Monetary Policy and Inequality

Evidence from the United Kingdom

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Research Question

- Who is affected the most by interest rate changes? The richest or the poorest?
- Does monetary policy increase or decrease inequality?
- Where do households change their spending when interest rates change?

Motivation

- Understanding redistributive effects is important for designing policy.
- Theory – inequality is a key mechanism for monetary policy transmission in heterogenous agent models.
- Empirically – monetary policy affects inequality [Coibion et al., 2017, Cloyne et al., 2020, Holm et al., 2021, Amberg et al., 2022, Andersen et al., 2023]
- **This paper**: Provide empirical evidence on how monetary policy shocks influence income and consumption inequality in the UK. Surprising result: little effect.

Summary

- Use micro-data to analyse how interest rates affect income and consumption across the distribution.
- Monetary policy is endogenous $\implies$ identification challenge
- I use a common approach in the literature: monetary policy shocks. Specifically:
  1. Romer-Romer shocks – [Romer and Romer, 2004]
  2. High frequency identification – [Cesa-Bianchi et al., 2020, Braun et al., 2024]

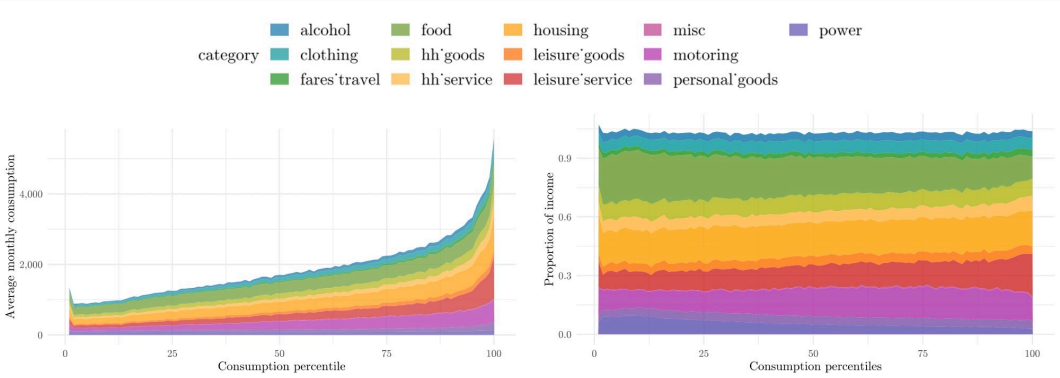
Data

- The UK has published surveys of consumer spending since the 1950s.

1975-2000	2001-2007	2008-2022
Family Expenditure Survey (*FES*)	Expenditure and Food Survey (*EFS*)	Living Costs and Food Survey (*LCFS*)

- These datasets are repeated cross-sections of households containing their consumption and spending, as well as demographic factors.
- **New data source** $\rightarrow$ the UKHLS (*in progress*)

Percentiles



(A) Consumption disaggregated by category (levels)

(B) Consumption disaggregated by category (shares)

Figure 1: Percentile consumption disaggregated by consumption category (2017)

Empirical Challenge: Identification of Monetary Policy

- Monetary policy is endogenous.
- In the macro literature, the main method for identifying the impacts of monetary policy is to use **'structural monetary policy shocks'**
- Idealised interpretation: innovation to policy rules $\perp$ to other structural impulses:

$$i_t = f(\Omega_t) + \varepsilon_t^m$$

where i_t is the interest rate, Ω_t is the time-t information set, $f(\cdot)$ is the policy rule and ε_t^m is the *policy shock*

- But central bankers don't flip coins
- *Intuitive notion: change in central bank preferences/composition of MPC, measurement error in preliminary data, ...*

[Romer and Romer, 2004] approach

- [Cloyne and Hürtgen, 2016] built a series following the [Romer and Romer, 2004] approach for the UK 1975:M1 - 2007:M12.
- The approach aims to isolate innovations to interest rate $\perp$ to BoE information set.
- They estimate:

$$\Delta i_m = \alpha + \beta i_{t-d14} + \sum_{j=-1}^{2} \underbrace{\gamma_j \hat{y}^F_{m,j}}_{\text{GDP forecast}} + \sum_{j=-1}^{2} \underbrace{\varphi_j \pi^F_{m,j}}_{\pi \text{ forecast}} + \sum_{j=-1}^{2} \underbrace{\delta_j (\hat{y}^F_{m,j} - \hat{y}^F_{m-1,j})}_{\text{forecast revisions}} + \sum_{j=-1}^{2} \vartheta_j \underbrace{(\pi^F_{m,j} - \pi^F_{m-1,j})}_{\text{forecast revisions}} + \sum_{j=1}^{3} \underbrace{\rho_j u_{t-j}}_{\text{unemployment rate}} + \underbrace{\varepsilon^{RR}_m}_{\text{MP shock}} \quad (1)$$

High Frequency Approach

[Braun et al., 2024] build the UK Monetary Policy Event Study Database: 1997:M6 - 2024:M6

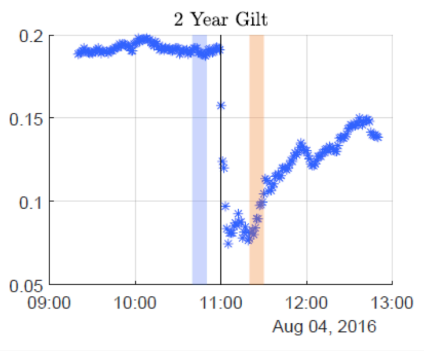


Figure 2: 2 year Gilt yield before and after a policy event. Highlighted regions show periods considered for identification.

Summary stats

Table 1: Summary Statistics of Monetary Policy Shock Series

	HFI Target		HFI Path		HFI QE		RR	
	monthly	quarterly	monthly	quarterly	monthly	quarterly	monthly	quarterly
Mean	-0.0033	-0.0087	-0.0066	-0.0175	-0.0031	-0.0082	0	0
Median	-0.0002	-0.0038	-0.0028	-0.0124	-0.0014	-0.0037	0	0
S.D.	0.0573	0.0750	0.0373	0.0582	0.0343	0.0504	0.4389	0.7803
Min	-0.5165	-0.2183	-0.1594	-0.2440	-0.1750	-0.2463	-1.6666	-2.9057
Max	0.2266	0.2295	0.1674	0.1325	0.1254	0.1068	2.3550	2.2755
Observations	291	109	291	109	291	109	396	132

Notes*: HFI shock series for 1997:M6 - 2024:M6, RR shock series for 1975:M1 - 2007:M12.*

Shock Series

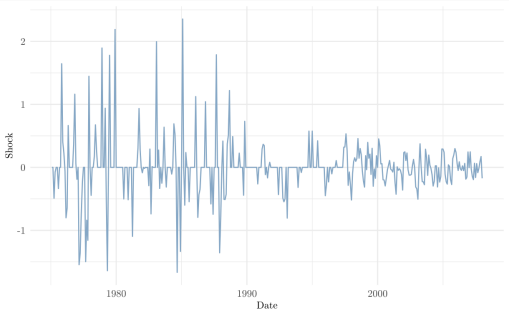


Figure 3: Romer-Romer Shock Series

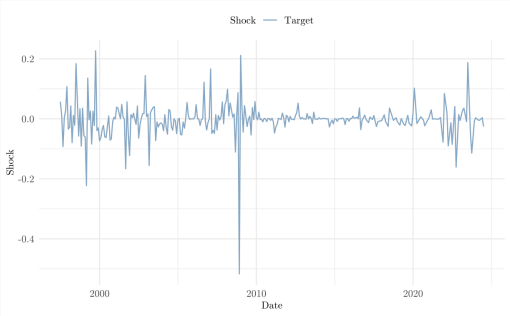


Figure 4: HFI Shock Series

Impulse Responses

- Impulse Response Functions (IRFs) are a standard approach used to investigate macroeconomic relationships – often estimated using VARs or Local Projections (LPs)
  - VAR-LP trade-off $\rightarrow$ bias-variance trade-off
- So far, lag-augmented LPs
  - [Montiel Olea and Plagborg-Møller, 2021] show that lag-augmented LPs make LPs simpler and more robust $\rightarrow$ can use normal HC1 standard errors rather than Newey-West.
- *In progress – VARs.*

Local Projections

I estimate the cumulative percentile-level outcome Y responses to monetary policy shocks using lag-augmented local projections for a 6 year horizon:

$$\underbrace{\frac{Y_{p,t+h} - Y_{p,t-1}}{Y_{p,t-1}}}_{\%\Delta\text{outcome}} = \alpha_{p,h} + \underbrace{\delta_{p,t,h}}_{\text{time FE}} + \underbrace{\beta_{p,h} \times \Delta i_t}_{\varepsilon_t^m \text{ as IV}} + \sum_{\ell=1}^{8} \underbrace{\gamma_{p,h,\ell} \frac{Y_{p,t-1} - Y_{p,t-\ell-1}}{Y_{p,t-\ell-1}}}_{\text{lag-augmentation}} + \underbrace{\boldsymbol{\lambda}'_{p,h} \boldsymbol{x}_t}_{\text{controls}} + u_{p,t,h}$$

(% change regression)

$$\underbrace{Y_{t+h} - Y_{t-1}}_{\text{pp }\Delta} = \alpha_h + \underbrace{\delta_{t,h}}_{\text{time FE}} + \underbrace{\beta_h \times \Delta i_t}_{\varepsilon_t^m \text{ as IV}} + \sum_{\ell=1}^{8} \underbrace{\gamma_{h,\ell} Y_{t-1} - Y_{t-\ell-1}}_{\text{lag-augmentation}} + \underbrace{\boldsymbol{\lambda}'_h \boldsymbol{x}_t}_{\text{controls}} + u_{t,h}$$

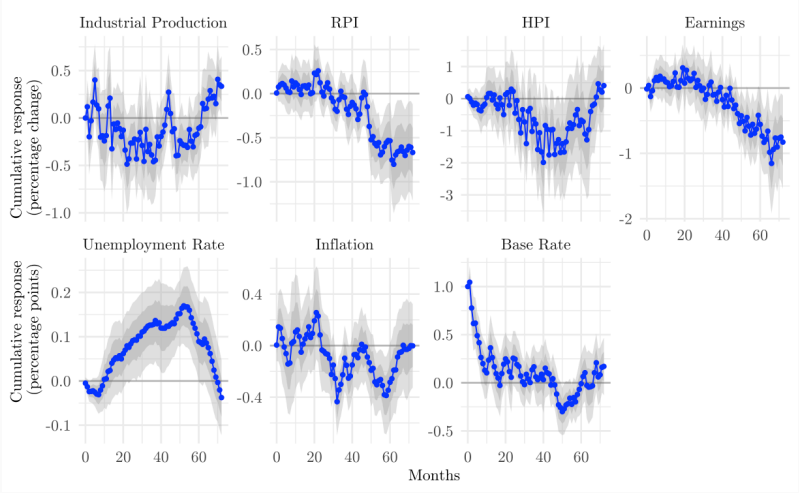
(pp change regression)

Panel Local Projections (*in progress*)

For the UKHLS I estimate the following panel local projections for a 6 year horizon [Andersen et al., 2023]:

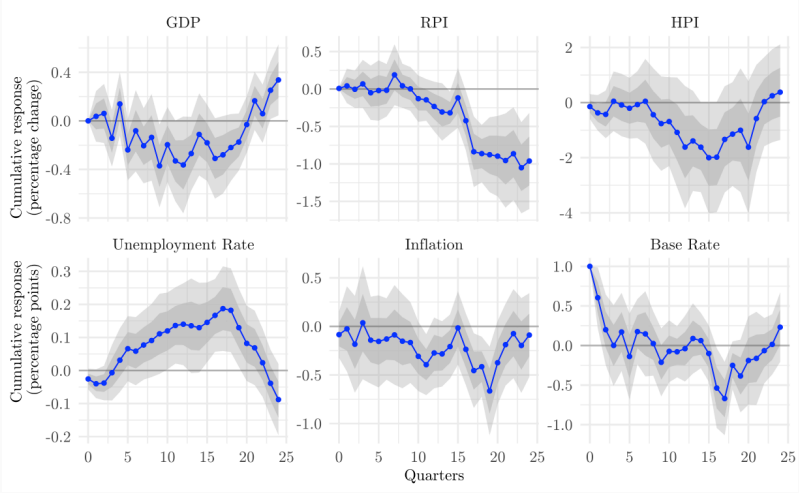
$$\underbrace{\frac{Y_{i,t+h} - Y_{i,t-1}}{Y_{i,t-1}}}_{\%\Delta \text{in Y}} = \sum_{p=1}^{10} \underbrace{1\{i \in p\}}_{\text{decile dummy}} \times \Bigg[\underbrace{\alpha_{p,h}}_{\text{decile FE}} + \underbrace{\beta_{p,h} \times \Delta i_t}_{\varepsilon_t^m \text{ as IV}} + \underbrace{\boldsymbol{\lambda}'_{p,h} \boldsymbol{x}_t}_{\text{controls}} \Bigg] + \underbrace{\delta_t}_{\text{time FE}} + v_{j,t} \qquad (2)$$

Findings – Monthly Macro Variables (Romer-Romer)



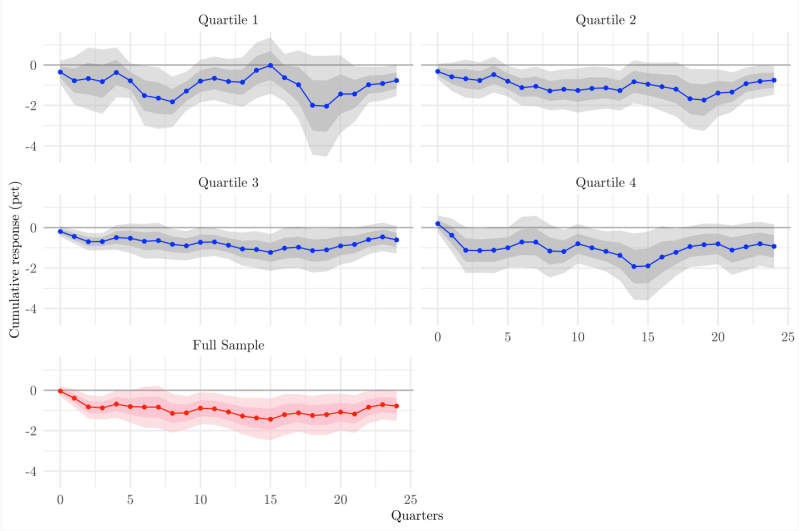
Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas represent 95% (68%) confidence bands.*

Findings – Quarterly Macro Variables (Romer-Romer)



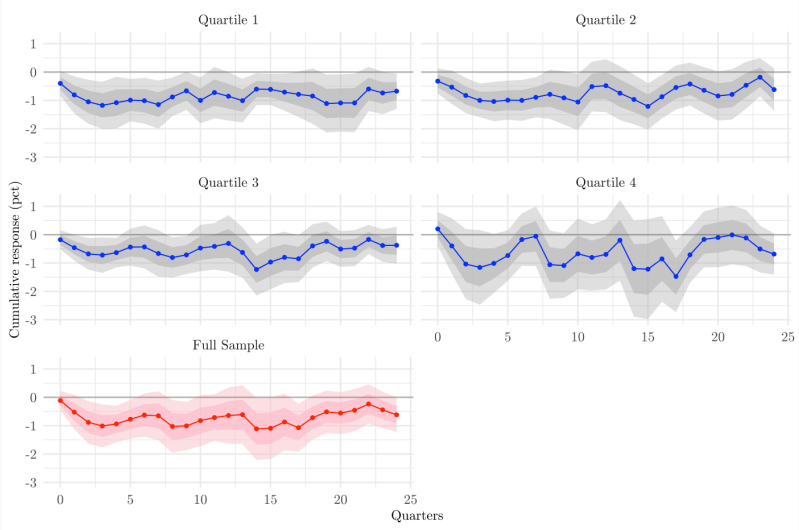
Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas represent 95% (68%) confidence bands.*

Findings – Total Income (Romer-Romer)



Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas*

Findings – Total Consumption (Romer-Romer)

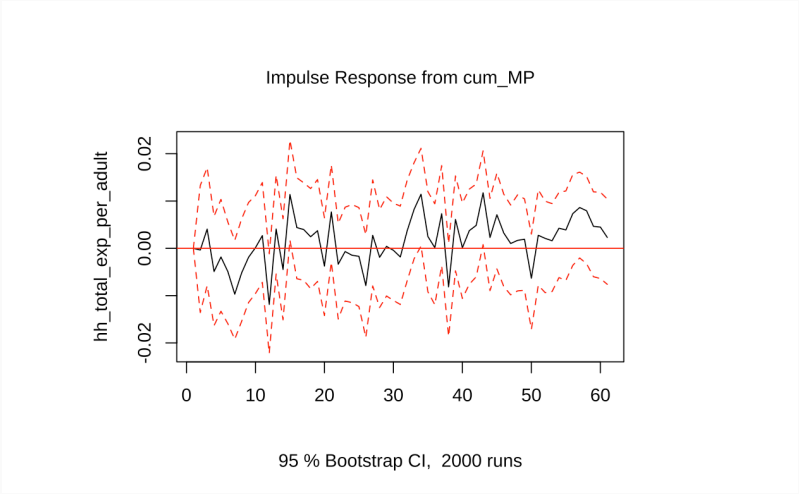


Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas*

Findings – Gini index (Romer-Romer)

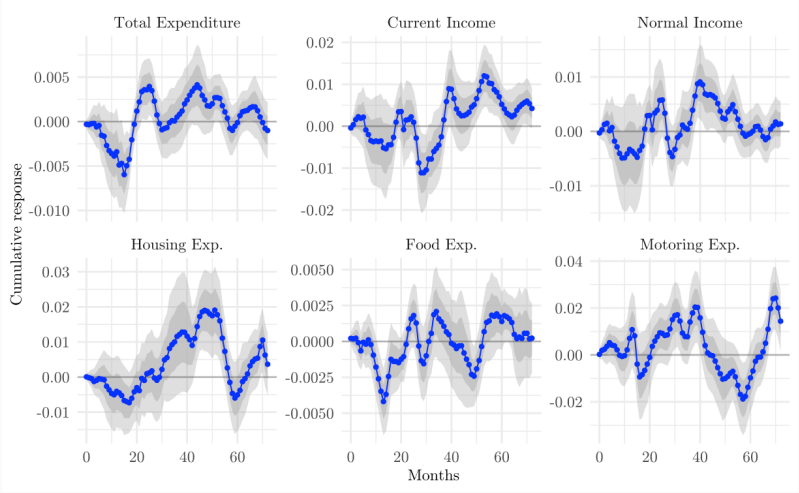
Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas represent 95% (68%) confidence bands.*

Findings – Consumption Gini index (Romer-Romer, VAR, monthly)



Notes: *VAR IRF of a 1pp Romer-Romer shock (not instrumented).*

Findings – Standard deviation of log levels (monthly) (Romer-Romer)



Notes: *LPIV IRF of a 1pp base rate change, instrumented using a Romer-Romer shock. Lightly (darkly) shaded areas represent 95% (68%) confidence bands.*

Discussion

- Confidence intervals are often wide and not significant at the 5% level.
- Results imply that there is little impact on inequality in the UK $\rightarrow$ surprising
- To strengthen/confirm results $\rightarrow$ VARs + current data and panel LPs + panel dataset.

Next steps

In Progress

- Estimating panel LPs $\rightarrow$ more efficient ($\approx$ 80,000 households in UKHLS).
- VARs for the current dataset

To be done:

- Other distributions – age, regions, tenure type.
- Alternative percentile specifications
- Other robustness checks – e.g. consider pre and post 1993 (inflation targetting)

Thanks!

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