

**“The Pass-Through from Inflation Perceptions to Inflation  
Expectations”**

**by**

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**Discussion by**

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# Outline of the Discussion

Brief summary of the paper

Comments:

- Role of the positive autocorrelation of inflation

- Aggregate vs. personal inflation rates

- Causality

Summary of the discussion

## Summary of the Paper

The paper examines empirically the relation between the perception of inflation and inflation expectations using individual data from the BOP-HH survey

Runs the OLS regression

$$E_t^i(\pi_{t+1}|\bullet) = \alpha + \beta P_t^i + \varepsilon_{i,t}$$

where  $P_t^i$  is the perception of inflation and with controls and fixed effects

Finding:  $\beta$  is quantitatively large and statistically significant

Thus, there is an *association* between inflation perceptions and expectations with heterogeneity across genders, age, income, etc. (see Jonung, *AER*, 1981)

## Summary (cont.)

RCT where some respondents are given additional information which may alter their perception of inflation

Claim: Inflation perceptions *causally* drive inflation expectations

## What is Inflation Perception?

“What do you think the rate of inflation or deflation in Germany was over the past twelve months?”

Write this as

$$P_t^i = E_t^i(\pi_t | \Omega_t^i, X^i)$$

where

$\pi_t$  is the twelve-month inflation rate

$\Omega_t^i$  is the information set of individual  $i$  at time  $t$

$X^i$  are demographic characteristics of individual  $i$

For some reason,  $\pi_t \notin \Omega_t^i$

## Role of Inflation Autocorrelation

Assume that agents' perceptions/expectations differ systematically from the true value

Write this as

$$\begin{aligned}\pi_t &= a + E_t^i(\pi_t | \Omega_t^i, X^i) + v_t \\ \pi_{t+1} &= b + E_t^i(\pi_{t+1} | \Omega_t^i, X^i) + u_t\end{aligned}$$

where  $a, b \neq 0$

Rational expectations is the special case where  $a, b = 0$ , and  $v_t, u_t$  are uncorrelated with  $\Omega_t^i$  and  $X^i$

# Regression

Then, the regression of inflation expectations on inflation perceptions

$$E_t^i(\pi_{t+1}|\Omega_t^i, X^i) = \alpha + \beta E_t^i(\pi_t|\Omega_t^i, X^i) + \varepsilon_t$$

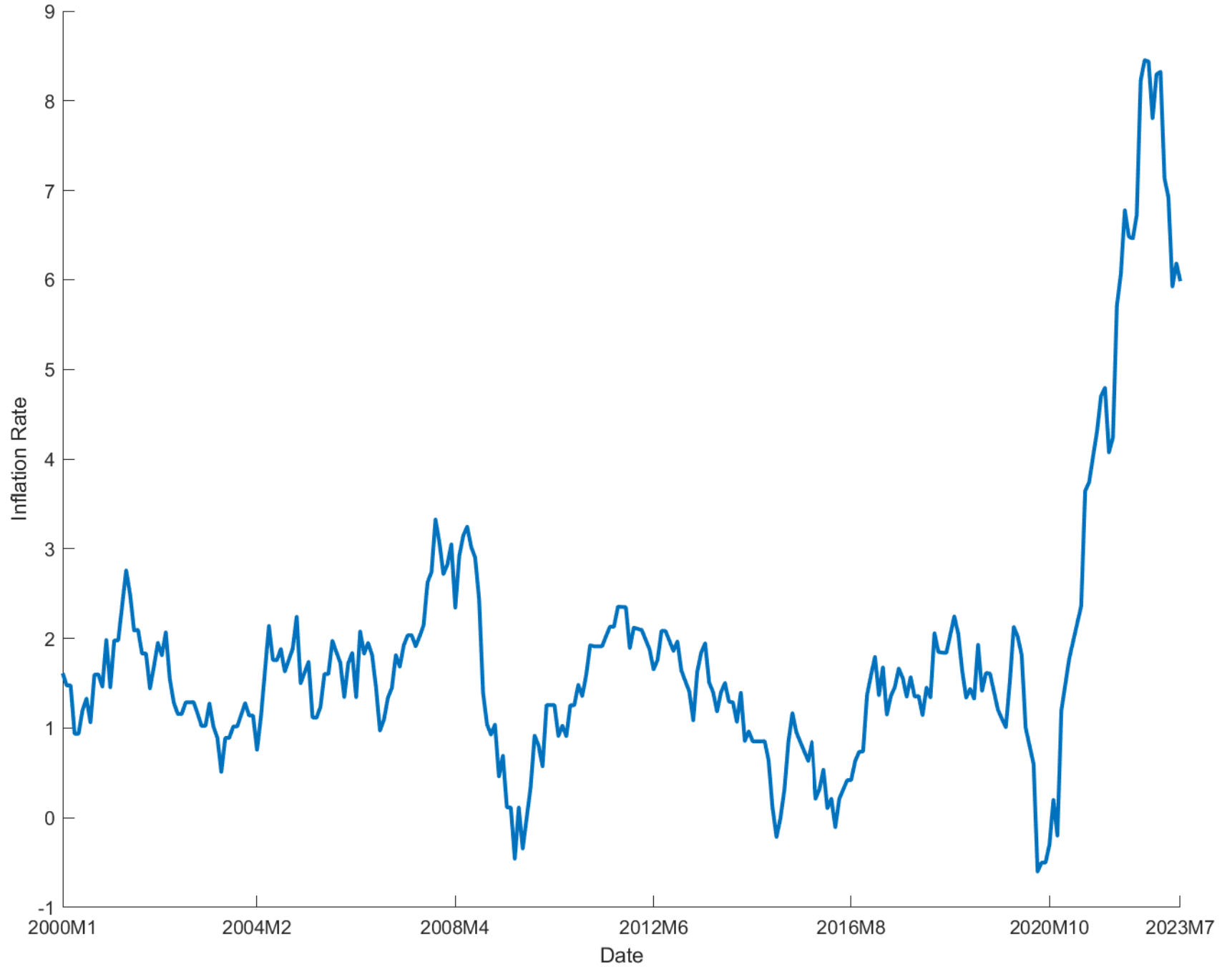
is equivalent to the regression of annual inflation on its lag

$$\pi_{t+1} = (\alpha + b - a\beta) + \beta\pi_t + w_t$$

where  $w_t = \varepsilon_t + u_t - \beta v_t$

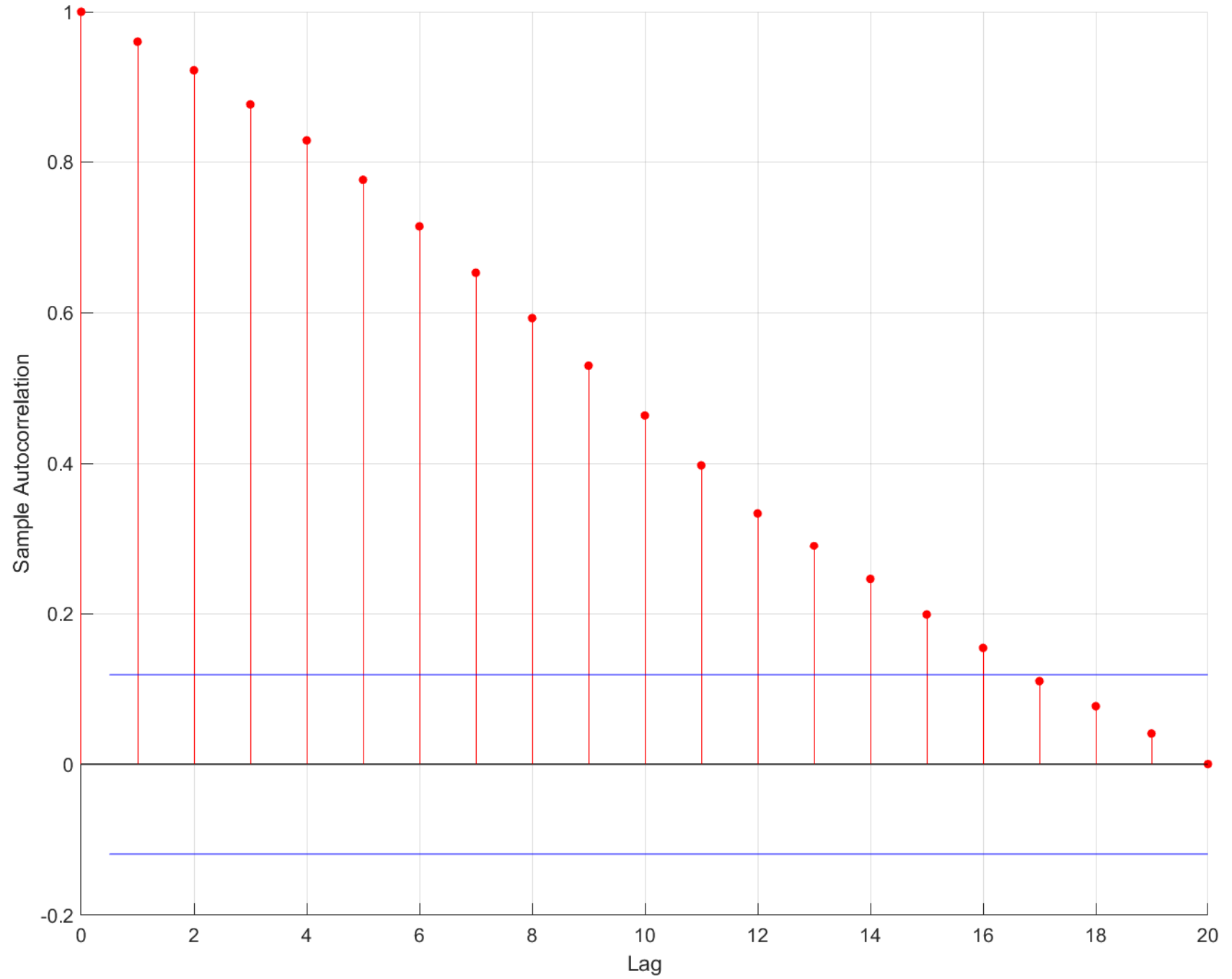
Data: German CPI inflation from 2000M1 to 2023M7

Inflation in Germany 2000-2023





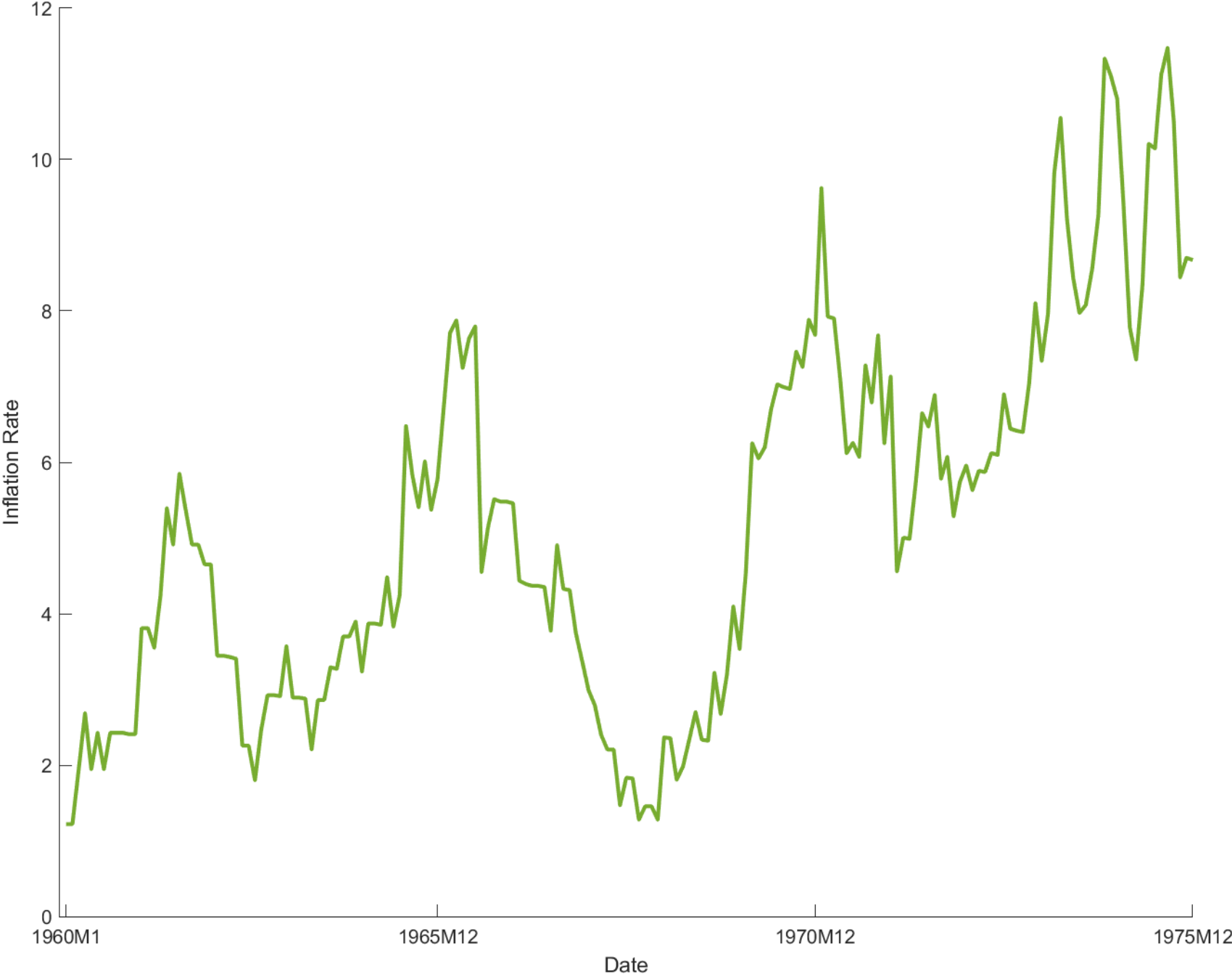
# Autocorrelation Function



## OLS Results: Germany

Parameter	AR		In the Paper (p. 10)		
	Full Sample	After July 2021	Full Sample	Before July 2021	After July 2021
$\beta$	0.755* (0.076)	0.467* (0.095)	0.736* (0.008)	0.872* (0.015)	0.665* (0.010)

Inflation in Sweden 1960-1975



## OLS Results: Sweden

	AR	Jonung (1981)		
Parameter		<i>I</i>	<i>II</i>	<i>III</i>
$\beta$	0.590* (0.072)	0.447* (0.010)	0.519* (0.020)	0.446* (0.013)

Data for AR: Swedish CPI inflation from 1960M1 to 1975M12

## Take Away

The association between inflation perceptions and expectations may not be causal

This is well-known, which is why the literature (including this paper) is careful to talk about an association between perceptions and expectations

The association may be driven by the positive serial correlation of inflation

Inflation may have been easier to forecast before July 2021 and this accounts for the lower estimate of  $\beta$  after July 2021

## Perceptions About What Inflation Rate?

The question “What do you think the rate of inflation or deflation in Germany was over the past twelve months?” concerns aggregate inflation:

$$E_t^i(\pi_t | \Omega_t^i, X^i)$$

but the answer may be more about “personal” inflation

$$E_t^i(\pi_t^i | \Omega_t^i, X^i)$$

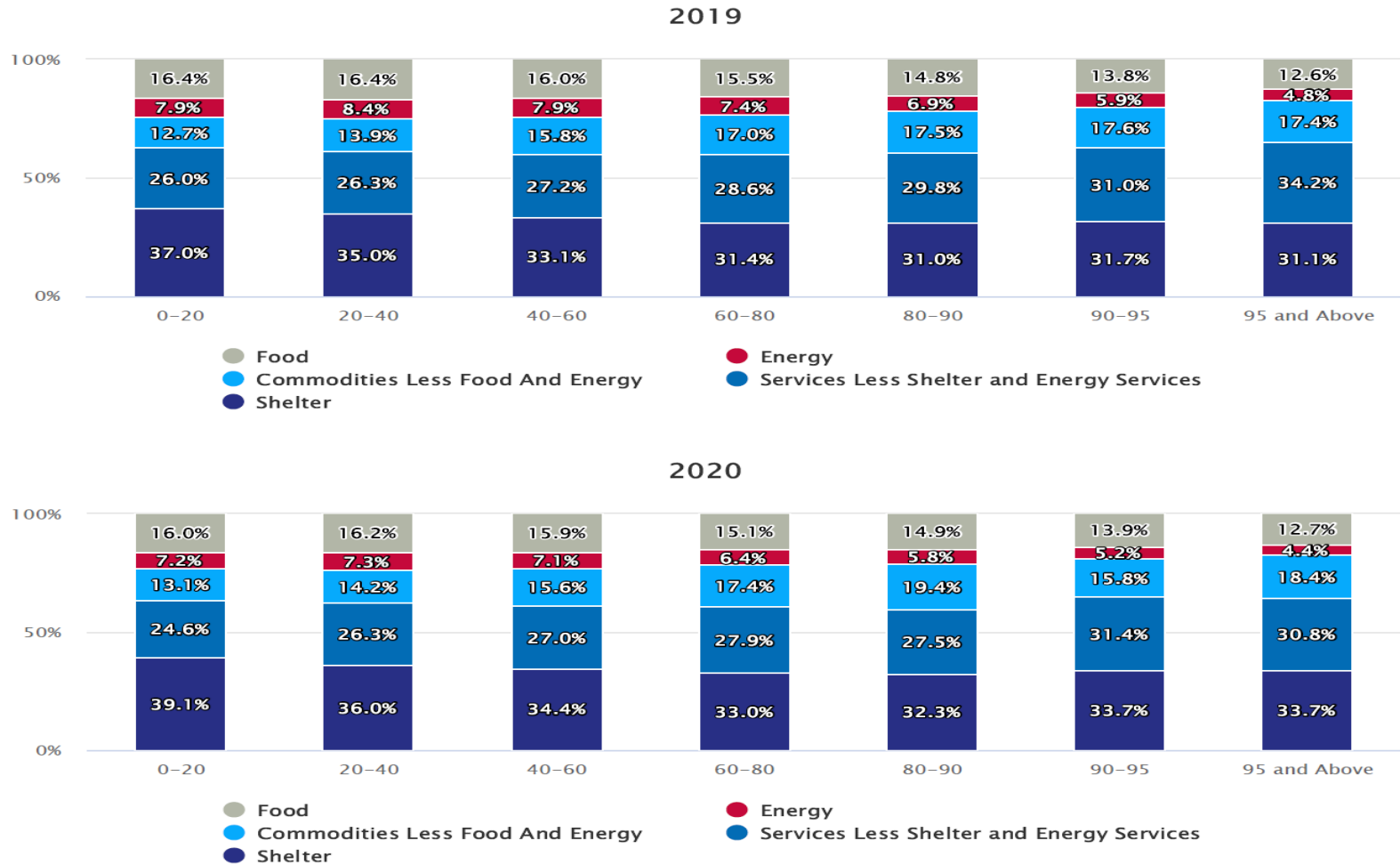
See Burgi (2020), based on the UK Inflation Attitudes of the Bank of England

Expectations are different for questions about “inflation” and “CPI inflation”

## Expenditures Shares by Income Group

Figure 2: Expenditure shares on major groups of items by income groups in 2019 and 2020

[DOWNLOAD DATA](#)

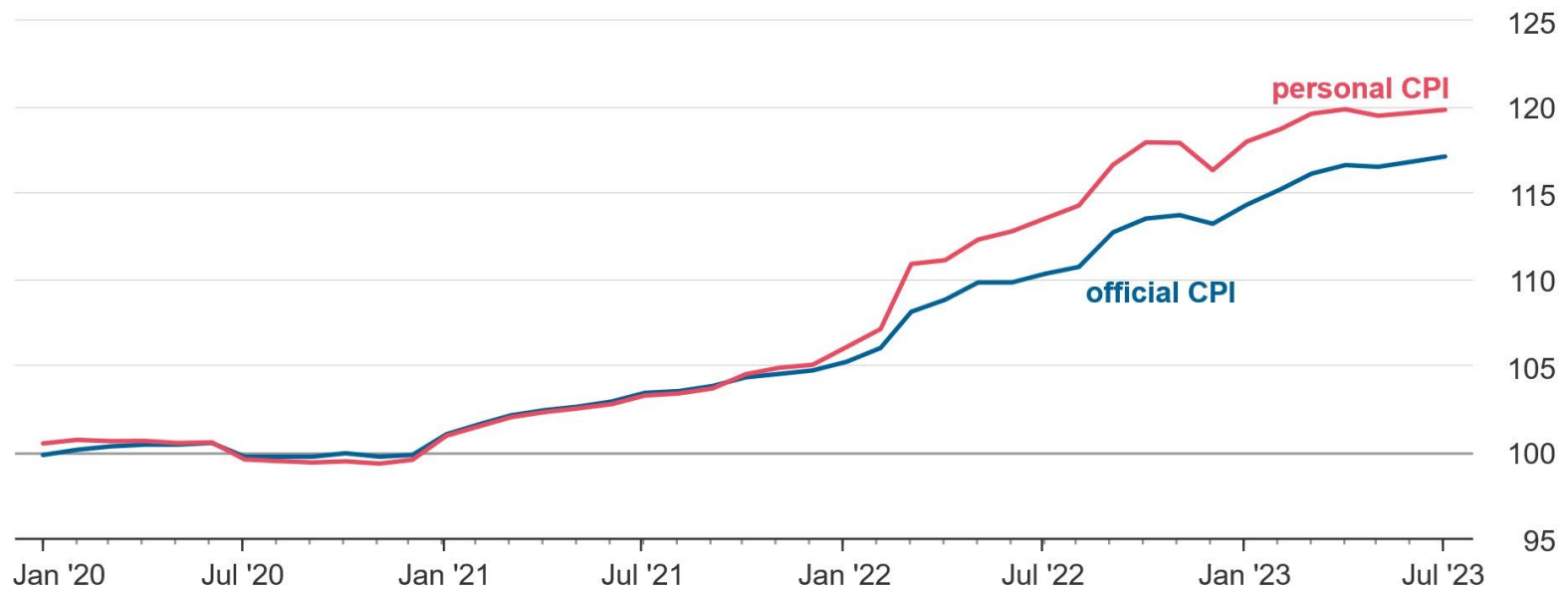


Note: Taken from <https://budgetmodel.wharton.upenn.edu/issues/2021/12/15/consumption-under-inflation-costs>

# Personal CPI for a Consumer that Spends More on Food, Shelter, and Energy than the Average German

## Verbraucherpreisindex

2020 = 100

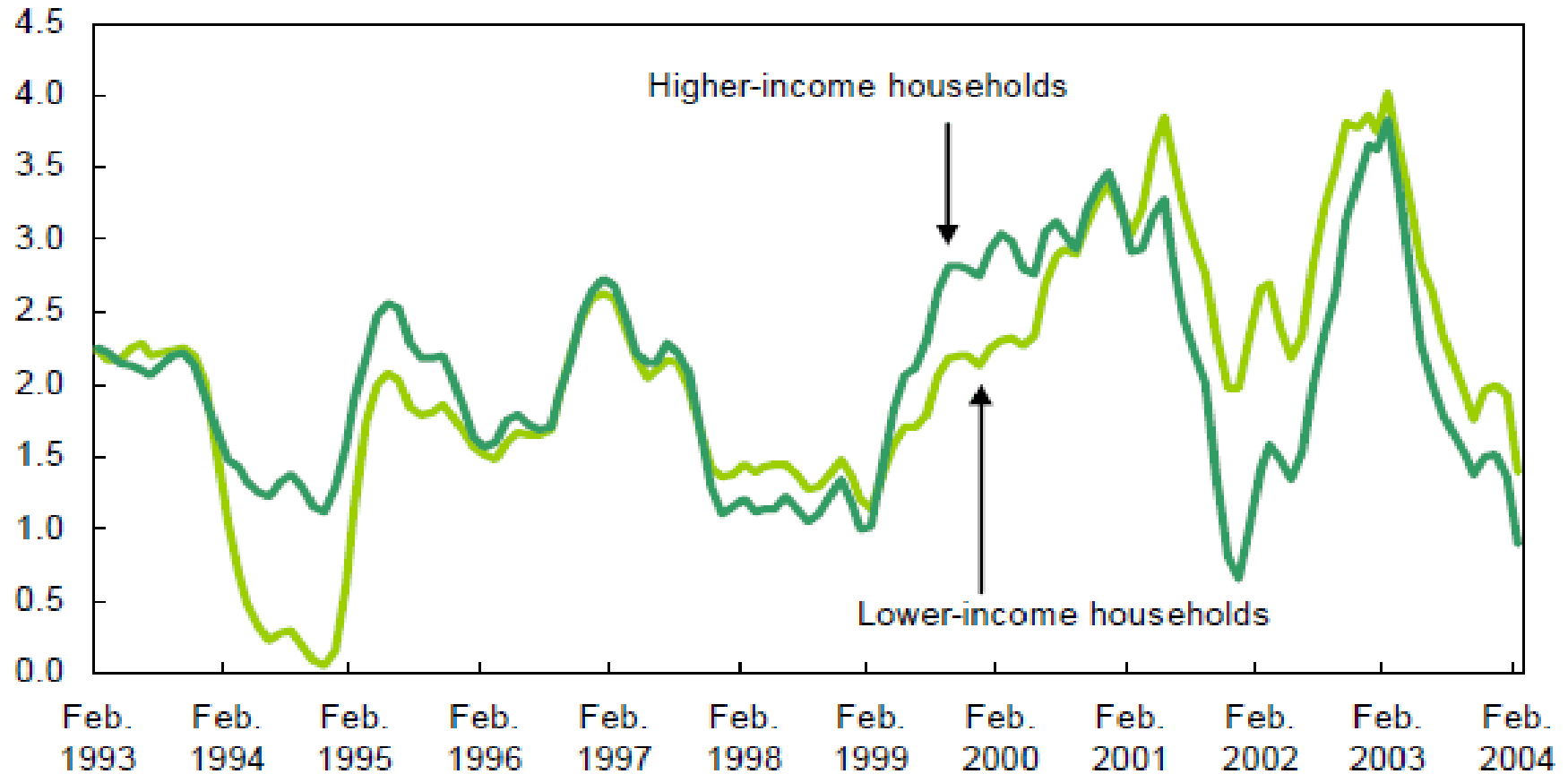


Deviations due to rounding possible.



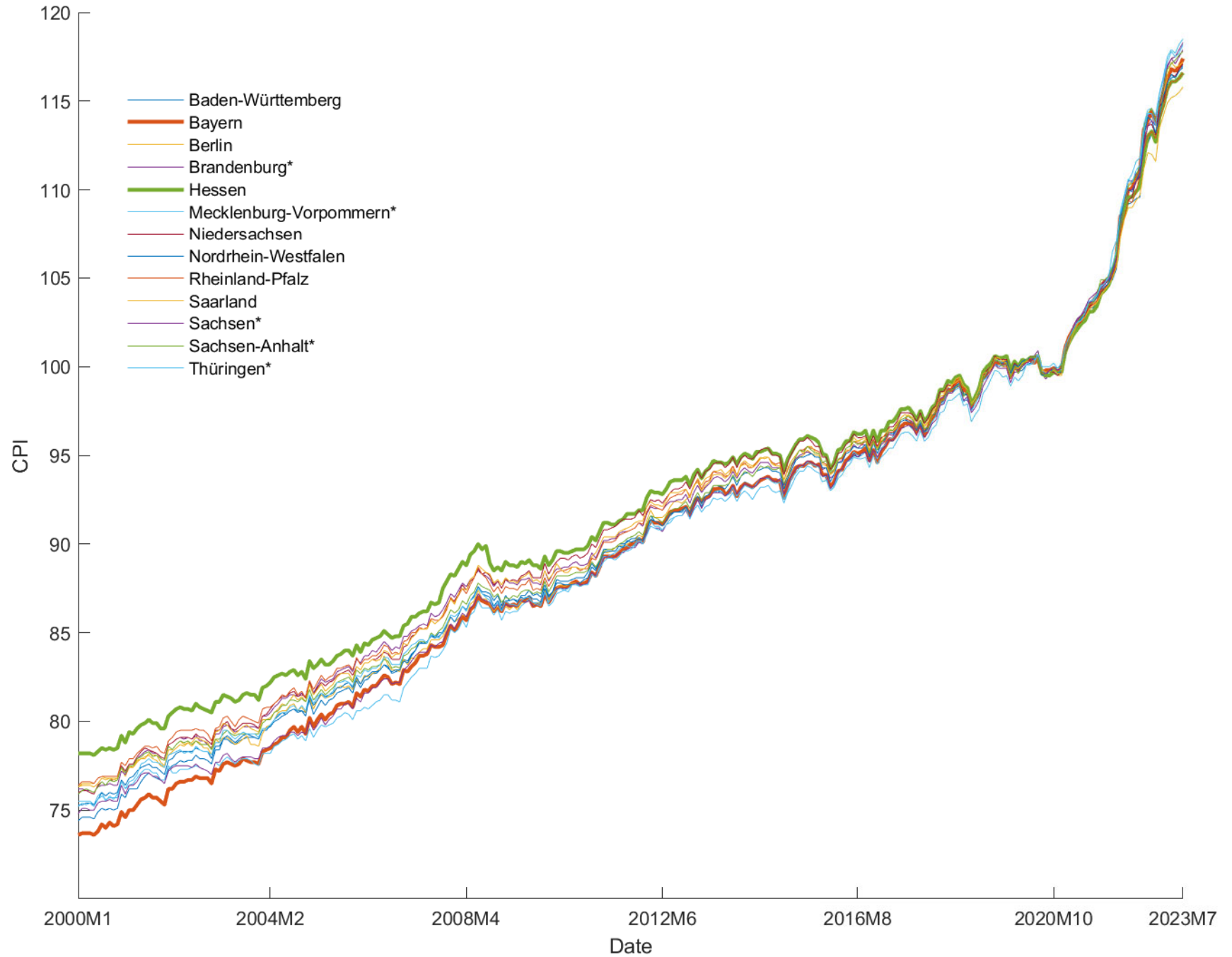
## Inflation Rate for Higher- and Lower- Income Consumers

12-month % change, index smoothed with a centered 3-month moving average



**Source:** Statistics Canada, special tabulation based on the Survey of Household Spending and the Consumer Price Index.

# CPI by Lander (2020 = 100)



Source: Federal Statistical Office of Germany

## Take Away

“Personal” inflation,  $\pi_t^i$ , depends on idiosyncratic characteristics like location, income, age, etc.

Possible reasons:

Consumption patterns depend on idiosyncratic characteristics

Price difference across location cannot always be arbitrated away

In D’Acunto et al. (*JPE*, 2021) and Weber et al. (2022) heterogeneity arises from imperfect information,  $\Omega_t^i$

In D’Acunto et al. (*PNAS*, 2021) heterogeneity arises from heterogeneous information,  $\Omega_t^i$ , related to gender roles in  $X^i$

## **Take Away (cont.)**

This partly explains why controls like gender, age, household income, location, etc. are statistically significant

But, beyond that, heterogeneity in personal inflation rates has important policy implications

For instance, concerning indexation and the welfare costs of inflation

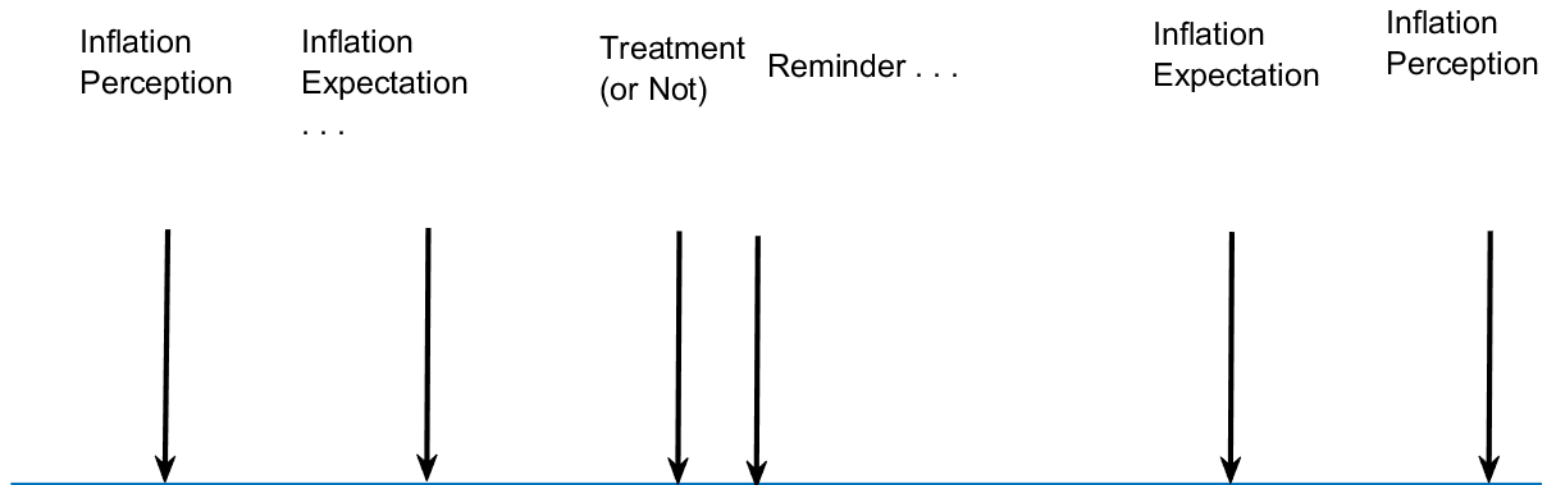
# Causality

The paper considers a RCT where researchers affect  $\Omega_t^i$

For instance: *The Federal Statistical Office reported the official inflation rate for Germany for the past twelve months, as measured by the consumer price index, as being 7.5% in July 2022. You indicated that you believe the inflation rate was [...] over the past twelve months*

Claim: Inflation perceptions *causally* drive inflation expectations

# Timing of RCT



# Interpretation

The regression is

$$E_t^i(\pi_{t+1}|\Omega_{post,t}^i, X^i) - E_t^i(\pi_{t+1}|\Omega_{pre,t}^i, X^i) = \alpha + \beta(E_t^i(\pi_t|\Omega_{post,t}^i, X^i) - E_t^i(\pi_t|\Omega_{pre,t}^i, X^i)) + \varepsilon_t$$

The RCT adds information into the set  $\Omega_t^i$ :  $\Omega_{pre,t}^i \rightarrow \Omega_{post,t}^i$

The treatment affects directly both inflation perceptions and expectations and in the same direction because inflation is positively serially correlated

Question: May this mechanically strengthen the relation between perception and expectations?

## Summary

This paper is a very nice contribution to the literature on the link between inflation perceptions and inflation expectations

It exploits a rich data set

Running a RCT is clever and potentially informative

I look forward to seeing future work by these authors