

TELL ME SOMETHING I DON'T ALREADY KNOW: LEARNING IN LOW- AND HIGH-INFLATION SETTINGS

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We do not speak for the European Central Bank, the Atlanta Fed, the Central Bank of Uruguay or the Bank of Italy.

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- But growing evidence that agents are systematically less than fully informed. This can matter.
 - Transmission of monetary policy (e.g. Lucas 1972)
 - Slope of Phillips curve (Pfäuti 2023)
 - Power of forward guidance (Kiley 2021)
 - Policy communication (Candia et al. 2021)

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as a result of which *the degree of inattention should be endogenous to economic conditions.*

EXISTING EVIDENCE OF ENDOGENOUS INATTENTION

- Households less likely to say “I don’t know” about recent inflation when inflation is high.
- Households’ perceived inflation is closer to actual inflation when inflation is high. (new)
- Households search for information about inflation more when inflation is high.
- Households revise their expectations more in response to surprises when inflation is high.
- Households report that they are more attentive to inflation when inflation is high. (new)
- Estimates of information rigidity are lower when volatility is high.
- Households respond less to information treatments when inflation is high. (new)
 - Cavallo, Cruces and Perez-Truglia (2017) show using *RCTs* that households in ARG respond less to information treatment about inflation than do U.S. households.

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 - When inflation is low and stable
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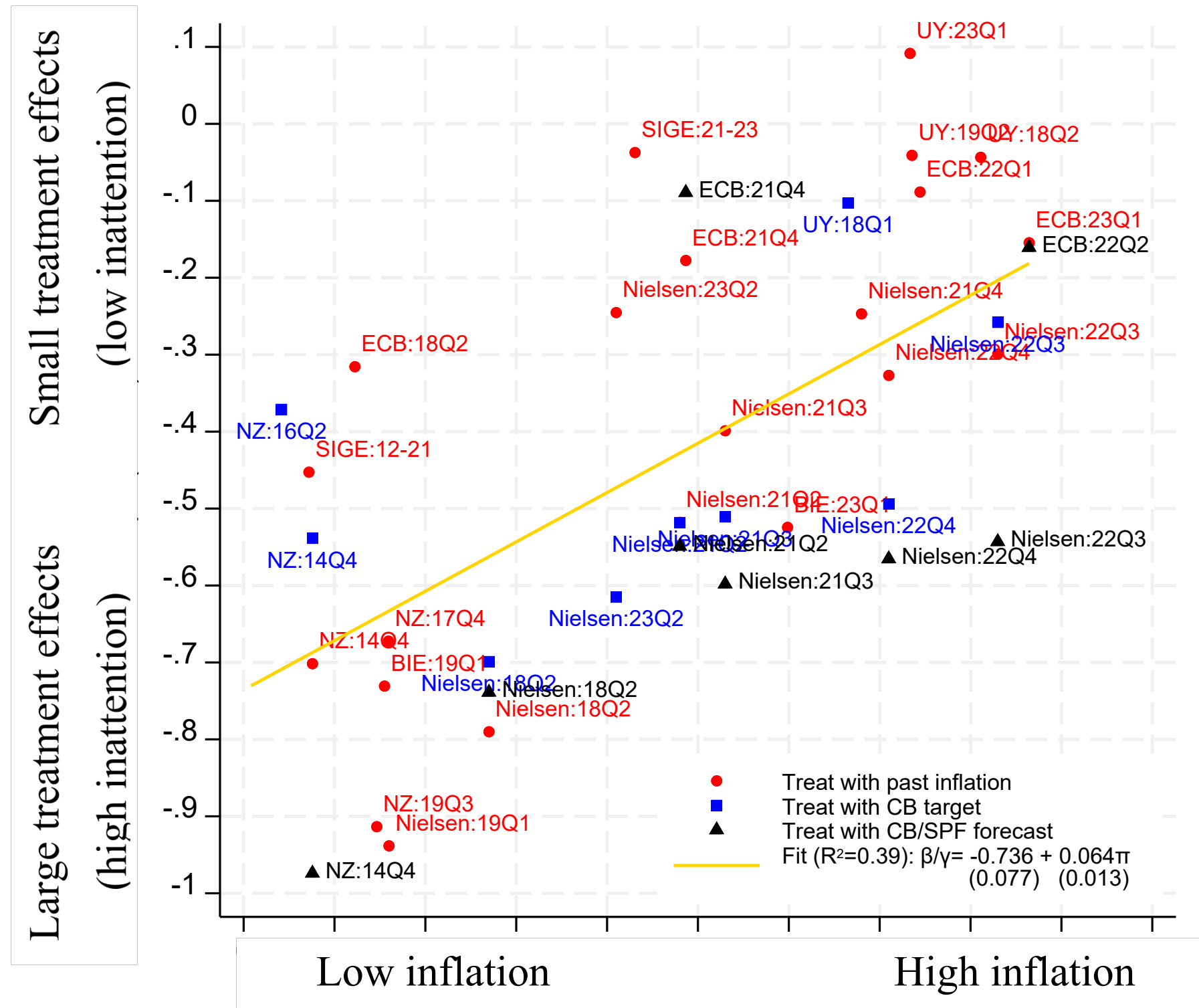
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- Pool comparable information treatments:
 - Information about recent inflation
 - Information about inflation targets
 - Information about inflation forecasts

WHAT WE FIND



Jointly, we provide comprehensive evidence that high-inflation environments lead households and firms to become more attentive to inflation.

BACKGROUND

Simple Bayesian updating predicts:

$$posterior_i = (1 - G) \times prior_i + G \times signal$$

where G will be large when signal is credible and informative and small otherwise. When G is small, posteriors will be close to priors.

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- Randomly assign agents to “control” and “treatment” groups such that only those in the treatment group are provided with signal.
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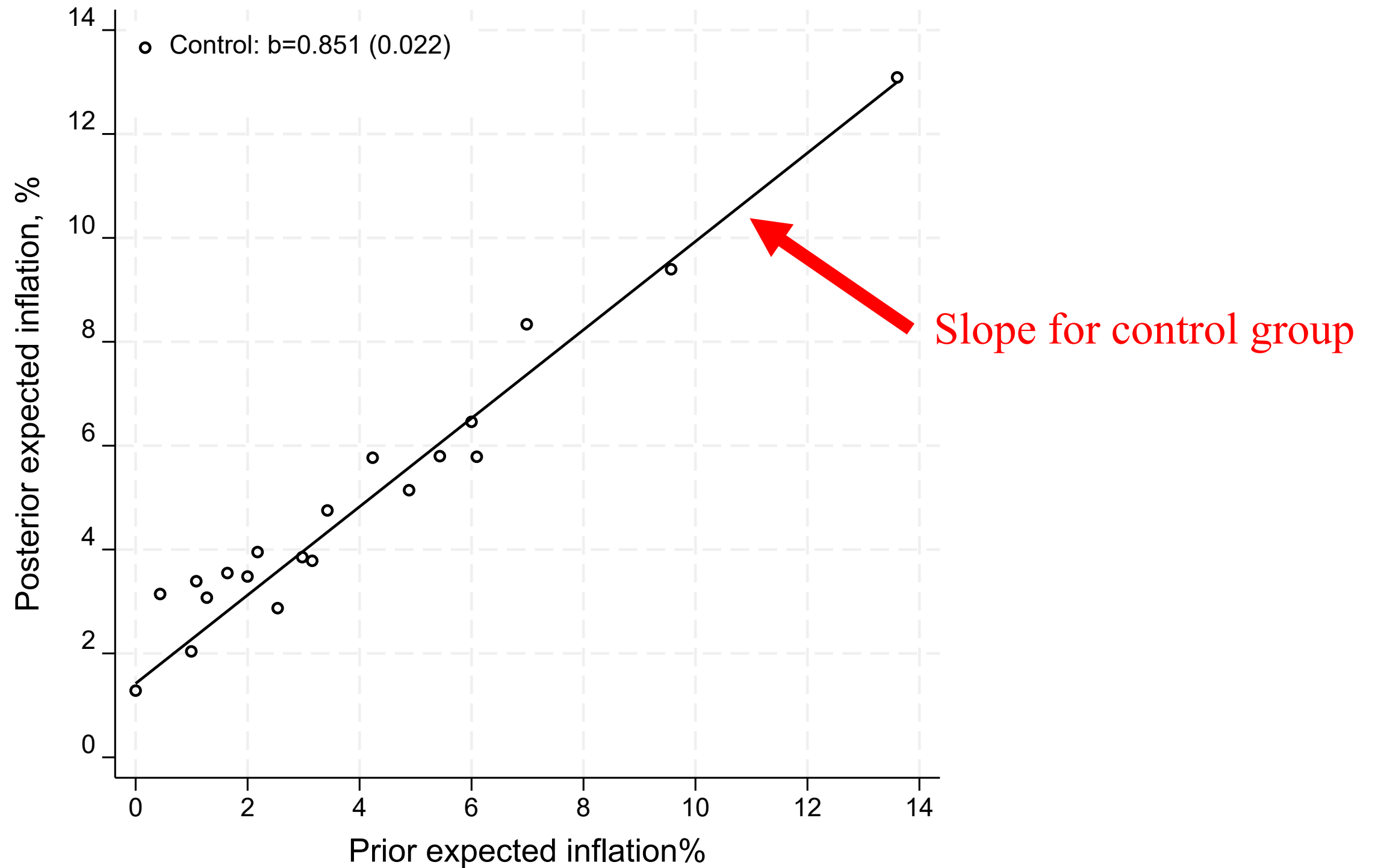
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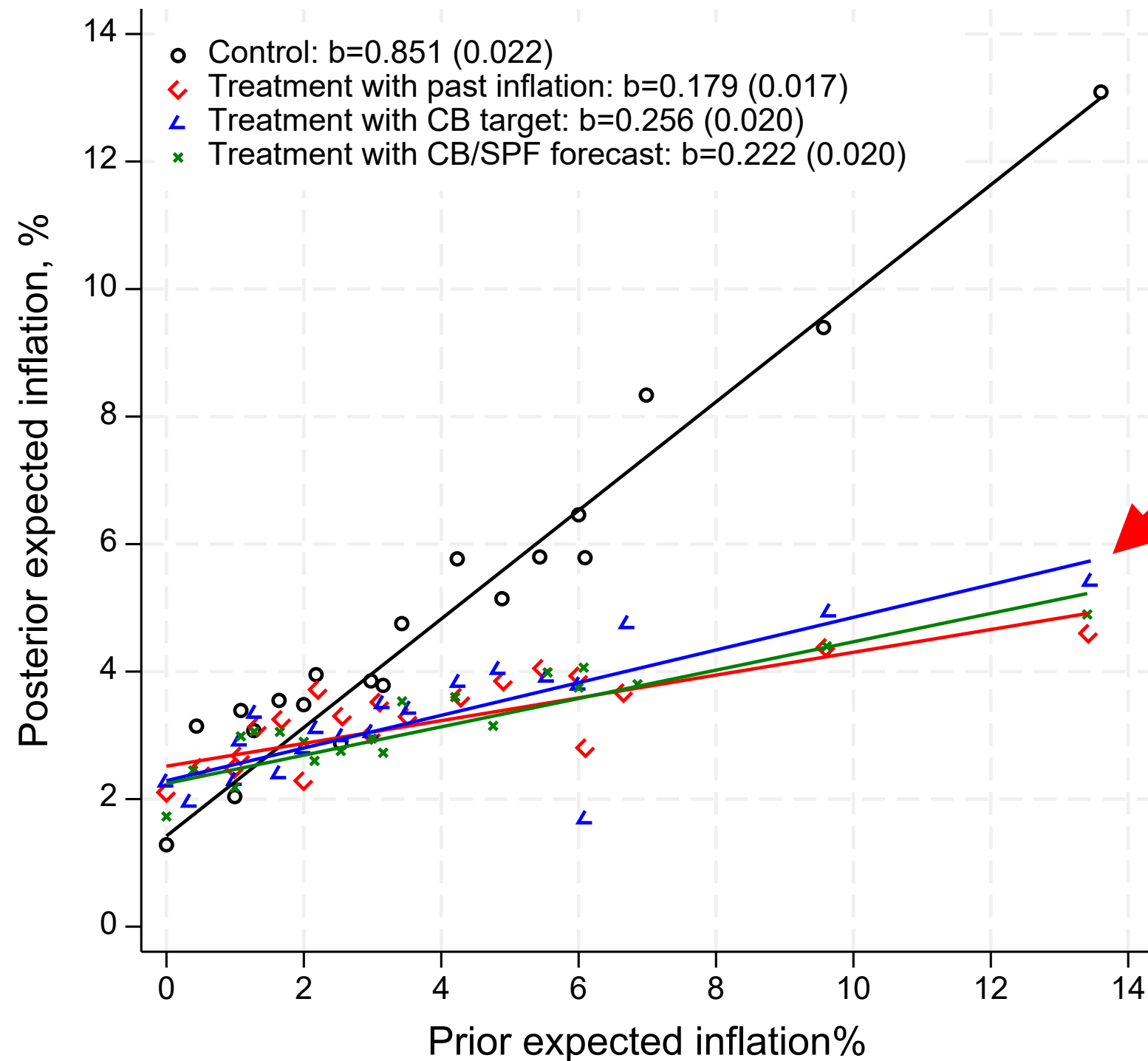
- *Control group*: $T_i = 0$, $posterior_i = prior_i$ so $\hat{\beta} = 1$ and $\hat{\alpha} = 0$
- *Treatment group*: $T_i = 1$, $posterior_i = \alpha + \delta + (\beta + \gamma) \times prior_i$, so $\hat{\gamma}$ tells us how much weight treated firms still place on their prior and $\beta + \gamma = 1 - G$.

ILLUSTRATION: NIELSEN RCT 2018Q2 (CGW 2022)



Because different questions are used for priors and posteriors, it is common for the slope coefficient to be less than one for control group. How different from one depends on question wording, etc.

ILLUSTRATION: NIELSEN RCT 2018Q2 (CGW 2022)



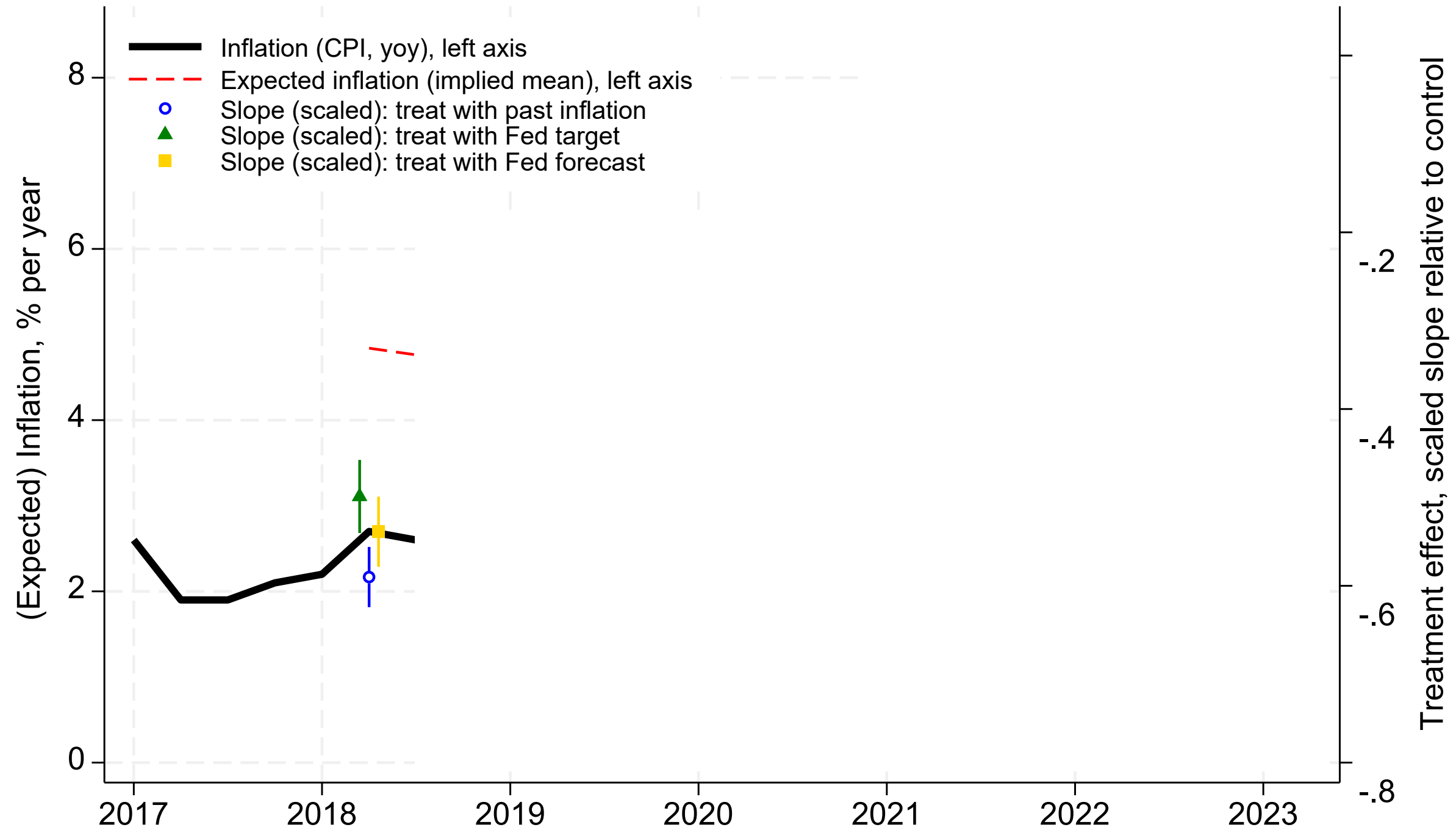
Slopes for treatment groups that are provided with information about inflation are much flatter, i.e. $\hat{\gamma} \ll 0$

This is an example of treatments having a very powerful effect on beliefs. We'll focus on $\hat{\gamma} / \hat{\beta}$ (≈ -0.75) as our metric for the strength of the treatment effect.

NIELSEN SURVEY

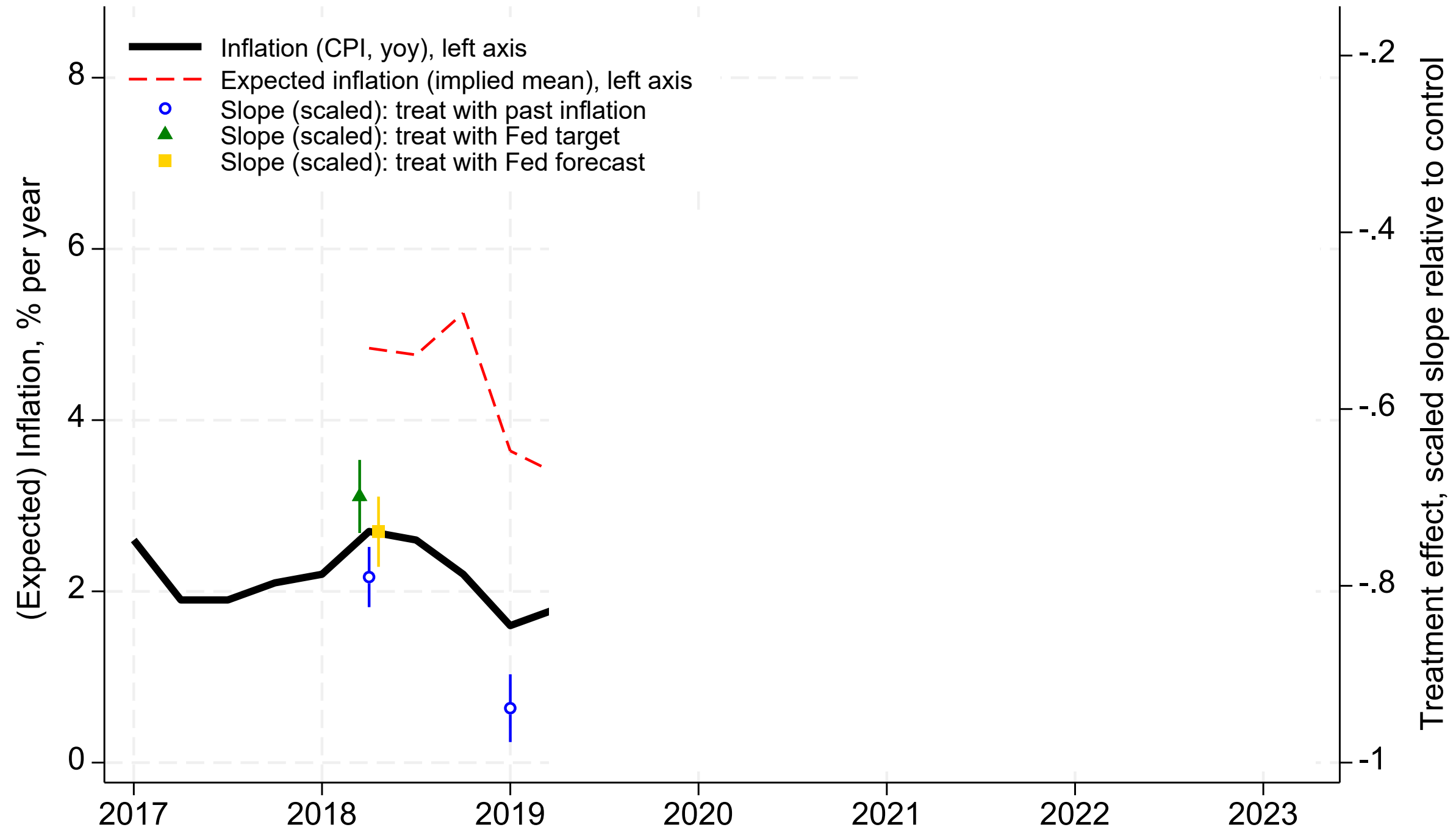
- Nielsen Homescan Panel tracks ~80,000 representative U.S. households.
- We implement quarterly surveys of these households since 2018Q2.
- Survey sizes are 15,000-20,000 respondents.
- Inflation treatments were implemented in 2018Q2, 2019Q1, 2021Q2-Q4, 2022Q3-Q4, 2023Q2
 - *Inflation over past year*
 - *Inflation target of Federal Reserve*
 - *Inflation forecast of FOMC*
- *Priors* are measured using distributional question for 12-month ahead inflation expectations.
- *Posteriors* are measured using point forecast for 12-month ahead inflation immediately after the information treatments.

NIELSEN SURVEY



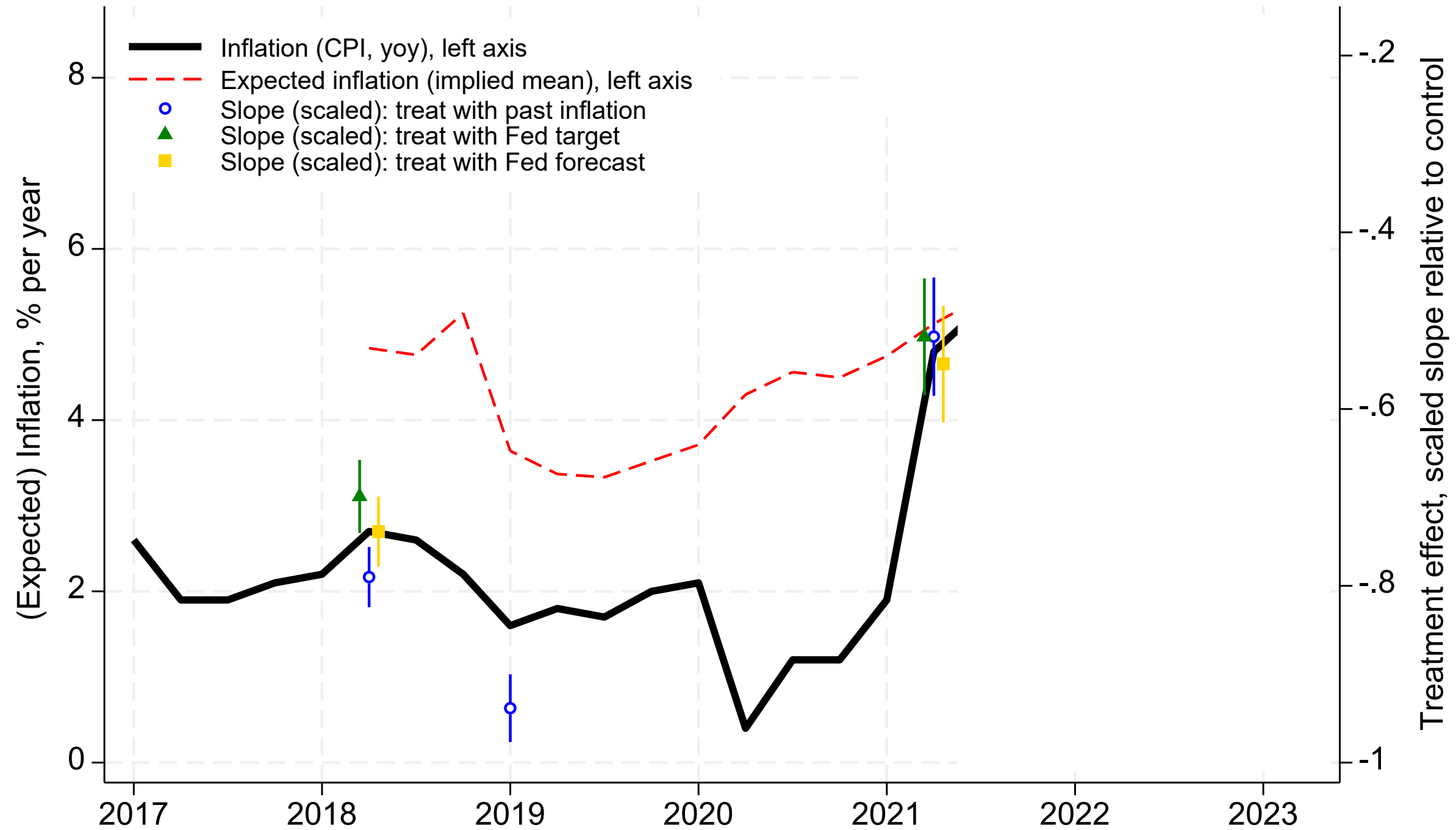
In 2018Q2, treatment effects were large for all three treatments.

NIELSEN SURVEY



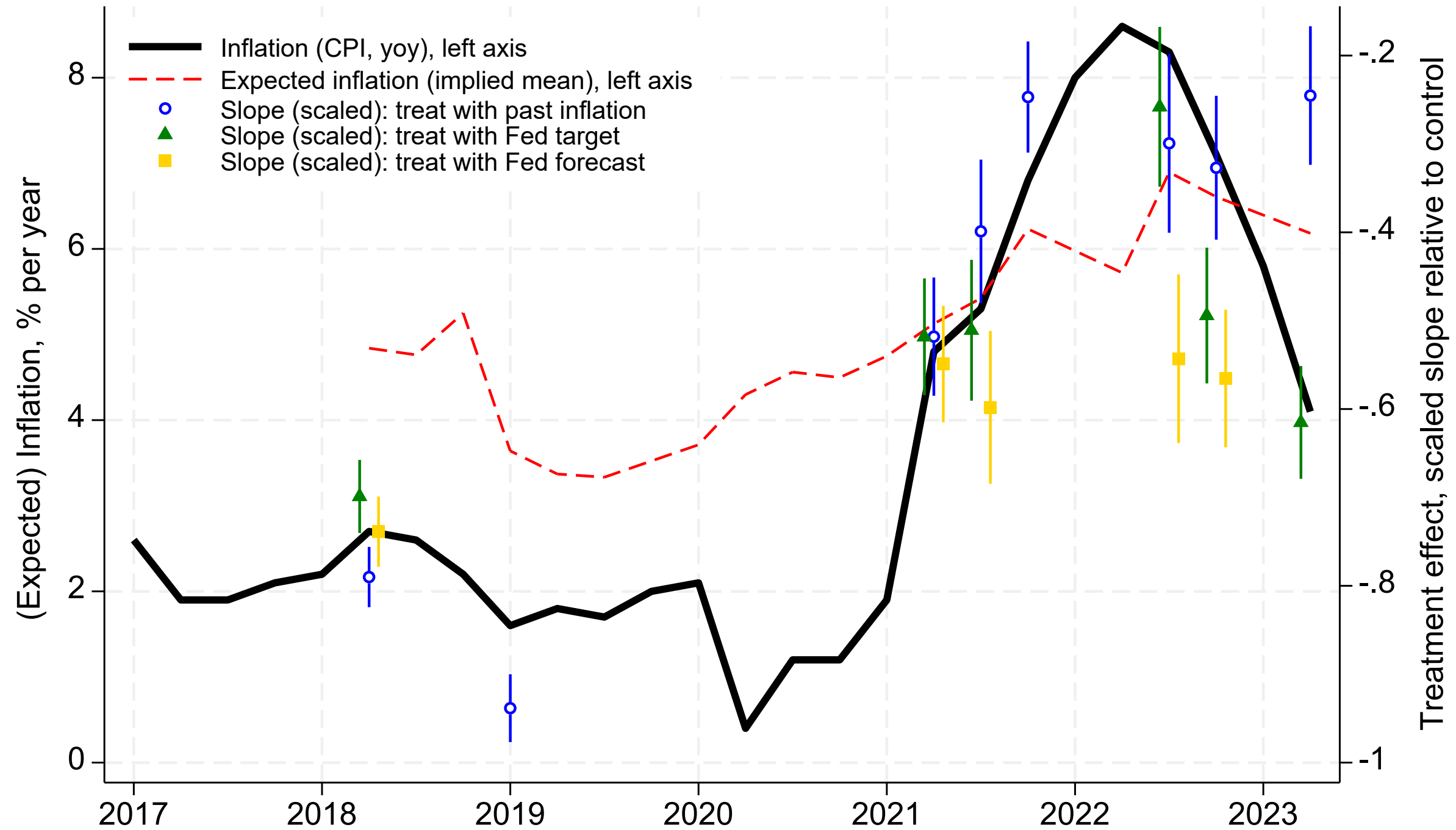
In 2019Q1, the treatment effect was large again as inflation remained low.

NIELSEN SURVEY



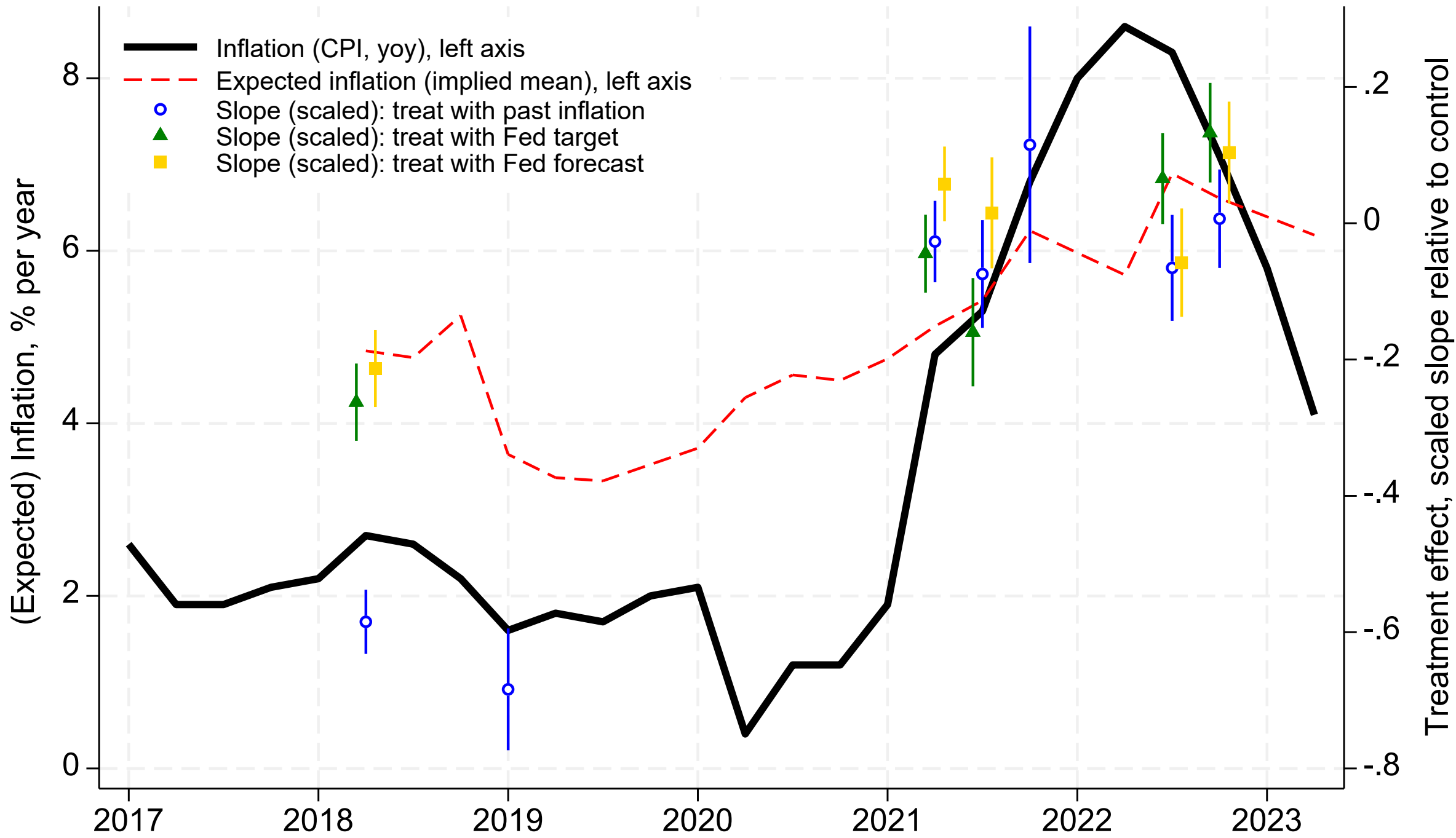
By 2021Q2, inflation had just started rising sharply and treatment effects fell and got noisy.

NIELSEN SURVEY



As the inflation rate stayed high through 2023, treatment effects became weaker overall.

NIELSEN SURVEY: *EFFECTS AFTER THREE MONTHS*

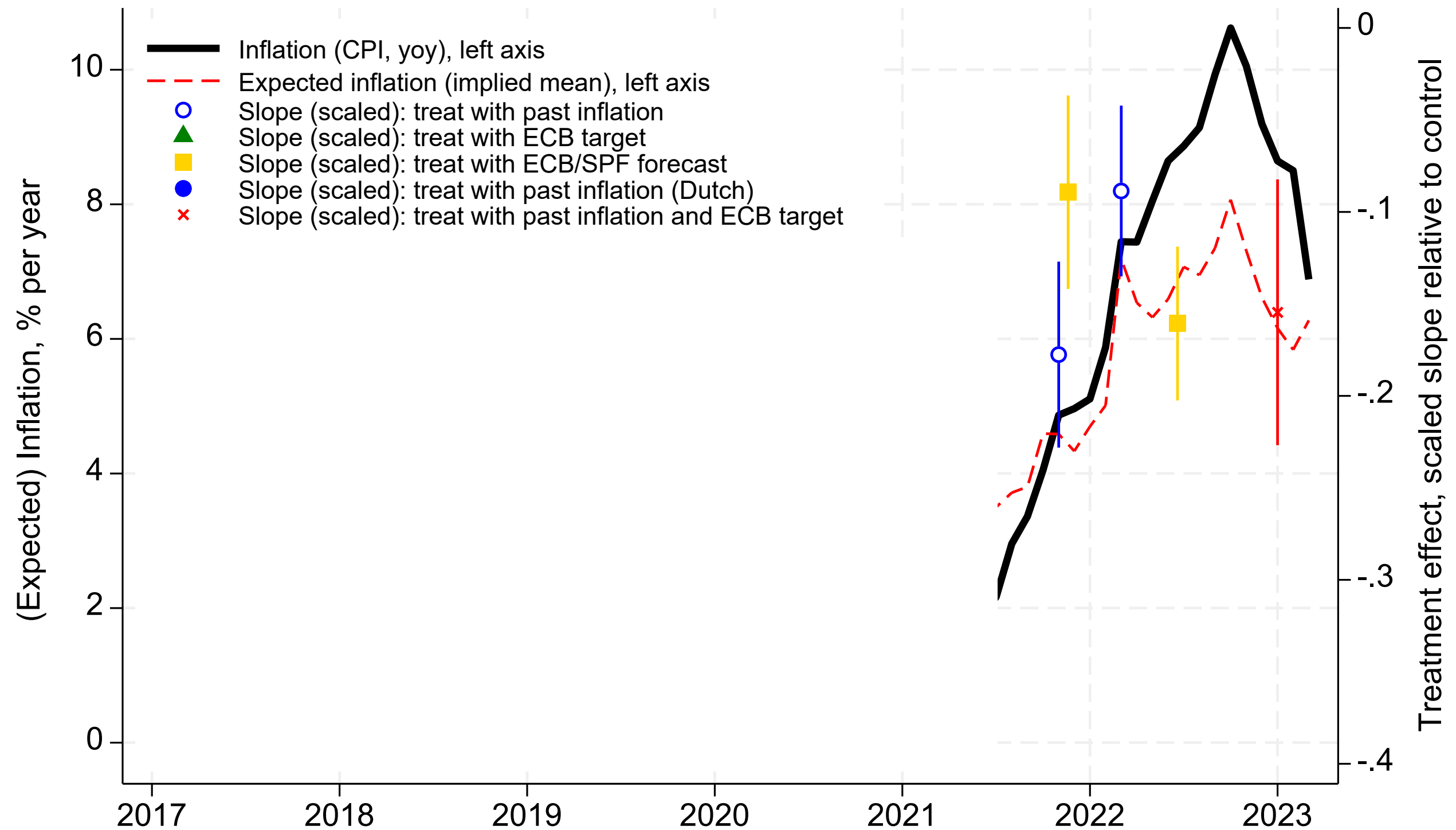


The results are qualitatively similar if we look at the effects on expectations 3 months later.

CONSUMER EXPENDITURE SURVEY (CES) IN EURO-AREA

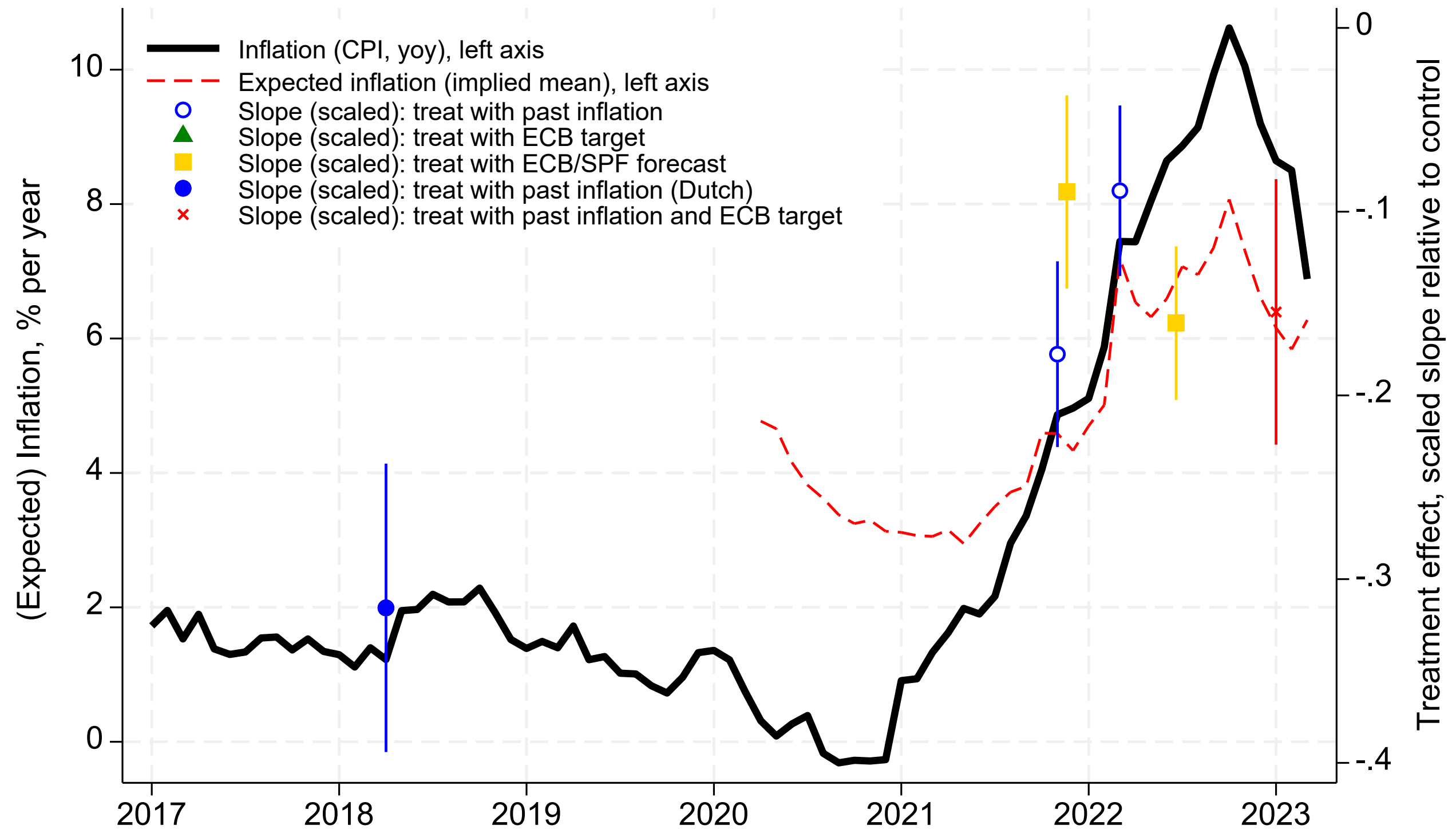
- The CES surveys ~20,000 households per month, across 11 countries (originally just 6)
- The survey has only been running since 2020.
- Unlike most other central bank surveys of households, the CES implements some RCTs.
- Inflation treatments were implemented in 2021Q4, 2022Q2-Q3, 2023Q1.
 - *Inflation over past year*
 - *Inflation target of European Central Bank*
 - *Inflation forecast of ECB SPF*
- *Priors* are measured using distributional question for 12-month ahead inflation expectations.
- *Posteriors* are measured using point forecast for 12-month ahead inflation immediately after the information treatments.

CONSUMER EXPENDITURE SURVEY (CES) IN EURO-AREA



We again see small treatment effects during high inflation.

WHY ATTRIBUTE CHANGING EFFECT TO INFLATION?



1. We can add survey in ND in 2018Q2 and find stronger treatment effect when inflation was lower.

WHY ATTRIBUTE CHANGING EFFECT TO INFLATION?

CROSS-SECTIONAL HETEROGENEITY IN TREATMENT EFFECTS

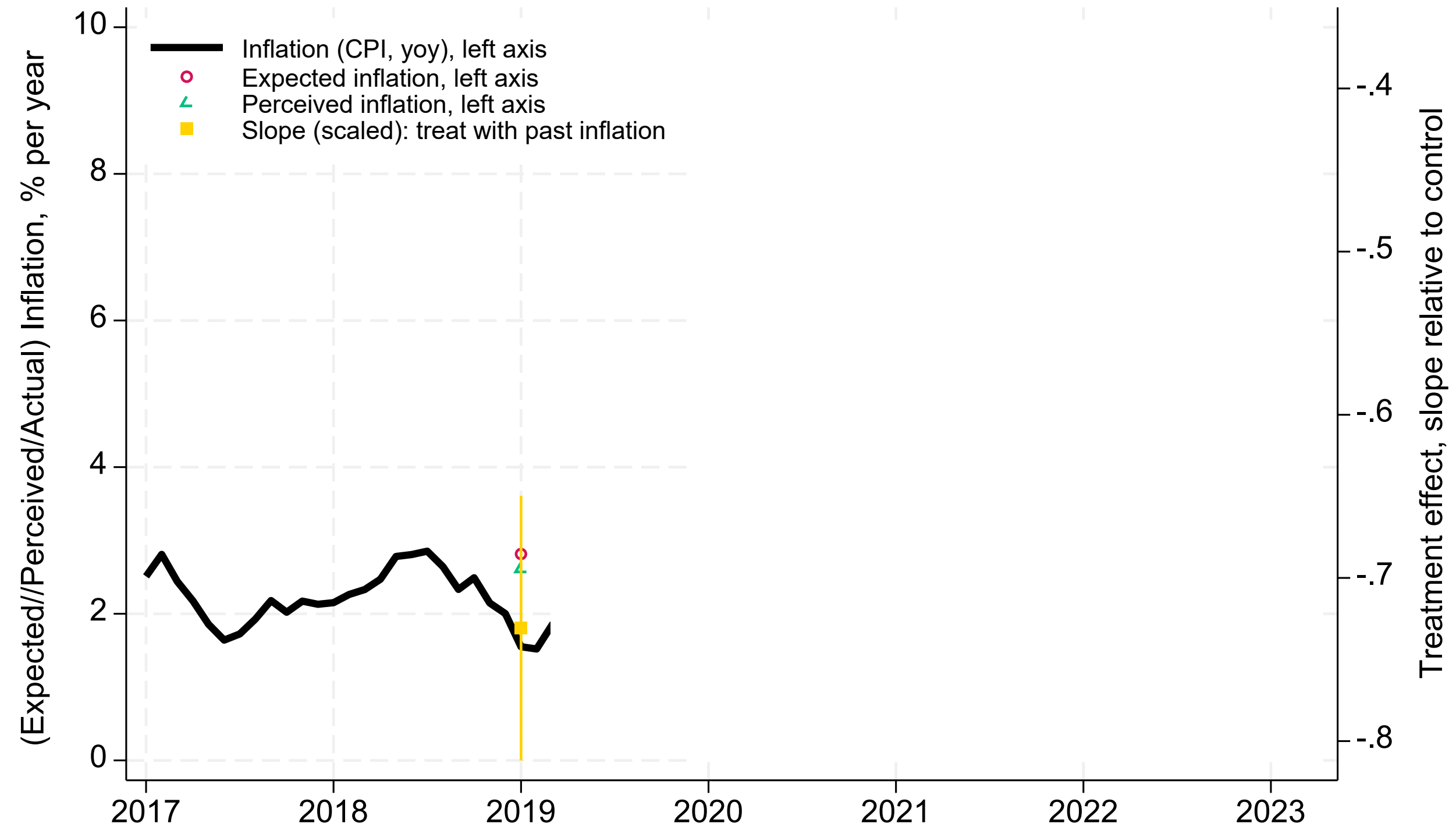
	Attentive hh's		Inattentive hh's	
	Slope (scaled)	Intercept	Slope (scaled)	Intercept
	(1)	(2)	(3)	(4)
Eurozone	0.01 (0.08)	-0.07 (0.41)	-0.19*** (0.06)	1.21*** (0.05)

2. *The treatment effects are strongest for those who say they are inattentive to inflation.*

BUSINESS INFLATION EXPECTATIONS (BIE) IN U.S.

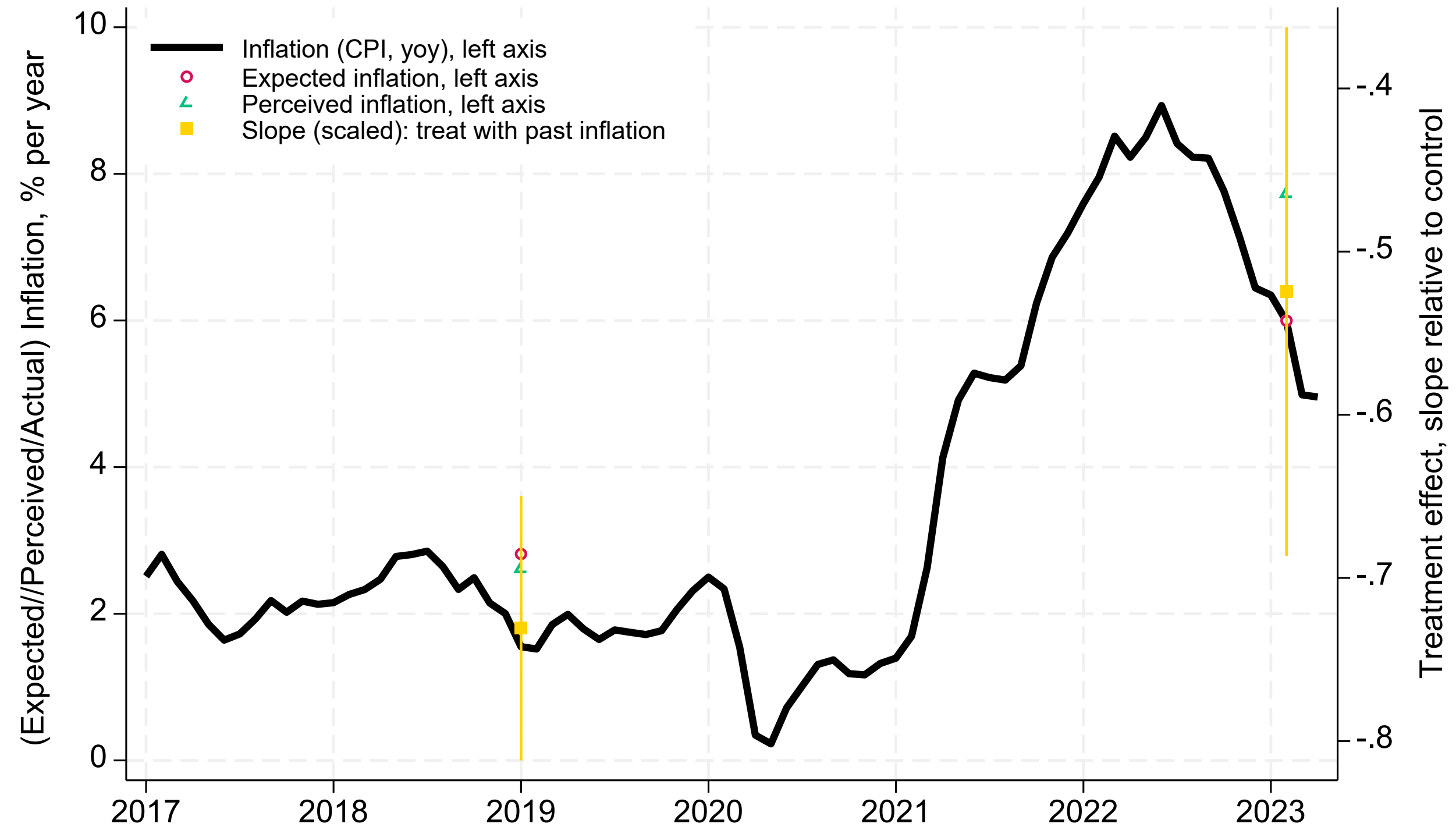
- The Atlanta Fed surveys **~300 firms** per month, representative across industries.
- Questions generally focus on unit cost expectations of the firm.
- On occasion, the Atlanta Fed has asked about aggregate inflation expectations.
- Inflation treatments were implemented in **2019Q1 and 2023Q1**.
 - *Inflation over past year*
- *Priors* are measured using **perceived** inflation over previous year.
- *Posteriors* are measured using point forecast for 12-month ahead inflation immediately after the information treatments.

BUSINESS INFLATION EXPECTATIONS (BIE) IN U.S.



Information treatments in 2019Q1 had powerful effects on U.S. firms' inflation expectations.

BUSINESS INFLATION EXPECTATIONS (BIE) IN U.S.

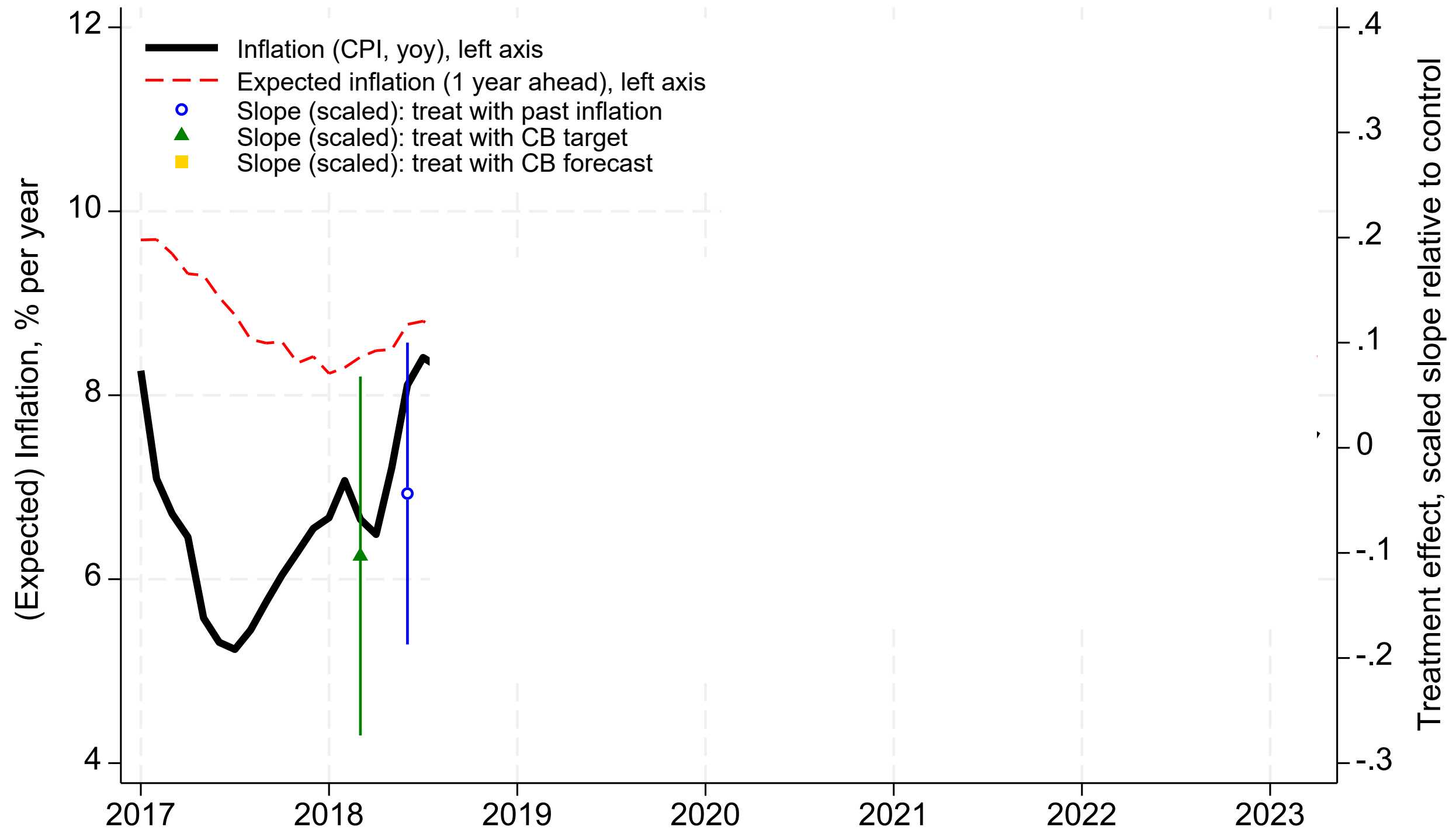


The treatment in 2023 had smaller effect (albeit not statistically significantly different).

URUGUAY

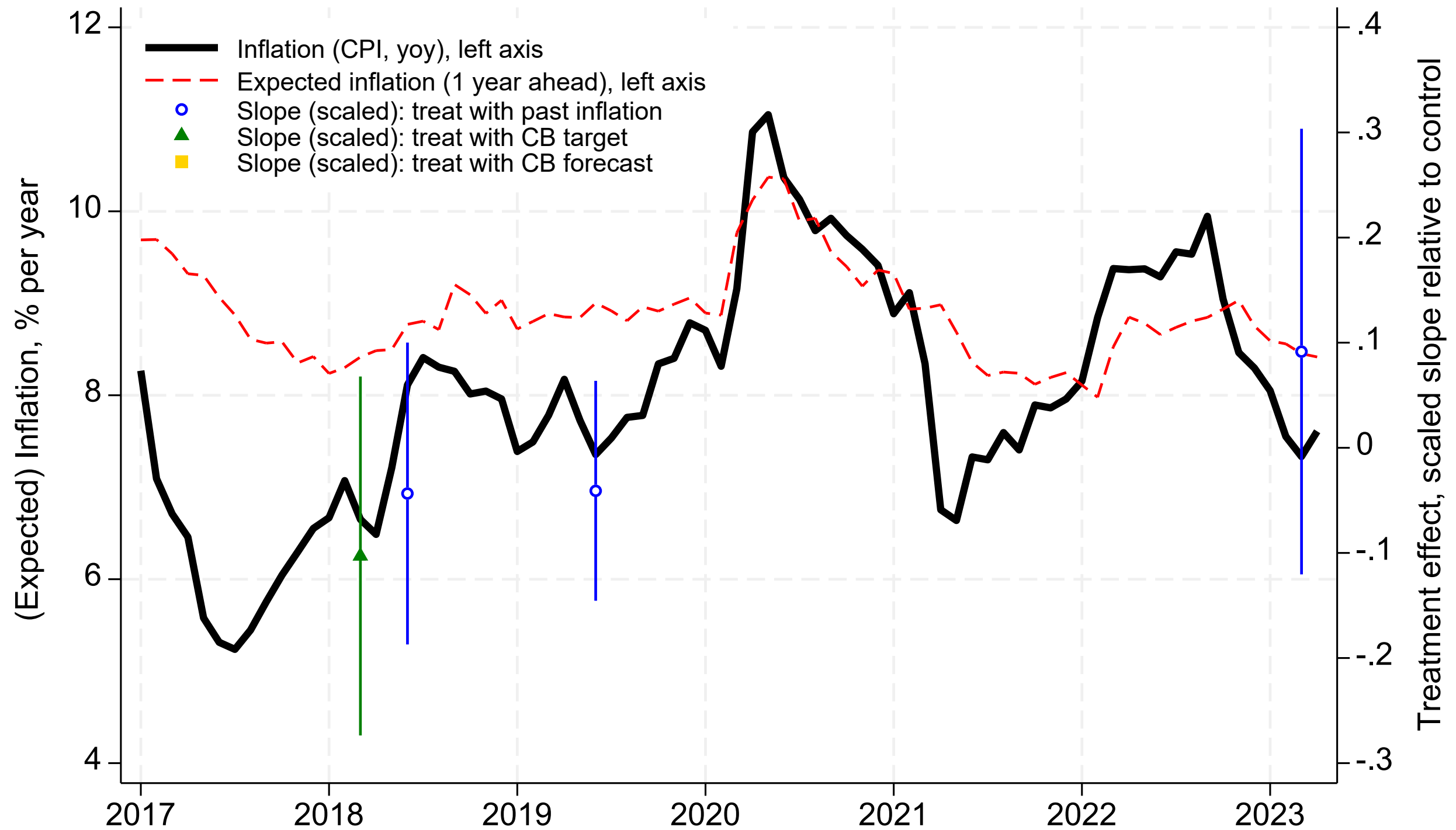
- The central bank of Uruguay surveys **~500 firms** per wave, representative across industries.
- Questions focus on inflation and wage expectations of firms.
- Uruguay has been experiencing around 8% inflation since early 2000s
- Inflation treatments were implemented in **2018Q1-Q2, 2019Q2 and 2023Q1**.
 - *Inflation over past year*
 - *Central bank's inflation target range*
- *Priors* are measured using point forecast for expected inflation over next year.
- *Posteriors* are measured using inflation expectations **from next wave**.

URUGUAY



In 2018 with ~7% inflation, treatment effects were close zero.

URUGUAY

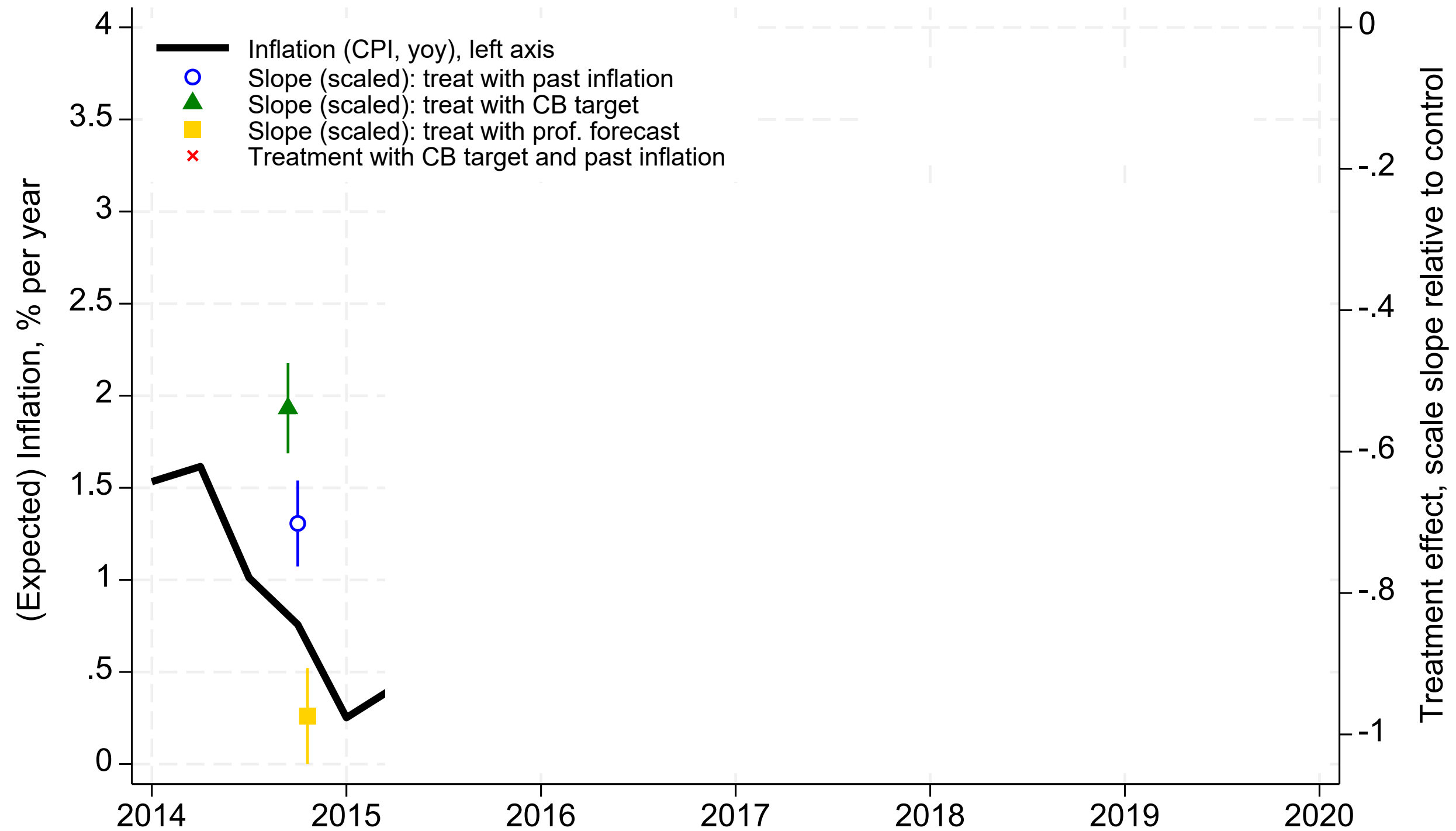


In 2023, still with ~7% inflation, treatment effects were still close to zero.

NEW ZEALAND

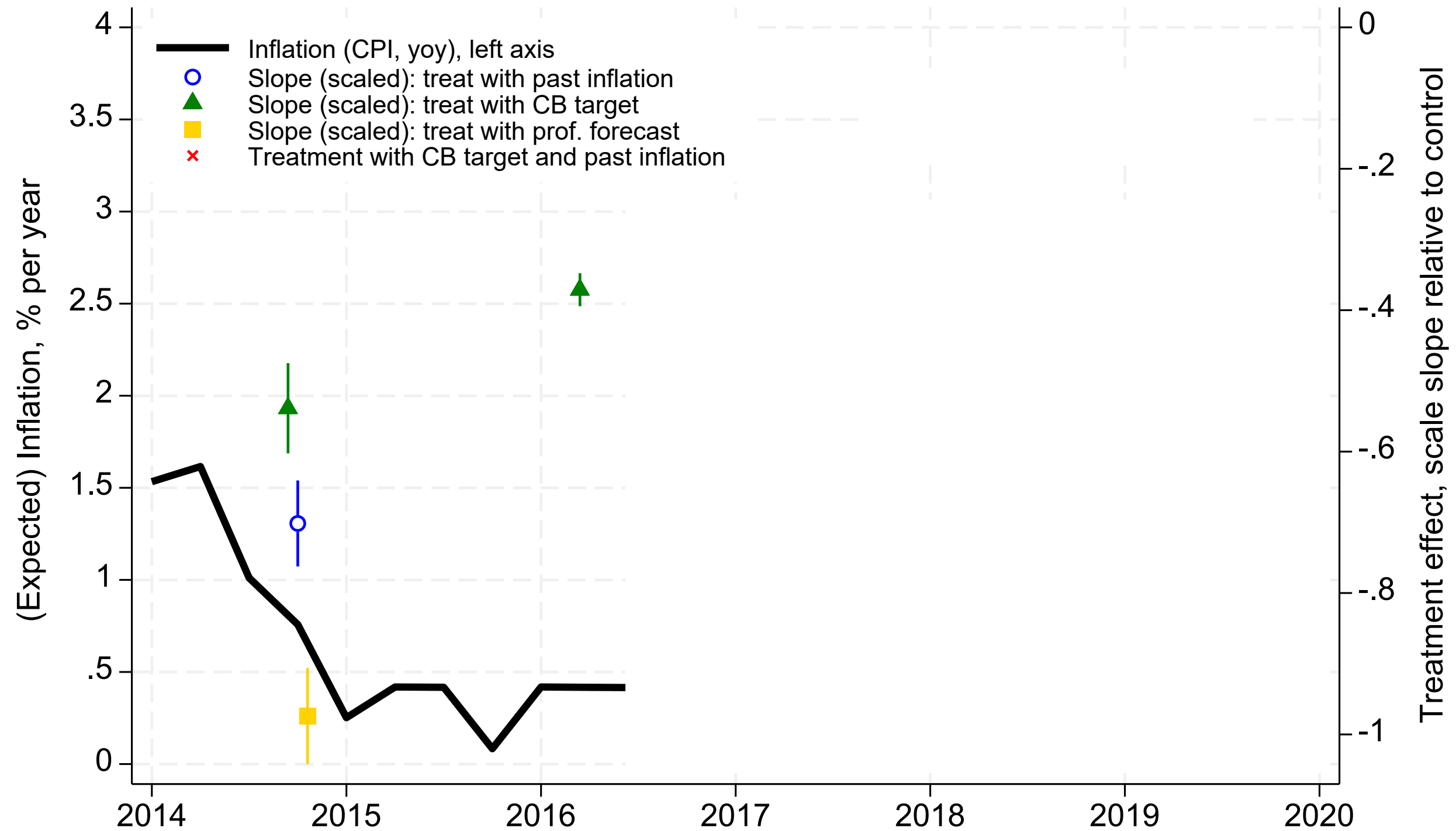
- Prior work has implemented occasional surveys of firms in New Zealand
- These surveys generally cover 2,000-3,000 firms.
- New Zealand has been experiencing low and stable inflation since mid-1990s.
- Inflation treatments were implemented in 2014Q4, 2016Q2, 2018Q1 and 2019Q3.
 - *Inflation over past year*
 - *Central bank's inflation target range*
 - *Professional forecasts of inflation*
- *Priors* are measured using forecast of inflation over next year from distribution question.
- *Posteriors* are measured using point forecast of inflation expectations after treatment.

NEW ZEALAND



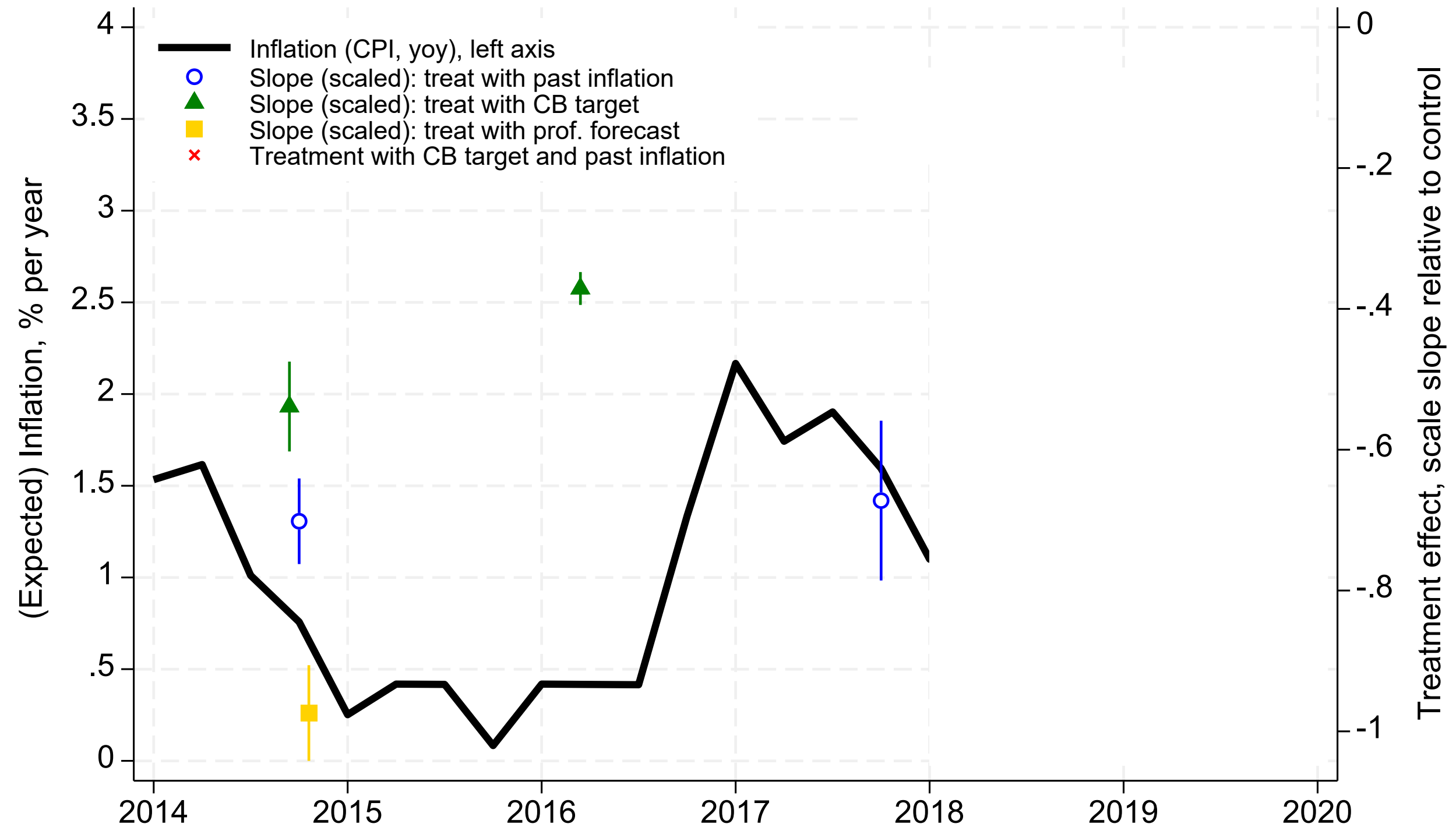
In 2014, with low inflation, treatment effects were large.

NEW ZEALAND



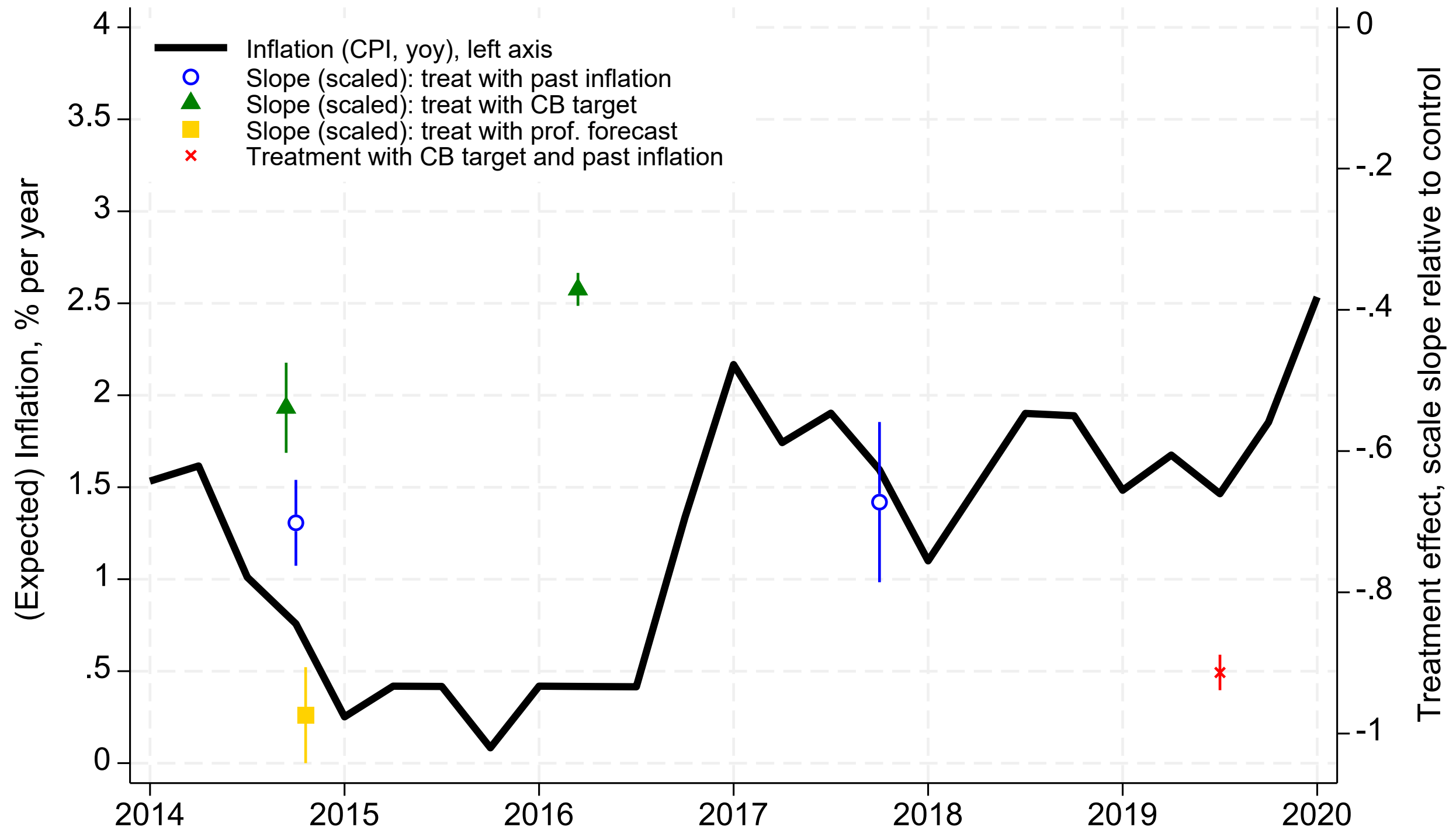
*In 2016, with **very** low inflation, treatment effects were a little smaller.*

NEW ZEALAND



In 2017, with low inflation, treatment effects were unchanged.

NEW ZEALAND

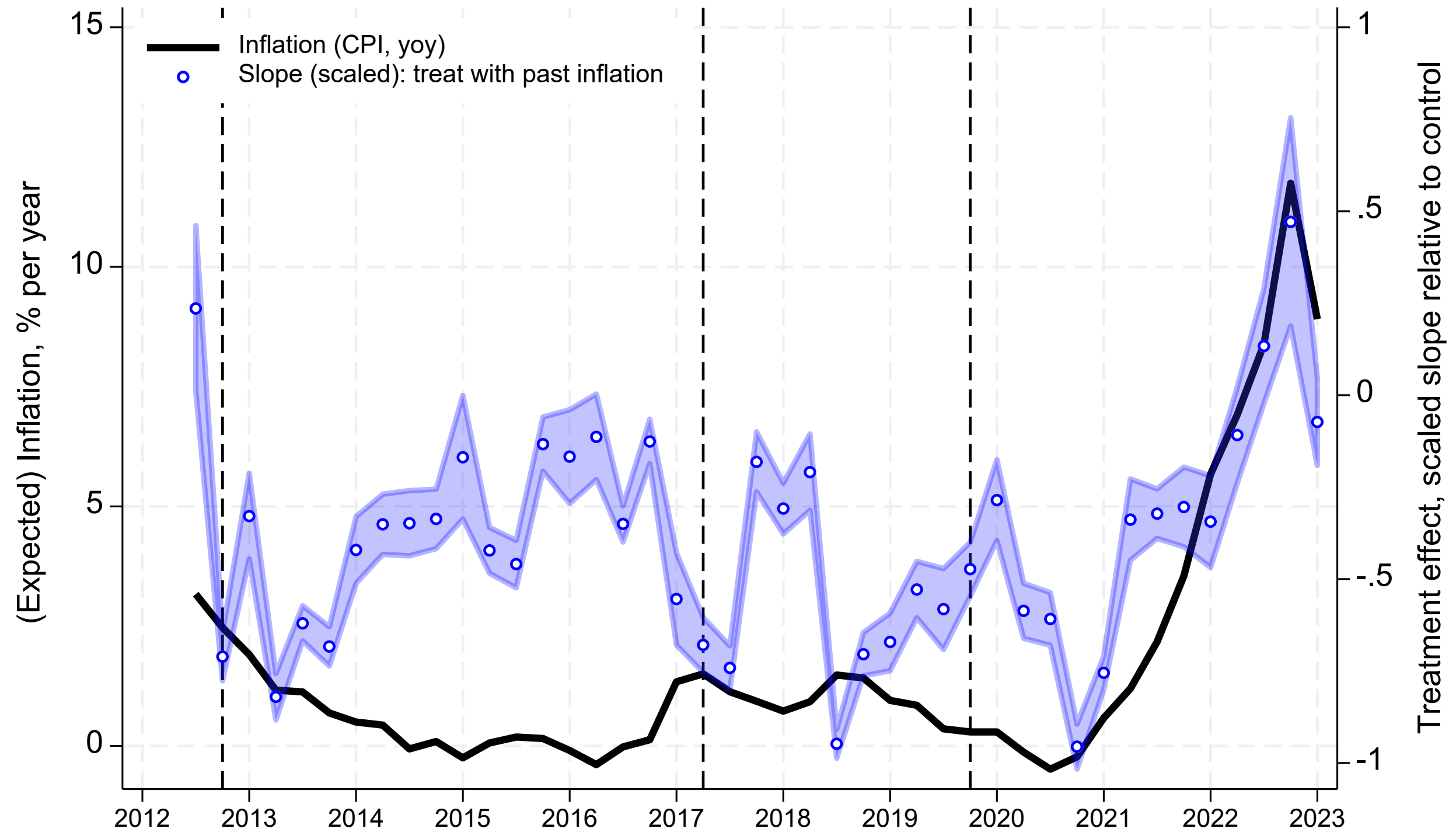


In 2019, with low inflation, treatment effects were similar.

ITALY

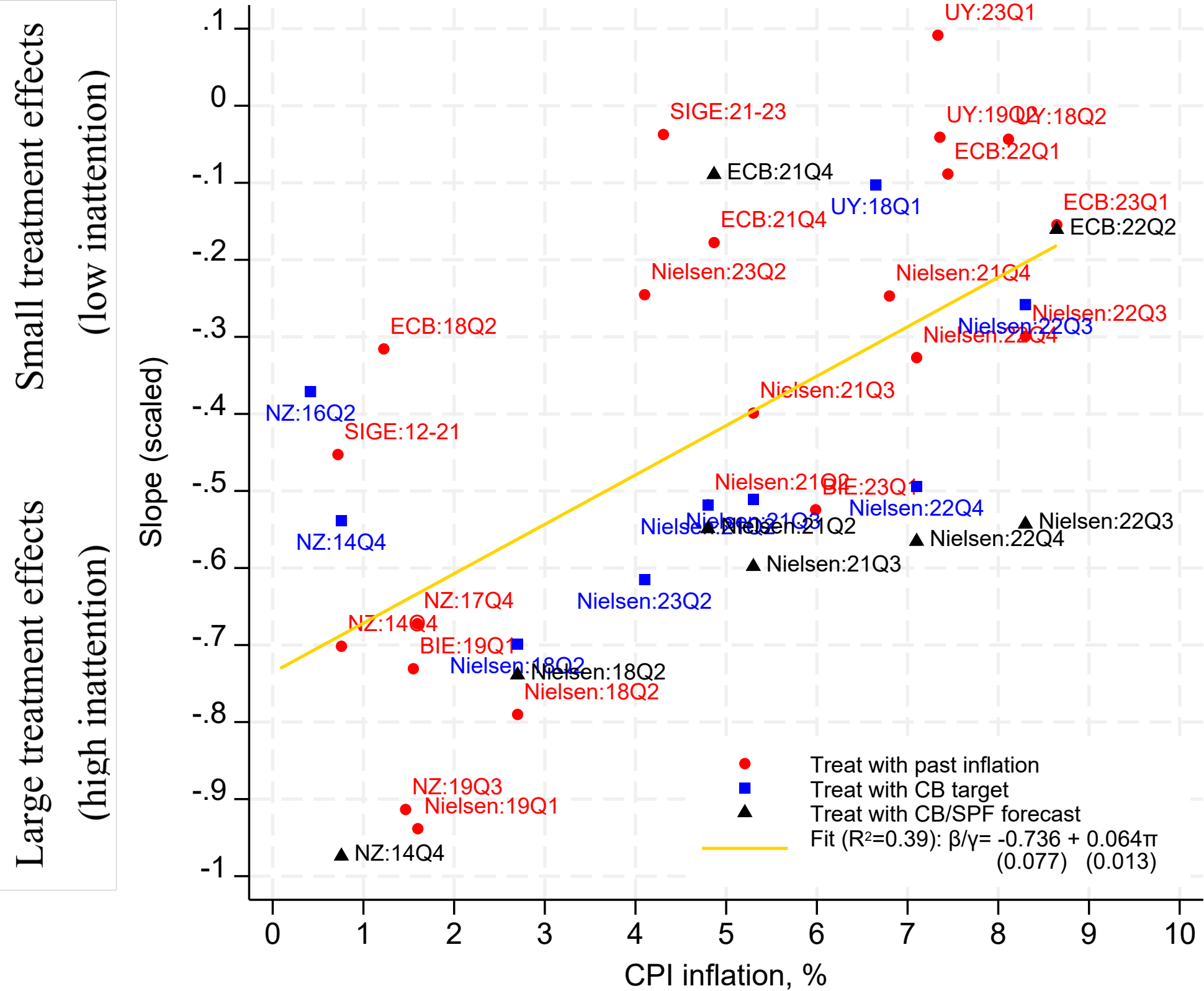
- The Bank of Italy runs a quarterly representative survey of ~1,000 firms in Italy.
- Starting 2012Q3, firms were randomly assigned to one of two groups. One group was just asked about future inflation. The other was told about recent inflation then asked for future inflation.
- Once assigned to group, firms stay in that group until next reshuffling.
- Reshuffling of firms in treatment and control occurred in 2012Q3, 2012Q4, 2017Q2, 2019Q4.
- Inflation treatments happen every quarter.
 - *Inflation over past year*
- *Priors* are measured using forecast of inflation over next year from previous wave.
- *Posteriors* are measured using point forecast of inflation expectations after treatment.

ITALY



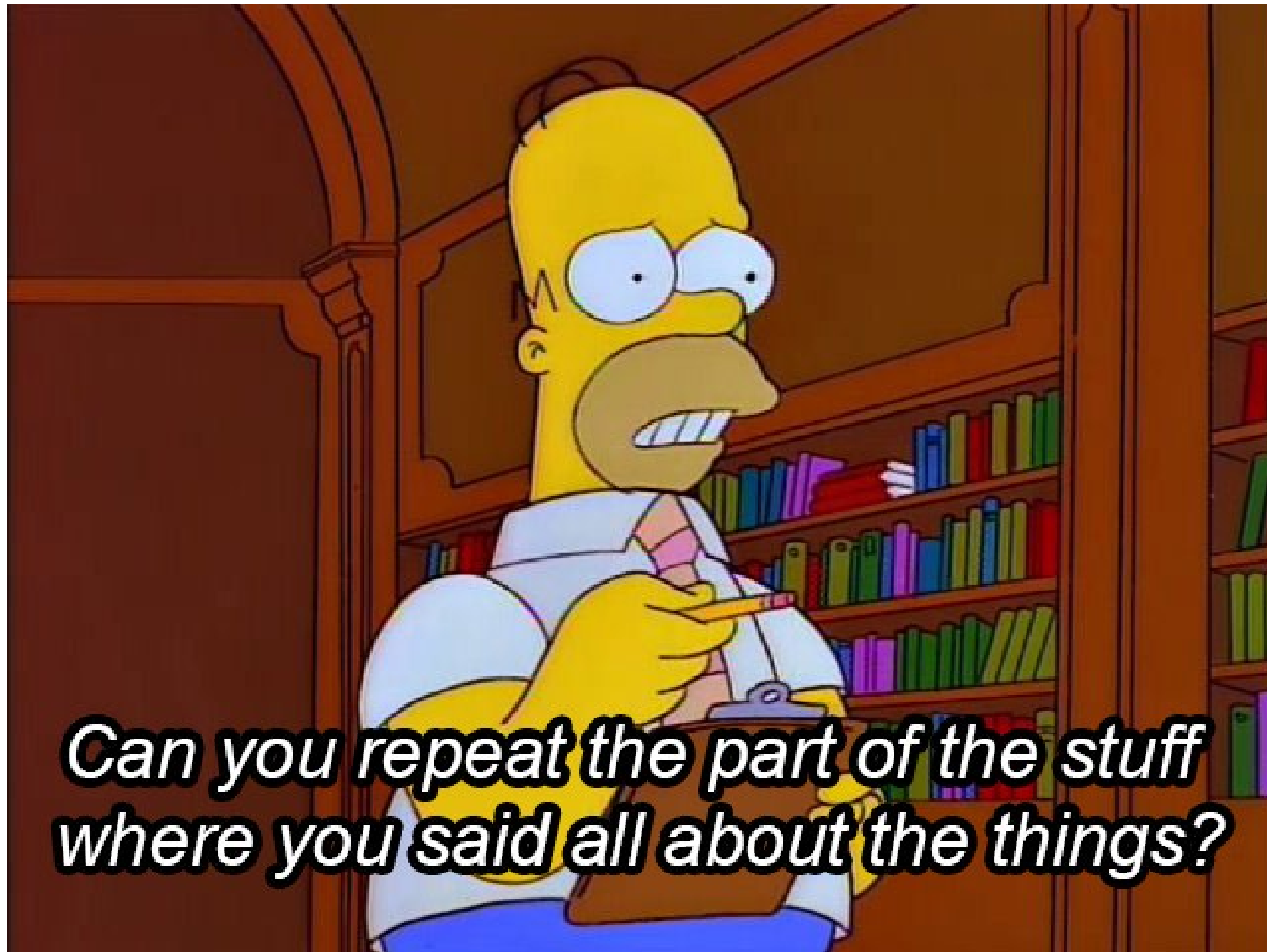
As inflation went up in 2021, treatment effects got smaller.

POOLING EVERYTHING



Treatment effects systematically vary with inflation: endogenous inattention!

CONCLUSION



***Can you repeat the part of the stuff
where you said all about the things?***

CONCLUSION

- We extend the evidence of Cavallo, Cruces and Perez-Truglia (2017) to a much wider range of treatments across countries, across time and across agents.
- Implications for macroeconomics:
 - *Inattention is pervasive across countries, time and agents.* This calls for using models that incorporate systematic deviations from full information.
 - *The degree of inattention can change rapidly with the economic environment.* This is a challenge for models that take the degree of inattention as given.

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- Implications for policy communication:
 - When inflation is low: the challenge is reaching the public since they are inattentive but conditional on reaching them, simple messages are very powerful.
 - When inflation is high: reaching the public is much easier since they are attentive, but changing their views is harder.
 - These are two very different communication environments.

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 - *When applied to similar economic environments*, our evidence suggests similar RCTs will yield consistent results, even across countries or time.

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- Implications for external validity of RCTs:
 - *When applied to similar economic environments*, our evidence suggests similar RCTs will yield consistent results, even across countries or time.
 - *When applied to different economic environments*, our evidence suggests similar RCTs may yield very different results, even within the same country over close periods of time.

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Thank you for your attention!