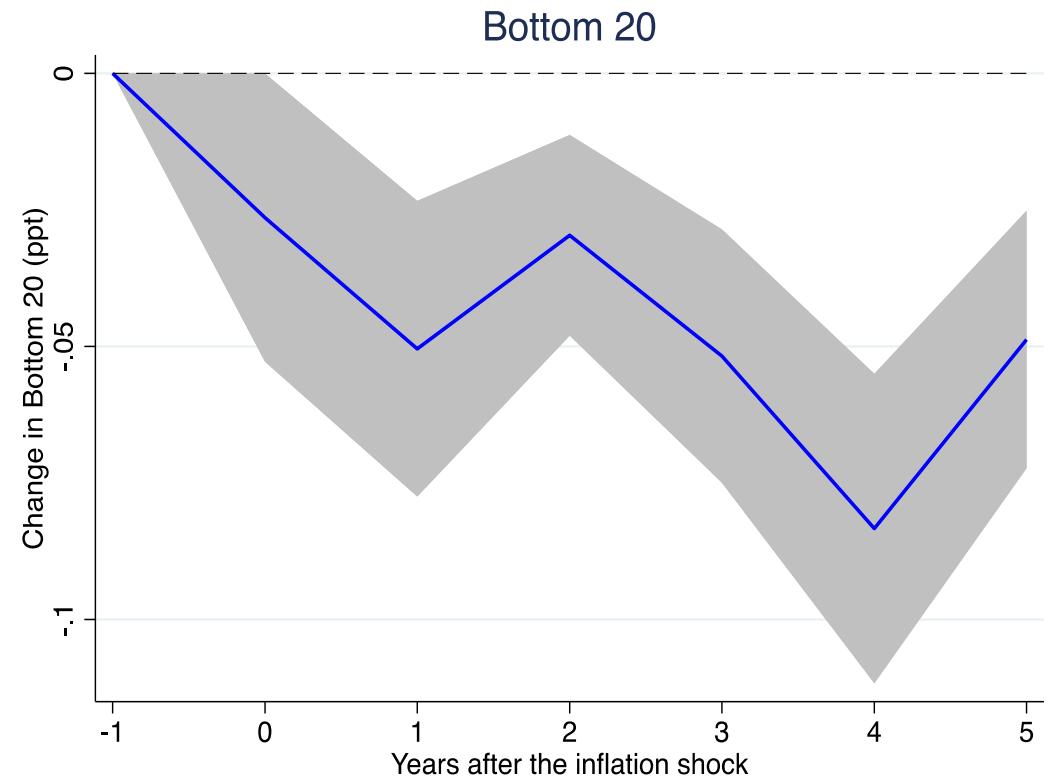
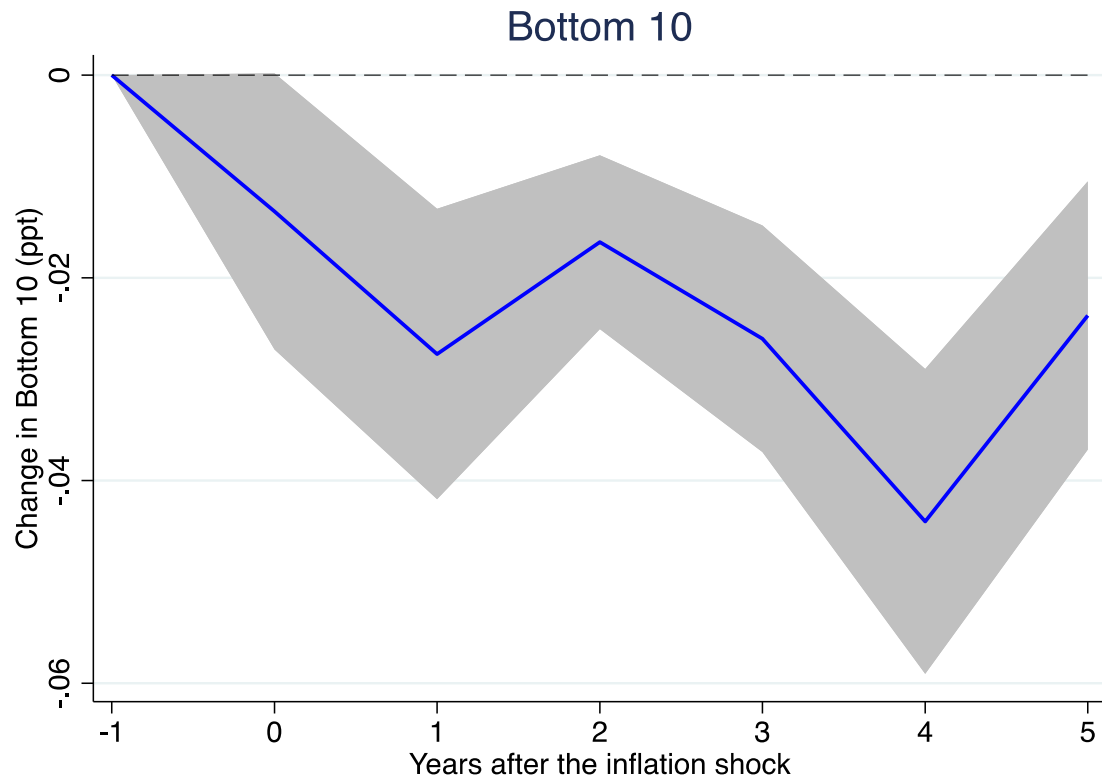
Effect of 1 SD increase in energy inflation



Notes: The graphs show the dynamic response of consumption inequality measures to one-standard deviation increase in energy inflation, as well as the associated 90 percent confidence bands. Impulse response functions are estimated based on equation (1). The x-axis shows years (k) after the shock; $t = 0$ is the year of the shock.

...through a decrease of the consumption share of people in the lowest consumption deciles

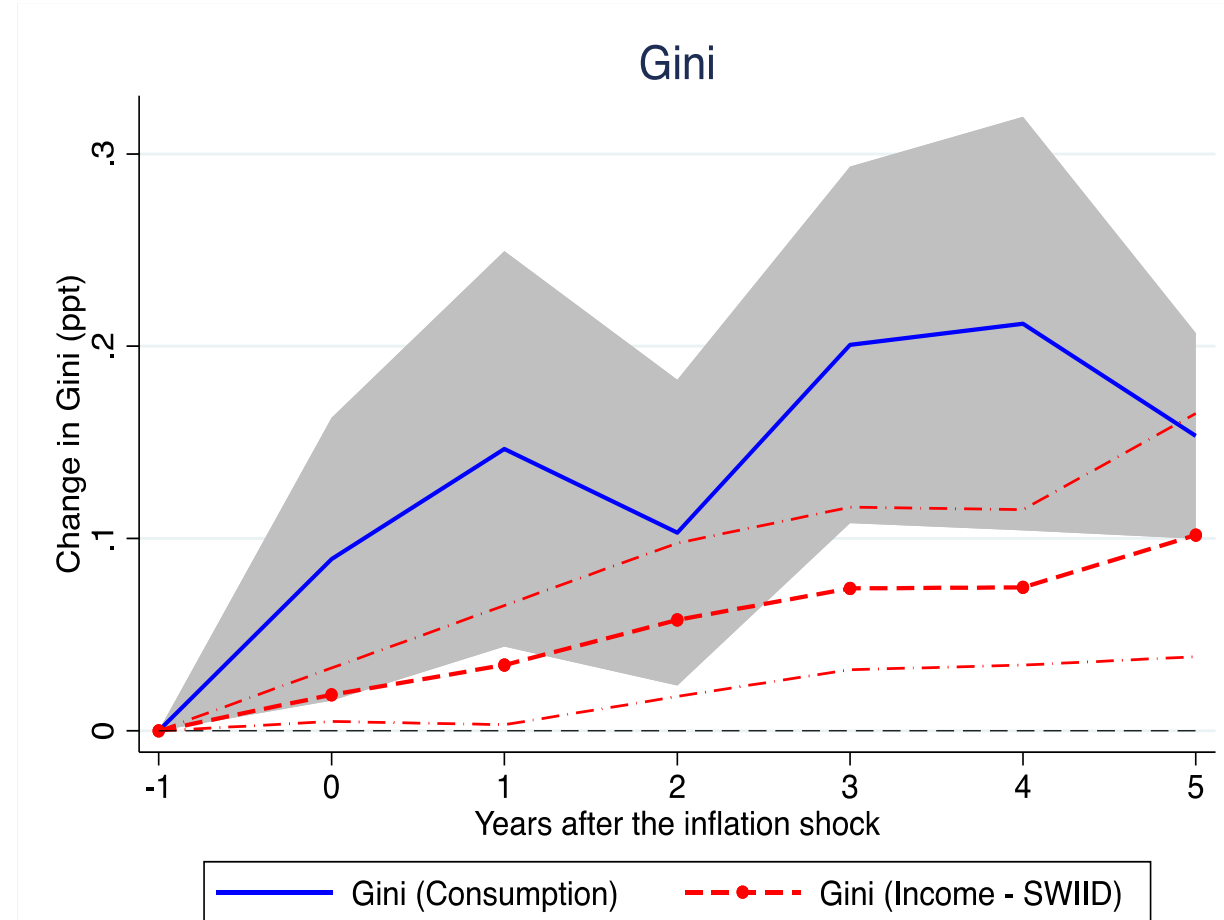
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Larger effects than for CPI inflation and income inequality

Effect of 1 SD increase in energy and CPI inflation



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Results robust to various sensitivity checks

- ❑ Excluding outliers
- ❑ Restricting sample 1990-2010
- ❑ Larger set of controls (from Furceri and Ostry, 2019)
- ❑ Diff-in-Diff IV approach:

$$y_{i,t+k} = \beta_c^k (\widehat{D}_{i,t}) + \theta^k X_{i,t} + \alpha_i^k + \gamma_t^k + \varepsilon_{i,t}^k$$

with

$$(\widehat{D}_{i,t}) = \vartheta^k S_{i,t} + \varphi^k X_{i,t} + \alpha_i^k + \gamma_t^k + v_{i,t}^k,$$

$$S_{i,t} = \text{Oil price growth (shock)}_t * \text{Fuel import share}_i$$

Heterogeneous effects

- ❑ Countries' structural characteristics:
 - Level of development (Alvaredo et al., 2013)
 - Depth and inclusiveness of financial markets (Easterly and Fischer, 2001; Levine, 2005)
 - Quality of monetary policy frameworks (Carriere-Swallow et al. 2023)

- ❑ Time-varying characteristics:
 - Economic slack
 - Government transfers (Dolmas et al. 2023)

Empirical framework

□ Local projection with smooth transition function:

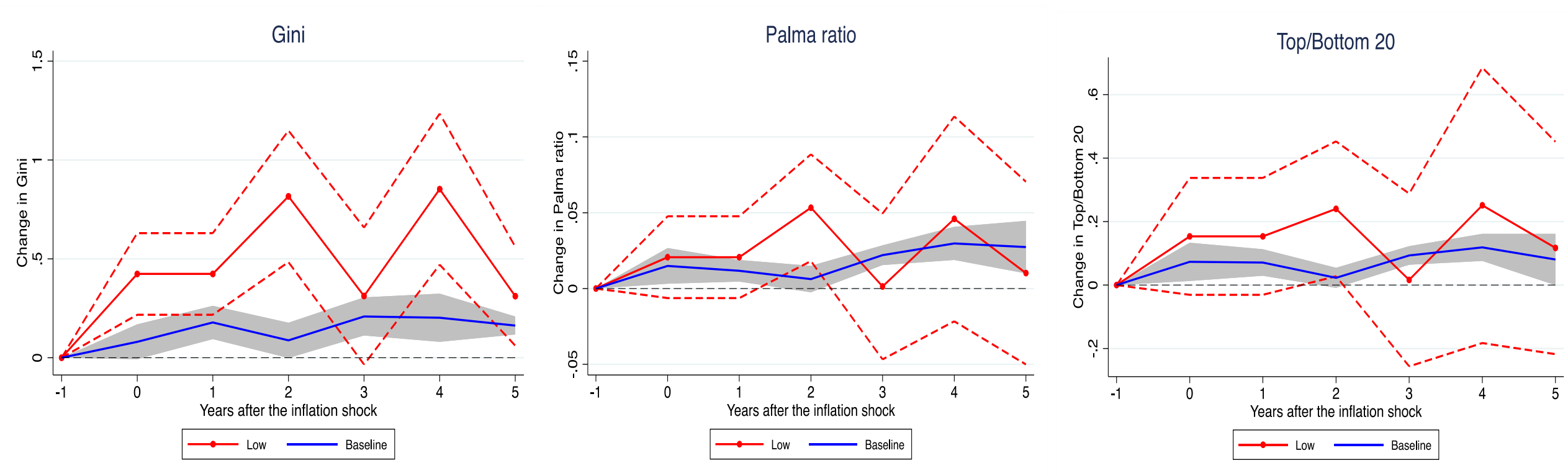
$$y_{i,t+k} - y_{i,t-1} = \alpha_i^k + \gamma_t^k + F(z_{it})[\beta_L^k E_{i,t-1} + \theta_L^k X_{i,t-l}] + (1 - F(z_{it}))[\beta_H^k E_{i,t-1} + \theta_H^k X_{i,t-l}] + \varepsilon_{i,t+k}$$

with $F(z_{it}) = \frac{\exp^{-\gamma z}}{1 + \exp^{-\gamma z}}$, $\gamma = 1.5$

- z characteristic normalized to have zero mean and unit variance
- results robust to alternative interaction forms

Effect larger for developing economies,...

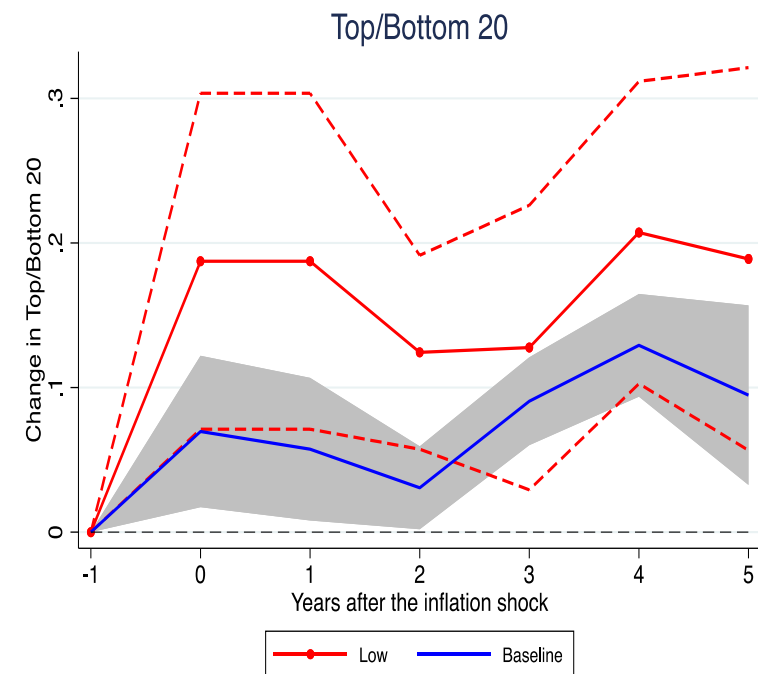
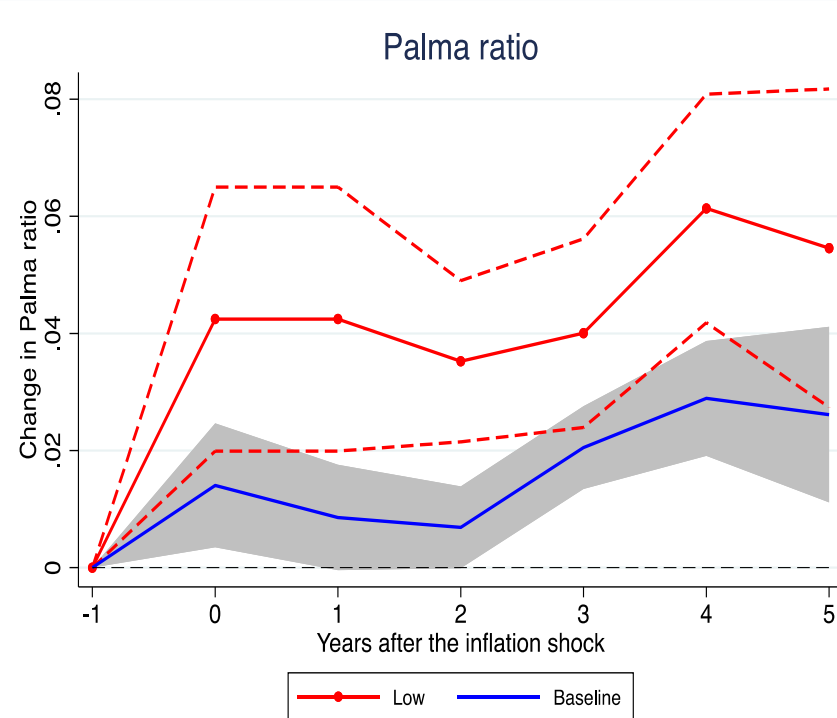
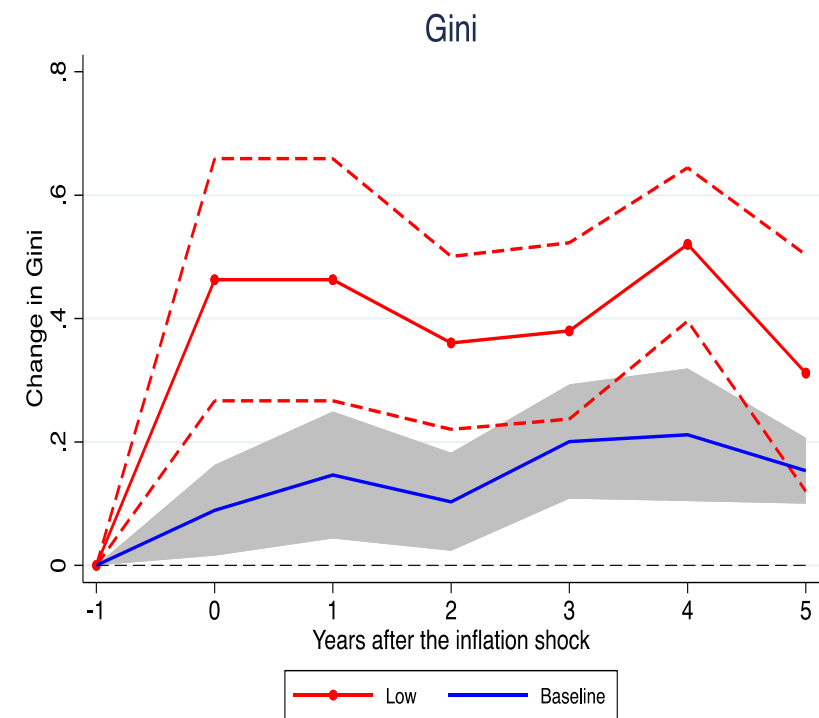
Effect of 1 SD increase in energy inflation



Notes: The graphs show the dynamic response of consumption inequality measures to one-standard deviation increase in energy inflation, as well as the associated 90 percent confidence bands. Impulse response functions are estimated based on equation (1). The x-axis shows years (k) after the shock; t = 0 is the year of the shock.

with more limited financial inclusion,...

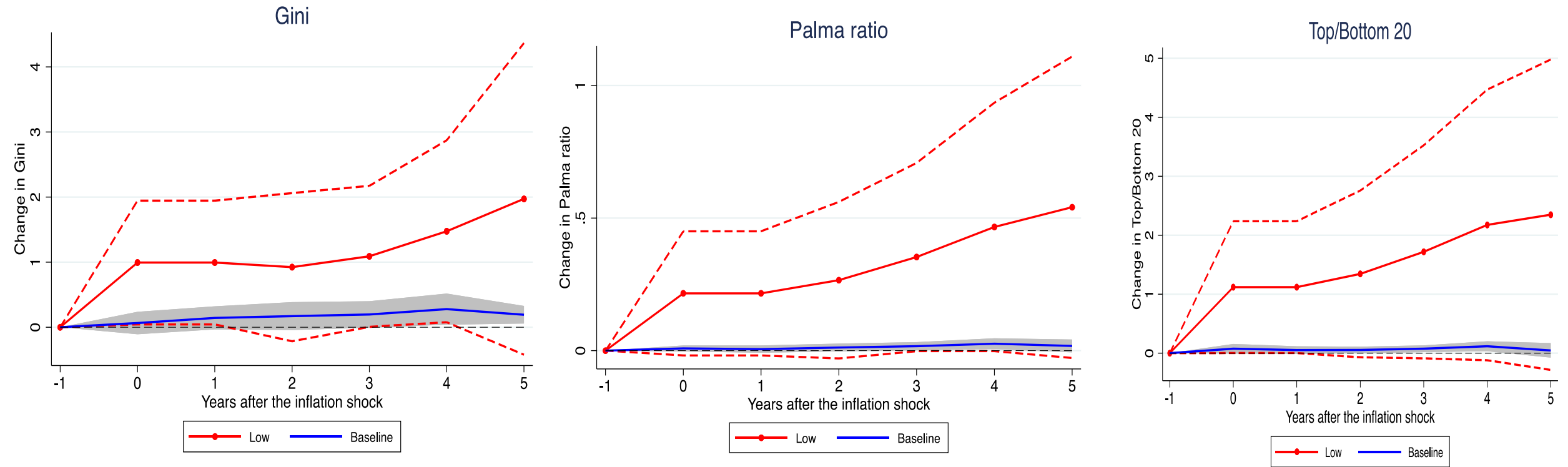
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...and weaker monetary policy frameworks

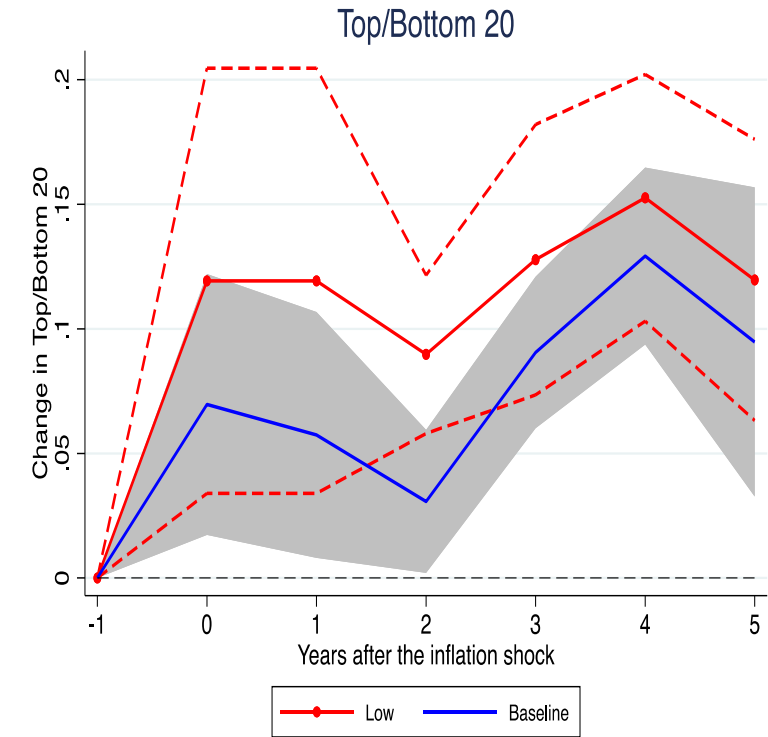
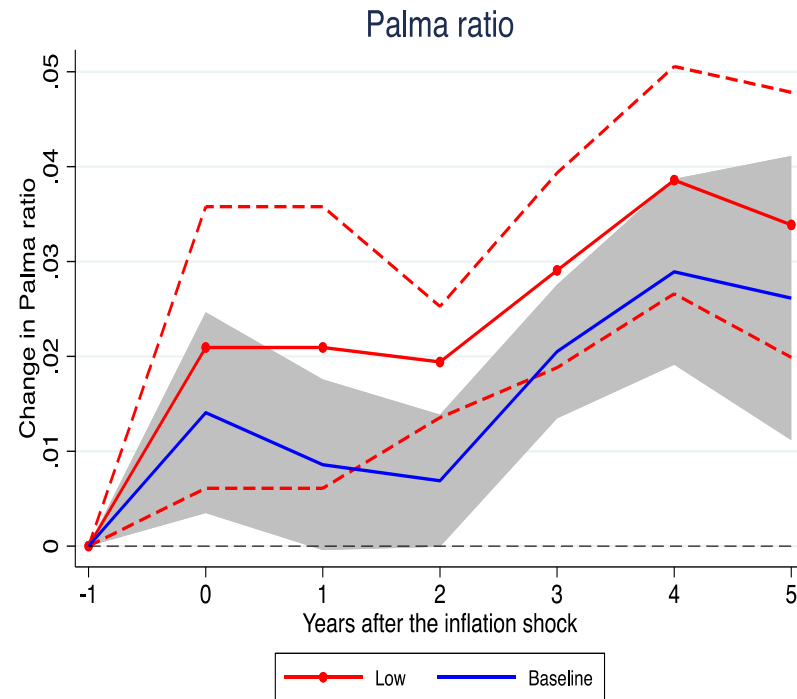
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During weaker GDP growth...

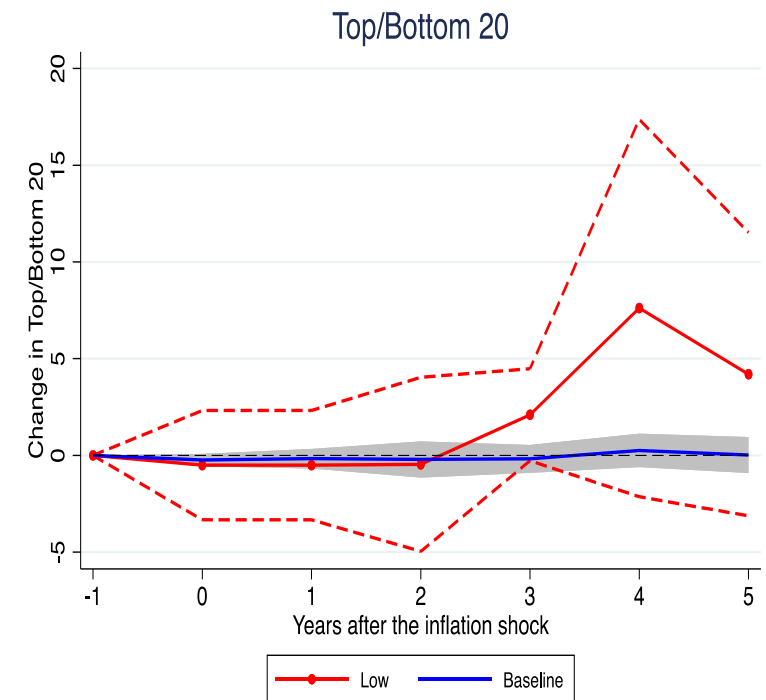
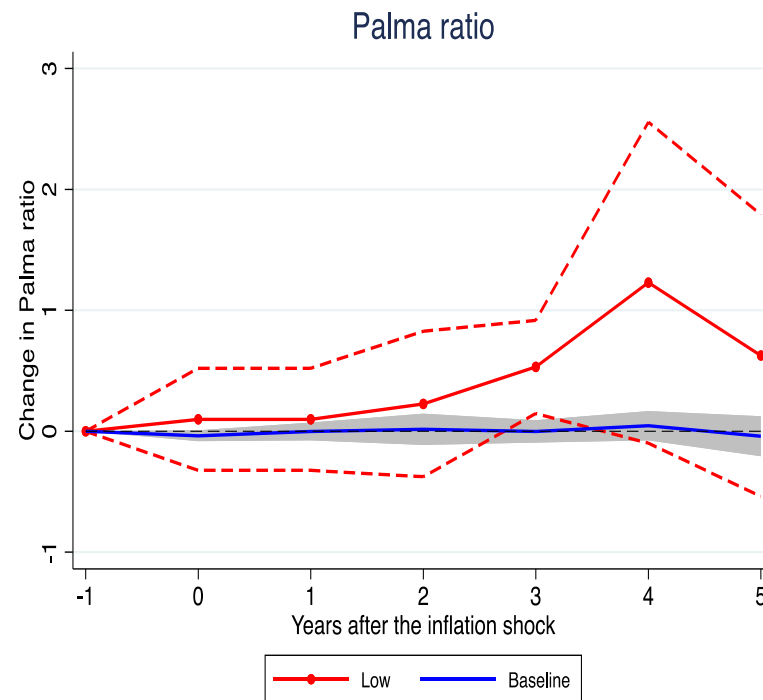
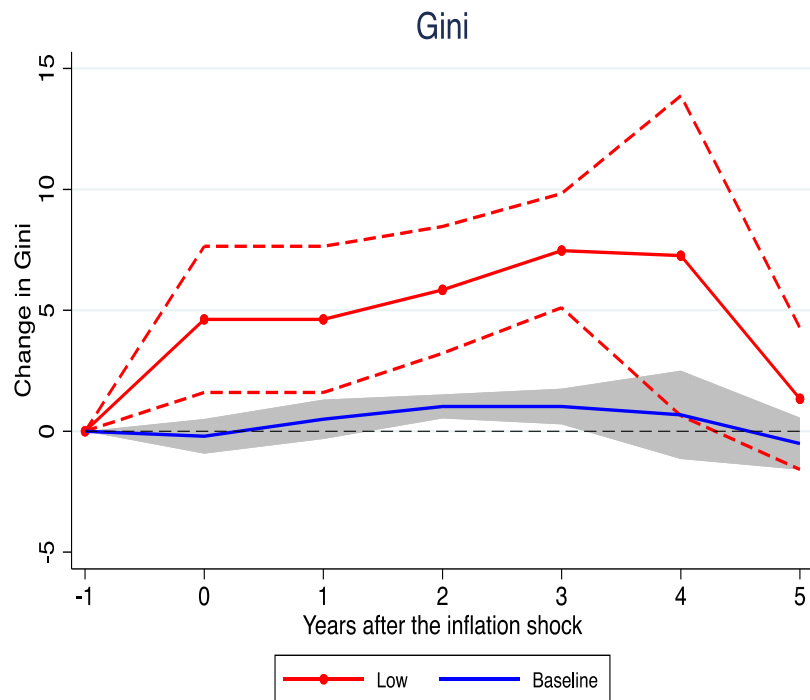
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...and limited government transfers

Effect of 1 SD increase in energy inflation



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Conclusion

- ❑ Energy inflation leads to sizeable and persistent increase on consumption inequality:
 - through a reduction in the consumption shares of the bottom deciles and a corresponding increase in the shares of the top deciles

- ❑ Larger effects than CPI inflation (income inequality)

- ❑ Significant heterogeneity:
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