THE CAUSAL EFFECTS OF INFLATION UNCERTAINTY ON HOUSEHOLD'S BELIEFS AND ACTIONS

Dimitris Georgarakos®
European Central Bank

Yuriy Gorodnichenko®
UC Berkeley &

Olivier Coibion®
UT Austin

Geoff Kenny®
European Central Bank

The views expressed in the paper are those of the authors and do not necessarily reflect the views of the ECB or the Eurosystem. The ordering of authors' names is randomized.

MOTIVATION

"Fundamentally, a low and stable inflation rate is beneficial for the decision-making processes of households and firms. Choices regarding work, savings, and the expansion of business enterprises are likely to be harder when there is uncertainty about the likely future course of prices. Retirement planning by households and investment decisions by firms are, consequently, put on a sounder footing if there is confidence about the future value of the currency. The avoidance of this uncertainty is also likely to be beneficial for national economic performance." Fed Governor Philip Jefferson (2023)

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"The topic of [inflation risk and uncertainty] could not be more timely." SNB Governor Thomas Jordan (2022)

MOTIVATION

The Economist

Finance & economics | Cold weather, hot prices

American inflation looks increasingly worrying

Trump's tariffs are fuelling consumer concerns, which may prove self-fulfilling

PHOTOGRAPH: LEHEL KOVACS

Feb 18th 2025

EMPIRICAL CHALLENGES

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- **Measurement** of uncertainty in surveys is a relatively new development and linking it with actual household behavior is quite rare.

- With decades of low and stable inflation in advanced economies, there has been **limited historical variation** in inflation uncertainty, making time series methods harder to use.

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- **Follow-up Surveys to Measure Outcomes**: By tracking the same households over time, we can measure how/whether the exogenous variation in inflation uncertainty (net of first moment expectations) affected household decisions:
  i. **Spending** (durables and non-durables)
  ii. Propensity to invest and actual **investment** in financial assets
  iii. **Labor** search and employment outcomes
  iv. Other choices (e.g., **mortgage** type; **shopping** intensity)

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- **Preference** for fixed-rate mortgages & more intense shopping

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- **October, November, December 2023 & January 2024:** regular survey waves measuring spending, investment and labour market outcomes

INFORMATION TREATMENTS

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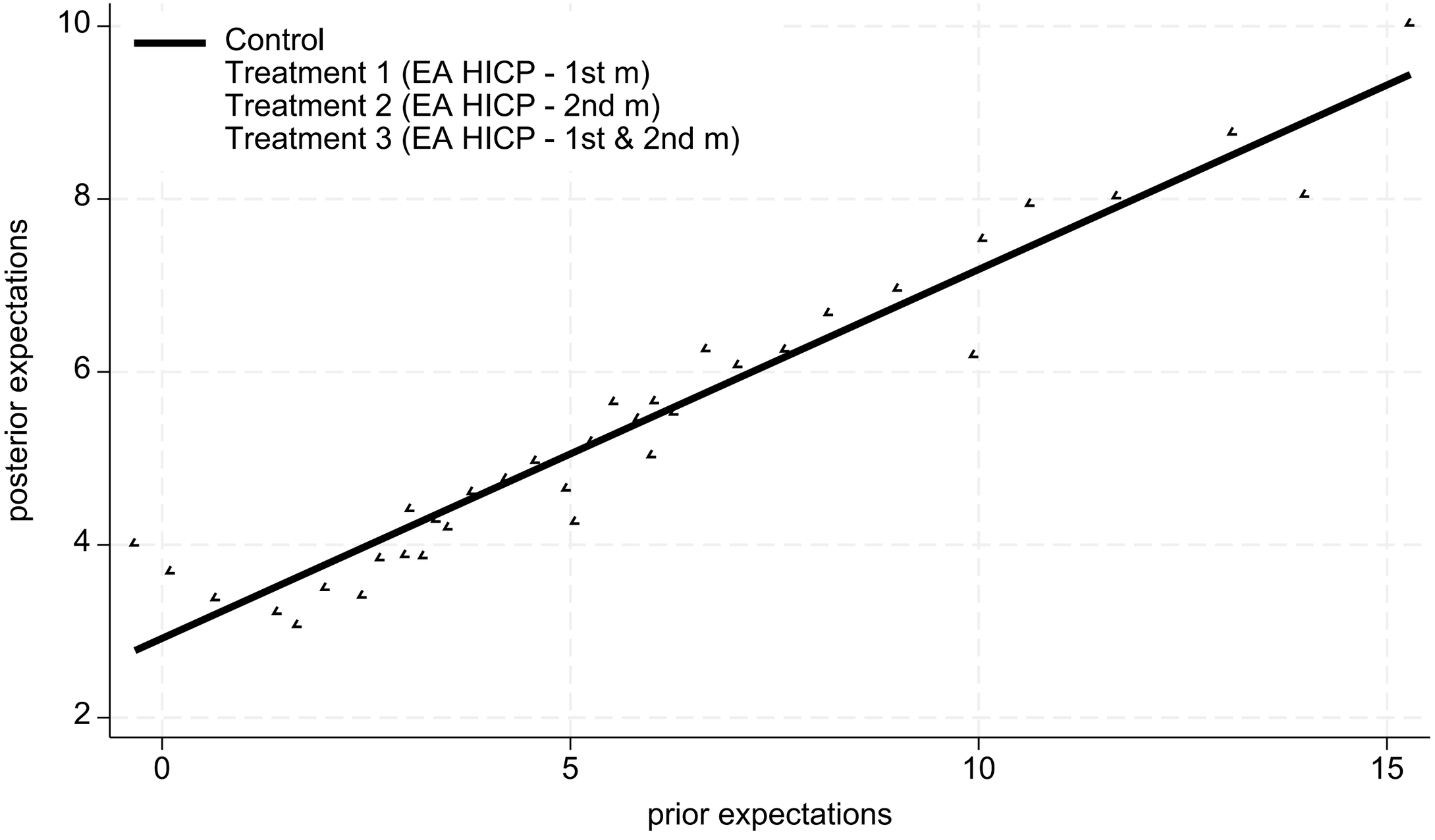
T3 (first and second moment): *The average prediction among professional forecasters is that inflation in the euro area will be at 2.5% over the next 12 months. At the same time, professional forecasters are exceptionally uncertain right now about inflation compared to recent years. As a result, there is a significant difference of 3.1 percentage points between the lowest and the highest predictions about inflation in the euro area over the next 12 months.*

TREATMENT EFFECTS ON 1ST MOMENT OF INFLATION EXPECTATIONS



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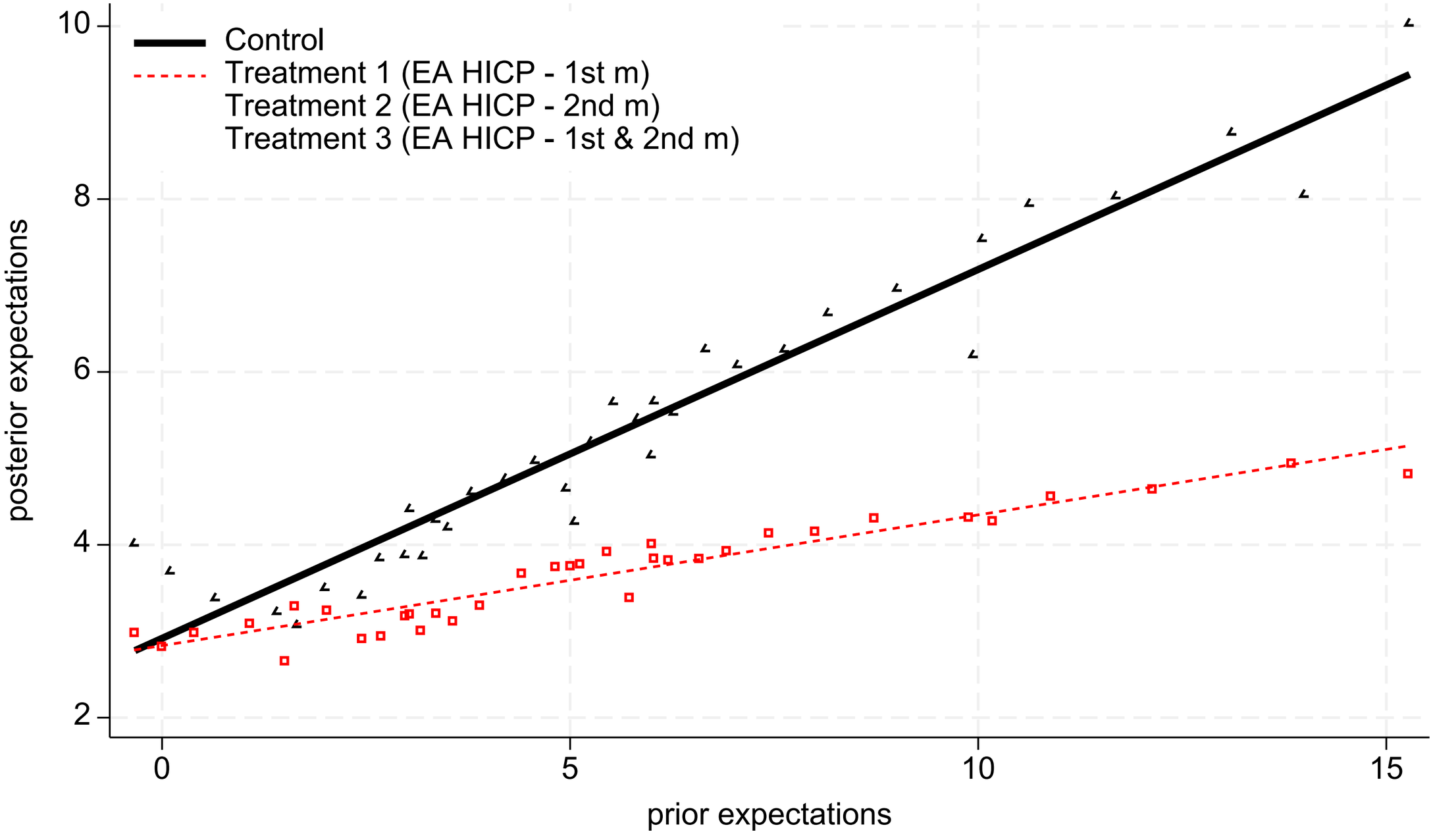

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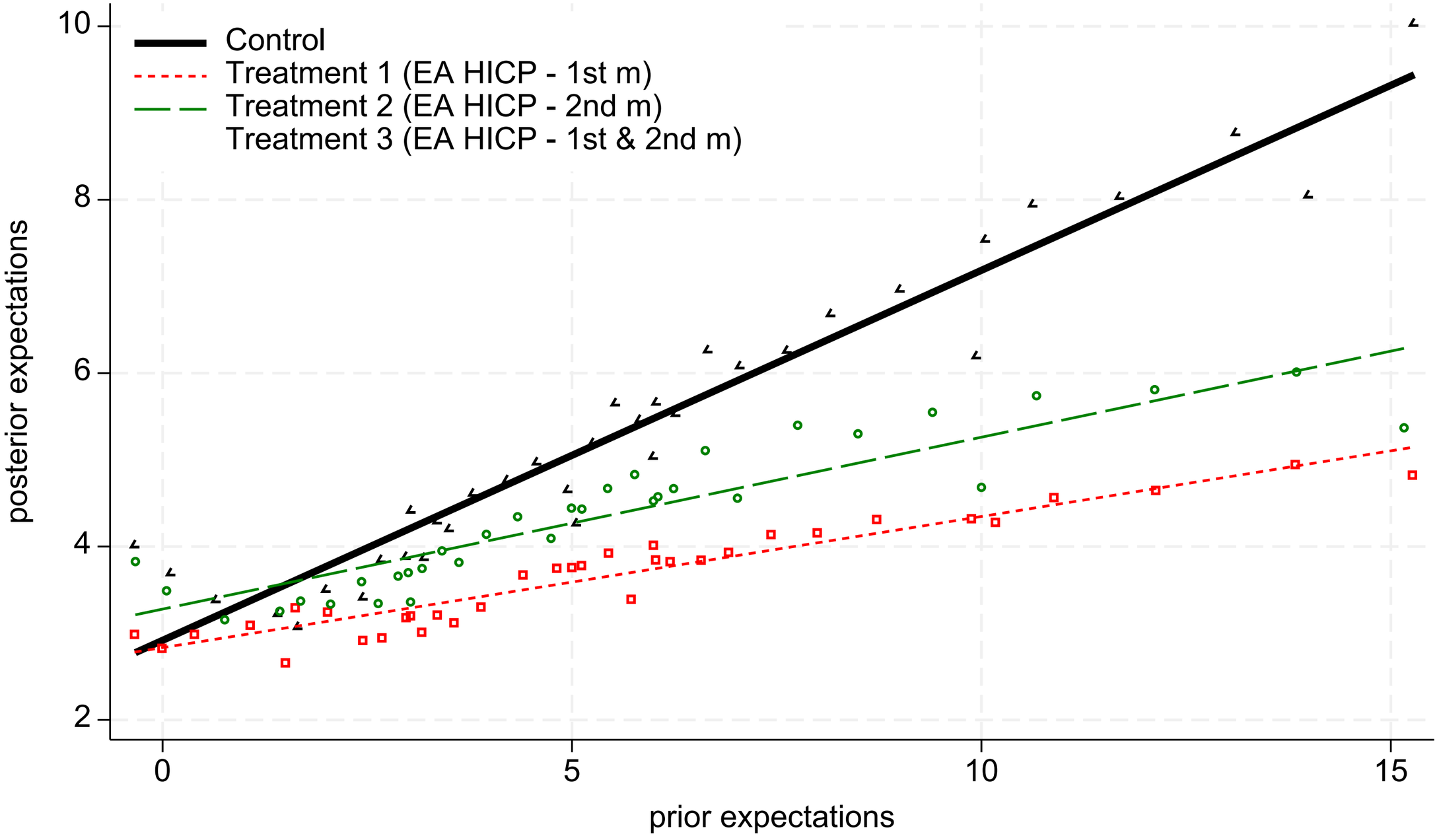

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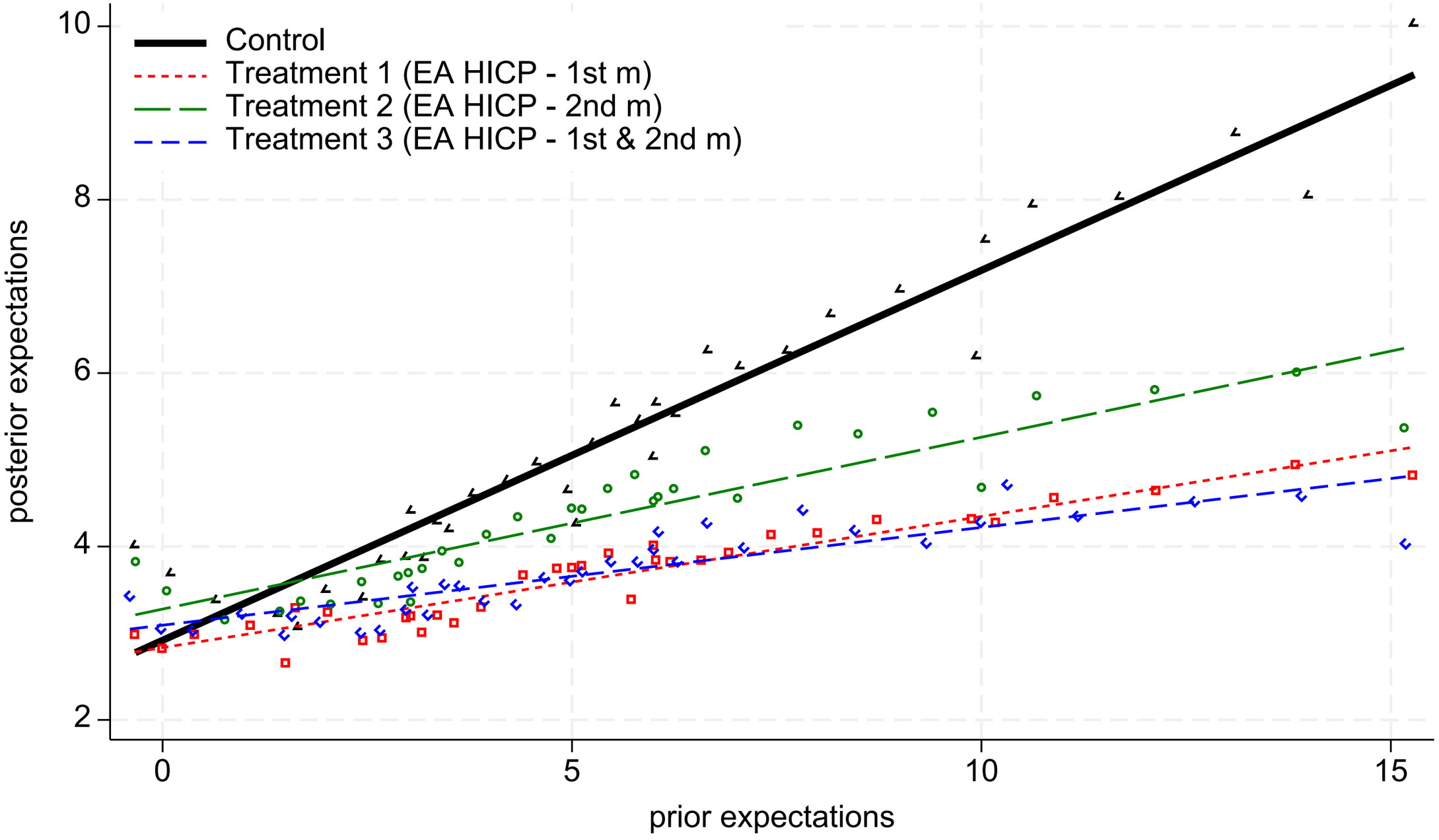
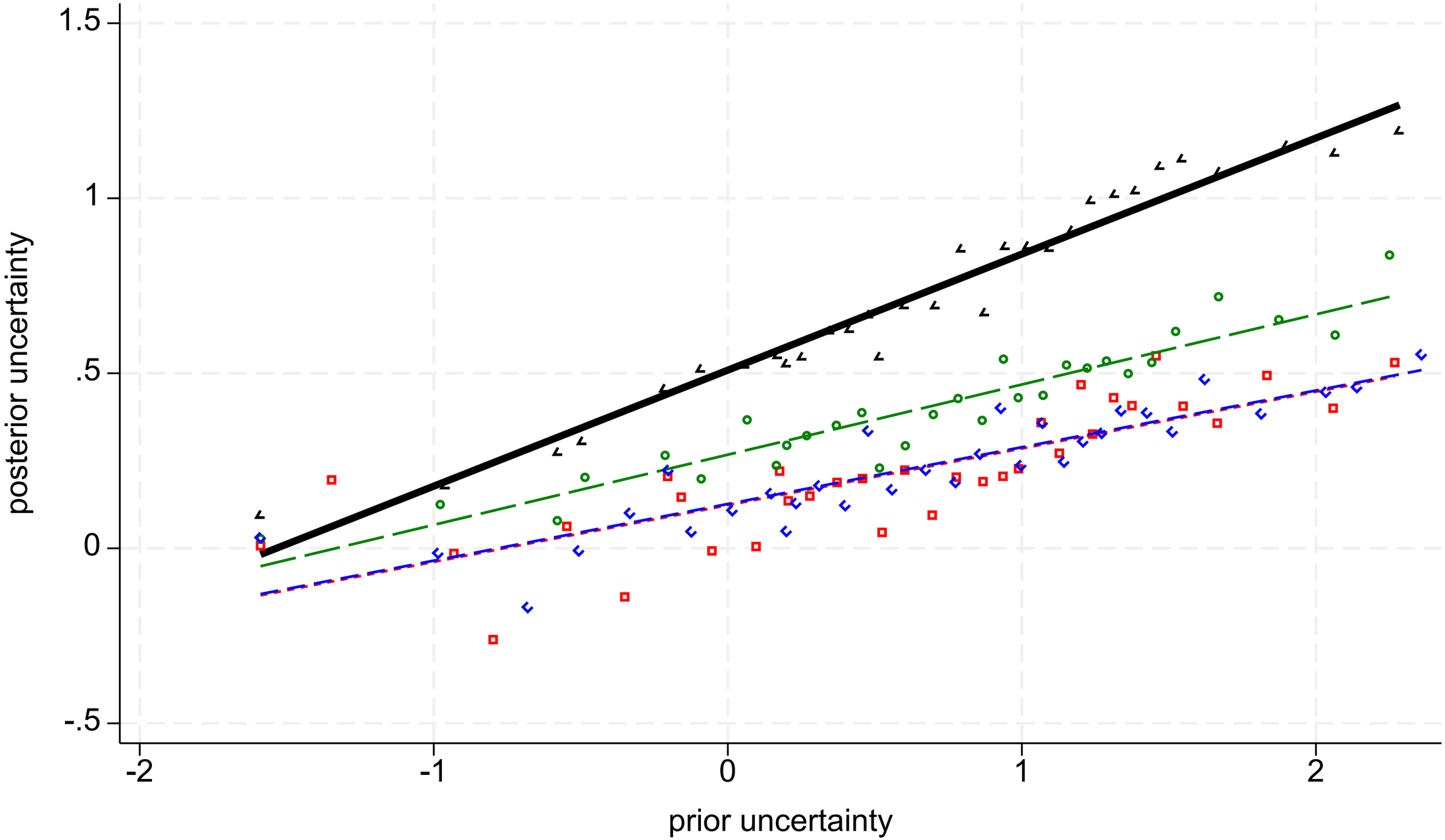
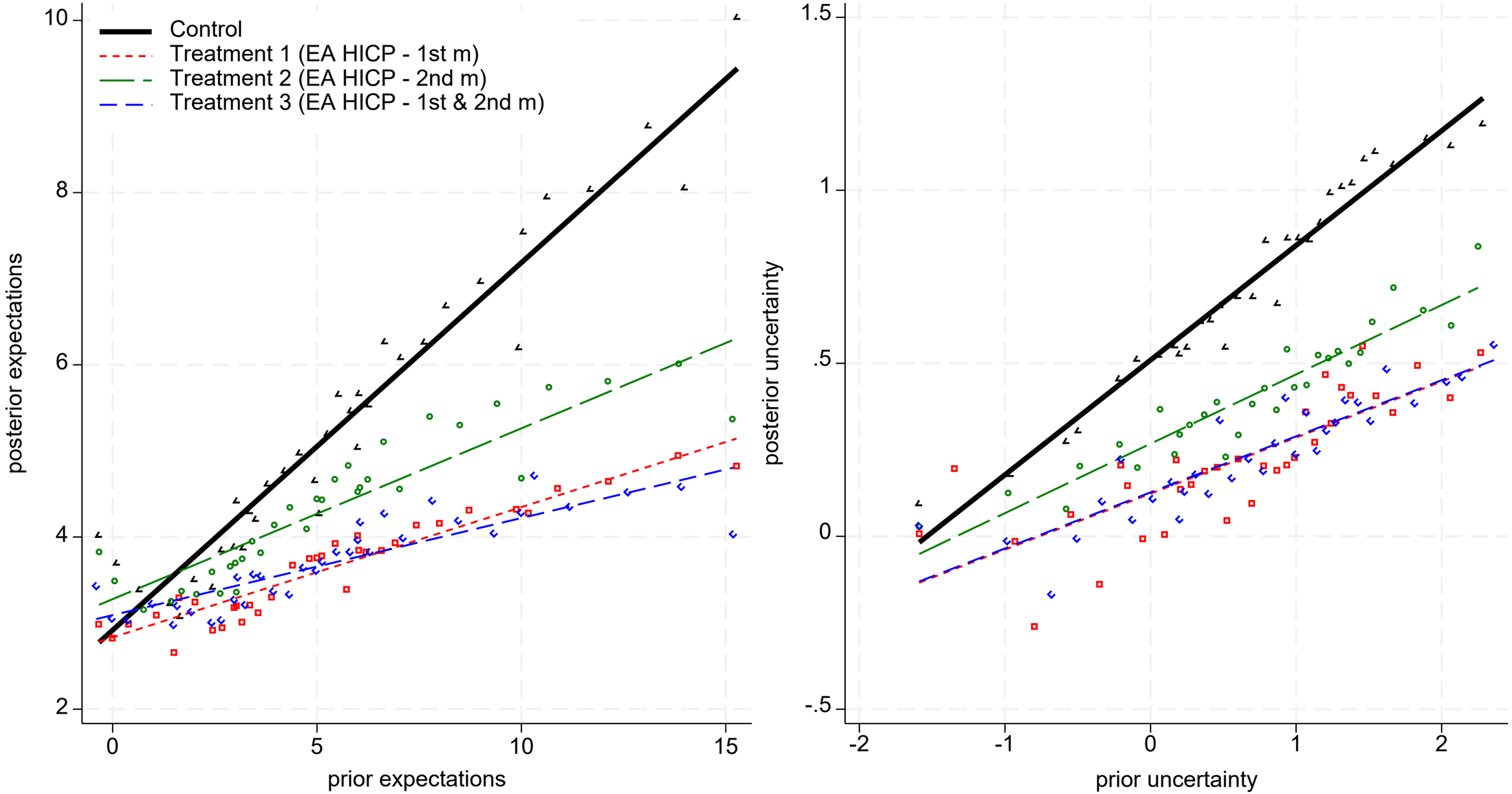


TREATMENT EFFECTS ON 2ND MOMENT: LOG(ST.DEV.)



Panel A: Implied mean

Panel B: Implied uncertainty (log)



POST-TREATMENT BEHAVIOR: ESTIMATION

$$\boldsymbol{Outcome_i} = \alpha_1 Post_i^{mean} + \beta_1 Post_i^{uncert} + \alpha_0 Prior_i^{mean} + \beta_0 Prior_i^{uncert} + Controls + error_i$$

$$Post_i^{mean} = a_0 + \sum_{j=1}^{3} a_j \times I\{i \in Treat\ j\} + \sum_{j=1}^{3} b_j \times I\{i \in Treat\ j\} \times Prior_i^{mean} + \sum_{j=1}^{3} c_j \times I\{i \in Treat\ j\} \times Prior_i^{uncert} + Controls + error_i$$

$$Post_i^{uncert} = \tilde{a}_0 + \sum_{j=1}^{3} \tilde{a}_j \times I\{i \in Treat\ j\} + \sum_{j=1}^{3} \tilde{b}_j \times I\{i \in Treat\ j\} \times Prior_i^{mean} + \sum_{j=1}^{3} \tilde{c}_j \times I\{i \in Treat\ j\} \times Prior_i^{uncert} + Controls + error_i$$

PURCHASES OF DURABLES: 1 MONTH AFTER TREATMENT

	Dependent variable: 100×indicator variable is a good is purchased.					
	Home	Durable	Car	Holiday package	Luxury items	Other
	(1)	(2)	(3)	(4)	(5)	(6)
Posterior mean						
100×log(Posterior uncertainty)						
Observations	11,514	11,506	11,502	11,512	11,519	11,483
1st stage F-stat (mean)	118.4	113.8	117.6	114.8	118	112.7
1st stage F-stat (uncert)	100.5	99.29	99.10	100.7	101.9	101.2
KP Wald test	10.63	9.532	10.34	10.51	10.48	10.19

Information treatments are powerful instruments.

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Posterior mean						
100×log(Posterior uncertainty)	-0.025**	-0.230***	-0.024*	-0.091	-0.021**	-0.055*
	(0.010)	(0.057)	(0.013)	(0.065)	(0.011)	(0.034)
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Higher inflation uncertainty leads to an immediate and large reduction in purchases of durable goods of different types.

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Posterior mean	0.421	4.812***	0.483	1.934	0.539*	0.451
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Higher inflation expectations lead to a rise in durable goods purchases.

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Panel A. Separate two moments						
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Panel B. Use only 1st moment						
Posterior mean	-0.305***	-1.695***	-0.325***	-1.158**	-0.208***	-1.452***
	(0.066)	(0.400)	(0.078)	(0.501)	(0.071)	(0.267)
1st stage F-stat (mean)	208.3	200.1	206.6	212.8	207.3	202.6

The total effect of inflation expectations is negative!

The direct effect is positive but the indirect effect via uncertainty is stronger.

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Panel A. IV						
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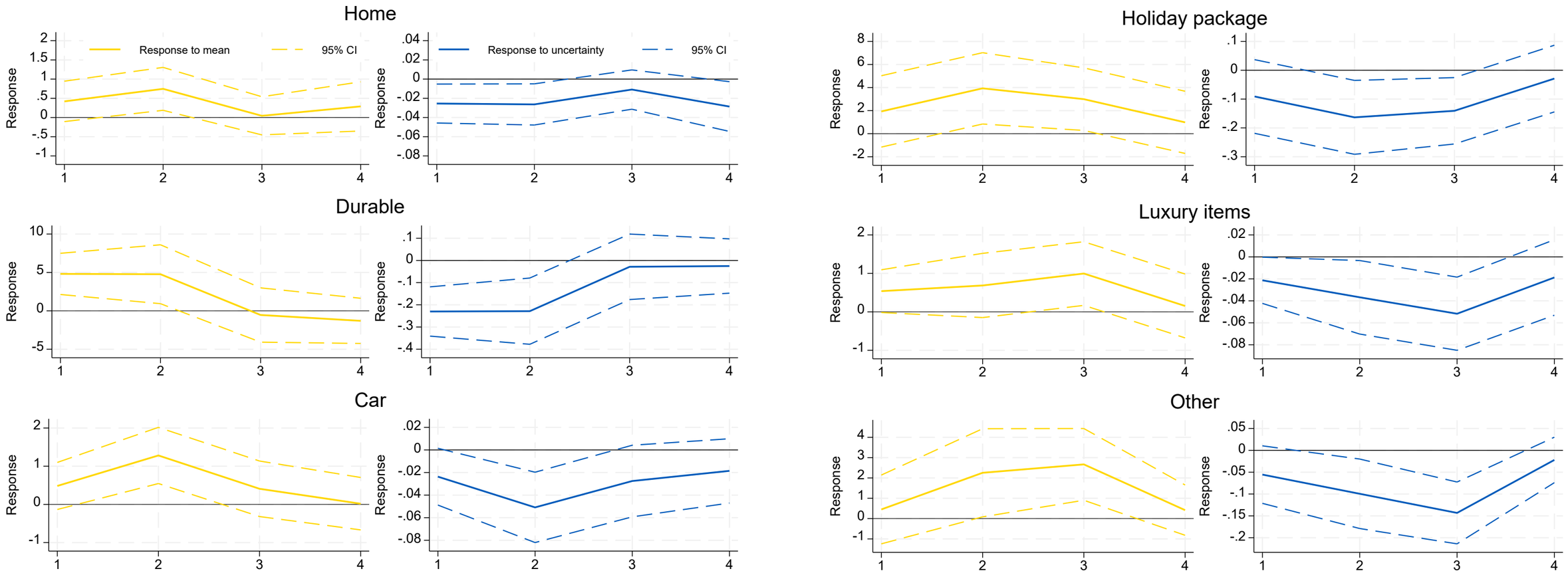
Panel B. OLS						
Posterior mean	0.077	-0.014	0.120	0.246	0.217***	0.685***
	(0.081)	(0.332)	(0.083)	(0.273)	(0.082)	(0.215)
100×log(Posterior uncertainty)	-0.131	3.383**	0.140	0.086	-0.465	-0.790
	(0.430)	(1.645)	(0.312)	(1.351)	(0.339)	(1.074)

The RCT/IV approach are essential to the identification.

With OLS, effects are much smaller and generally insignificant.

PURCHASES OF DURABLES: DYNAMICS



The effect dissipates after ~ 4 months.

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- For policy purposes, the total effect is generally the most relevant statistic. But even in that case, knowing how decisions respond to inflation expectations and uncertainty can be useful in designing communications.
  - To boost spending, we could try to raise inflation expectations **OR** reduce inflation uncertainty (doing both would be particularly effective).
  - Communication should focus on policy objectives rather than instruments?