Households' Macroeconomic Beliefs: The Role of Education

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What we do & find

- Run an online survey among 1,5k Dutch hhs

1 Collect **beliefs** to understand hhs' views of the macroeconomy
* How inflation, unempl., mortgage rate correlate according to hhs?
* Education matters for inflation/unemployment trade-off, it doesn't for Taylor rule/cost-of-living view

2 Elicit hhs' beliefs on effects of **mpol shocks** via **vignettes**
* Impact on inflation, unemployment, stock prices?
* Highly (low) educated:
- effects of mp shocks in line with standard models (residual frameworks, stubborness)
- financial behavior in response to a mp shock consistent with intertemporal substitution (unwise: spending up!)

3 Insights about **highly educated**
* Asset owners, better nowcasters, able to deal with hypothetical scenarios, appeal to traditional sources of information

Survey: Characteristics and Design

Data collection

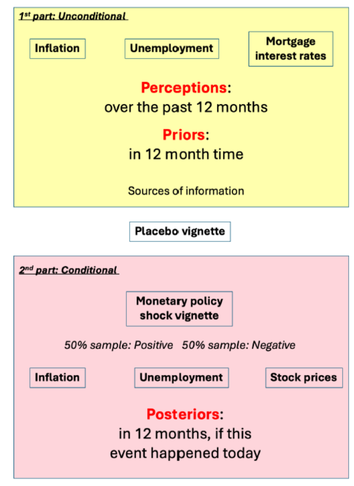
- Online survey: 1,500 respondents (1,056 after censoring ⏩ Censoring) btw May 6 and May 28, 2024 (Other hhs surveys: ⏩ NYFed ⏩ MCS ⏩ DNB ⏩ ECB ⏩ BoC)
- Sample representative of the Dutch population:

Variable	Our survey	DNB 2023
Gender (female)	50%	51%
Age (median)	56	53
Personal net income (in Euros, median)	2,218	2,394
Education (years, median)	16	16

⏩ Highly vs. low educated

- Data collected through the LISS Panel, a hhs survey admin. by Tilburg University (Centerdata Research Institute)
- Matchable to the LISS Core Study, which regularly collects a wealth of demographic information on Dutch hhs (done: political views, participation in financial investments, mortgage status, etc.)
- Also matchable to admit. data from Statistics Netherlands (CBS) (to be done, e.g., full sample w/o self-reporting errors)

Survey structure



Unconditional Expectations

PPPs and vignettes

- **Perceptions**: hhs' estimate of current macro situation
* e.g., *"What do you think the inflation rate was in the Netherlands over the past 12 months (between May 2023 and May 2024)? Please try to give as accurate an estimate as possible."* ⏩ Macro cond.
- **Priors**: hhs' estimate of future macro situation
* e.g., *"What do you think the inflation rate will be in the Netherlands in the next 12 months (May 2024 and May 2025)? Try to give as accurate an estimate as possible."*
- **Vignette**: Hyp. scenario to simulate a macro shock
* e.g., *"Imagine that the European Central Bank unexpectedly raises interest rates from 4.5% to 5%. No other major economic events occur at the same time."*
- **Posteriors**: hhs' estimate of post-vignette future macro situation
* e.g., *What do you think inflation would be in 12 months if this event happened today?"*

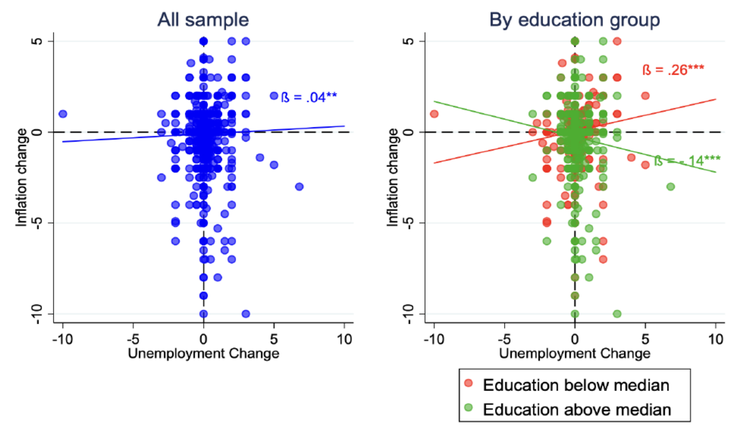
PPPs: Expected changes

- Perceptions/priors: Inflation, unemployment, mortgage rate ⏩ Distribution of perceptions ⏩ Distribution of priors ⏩ Distribution of Expected changes
- Expected changes computed as follows:

$$\mathbb{E}^i \Delta_{z,t+1} = \underbrace{\mathbb{E}^i[z_{t+1}|\mathcal{I}_t]}_{\text{Prior}} - \underbrace{\mathbb{E}^i[z_t|\mathcal{I}_t]}_{\text{Perception}}$$

- Beliefs formed on variables $z \in \{\pi, u, r\}$
- *Changes in beliefs* to pin down *hh-level "sacrifice ratio"*
* vs. aggr. wedges in beliefs in Bhandari et al. (2024), hh-level priors in Kamdar and Ray (2024)
* Euro-area inflation as driven by demand shocks (Giannone and Primiceri 2024, Ascari et al. 2024, Mori 2024)
- Combine uncondit. moments to check consistency with theory

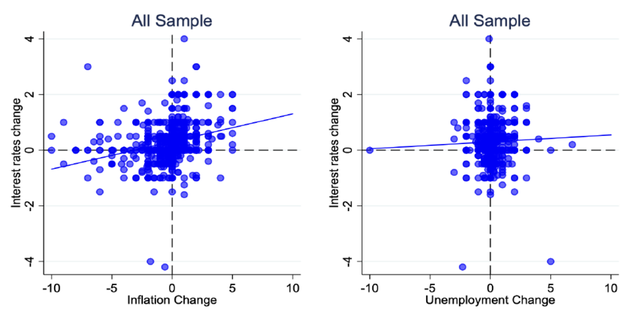
Inflation-unemployment correlation: Role of education



- Above median = college and above (financial literacy)

Conditional Expectations

"Taylor rule" correlations



- Int. rate-unempl. correlation not in line with a TR (Carvalho and Nechio 2014); in line with cost-of-living/pessimism hypothesis (Bolhuis et al. 2024) ⏩ Summers' inflation
- No role for education

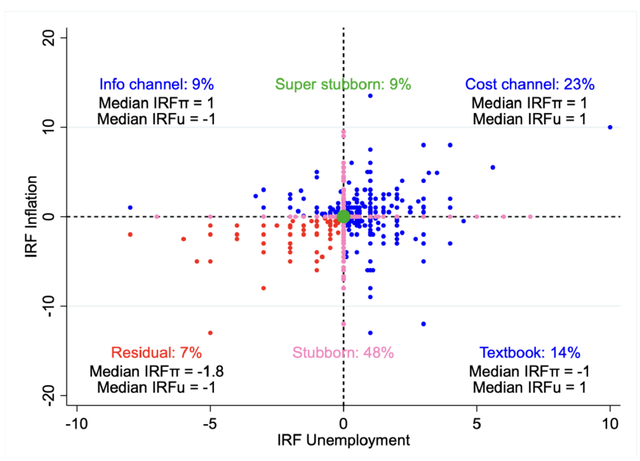
IRFs

- Posteriors: Infl., unempl., stock market (categorical)
* Posterior beliefs formulated after the exposition to vignettes (to simulate macro shocks)
- IRFs computed as follows:

$$IRF^i_{z,t+1,\delta} = \underbrace{\mathbb{E}^i[z_{t+1}|\tilde{\mathcal{I}}_t]}_{\text{Posterior}} - \underbrace{\mathbb{E}^i[z_{t+1}|\mathcal{I}_t]}_{\text{Prior}}, \ \tilde{\mathcal{I}}_t = \{\mathcal{I}_t\} \cup \{\varepsilon_t = \delta\}$$

- Size of the monetary policy shock $\delta = 50$bp (up/down)
- Beliefs formed on variables $z \in \{\pi, u\}$; stock prices: Just up/nil/down response to the mp shock (no comp. with prior)
- Combine condit. moments (IRFs) to check consistency with theory

Interpretative models

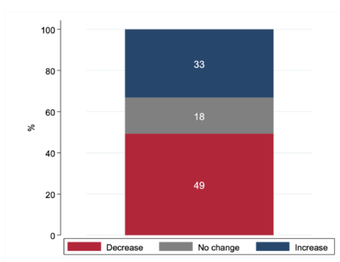


Interpretative models

- HHs potentially forming beliefs in line with known theories
- textbook model: Smets and Wouters (2007), Bilbiie (2008, 2020, 2023), Kaplan et al. (2018), Auclert (2019), Debortoli and Galí (2024)
- cost channel: Christiano et al. (2005), Altig et al. (2011)
- info channel: Melosi (2017), Nakamura and Steinsson (2018)

- HHs forming beliefs *not* in line with known theories
- stubborn/super stubborn: HHs not adjusting beliefs
- residual models: HHs adjusting beliefs not in line with typical macroeconomic models

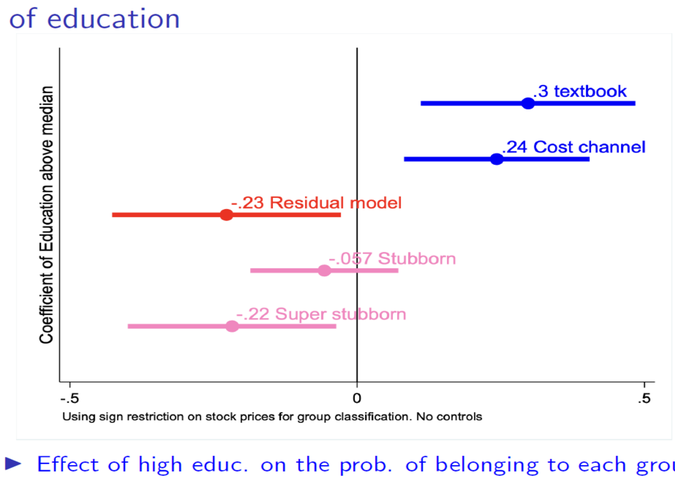
Consistency with stock market response



models	π	u	sp	% satisfying all restrictions	just π and u
textbook	< 0	> 0	< 0	8.10%	14.40%
cost channel	> 0	> 0	< 0	13.25%	22.8%
info channel	> 0	< 0	> 0	3.05%	8.5%

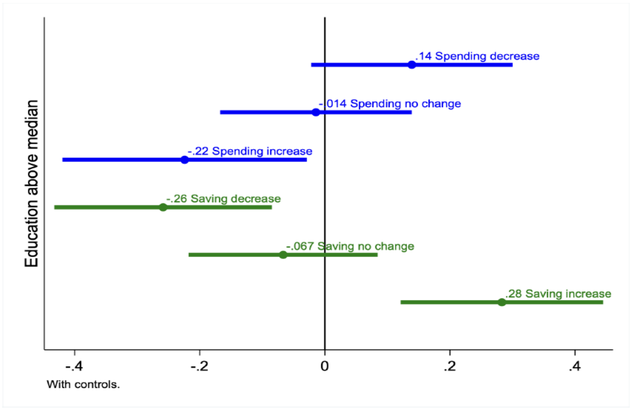
The Role of Education

Role of education



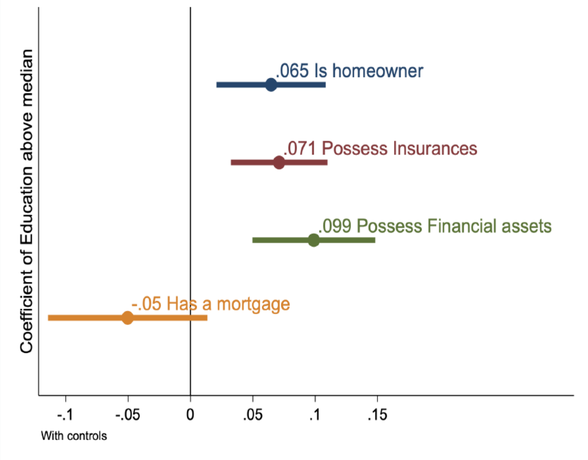
- Effect of high educ. on the prob. of belonging to each group

Reactions to mp shock and education



- Education matters! ⏩ Survey question
- Highly educated: Responses consistent with int. substit.
- Low educated: Unsavvy spending decision (?)

Assets and education



- Effect of high educ. on the prob. of belonging to each group

Conclusions

- Education key! Significantly behind:

1 understanding of the inflation-unemployment trade-off
2 mental models in line with standard ones (textbook/cost channel), less extreme estimates of macro effects of mp shocks
3 economic/financial behavior in response to monetary policy shocks coherent with intertemporal substitution

- Modeling: Models with education-related heterogeneity to understand transmission of mp shocks
- Policy: teaching (Lusardi and Mitchell 2023), outreach programmes and policy communication to reach low-educated (McMahon et al. 2018, Cobion, Gorodnichenko, Weber 2022; Istrefi and McMahon 2024) with social media as a potentially relevant channel