People's Understanding of Macroeconomic Shocks *

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Abstract

How do households' beliefs respond to macroeconomic shocks? I design a novel survey that measures how inflation and unemployment expectations react to monetary policy, oil price, and income tax shocks. I compare the directions of households' predicted inflation and unemployment responses with those implied by macroeconomic theory. Only 1% of respondents align with these theoretical predictions across all three shocks. Most households anticipate both higher inflation and higher unemployment. Many do not revise their expectations at all. Alignment varies by shock and is systematically related to gender, education, income, age, and homeownership. Households whose beliefs align with the theoretical predictions are more likely to adjust their saving and spending. These findings suggest that differences in macroeconomic understanding may shape households' responses to aggregate shocks.

Keywords: Households' expectations, subjective models, survey data, macroeconomic shocks

JEL codes: C93, D12, D84, E21, E31

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1 Introduction

Standard macroeconomic models frequently posit that agents are rational, well-informed, and possess a common understanding of the economy. However, a burgeoning body of empirical evidence challenges this paradigm. Household expectations are heterogeneous, often systematically biased (Bianchi et al., 2022; Bordalo et al., 2020; Coibion & Gorodnichenko, 2015), and subject to significant cognitive (D'acunto et al., 2023) and informational constraints (Coibion & Gorodnichenko, 2012; Mankiw & Reis, 2002). Despite this, we know little about whether households grasp how macroeconomic shocks propagate through the economy—and, crucially, whether this understanding influences their behavior. If households misperceive the nature or consequences of a shock, their responses may diverge significantly from theoretical predictions, potentially dampening or distorting the intended effects of policy.

This paper directly addresses these questions. I design and implement a novel survey on a probability-based sample of Dutch households. Beyond eliciting baseline inflation and unemployment expectations, the survey presents respondents with hypothetical vignettes describing three archetypal macroeconomic shocks: a monetary policy shock, an oil price shock, and a fiscal shock in the form of an income tax variation. For each vignette, I measure respondents' expectations about inflation and unemployment in the context of the scenario, their interpretation of the shock's primary transmission channel (supply-side versus demand-side), and their intended changes in saving and spending behaviors. The use of controlled, hypothetical scenarios allows me to precisely measure how households would react under well-defined conditions and to systematically compare their understanding both across individuals and across shocks of diverse natures.

The core exercise of the paper is to compare households' beliefs about the effects of macroeconomic shocks with the predictions of benchmark macroeconomic models. To do so, I analyze the sign of households' subjective impulse responses—measured as the difference between their expectations within the shock scenario and their baseline forecasts—and assess whether they align with the directional predictions of standard macroeconomic theory. As a benchmark, I rely on the predictions of canonical New Keynesian models, as presented in widely used macroeconomics textbooks such as (Blanchard, 2020) and (Mankiw, 2018). These theoretical predictions are further supported by the empirical literature, particularly vector autoregression and local projections studies that estimate the dynamic effects of macroeconomic shocks on inflation and unemployment. Together, these sources reflect a widely shared consensus among economists about the qualitative effects of monetary, oil price, and fiscal shocks. By comparing each respondent's stated expectations to these benchmark predictions, I assess the extent to which their interpretations align with conventional macroeconomic reasoning. I then examine whether such alignment matters for behavior, by studying how theory-consistent households differ in their intended saving and spending responses to the shocks.

The results reveal a striking gap between households' expectations and the benchmark. Only about 1% of respondents predict changes in both inflation and unemployment that match the benchmark across all three shocks, while 46% align on none. Alignment varies sharply across

shocks: 41% report benchmark-consistent responses to oil price shocks, compared with 14% for monetary policy and 12% for taxes.

Departures from the benchmark exhibit a prominent pattern of positive co-movement: among respondents who revise their expectations, the most common response to all three shocks is to expect both inflation and unemployment to rise. Thus, even demand shocks such as monetary tightening and tax increases are commonly interpreted as inflationary and recessionary, consistent with a "bad outcomes come together" heuristic. In addition, many respondents report no change: between one third and nearly one half leave at least one expectation unchanged, reporting no effect on inflation or unemployment despite the sizeable shocks described in the vignettes. Other combinations of predicted changes in inflation and unemployment may reflect alternative models or interpretations of the scenarios. To explore these possibilities, I combine respondents' predictions for inflation and unemployment with their answers to a question asking whether the shock primarily affects firms' costs or household expenditure. These combinations help identify possible alternative explanations, which nevertheless account for only a minority of respondents.

Matching survey responses with individual-level data allows me to examine which characteristics are correlated with households' understanding of shocks. Women are more likely to align for monetary policy and taxes, while higher education is associated with greater alignment for monetary policy. Income is positively associated with alignment, particularly for monetary and oil shocks, and homeowners are more likely to align for oil. Older respondents are generally less likely to report benchmark-consistent beliefs.

A key feature of the survey is that it connects households' understanding of the macroeconomic implications of shocks to their intended personal choices. When asked how they would adjust spending and saving following each shock, many respondents report no intended change, especially following positive shocks. Crucially, macroeconomic beliefs are associated with both whether households act and how they adjust their personal choices. Following monetary tightening, respondents whose beliefs align with the benchmark report choices more consistent with intertemporal substitution (reducing spending and increasing saving). Following a tax increase, they are more likely to reduce both spending and saving, consistent with perceiving a contraction in their household budget. Belief inertia is also associated with inertia in intended choices: respondents who leave at least one expectation unchanged are more likely to leave spending or saving unchanged.

Understanding how households perceive macroeconomic shocks matters for both theory and policy. In standard models, the transmission of monetary and fiscal policy relies critically on households updating their expectations and adjusting their behavior in predictable ways. My findings show that this assumption is far from realistic: most households either misinterpret shocks—often adopting stagflationary heuristics—or fail to respond at all. This has two key implications. For modelers, it highlights the importance of incorporating belief heterogeneity, inertia, and heuristic-driven reasoning into macroeconomic frameworks, as these features can dampen or distort the aggregate effects of policy. For policymakers, the results suggest that the effectiveness of stabilization policies depends not only on their design but also on how households

perceive their transmission and react to them.

2 Literature review

This paper studies how households interpret macroeconomic shocks and how these interpretations relate to their intended economic choices. Its contribution brings together three elements: the joint elicitation of inflation and unemployment expectations alongside intended spending and saving responses to shocks; the linkage of these responses to detailed demographic and economic characteristics; and the comparison of monetary policy, oil price, and income-tax shocks within the same respondents. To my knowledge, this is the first paper to combine these elements in a common survey framework. This combination makes it possible to examine how households connect aggregate developments to their own decisions, how these connections vary across households, and whether the patterns differ across shocks with distinct transmission mechanisms. The same survey is also used in Piccolo et al. (2026), which focuses on the role of education in understanding monetary policy trade-offs and responses to the monetary policy scenario. The present paper addresses a distinct question: how households interpret shocks that have different transmission mechanisms and how these interpretations relate to intended spending and saving across monetary policy, oil price, and tax scenarios.

The paper builds on research on households' subjective models of the macroeconomy. Andre et al. (2022) elicit households' and experts' predictions about the effects of macroeconomic shocks on inflation and unemployment, documenting substantial disagreement and relating it to differences in the propagation channels respondents consider. My paper connects such conditional macroeconomic predictions to households' intended spending and saving within each scenario. Eliciting aggregate outcomes together with personal choices provides a joint picture of households' responses: what they expect to happen to the economy and what they intend to do themselves.

A closely related contribution is D'Acunto et al. (2026), who examine how subjective models of monetary policy transmission relate to consumption responses to interest-rate changes. My analysis considers both spending and saving and compares their relationship with inflation and unemployment expectations across three types of shocks. Studying the two choices jointly helps distinguish different forms of household adjustment. For example, reducing spending while increasing saving suggests a reallocation between current and future consumption, whereas reducing both is consistent with a perceived tightening of household resources. Comparing these combinations across monetary policy, oil price, and tax scenarios reveals how the relationship between macroeconomic beliefs and intended choices depends on the shock.

The cross-shock comparison also contributes to research on households' understanding of inflation and economic policy (Andre et al., 2024; Binetti et al., 2024; Carvalho & Nechio, 2014; Claus & Nguyen, 2020). Because the same respondents evaluate all three shocks, the survey reveals whether they distinguish their effects or apply similar reasoning across scenarios. The results indicate that respondents expect inflation and unemployment to move together following increases in interest rates, oil prices, and income taxes. This pattern extends the evidence of

positive co-movement in households' unconditional expectations (Candia et al., 2020; Ferreira & Pica, 2024; Gonçalves Raposo, 2025; Zhang, 2024). A leading explanation for that evidence is that households place relatively greater weight on supply shocks (Bhandari et al., 2025; Kamdar, 2019). Here, however, the vignettes specify the shock, holding fixed beliefs about which disturbances drive the economy. Positive co-movement therefore reflects households' beliefs about the shock's transmission or heuristics about how macroeconomic aggregates move, rather than the relative salience or weight they assign to different shocks.

The paper also connects to the literature on expectations and household expenditure. Previous work examines the relationship between inflation expectations and spending (R. Bachmann et al., 2015; Burke & Ozdagli, 2023; Crump et al., 2022; D'Acunto et al., 2016; Dräger & Nghiem, 2021), while information experiments investigate how changes in households' macroeconomic outlook affect their decisions (Armantier et al., 2016; Armona et al., 2019; Binder & Rodrigue, 2018; Cavallo et al., 2017; Coibion et al., 2023; Roth & Wohlfart, 2020). Here, I use vignettes to elicit how households would adjust their spending and saving in hypothetical scenarios involving macroeconomic shocks. Recent evidence linking vignette responses to observed choices shows that individuals' stated responses are consistent with their actual behavior in a natural experiment (Andersen et al., 2026), supporting the use of vignettes to study households' behavioral responses.

Finally, linking the survey to the LISS Core Study makes it possible to examine macroeconomic and behavioral responses to shocks across households with different demographic and economic characteristics. This relates to evidence that expectations vary with financial literacy, gender, cognitive ability, economic circumstances and personal experience (O. Bachmann et al., 2021; Bruine de Bruin et al., 2010; D'Acunto et al., 2020; D'acunto et al., 2023; Malmendier & Nagel, 2015; Masolo & Monti, 2024; Minina et al., 2024; Reiche, 2024). My analysis examines how household characteristics relate to the interpretation of specified shocks and whether these relationships vary across monetary policy, oil prices, and income taxes. The linkage also allows the relationship between beliefs and intended choices to be examined conditional on respondents' economic circumstances.

3 Data and survey design

3.1 Survey design

I design a novel survey to investigate how households interpret and respond to macroeconomic shocks. This section briefly outlines the survey, whose structure is summarized in Figure 1. The full text is provided in Appendix C.

The questionnaire begins with a brief introduction, followed by two questions designed to elicit respondents' sentiment: ne asks whether they consider themselves financially better off than their peers, and the other asks whether they expect their financial situation to improve over the next 12 months.

In the first section, I elicit perceptions and expectations regarding year-on-year CPI inflation and the unemployment rate. Respondents receive plain-language definitions of each concept, then

provide both their current estimates (perceptions) and one-year-ahead forecasts.

To measure general attentiveness and macro reasoning, the survey includes a placebo vignette describing a shock plausibly irrelevant for the Dutch economy, followed by questions on its perceived effects on key macroeconomic variables. The goal is to capture respondents' tendency to attribute effects even to neutral shocks, thereby identifying potential attribution biases.[1]

The second section introduces all respondents to three vignettes, describing hypothetical yet plausible macroeconomic shocks: a monetary policy shock (unexpected change in the policy rate), an oil price shock (driven by a sudden geopolitical crisis in the Middle East), and a fiscal shock (stemming from joining or leaving an environmental agreement with the EU). Each respondent is shown all three scenarios. Random assignment performed by the LISS Panel allocates respondents to one of two groups: one exposed to negative shocks (rate hike, oil price increase, tax increase), and the other to positive ones (rate cut, oil price decline, tax reduction). The two groups are balanced across key demographics, including gender, employment, education, homeownership, household size, and income (Table A1). The vignettes were presented in the same order to all respondents: first the monetary policy shock, followed by the oil price shock, and finally the income tax shock.

Following each vignette, respondents report how they would adjust a set of economically relevant behaviors, in particular spending and saving: they indicate whether their behavior would increase, decrease, or remain unchanged. These questions allow me to examine how shocks influence intended economic choices.

I also ask respondents to identify the channels through which they believe the shocks propagate. Specifically, they indicate which variable is most affected by each shock, choosing between household expenditure and firms' costs. This allows me to classify whether respondents perceive the shock as primarily supply- or demand-driven.

Lastly, for each shock, I elicit revised one-year-ahead expectations for inflation and unemployment. Comparing these forecasts with the baseline expectations provides a within-respondent measure of the causal effect of the shock. The vignette introduces a single change to the respondent's information set: the hypothetical shock. Respondent characteristics, personal circumstances, and pre-existing beliefs are held fixed across the two elicitations, and each respondent's baseline forecast serves as their own counterfactual. Under the assumption that respondents maintain this baseline when evaluating the scenario, the difference identifies the causal effect of the described shock on their stated expectations.

[1]The placebo vignette describes a hypothetical scenario in which a new copper mine is discovered in Australia—a plausible but economically remote event for the Dutch economy. Respondents indicate how this shock would affect domestic firms' costs, household expenditure, prices, and unemployment, choosing among "increase," "decrease," or "no change." Since the shock is not expected to affect the Dutch economy, a placebo score (0–4) is computed by awarding one point for each "no change" response (and, for firms' costs and prices, also for "decrease" responses, consistent with general equilibrium reasoning). Low scores capture respondents' tendency to attribute effects even to shocks that should be irrelevant, while high scores indicate a stronger grasp of macroeconomic scenarios. The placebo score is used as a control in the regression analysis. For further discussion of the placebo design and scoring rationale, see Piccolo et al. (2026).

3.2 Vignette scenarios

I employ vignette-based scenarios to present all respondents with a standardized description of each macroeconomic shock. This approach ensures that, conditional on the vignette, all individuals share a comparable information set. As a result, I can attribute heterogeneity in beliefs to differences in respondents' mental models of the economy, rather than to variation in exposure to information — an approach similar to that employed by Andre et al. (2022).

Table 1 reports the full text of each vignette, in both its positive and negative formulations. The monetary policy shock describes an unexpected change in the ECB policy rate from 4.5% to either 5% (negative scenario) or 4% (positive scenario). The oil price shock depicts a sudden change in the price of oil from \$85 per barrel to either \$115 (negative scenario) or \$55 (positive scenario), driven by political developments in the Middle East. The tax shock involves a permanent change in income tax of about €150 per year (approximately 1% of the tax bill for a median-income Dutch resident)[2], framed as the result of entering into (negative scenario) or withdrawing from (positive scenario) an environmental agreement with the European Union.

Each shock is designed to meet three main criteria, following the principles outlined by Ramey (2016) in defining the characteristics of macroeconomic shocks. First, the shocks are constructed to be mutually orthogonal. That is, they are described as distinct and unrelated events, allowing for the identification of beliefs specific to each shock. Second, the vignettes emphasize the exogeneity of the shocks with respect to the business cycle in the Netherlands: the monetary policy scenario explicitly notes that no other major economic events take place at the same time; the oil price shock is framed as the consequence of a sudden political crisis in the Middle East; the tax shock arises from new environmental agreements with the European Union.[3] Third, the shocks are portrayed as unanticipated: I use language such as "sudden" or "unexpected" to underline their surprising nature.

These shocks are notably larger than those typically analyzed in standard VAR frameworks. For what concerns the monetary policy shock, Badinger and Schiman (2023) estimate a VAR for the euro area using a narrative identification strategy. Re-estimating their model with year-on-year CPI inflation and the unemployment rate—variables that match the outcomes elicited in this survey—yields a median standard deviation of monetary policy shocks of about 7 basis points (between 7 and 8 times smaller than the shock described in the vignette). Jarociński and

[2]The annual increase of €150 is calibrated as approximately 1% of the pre-credit income-tax and national-insurance liability at the 2024 median personal gross income in the Netherlands. Statistics Netherlands reports median personal gross income of €38,700 in 2024; the applicable first-bracket rate for individuals below the state-pension age was 36.97%. Thus, $38{,}700 \times 0.3697 \times 0.01 \approx €143$, rounded to €150. See Statistics Netherlands (CBS), "Inkomen van personen; inkomensbestanddelen, persoonskenmerken," https://www.cbs.nl/nl-nl/cijfers/detail/84494NED, and the Dutch Tax Administration, "Box 1: uitleg en tarieven," https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/inkomstenbelasting/heffingskortingen_boxen_tarieven/boxen_en_tarieven/box_1/box_1.

[3]The vignette links the tax change to an environmental agreement with the European Union on CO_2 emissions reduction. This framing was intended to present the tax change as externally motivated, rather than as a response to Dutch business-cycle conditions or domestic budgetary pressures. However, the vignette does not specify whether the associated government expenditure occurs domestically or abroad, leaving open an interpretation in which higher taxes finance additional domestic public spending. I discuss responses consistent with this interpretation in Section 6.3.

Karadi (2020) obtain comparable estimates. For oil shocks, the vignette features a price change of $30. In comparison, Känzig (2021) estimates a structural VAR where a one standard deviation oil supply news shock leads to an immediate change in oil prices of approximately 6%, making the vignette shock about six times larger than the shocks used in his estimation. For tax shocks, Mertens and Ravn (2013) construct a narrative series of exogenous tax changes expressed as a percentage of personal income over the period 1950—2006. The average tax shock in their sample is approximately -0.28%, which, in absolute value, is roughly 40% smaller than the shock featured in the vignette.[4] The choice to present relatively large shocks in the vignettes is deliberate: it aims to generate clear shifts in expectations and intended behavior. Nevertheless, while sizable, these shocks remain within the range of policy actions and oil price fluctuations historically observed, and are therefore empirically plausible and unlikely to be perceived by households as unrealistic.[5]

3.3 Sample and data collection

The survey was fielded in May 2024 and includes responses from 1,549 Dutch individuals between the ages of 18 and 75. The sample is representative of the Dutch population: as shown in Table A2, the sample closely matches the distribution of key demographic characteristics—gender, age, income, and years of education—observed in the Dutch Central Bank's Household Survey (DNB Household Survey).

The survey was distributed through the LISS Panel, a longitudinal household survey administered by Centerdata at Tilburg University in the Netherlands. The panel consists of a true probability sample of 5,000 Dutch households,[6] drawn from the population register maintained by Statistics Netherlands (CBS). Since 2007, the LISS Panel has gathered rich background information via the LISS Core Study, which comprises 11 annual or biannual modules covering economic conditions, household composition, health, personality traits, and beliefs. The infrastructure allows external researchers to field customized modules with considerable flexibility in design and content, including experimental and vignette-based formats. Data from these ad hoc modules are linked to the detailed household-level information in the LISS Core Study, enabling analyses of heterogeneity along multiple socioeconomic characteristics. The survey analyzed in this study is one such ad hoc modules.[7]

[4] I approximate median annual net income at €32,335, based on median personal gross income of €38,700 less estimated 2024 income tax and national-insurance contributions after the general and employment tax credits: (38,700-[0.3697 × 38,700-2,441-5,501]). Sources for the general tax credit: https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/inkomstenbelasting/heffingskortingen_boxen_tarieven/heffingskortingen/algemene_heffingskorting/tabel-algemene-heffingskorting-2024; source for the employment tax credit: https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/inkomstenbelasting/heffingskortingen_boxen_tarieven/heffingskortingen/arbeidskorting/tabel-arbeidskorting-2024. The €150 vignette shock therefore equals (150/32,335 = 0.46%) of net income; hence ($0.28/0.46 \approx 0.60$).

[5] Figure A1 plots the observed changes in policy rates (panel A), in Brent oil prices (panel B) and in income tax brackets (panel C) observed in the 10 years preceding the survey(2014-2024). The plots show that the magnitudes in the vignettes are comparable to movements in policy rates, oil prices and income taxes that Dutch respondents could have observed over the decade preceding the survey. It is important to note, however, that the ones reported in Figure A1 are realized changes, not identified shocks: they are not purged of the component that households, firms or markets anticipated.

[6] The sample of the survey presented in this paper was randomly selected from among the LISS Panel participants.

[7] The survey questionnaire was administered online through the LISS Panel platform.

For the empirical analysis presented in the following sections, I restrict the sample to respondents who demonstrate a minimum level of attention and engagement. Specifically, I exclude individuals whose total response time falls below the 5th percentile of the full sample distribution, as well as those who took more than two days to complete the survey.[8] The former filter removes inattentive or overly hasty respondents, while the latter ensures that participants still recall the definitions and information provided at the beginning of the survey. Similar data cleaning criteria have been adopted in other papers, such as Colarieti et al. (2024).

The resulting sample includes 1,318 individuals, who constitute 85% of the original sample. In the cleaned dataset, the median completion time was 13 minutes and 28 seconds, with 91% of respondents finishing within one hour.

To limit the influence of outliers, I winsorize the point estimates of inflation and unemployment expectations reported throughout the survey—that is, I replace values above the 95th percentile with the 95th percentile itself.[9] This is a standard data-cleaning practice, also adopted in (Kim & Binder, 2023).

4 Impact of shocks on expectations

In this section, I describe how I estimate households' expected responses of inflation and unemployment to the macroeconomic shocks presented in the vignettes. I refer to households' point estimates of these variables — elicited in the context of the hypothetical scenario — as posteriors, since they reflect beliefs formed after exposure to the vignette. I compute the difference between these estimates and households' priors, which are recorded earlier in the survey and reflect beliefs before being exposed to the shock. Given that the only difference in the information set between the two elicitations is the content of the vignette, the change from prior to posterior provides a direct measure of how households perceive the impact of the shock. As in Piccolo et al. (2026), I interpret this difference as the subjective impulse response (SIR) of households' beliefs regarding inflation and unemployment.

Formally, I compute the belief-based SIR as follows:

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

with $z \in \{\pi, u\}$, ε_t is the shock and δ is the size of the shock.

Figure 2 shows the distribution of one-year-ahead SIR for inflation and unemployment, while Table 2 reports their moments for each of the three shocks, separately for negative (increases in interest rates, oil prices, or taxes) and positive (decreases) scenarios.

For unemployment, median expected responses to monetary and fiscal shocks are close to zero in both directions, suggesting limited anticipated labor market effects. Oil shocks elicit larger and symmetric responses: median expected unemployment rises by 0.5 percentage points when

[8] The 5th percentile of completion time in the original sample corresponds to 5 minutes and 33 seconds.

[9] Results are robust to winsorizing at the 99th percentile; see Appendix B2.

oil prices increase and falls by the same amount when they decrease. Median inflation responses to oil shocks are also symmetric, at 1 and -1 percentage points, respectively. For monetary and tax shocks, there are slightly larger median declines for positive shocks than the corresponding increases for negative scenarios, but the differences are small. The variance of the SIR is broadly similar across positive and negative scenarios for all shocks.

Although the median responses suggest approximate symmetry, Table 3 formally tests whether mean SIR are equal in magnitude and opposite in sign across the positive- and negative-shock scenarios. Equality is rejected at the 5% level for five of the six shock–outcome pairs, the exception being the unemployment response to oil shocks. Thus, the symmetry observed in some median responses does not generally extend to average responses.

For the subsequent analysis, I pool the two scenarios after reversing the signs of responses in the positive-shock arm, so that all observations are expressed as responses to a negative shock. The pooled results summarize households' reported responses across both shock directions without assuming that the two arms have identical means. Since the analysis focuses on whether the direction of respondents' reported responses agrees with the benchmark, Appendix A also presents results separately by shock sign. The main qualitative conclusions hold in both arms, supporting the use of the pooled sample to summarize the patterns of interest.

5 Benchmark: theory and empirical evidence

To assess households' understanding of macroeconomic shocks, I compare their expected responses of inflation and unemployment with a benchmark. The benchmark is given by the predictions of standard macroeconomic models, interpreted in light of the empirical evidence on how these shocks affect prices and real activity. These predictions are grounded in the standard macroeconomic mechanisms presented in textbooks such as Blanchard (2020) and Mankiw (2018), and are supported by a large empirical literature that estimates the effects of macroeconomic shocks on inflation and real activity using time-series methods, including structural VARs and local projections. The benchmark therefore reflects both the core logic of the New Keynesian framework and the empirical evidence on how these shocks are transmitted through the economy. It provides a disciplined reference point against which to compare households' expectations.

Monetary Policy Shock. In the canonical New Keynesian model, a contractionary monetary policy shock raises the nominal interest rate. Assuming prices are sticky in the short run, this leads to an increase in the real interest rate. The higher real rate reduces consumption via intertemporal substitution and dampens investment, thereby lowering aggregate demand. The decline in aggregate demand has two implications for firms' decisions: it leads them to reduce prices, therefore driving inflation downward, and labor demand, which implies a higher unemployment rate in equilibrium. Evidence from the VAR literature broadly corroborates the model's predictions about the effects of monetary policy shocks on inflation and unemployment. A paradigmatic example is the contribution by Miranda-Agrippino and Ricco (2021), who study the transmission of monetary policy shocks using high-frequency identification combined with a proxy SVAR framework. A

similar analysis in the European context is conducted by Jarociński and Karadi (2020). The results of both papers confirm the textbook view: contractionary monetary policy shocks lead to persistent declines in output and inflation, and increases in unemployment.

Oil Price Shock. An increase in oil prices is modeled as a negative supply shock. Higher oil prices raise firms' marginal costs, prompting them to increase prices. As a result, inflation rises, triggering a monetary policy response in the form of higher interest rates. According to the Taylor principle, the central bank raises nominal interest rates by more than one-for-one with inflation, thereby increasing the real interest rate. Faced with higher real rates, consumers postpone consumption, dampening aggregate demand. As demand weakens, firms reduce labor demand, resulting in higher unemployment in equilibrium. From the empirical side, Känzig (2021) investigates the macroeconomic effects of oil supply news shocks using a novel identification strategy that exploits the institutional features of OPEC and high-frequency financial data around announcement windows. By isolating shifts in oil supply expectations, Känzig (2021) constructs a credible measure of exogenous oil supply shocks. These shocks are found to raise prices and depress real activity—manifested as rising unemployment—in the U.S. economy. Similar evidence based on euro area data is provided by Neri et al. (2023), who show that such effects of oil shocks on inflation and unemployment are robust across a range of identification strategies and estimation methods. These results closely align with the standard theoretical prediction of oil shocks as adverse supply shocks.

Tax Shock. In the theoretical framework, a tax increase primarily operates through its effect on household disposable income. Higher taxes reduce the amount of income available for consumption, prompting households to cut back on spending. This decline in consumption lowers aggregate demand, which leads to downward pressure on prices. In response to weaker demand, firms reduce production and scale back hiring, resulting in higher unemployment.[10] Empirical evidence supports this view. A large body of literature has examined the real effects of tax changes, using a variety of identification strategies. Early work by Blanchard and Perotti (2002) relies on structural vector autoregressions (SVARs), while Mountford and Uhlig (2009) introduce sign restrictions to identify fiscal shocks. Mertens and Ravn (2013) extend the analysis by combining VAR models with narrative identification of tax shocks. Across these approaches, the consensus finding is that tax cuts stimulate output and reduce unemployment. The inflationary consequences of tax changes have received less attention, but Cloyne et al. (2023), using local projection methods, show that tax increases exert downward pressure on inflation—consistent with the demand-side transmission channel emphasized in textbook models.

Based on these criteria, I classify respondents as consistent with the benchmark if their SIR for inflation and unemployment, as defined in Section 4, satisfy the following conditions:

- **Monetary Policy Shock**: following an increase (decrease) in interest rates, the model predicts a decline (rise) in prices and an increase (decrease) in unemployment caused by

[10]This reasoning treats the tax shock as a demand-side contraction, though alternative interpretations may view certain tax changes as supply-side disturbances, depending on incidence and expectations (Zubairy, 2014). Alternative interpretations of the scenarios are discussed in Section 6.3.

the shock. Respondents who report an impulse response of inflation <0 and unemployment >0 to a negative monetary policy shock will be considered as having benchmark-consistent expectations.

- **Oil Price Shock**: following an increase (decrease) in oil prices, the model predicts an increase (decrease) in both inflation and unemployment caused by the shock. Respondents who report an impulse response of inflation >0 and unemployment >0 to a negative oil price shock will be considered as having benchmark-consistent expectations.
- **Tax Shock**: following an increase (decrease) in taxes, the model predicts a decline (rise) in prices and an increase (fall) in unemployment caused by the shock. Respondents who report an impulse response of inflation <0 and unemployment >0 to a negative tax shock will be considered as having benchmark-consistent expectations.

Figure 3 and Table A3 summarize these benchmark classifications.

6 Households' understanding of the shocks

6.1 Alignment with the benchmark

Figure 4 shows the distribution of households' joint inflation and unemployment expectations following a monetary tightening, an oil price increase, and a tax hike, classified by the signs of their SIR. The signs of responses in the positive-shock group are reversed so that all observations refer to negative shocks. The four quadrants distinguish the possible combinations of positive and negative responses. Percentages at the top report zero responses for either variable; the central percentage reports no change in both.

Alignment with the benchmark varies sharply across shocks. As Figure 4 shows, 41% of households expect both variables to move in the direction predicted by the benchmark after an oil shock, compared with only 14% after a monetary policy shock and 12% after a tax shock.[11]

Few households align with the benchmark across shocks. Figure 5 shows that only about 1% report benchmark-consistent responses for both variables across all three shocks, and roughly 10% do so for two shocks. Another 34% align only on oil, while 46% align on none. Yet these responses differ from random guessing. Under the random-response model described in Appendix B, respondents independently assign equal probability to a positive, negative, or zero response for each variable. This yields a 70.2% probability of aligning on no shock, well above the observed 46%. The comparison suggests that responses contain information beyond random guessing, despite their limited alignment with the benchmark. Section 6.3 examines possible alternative reasoning behind these responses.

Alignment also differs by outcome (Figure 6). For monetary and tax shocks, around 46% of households report the benchmark sign for unemployment, compared with just over 30% for

[11] Figure A2 separates responses by shock sign. Alignment is higher for interest rate hikes than cuts (17% versus 10%) and for tax increases than cuts (14% versus 10%). For oil shocks, alignment is slightly higher for price decreases than increases (43% versus 39%). Oil shocks have the highest alignment in both scenarios.

inflation. For oil shocks, alignment is higher for inflation (65%) than unemployment (58%).[12]

6.2 Where the non-aligned go

6.2.1 Co-movement

Among respondents who revise at least one expectation, the modal response across all three shocks is to expect inflation and unemployment to rise together. Households tend to expect both variables to increase following hikes in interest rates, oil prices, or taxes, and to fall following cuts.[13] The pattern also persists within individuals: 14% of respondents predict increases in both inflation and unemployment across all three vignettes, well above the 2.9% implied by independence across shocks.[14] Respondents who expect co-movement after one shock are thus more likely to expect it after the others.

These responses suggest a common heuristic: bad outcomes come together. Households may perceive increases in interest rates, oil prices, or taxes as harmful and therefore expect both higher inflation and higher unemployment. This reasoning yields the benchmark prediction for oil shocks, where both variables rise. The higher alignment observed in the oil shock vignette may therefore reflect a general association between adverse outcomes rather than an understanding of the shocks' transmission.

Positive co-movement between households' inflation and unemployment expectations is well documented for unconditional expectations (see, e.g., Candia et al., 2020; Ferreira & Pica, 2024; Gonçalves Raposo, 2025; Zhang, 2024). A leading explanation for this pattern is that households place relatively greater weight on supply shocks, which raise prices while weakening employment and thus worsen both purchasing power and employment prospects (Bhandari et al., 2025; Kamdar, 2019). On this view, households may understand how individual shocks propagate; co-movement arises from their beliefs about the mix of shocks. The vignettes allow to test this mechanism: because each scenario specifies the shock, beliefs about the shock mix cannot generate the co-movement. Yet positive co-movement persists even for demand shocks: 24% of respondents expect inflation and unemployment to rise after a monetary tightening, and 29% after a tax increase. Co-movement therefore reflects beliefs about how a given shock propagates, or heuristic associations between macroeconomic concepts, beyond beliefs about which shocks drive the economy.

6.2.2 Inertia

A large share of respondents leave at least one expectation unchanged after the shock: 44% for monetary policy, 34% for oil, and 37% for taxes. The corresponding shares leaving both inflation and unemployment expectations unchanged are 8%, 5%, and 6%, respectively.[15]

This degree of inertia is notable given the size of the vignettes. As discussed in Section 3.2, the hypothetical shocks are large relative to the innovations typically used to identify impulse

[12] Figure A5 separates responses by shock sign. The same ordering across variables holds in both scenarios. For monetary and tax shocks, inflation expectations align less often after cuts (around 23%) than after hikes (around 40%).

[13] Figure A2 shows that this is the modal quadrant in both positive and negative scenarios for each shock.

[14] Under independence, this share equals the product of the co-movement shares for monetary policy, oil, and taxes: $0.241 \times 0.413 \times 0.288 \approx 0.029$.

[15] Figure A2 shows similar shares of no-change responses across positive and negative scenarios.

responses in VAR models. Nonetheless, a substantial share reports no revision in expectations, even in response to sizeable macroeconomic shocks. The finding is consistent with experimental evidence that households' inflation expectations are difficult to move (Binetti et al., 2024), but extends it to a broader set of aggregate outcomes and shocks. It suggests that even quantitatively large macroeconomic developments may have limited salience for households' expectations. In this sense, belief inertia is not a peripheral feature of the data: it is a central part of how households respond to macroeconomic news.

Inertia is more common for unemployment than inflation across all three shocks (Figure 7). For monetary policy, 31% leave unemployment expectations unchanged, compared with 20% for inflation. Both shares are lower for tax shocks and lowest for oil shocks. Households may perceive a more direct link between these shocks and prices than between the shocks and employment.

6.3 Can alternative models account for the non-aligned?

Departures from the benchmark need not imply an incoherent view of the economy. Households may instead have a different transmission mechanism in mind, or interpret the scenario differently from its intended design. To distinguish between these possibilities, I examine alternative explanations for the observed sign combinations and relate them, where possible, to respondents' stated views about the relevant transmission channel. In particular, the survey asks whether respondents see the shock's primary effect as operating through household expenditure or firms' costs.[16] These responses provide information about the transmission mechanism underlying their expectations that sign predictions alone cannot reveal. Table 4 reports the share matching each explanation's sign predictions and the share matching both signs and channel.

For monetary policy, the cost channel offers one explanation for expectations of higher inflation and unemployment after a hike in interest rates. Higher financing costs can raise firms' production costs, generating an inflationary effect of monetary tightening (Barth & Ramey, 2001; Christiano et al., 2005; Ravenna & Walsh, 2006). The corresponding sign combination accounts for 24.1% of respondents; 14.7% of the sample also select firms' costs as the main transmission channel. A related interpretation emphasizes households' borrowing expenses: higher mortgage payments may be perceived as an increase in the cost of living (Bolhuis et al., 2024).[17] Consistent with this view, 9.4% of respondents expect both unemployment and inflation to increase and identify household expenditure as the variable most affected by the shock. Another possibility is that households interpret a rate hike as a signal of a stronger economy, as in the monetary policy information effect (Jarociński & Karadi, 2020; Miranda-Agrippino & Williams, 2026; Nakamura & Steinsson,

[16] Figure A3 reports the share selecting household expenditure or firms' costs for each shock.

[17] Bolhuis et al. (2024) argue that the higher cost of living caused by increased mortgage payments may deteriorate economic sentiment. This raises the question of whether deteriorating sentiment can explain households' stagflationary beliefs in response to monetary policy shocks. Figure A4 examines this possibility by regressing an indicator for expecting both inflation and unemployment to rise on two survey measures of sentiment: whether respondents expect their financial situation to improve over the next 12 months, and whether they consider themselves financially better off than their peers. The estimates are generally insignificant; the only exception is the oil price shock for sentiment relative to respondents' own past finances. Overall, general sentiment does not appear to be a primary driver of stagflationary expectations.

2018). The channel question cannot establish that respondents draw such an inference from the policy decision; however, an information-shock interpretation is consistent with a demand-based reading of the rate hike: 4.9% of the full sample both expect inflation to rise and unemployment to fall and identify household expenditure as the variable most affected by the shock.

For oil, an alternative interpretation is that the price increase reflects stronger global demand (Kilian, 2009). Because the vignette explicitly attributes the increase to a supply disruption, this interpretation requires respondents to reinterpret the scenario rather than apply a different transmission mechanism to the stated shock. The resulting prediction is higher inflation and lower unemployment. This combination is reported by 8.7% of respondents; 3.6% of the full sample also identify household expenditure as the variable most affected by the scenario. Their responses are therefore compatible with a global-demand interpretation of the oil price increase.

For the tax vignette, alternative explanations concern both the transmission mechanism and respondents' interpretation of the scenario. The vignette motivates an increase in individual income taxes as part of a CO_2-emissions agreement with the European Union. One possible interpretation is supply-side: higher taxes, or the higher energy costs associated with climate policy, may be expected to raise firms' production costs and weaken activity (Zubairy, 2014). This interpretation predicts higher inflation and higher unemployment. While 28.8% of respondents report this combination of expectations, only 4.2% of the full sample also identify firms' costs—rather than household expenditure—as the variable most affected by the scenario. The remaining 24.6% instead select household expenditure: thus, for most respondents who expect both inflation and unemployment to rise, the stated channel does not support a cost-based interpretation. A different reading of the vignette is that the additional revenue from higher income taxes finances domestic spending (for example, public investment on CO_2-emissions reduction). This interpretation predicts higher inflation, lower unemployment, and an effect operating through household expenditure. The combination of higher inflation and lower unemployment is reported by 11.7% of respondents, and 9.1% of the full sample also select household expenditure as the primary affected variable. Their responses are therefore compatible with an expansionary public-spending interpretation.

In conclusion, some departures from the benchmark may therefore reflect different interpretations of how the shock affects the economy. Pairing respondents' expectations with their answers to whether the scenario primarily affects firms' costs or household expenditure does not establish their reasoning, but it provides a more informative guide to the mechanisms that may underlie those expectations.

6.4 Who aligns with the benchmark?

A distinctive feature of the survey is that it allows me to link elicited responses to detailed demographic and economic information for the same individuals from the LISS Core Study. This individual-level linkage extends the analysis beyond average beliefs, making it possible to examine which households are more likely to hold benchmark-consistent views and whether such alignment is related to their financial circumstances.

For each shock, I estimate a linear probability model in which the outcome equals one if the signs

of both the inflation and unemployment responses match the benchmark. I also consider whether respondents align on all three shocks jointly, align on none, or leave at least one variable unchanged in every scenario (inertia). The regressions include demographic and economic characteristics such as gender, age, marital status, number of children, personal net income, employment status, homeownership, expectations about personal finances, education, the placebo comprehension score, and assignment to the positive or negative scenario. Table 5 reports the results.

Women are significantly more likely than men to report benchmark-consistent responses to monetary policy and tax shocks, and to align with the benchmark across all three shocks. Previous work documents gender differences in the level and uncertainty of inflation expectations (D'Acunto et al., 2020; Reiche, 2024). The results here add a distinct dimension: gender differences also appear in how households expect inflation and unemployment to respond to specified shocks.

Education is positively associated with alignment for monetary policy. Education is measured by an indicator for more than 16 years of schooling, the sample median. The monetary policy result is consistent with Piccolo et al. (2026), who link education to greater alignment between households' predictions and macroeconomic models. More broadly, it complements evidence on the relationship between education and financial literacy (Lusardi & Mitchell, 2023).

Respondents aged 50 or older are less likely to hold benchmark-consistent beliefs across all three shocks jointly, with the largest gap for tax shocks. This pattern is consistent with evidence that expectations are shaped by personal macroeconomic experience (Malmendier & Nagel, 2015): older respondents have formed their views over a different sequence of inflation, labor-market, and policy episodes than younger cohorts. The cross-sectional evidence cannot distinguish age from cohort effects, but it suggests that accumulated experience is related to how households interpret macroeconomic shocks.

Income is positively associated with alignment, with statistically significant coefficients for monetary policy and oil. Higher-income respondents are also more likely to align on all three shocks jointly and less likely to align on none. Homeownership has a narrower association: homeowners are more likely to align on oil shocks, with no clear association for monetary policy or taxes. This finding complements evidence of greater inflation sensitivity among homeowners (Piccolo & Gorodnichenko, 2025).

The linked LISS data also allow me to examine the role of financial asset ownership, borrower status, self-employment, and political orientation (Table A4). None is significantly associated with alignment after accounting for the baseline controls. Including these characteristics leaves the direction of the estimated associations with gender, education, age, income, and homeownership unchanged. Thus, the additional financial and political characteristics do not account for the demographic patterns documented above.

I also examine whether benchmark alignment is associated with the accuracy of respondents' baseline forecasts. Forecast errors are measured as the absolute difference between one-year-ahead expectations and the realized outcomes. Respondents with larger unemployment forecast errors are less likely to align with the benchmark for each shock, more likely to align on none, and more likely to leave at least one variable unchanged in every scenario (Figure 8). For inflation, the

relationship differs across shocks. Larger forecast errors are associated with lower alignment for oil but higher alignment for monetary policy and taxes. More accurate baseline forecasts therefore do not consistently go together with benchmark-consistent interpretations of shocks. This distinction matters: forecasting an outcome and predicting its response to a specified shock are different tasks.[18]

7 Households' choices in response to shocks

7.1 Distribution of spending and saving choices

After each vignette, respondents indicate whether they would increase, decrease, or leave unchanged their spending and saving. Table 6 reports the marginal distributions, and Figure 9 shows the joint distribution of spending and saving responses in each of the six scenarios.

The most common response is to leave both choices unchanged, especially after positive shocks. In every scenario (except the increase in taxes), this is the modal response, but it is much more frequent following good news (51-59%) than following bad news (29-37%). Formal tests reject symmetry between positive and negative shocks for nearly every action (Table A5).[19] This asymmetry is consistent with evidence that consumption reacts more strongly to losses than to gains (Bunn et al., 2018; Christelis et al., 2019), and with broader evidence of negativity bias in behavioral responses to adverse events (Baumeister et al., 2001).

Among respondents who do change their choices, spending and saving usually move together, particularly for tax and oil price shocks. After a tax increase, 41% would reduce both spending and saving; following an oil price increase, 18% would do the same. Conversely, 19% would increase both after a tax cut, and 14% after an oil price decline. Rather than shifting resources from spending to saving, respondents tend to adjust both margins in response to what they perceive as a deterioration or improvement in their household budget. This tendency to adjust spending and saving in the same direction echoes the co-movement in inflation and unemployment expectations documented in Section 6.2.1. The marginal distributions show that the tax increase elicits the strongest response: 59% would save less and 49% would spend less.

Monetary policy is the exception. A change in interest rates changes the return to saving relative to current spending. Consistent with this intertemporal-substitution channel, 14% of respondents would save more and spend less after a rate increase, while 11% would spend more and save less after a rate cut. These responses remain a minority, but they are much more common for monetary policy shocks than for oil or tax shocks.

Overall, reported choices appear to reflect perceived changes in household resources, with a smaller role for substitution between current spending and saving.

[18] Appendix Figure A6 reports a similar pattern using errors in perceptions of current conditions.

[19] For these tests, I recode opposite actions in corresponding positive and negative scenarios as equivalent—for example, increasing spending after a positive shock and decreasing spending after the corresponding negative shock—and compare mean responses across randomization groups. The tests reject symmetry for every action except saving responses to the oil and tax shocks.

7.2 Beliefs and intended spending and saving choices

This section examines whether respondents whose beliefs are closer to the benchmark also make different choices. To examine this question, I estimate the relationship between respondents' beliefs and each of their reported actions separately for monetary policy, oil price, and tax shocks. Specifically, for each action y (increasing, leaving unchanged, or decreasing spending or saving) I estimate:

$$\mathbb{1}\{\text{action } y \text{ for } s\} = \alpha + \beta B_{is} + \delta \,\text{Neg}_i + \gamma' X_i + \varepsilon_{is}, \tag{2}$$

where B_{is} captures respondent i's beliefs about shock s. I reverse the coding of responses in the positive scenarios, so that all scenarios can be interpreted as negative shocks. Neg_i indicates assignment to a negative scenario, and X_i includes the demographic controls from Table 5. In Figure 10, B_{is} equals one when the respondent's perceived responses of inflation and unemployment have the same signs as the benchmark impulse responses for shock s. Figure 11 instead defines B_{is} as an indicator for leaving inflation or unemployment expectations unchanged ($\text{SIR}_{\pi,is} = 0$ or $\text{SIR}_{u,is} = 0$).

Figure 10 asks whether respondents whose expectations match the benchmark make different spending and saving choices from other respondents. They do. Following a monetary tightening, benchmark-aligned respondents are about 6 percentage points more likely to reduce spending and 10 percentage points less likely to leave saving unchanged. They are also more likely to increase saving, although this estimate is imprecise. Taken together, these responses are consistent with intertemporal substitution: higher interest rates lead households to reduce current spending and save more. Following a tax increase, aligned respondents are 16 percentage points more likely to reduce spending and 9 percentage points more likely to reduce saving, as would be expected if they see the shock as reducing disposable income. Following an oil price increase, they are about 6 percentage points more likely to reduce saving, consistent with drawing on saving to absorb higher living costs.

Figure 11 addresses a different question: are respondents who do not revise their macroeconomic expectations also less likely to change their intended choices? For oil and tax shocks, the answer is yes. Respondents who leave at least one expectation unchanged are 5 to 8 percentage points more likely to leave spending or saving unchanged as well. The estimates for monetary policy are positive but imprecise.

Together, these results show that beliefs matter along two dimensions. First, updating expectations is associated with taking action: respondents who do not revise their beliefs tend not to revise their intended spending or saving. Second, the content of beliefs is associated with the type of action respondents plan to take. Respondents with benchmark-consistent beliefs are more likely to show intertemporal substitution after a monetary policy shock, and to cut both spending and saving after a tax increase. Thus, beliefs are related not only to whether households respond to a shock, but also to how they respond.

8 Conclusion

This paper uses a survey with conditional vignettes to study how households understand macroeconomic shocks and how their beliefs relate to intended spending and saving choices. I compare households' predictions about how inflation and unemployment respond to these shocks with a benchmark drawn from mainstream New Keynesian models and the empirical macroeconomic literature.

The main finding is widespread inconsistency with this benchmark: only 14% of respondents have benchmark-consistent expectations after a monetary policy shock and 12% after a tax shock; alignment is higher for oil price shocks, at 41%. Two patterns account for much of this inconsistency. First, among respondents who revise their expectations, the most common response to every shock is that inflation and unemployment move in the same direction. Second, between one third and one half of respondents leave at least one expectation unchanged, despite the sizeable shocks described in the vignettes. Some departures from the benchmark are compatible with alternative mechanisms, including a cost-of-living interpretation of monetary tightening, but these mechanisms explain only part of the observed responses. Beliefs also matter for intended choices. Respondents who leave expectations unchanged are more likely to leave spending and saving unchanged; those with benchmark-consistent beliefs are more likely to shift between spending and saving after monetary policy shocks, and to cut both after a tax increase.

These patterns have direct implications for macroeconomic modeling. They indicate that a useful account of household expectation formation should accommodate a population in which some households leave expectations unchanged, others apply a common co-movement heuristic across shocks, and a smaller group forms beliefs consistent with the benchmark mechanism. Models with heterogeneous subjective expectations, limited attention, and state-dependent heuristics provide a natural way to incorporate these patterns. The intended-choice responses further suggest that heterogeneity should extend to the behavioral block of such models. In particular, models that link subjective beliefs to consumption and saving decisions can capture differences not only in what households expect, but also in whether and how they respond to macroeconomic news.

The findings also have implications for stabilization policy. Monetary policy transmission partly depends on how households interpret the effects of interest-rate changes on inflation, activity, and their own intertemporal choices. When households view a rate increase as inflationary rather than disinflationary, the expectations channel of monetary policy operates differently from the benchmark. This highlights the importance of communication that makes the relevant transmission mechanism transparent. The tax results point to a complementary lesson. Tax shocks generate the lowest benchmark alignment in macroeconomic expectations, but the largest intended changes in spending and saving. This contrast suggests that households respond strongly when a policy has direct and salient consequences for their own budget, even if their expectations about its aggregate effects differ from the benchmark. An important question for future research is therefore how policy effectiveness depends on whether households can readily connect a policy intervention to their financial circumstances.

Finally, alignment with the benchmark varies systematically with observable characteristics, including gender, income, education, and age. Together with the association between beliefs and intended choices, this suggests that differences in macroeconomic understanding may contribute to the distributional effects of aggregate shocks.

Looking ahead, a promising avenue for future research is to link expectation formation more explicitly to actual, rather than self-reported, behavior. Combining survey-based measures of beliefs with administrative data or high-frequency spending records would allow researchers to trace how heterogeneous expectations and understanding of macroeconomic events translate into real economic actions, and to quantify the extent to which belief heterogeneity and inertia shape the transmission of macroeconomic shocks. Linking beliefs to realized choices would connect differences in macroeconomic understanding directly to the household-level incidence and aggregate transmission of shocks.

References

Andersen, A. L., Johannesen, N., Petersen, J. B., Settele, S., & Wohlfart, J. (2026). Household behavior below the zero lower bound.

Andre, P., Haaland, I., Roth, C., Wiederholt, M., & Wohlfart, J. (2024). *Narratives about the macroeconomy* (tech. rep.). SAFE Working Paper.

Andre, P., Pizzinelli, C., Roth, C., & Wohlfart, J. (2022). Subjective models of the macroeconomy: Evidence from experts and representative samples. *The Review of Economic Studies*, *89*(6), 2958–2991.

Armantier, O., Nelson, S., Topa, G., Van der Klaauw, W., & Zafar, B. (2016). The price is right: Updating inflation expectations in a randomized price information experiment. *Review of Economics and Statistics*, *98*(3), 503–523.

Armona, L., Fuster, A., & Zafar, B. (2019). Home price expectations and behaviour: Evidence from a randomized information experiment. *The Review of Economic Studies*, *86*(4), 1371–1410.

Bachmann, O., Gründler, K., Potrafke, N., & Seiberlich, R. (2021). Partisan bias in inflation expectations. *Public Choice*, *186*, 513–536.

Bachmann, R., Berg, T. O., & Sims, E. R. (2015). Inflation expectations and readiness to spend: Cross-sectional evidence. *American Economic Journal: Economic Policy*, *7*(1), 1–35.

Badinger, H., & Schiman, S. (2023). Measuring monetary policy in the euro area using svars with residual restrictions. *American Economic Journal: Macroeconomics*, *15*(2), 279–305.

Barth, M. J., & Ramey, V. A. (2001). The cost channel of monetary transmission. *NBER macroeconomics annual*, *16*, 199–240.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of general psychology*, *5*(4), 323–370.

Bhandari, A., Borovička, J., & Ho, P. (2025). Survey data and subjective beliefs in business cycle models. *Review of Economic Studies*, *92*(3), 1375–1437.

Bianchi, F., Ludvigson, S. C., & Ma, S. (2022). Belief distortions and macroeconomic fluctuations. *American Economic Review*, *112*(7), 2269–2315.

Binder, C., & Rodrigue, A. (2018). Household informedness and long-run inflation expectations: Experimental evidence. *Southern Economic Journal*, *85*(2), 580–598.

Binetti, A., Nuzzi, F., & Stantcheva, S. (2024). People's understanding of inflation. *Journal of Monetary Economics*, *148*, 103652.

Blanchard, O. (2020). *Macroeconomics, global edition* (8th ed.). Pearson Education Limited.

Blanchard, O., & Perotti, R. (2002). An empirical characterization of the dynamic effects of changes in government spending and taxes on output. *the Quarterly Journal of economics*, *117*(4), 1329–1368.

Bolhuis, M. A., Cramer, J. N., Schulz, K. O., & Summers, L. H. (2024). *The cost of money is part of the cost of living: New evidence on the consumer sentiment anomaly* (tech. rep.). National Bureau of Economic Research.

Bordalo, P., Gennaioli, N., Ma, Y., & Shleifer, A. (2020). Overreaction in macroeconomic expectations. *American Economic Review*, *110*(9), 2748–2782.

Bruine de Bruin, W., Vanderklaauw, W., Downs, J. S., Fischhoff, B., Topa, G., & Armantier, O. (2010). Expectations of inflation: The role of demographic variables, expectation formation, and financial literacy. *Journal of Consumer Affairs*, *44*(2), 381–402.

Bunn, P., Le Roux, J., Reinold, K., & Surico, P. (2018). The consumption response to positive and negative income shocks. *Journal of Monetary Economics*, *96*, 1–15.

Burke, M. A., & Ozdagli, A. (2023). Household inflation expectations and consumer spending: Evidence from panel data. *Review of Economics and Statistics*, *105*(4), 948–961.

Candia, B., Coibion, O., & Gorodnichenko, Y. (2020). *Communication and the beliefs of economic agents* (tech. rep.). National Bureau of Economic Research.

Carvalho, C., & Nechio, F. (2014). Do people understand monetary policy? *Journal of Monetary Economics*, *66*, 108–123.

Cavallo, A., Cruces, G., & Perez-Truglia, R. (2017). Inflation expectations, learning, and supermarket prices: Evidence from survey experiments. *American Economic Journal: Macroeconomics*, *9*(3), 1–35.

Christelis, D., Georgarakos, D., Jappelli, T., Pistaferri, L., & Van Rooij, M. (2019). Asymmetric consumption effects of transitory income shocks. *The Economic Journal*, *129*(622), 2322–2341.

Christiano, L. J., Eichenbaum, M., & Evans, C. L. (2005). Nominal rigidities and the dynamic effects of a shock to monetary policy. *Journal of political Economy*, *113*(1), 1–45.

Claus, E., & Nguyen, V. H. (2020). Monetary policy shocks from the consumer perspective. *Journal of Monetary Economics*, *114*, 159–173.

Cloyne, J., Martinez, J., Mumtaz, H., & Surico, P. (2023). Do tax increases tame inflation? *AEA Papers and Proceedings*, *113*, 377–381.

Coibion, O., Georgarakos, D., Gorodnichenko, Y., & Van Rooij, M. (2023). How does consumption respond to news about inflation? field evidence from a randomized control trial. *American Economic Journal: Macroeconomics*, *15*(3), 109–152.

Coibion, O., & Gorodnichenko, Y. (2012). What can survey forecasts tell us about information rigidities? *Journal of Political Economy*, *120*(1), 116–159. Retrieved June 12, 2025, from http://www.jstor.org/stable/10.1086/665662

Coibion, O., & Gorodnichenko, Y. (2015). Information rigidity and the expectations formation process: A simple framework and new facts. *American Economic Review*, *105*(8), 2644–2678.

Colarieti, R., Mei, P., & Stantcheva, S. (2024). *The how and why of household reactions to income shocks* (tech. rep.). National Bureau of Economic Research.

Crump, R. K., Eusepi, S., Tambalotti, A., & Topa, G. (2022). Subjective intertemporal substitution. *Journal of Monetary Economics*, *126*, 118–133.

D'Acunto, F., Georgarakos, D., Kenny, G., & Weber, M. (2026). *Subjective models of the macroeconomy and the transmission of monetary policy* (tech. rep.). National Bureau of Economic Research.

D'acunto, F., Hoang, D., Paloviita, M., & Weber, M. (2023). Iq, expectations, and choice. *The Review of Economic Studies*, *90*(5), 2292–2325.

D'Acunto, F., Hoang, D., & Weber, M. (2016). *The effect of unconventional fiscal policy on consumption expenditure* (tech. rep.). National Bureau of Economic Research.

D'Acunto, F., Malmendier, U., & Weber, M. (2020). *Gender roles and the gender expectations gap* (tech. rep.). National Bureau of Economic Research.

Dräger, L., & Nghiem, G. (2021). Are consumers' spending decisions in line with a euler equation? *Review of Economics and Statistics*, *103*(3), 580–596.

Ferreira, C., & Pica, S. (2024). Household perceptions of the sources of business cycle fluctuations: A tale of supply and demand.

Gonçalves Raposo, I. (2025). Inflation expectations, wages and on-the-job search. *manuscript*.

Jarociński, M., & Karadi, P. (2020). Deconstructing monetary policy surprises—the role of information shocks. *American Economic Journal: Macroeconomics*, *12*(2), 1–43.

Kamdar, R. (2019). The inattentive consumer: Sentiment and expectations (meeting papers 647). *Society for Economic Dynamics*.

Känzig, D. R. (2021). The macroeconomic effects of oil supply news: Evidence from opec announcements. *American Economic Review*, *111*(4), 1092–1125.

Kilian, L. (2009). Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. *American economic review*, *99*(3), 1053–1069.

Kim, G., & Binder, C. (2023). Learning-through-survey in inflation expectations. *American Economic Journal: Macroeconomics*, *15*(2), 254–278.

Lusardi, A., & Mitchell, O. S. (2023). The importance of financial literacy: Opening a new field. *Journal of Economic Perspectives*, *37(4)*, 137–154.

Malmendier, U., & Nagel, S. (2015). Learning from inflation experiences *. *The Quarterly Journal of Economics*, *131*(1), 53–87. https://doi.org/10.1093/qje/qjv037

Mankiw, N. G. (2018). *Macroeconomics* (10th ed.). Worth Publishers.

Mankiw, N. G., & Reis, R. (2002). Sticky information versus sticky prices: A proposal to replace the new keynesian phillips curve. *The Quarterly Journal of Economics*, *117*(4), 1295–1328.

Masolo, R., & Monti, F. (2024). *Inflation expectations of savers and borrowers* (CEPR Discussion Paper No. 19776). CEPR. Paris & London, CEPR Press.

Mertens, K., & Ravn, M. O. (2013). The dynamic effects of personal and corporate income tax changes in the united states. *American economic review*, *103*(4), 1212–1247.

Minina, D., Galati, G., Moessner, R., & van Rooij, M. (2024). The effect of information on consumer inflation expectations.

Miranda-Agrippino, S., & Ricco, G. (2021). The transmission of monetary policy shocks. *American Economic Journal: Macroeconomics*, *13*(3), 74–107.

Miranda-Agrippino, S., & Williams, J. C. (2026). Interest rate surprises when the fed doesn't speak. *FRB of New York Staff Report*, (1178).

Mountford, A., & Uhlig, H. (2009). What are the effects of fiscal policy shocks? *Journal of applied econometrics*, *24*(6), 960–992.

Nakamura, E., & Steinsson, J. (2018). High-frequency identification of monetary non-neutrality: The information effect. *The Quarterly Journal of Economics*, *133*(3), 1283–1330.

Neri, S., Busetti, F., Conflitti, C., Corsello, F., Delle Monache, D., & Tagliabracci, A. (2023). Energy price shocks and inflation in the euro area. *Bank of Italy Occasional Paper*, (792).

Piccolo, J., & Gorodnichenko, Y. (2025). *Homeownership and attention to inflation: Evidence from information treatments* (tech. rep.). National Bureau of Economic Research.

Piccolo, J., Russo, A., Granziera, E., & Castelnuovo, E. (2026). *Dp21641 households' macroeconomic beliefs: The role of education* (tech. rep.). CEPR Press.

Ramey, V. A. (2016). Macroeconomic shocks and their propagation. *Handbook of macroeconomics*, *2*, 71–162.

Ravenna, F., & Walsh, C. E. (2006). Optimal monetary policy with the cost channel. *Journal of Monetary Economics*, *53*(2), 199–216. https://doi.org/10.1016/j.jmoneco.2005.01.004

Reiche, L. (2024). *Beyond groceries: Financial confidence and the gender gap in inflation expectations* (tech. rep.). CESifo Working Paper.

Roth, C., & Wohlfart, J. (2020). How do expectations about the macroeconomy affect personal expectations and behavior? *Review of Economics and Statistics*, *102*(4), 731–748.

Zhang, Y. (2024). Rational inattention choices in firms and households.

Zubairy, S. (2014). On fiscal multipliers: Estimates from a medium scale dsge model. *International Economic Review*, *55*(1), 169–195.

Tables

Negative scenario	Positive scenario
Monetary policy shock	
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.	Imagine that the European Central Bank unexpectedly lowers interest rates from 4.5% to 4%. No other major economic events occur at the same time.
Oil price shock	
Imagine a sudden political crisis in the Middle East, causing the price of oil to rise from $85 to $115 per barrel.	Imagine a political crisis being resolved in the Middle East, causing the price of oil to drop from $85 to $55 per barrel.
Tax shock	
Imagine that the Netherlands enters into an agreement with the European Union. This agreement states that the Dutch government must spend money to reduce CO_2 emissions. In order to pay for this, the government decides to increase income tax by €150 from now on. As a result, the average Dutch citizen will pay 1% more tax on his/her salary every year.	Imagine that the Netherlands decides to withdraw from an agreement with the European Union. The agreement stated that the Dutch government must spend money to reduce carbon emissions. Because the Netherlands withdraws, the government has to spend less money. The government decides to reduce income tax by €150 from now on. As a result, the average Dutch citizen will pay 1% less tax on his/her salary each year.

Table 1: **Verbatim of the vignettes.**

IRF Inflation			
Shock	Mean	Median	SD
Monetary policy shock			
Negative scenario	-0.38	0.00	2.78
Positive scenario	-1.07	-0.50	2.88
Oil shock			
Negative scenario	0.78	1.00	3.02
Positive scenario	-1.70	-1.00	2.98
Tax shock			
Negative scenario	-0.04	0.00	2.91
Positive scenario	-1.51	-0.95	3.06
IRF Unemployment			
Shock	Mean	Median	SD
Monetary policy shock			
Negative scenario	-0.10	0.00	2.40
Positive scenario	-0.57	0.00	2.24
Oil shock			
Negative scenario	0.51	0.50	2.65
Positive scenario	-0.77	-0.50	2.43
Tax shock			
Negative scenario	-0.14	0.00	2.80
Positive scenario	-0.64	-0.10	2.50

Table 2: **Moments of SIR for inflation and unemployment by shock type and sign.** This table reports the mean, median, and standard deviation of subjective impulse responses (SIR) for inflation and unemployment, elicited in response to three macroeconomic shocks: monetary policy, oil price, and tax shocks. Results are shown separately for the negative scenario (increases in interest rates, oil prices, or taxes) and the positive scenario (decreases). The SIR are computed as the difference between respondents' expectations under the shock and their baseline forecasts.

	Difference in means	SE	p-value	Reject symmetry?
Monetary policy shock				
Inflation	-1.45	0.16	<0.001	Yes
Unemployment	-0.67	0.13	<0.001	Yes
Oil shock				
Inflation	-0.92	0.17	<0.001	Yes
Unemployment	-0.26	0.14	0.063	No
Tax shock				
Inflation	-1.56	0.16	<0.001	Yes
Unemployment	-0.78	0.15	<0.001	Yes

Table 3: **Tests of symmetry in mean subjective impulse responses.** The table compares mean SIR in the negative-shock scenario with mean SIR in the positive-shock scenario after reversing the latter's sign. Differences are computed as the negative-arm mean minus the sign-reversed positive-arm mean, in percentage points. Standard errors and two-sided p-values are from equal-variance two-sample t-tests. "Reject symmetry?" indicates whether equality is rejected at the 5% level.

Shock	Model	π	u	Channel	Quadrant (%)	Quadrant $\times$ channel (%)
MP	Cost channel	+	+	Firm costs	24.1	14.7
MP	Cost of living	+	+	Household exp.	24.1	9.4
MP	Information effect	+	−	Household exp.	9.4	4.9
Tax	Supply-side	+	+	Firm costs	28.8	4.2
Tax	Public spending	+	−	Household exp.	11.7	9.1
Oil	Global demand	+	−	Household exp.	8.7	3.6

Table 4: **Compatibility of respondents' expectations and stated transmission channels with benchmark and alternative models.** For each shock, the π and u columns report the model's predicted signs for inflation and unemployment. *Quadrant* is the share of respondents whose reported SIR match those signs. *Quadrant* $\times$ *channel* is the share whose SIR match the predicted signs and who identify the model-consistent channel—-firms' costs or household expenditure—-as the variable most affected by the scenario. Percentages are calculated over the full sample.

	(1) MP shock	(2) Oil shock	(3) Tax shock	(4) Always consistent	(5) Never consistent	(6) Always inertia
Gender: female	0.047**	-0.023	0.050**	0.017**	-0.015	0.003
	(0.022)	(0.030)	(0.021)	(0.007)	(0.031)	(0.025)
Age over 50	-0.032	-0.032	-0.054**	-0.037***	0.032	0.024
	(0.024)	(0.035)	(0.024)	(0.010)	(0.035)	(0.026)
Married	0.031	0.002	0.032	0.019**	-0.031	-0.027
	(0.022)	(0.030)	(0.020)	(0.009)	(0.031)	(0.024)
Number of children	-0.008	0.027*	0.004	0.003	-0.027*	-0.014
	(0.009)	(0.015)	(0.009)	(0.005)	(0.015)	(0.011)
Net income (1000)	0.023**	0.035**	0.010	0.008**	-0.035***	0.006
	(0.010)	(0.014)	(0.010)	(0.004)	(0.014)	(0.011)
Employed	-0.022	-0.110***	-0.010	-0.005	0.115***	0.021
	(0.023)	(0.033)	(0.023)	(0.007)	(0.033)	(0.026)
Homeownership	-0.024	0.060*	-0.015	-0.002	-0.039	-0.006
	(0.024)	(0.033)	(0.022)	(0.008)	(0.034)	(0.026)
Sentiment	-0.000	0.030**	-0.007	0.000	-0.019	-0.009
	(0.010)	(0.015)	(0.010)	(0.004)	(0.015)	(0.011)
Education above median	0.038*	0.018	0.032	0.010	-0.035	0.010
	(0.021)	(0.032)	(0.021)	(0.006)	(0.032)	(0.024)
Placebo score	-0.013*	0.012	-0.006	-0.000	-0.004	0.017**
	(0.007)	(0.009)	(0.006)	(0.003)	(0.010)	(0.007)
Negative scenario	0.066***	-0.043	0.048***	0.005	-0.006	-0.044**
	(0.019)	(0.028)	(0.018)	(0.007)	(0.028)	(0.022)
Observations	1237	1237	1237	1237	1237	1237
R-squared	0.027	0.029	0.022	0.034	0.021	0.015

Table 5: **Determinants of benchmark-consistent interpretations of macroeconomic shocks.** This table reports coefficients from linear probability models (OLS) where the dependent variable equals one if the respondent's subjective impulse responses for inflation and unemployment match the sign predictions implied by the benchmark, as described in Section 5. Age: a dummy equal to 1 if the respondent is aged 50 or older; Income: a continuous variable measuring net personal income (in €1,000); Education: a dummy equal to 1 if the respondent's years of education are above the sample median (16 years of education, which correspond to a bachelors' degree in the Dutch education system). Robust standard errors in parentheses. */**/*** refer to p-values lower than 0.10/0.05/0.01, respectively.

	Spending			Saving			
	Incr.	Same	Decr.	Incr.	Same	Decr.	N
Monetary policy							
Increase	16.3	53.2	30.5	29.0	47.8	23.2	620
Decrease	24.5	69.3	6.1	17.7	60.4	21.9	587
Taxes							
Increase	6.8	43.8	49.4	3.7	37.2	59.1	635
Decrease	27.5	68.8	3.7	36.0	59.8	4.2	593
Oil prices							
Increase	23.1	43.7	33.2	6.7	51.4	42.0	632
Decrease	24.7	66.6	8.8	24.4	70.6	5.0	580

Table 6: **Marginal distribution of spending and saving responses by shock scenario.** This table shows the share of households reporting an increase, decrease, or no change in spending and saving in response to six macroeconomic shock scenarios

Figures

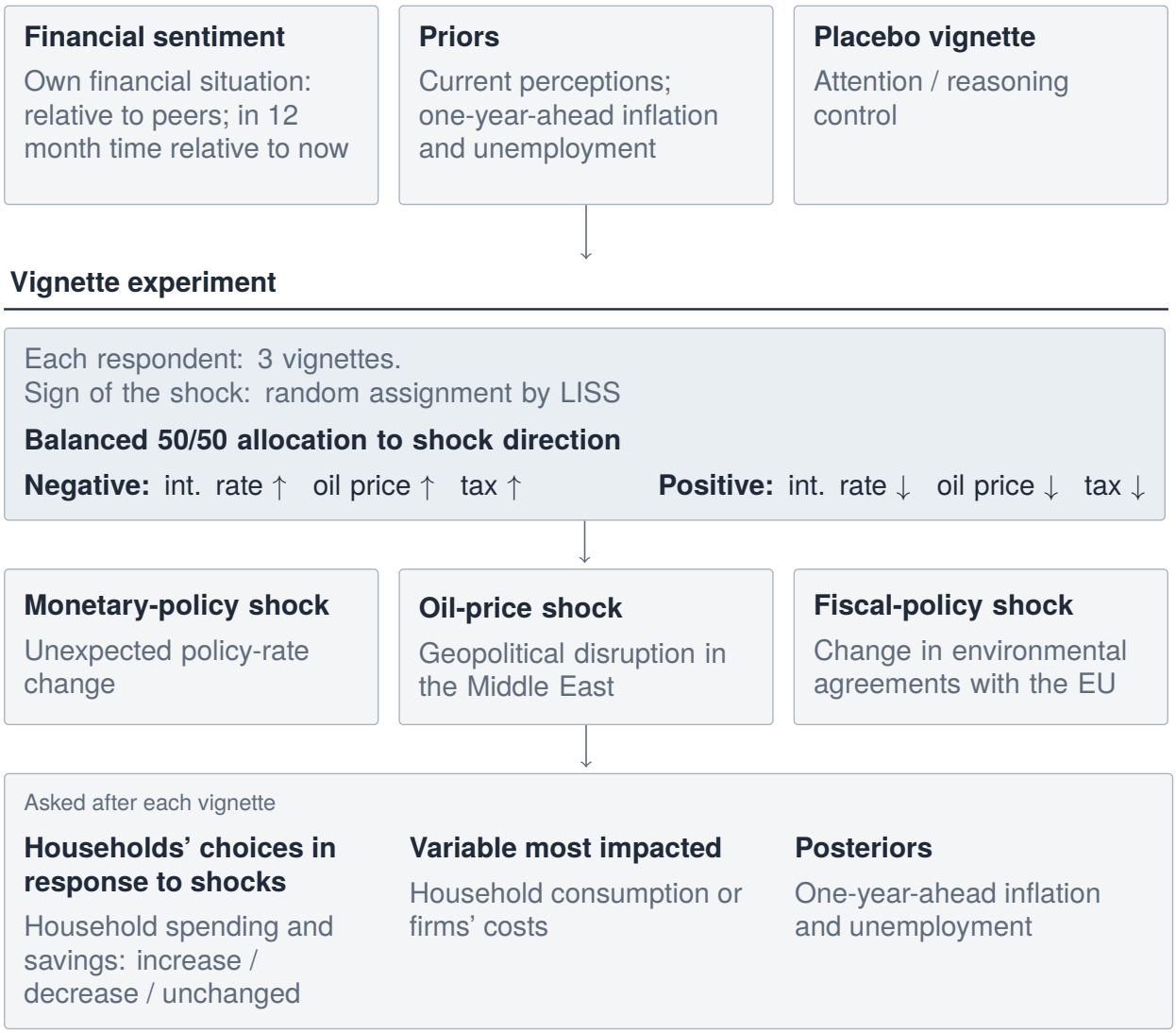


Figure 1: **Overview of the survey structure.**

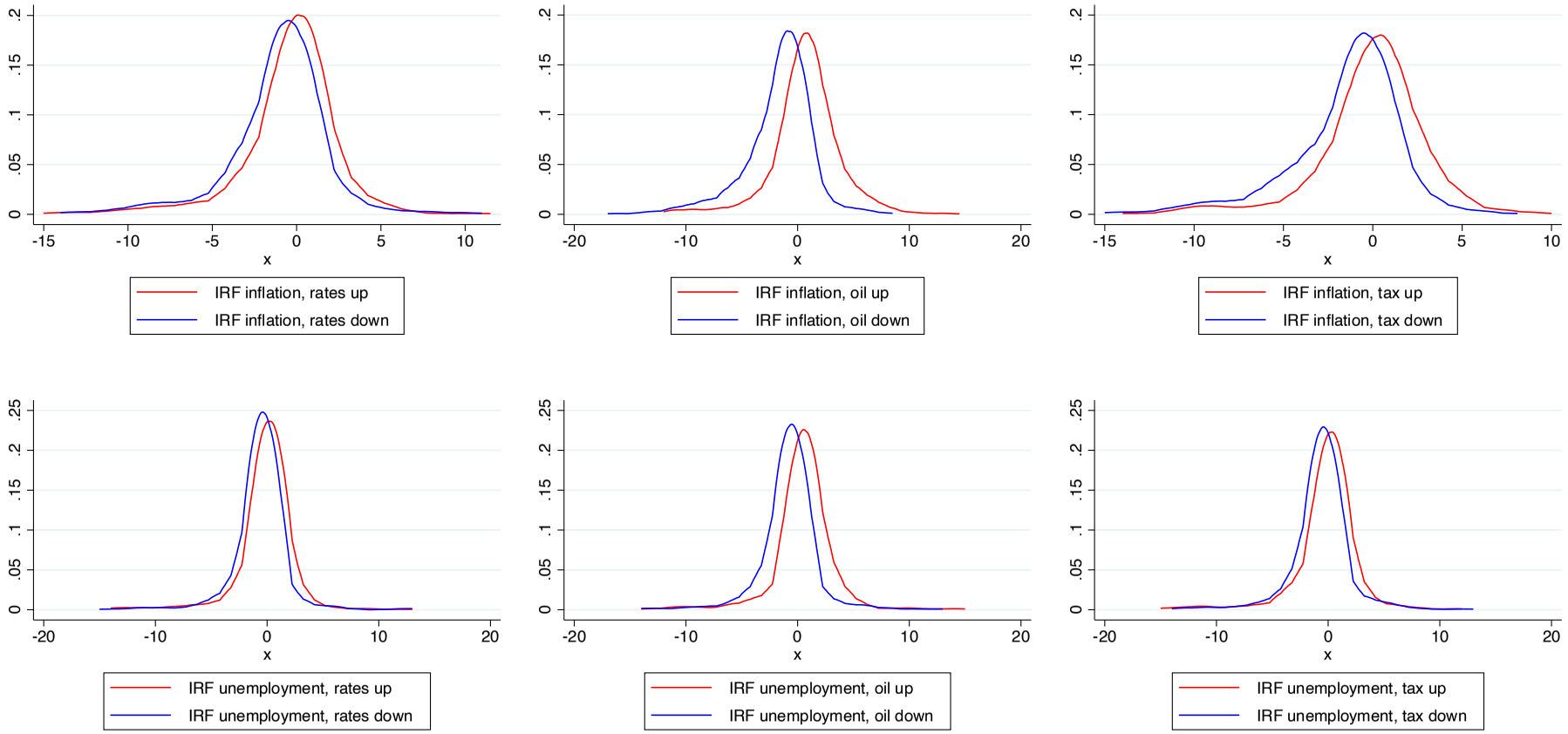


Figure 2: **Distribution of one-year-ahead subjective impulse responses (SIR) of inflation and unemployment to monetary, oil price, and tax shocks**. Each panel shows the distribution of SIR following the positive and negative versions of each shock scenario: a 50 basis point monetary tightening or easing, a $30 change in oil prices, and a €150 change in annual taxes. SIR are defined as the difference between expectations under the shock scenario and baseline forecasts. Distributions are estimated using an Epanechnikov kernel with bandwidth equal to 1.

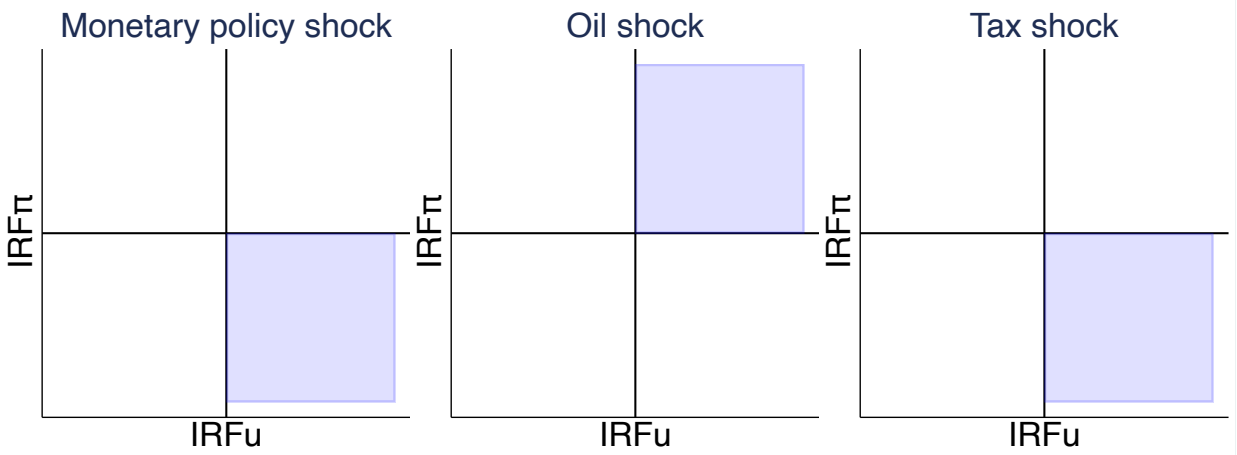


Figure 3: **Signs of IRFs for inflation and unemployment in the benchmark.** The highlighted quadrants are the combinations of signs for the impulse responses (IRFs) of inflation and unemployment that are consistent with the theoretical framework and empirical evidence presented in Section 5. These sign combinations serve as benchmarks for evaluating whether households' expectations about the impact of shocks align with standard macroeconomics theory and evidence from the empirical marcoeconomics literature.

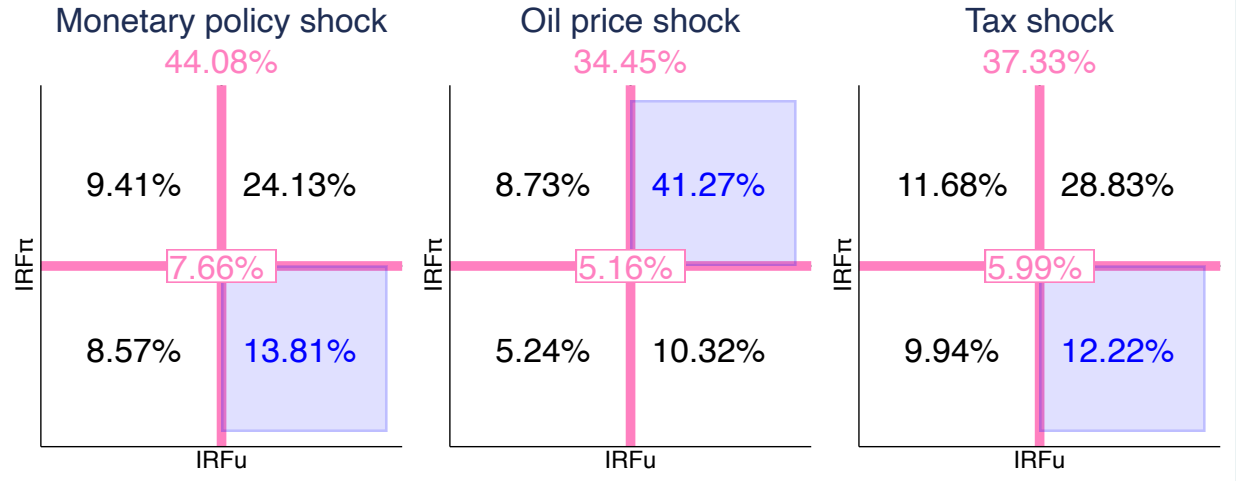


Figure 4: **Joint distribution of signs of SIR for inflation and unemployment.** This figure shows the distribution of households' subjective impulse responses (SIR) for inflation and unemployment following three negative macroeconomic shocks: a monetary tightening, an oil price increase, and a tax hike. SIR are sign-adjusted so that all shocks are interpreted as negative. Each panel reports the share of respondents falling into each sign combination quadrant, with additional percentages for those reporting no change in at least one variable (pink % on the top) or both variables (% in the center).

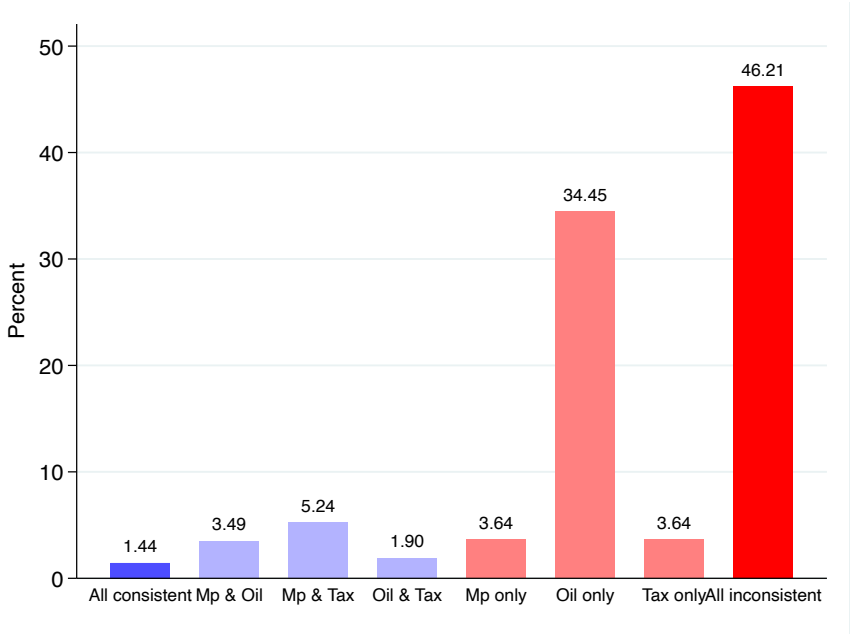


Figure 5: **Joint consistency of beliefs across shocks**. This figure shows the percentage of households whose sign expectations for inflation and unemployment are consistent with the benchmark across different combinations of shocks. SIR are sign-adjusted so that all shocks are analyzed as negative (i.e., increases in interest rates, oil prices, or taxes).

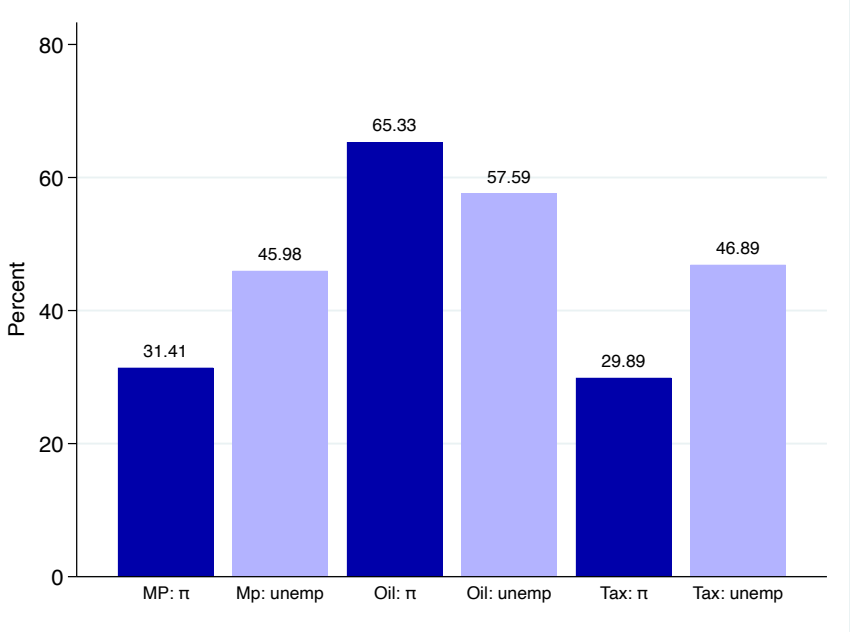


Figure 6: **Share of households with benchmark-consistent SIR sign, by variable and shock.** This figure shows the percentage of households predicting a benchmark-consistent direction of the shock's impact on inflation and unemployment, separately for each macroeconomic shock. SIR are sign-adjusted so that all shocks are analyzed as negative (i.e., increases in interest rates, oil prices, or taxes).

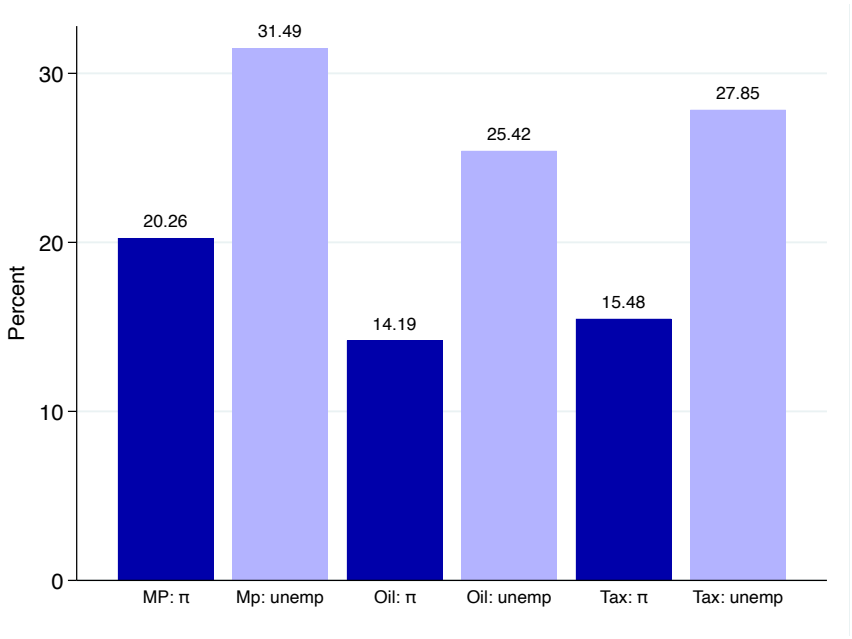


Figure 7: **Inertia in inflation and unemployment expectations by shock.** Bars report the share of respondents whose perceived response of inflation or unemployment to each shock is zero. A zero SIR, $\text{SIR}^{\pi} = 0$ or $\text{SIR}^{u} = 0$, indicates that the respondent's posterior expectation is unchanged from their prior expectation.

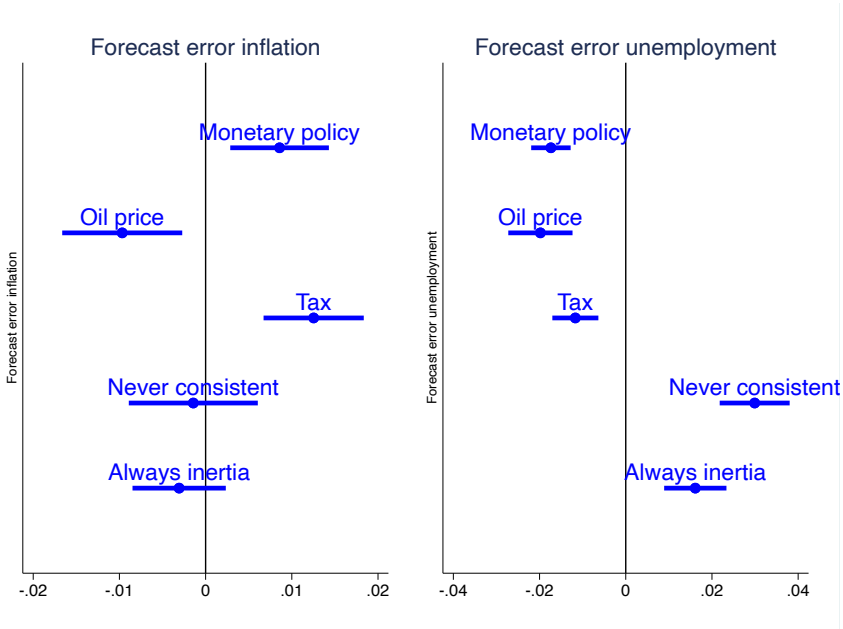


Figure 8: **Forecast errors and benchmark-consistent interpretations of macroeconomic shocks.** This figure reports the coefficients from linear probability models regressing various indicators of belief consistency on forecast errors for inflation and unemployment. Belief consistency is measured by dummy variables equal to one if the respondent's subjective impulse response (SIR) signs for inflation and unemployment match those implied by the benchmark, separately for each of the three shocks (monetary, oil, tax). Additional indicators include: "never consistent" (never consistent with the benchmark), and "always inertia" (reporting no change for at least one variable in each vignette). Forecast errors are computed as the absolute difference between the respondent's one-year-ahead expectations and the actual value observed in May 2025 (2.9% for inflation, 3.8% for unemployment). All regressions control for gender, age, marital status, presence of children, personal net income, employment status, homeownership, expectations about personal finances, education (above median), a placebo comprehension score, and the randomization group (positive vs. negative shock scenario). Robust SE, and 90% confidence bands.

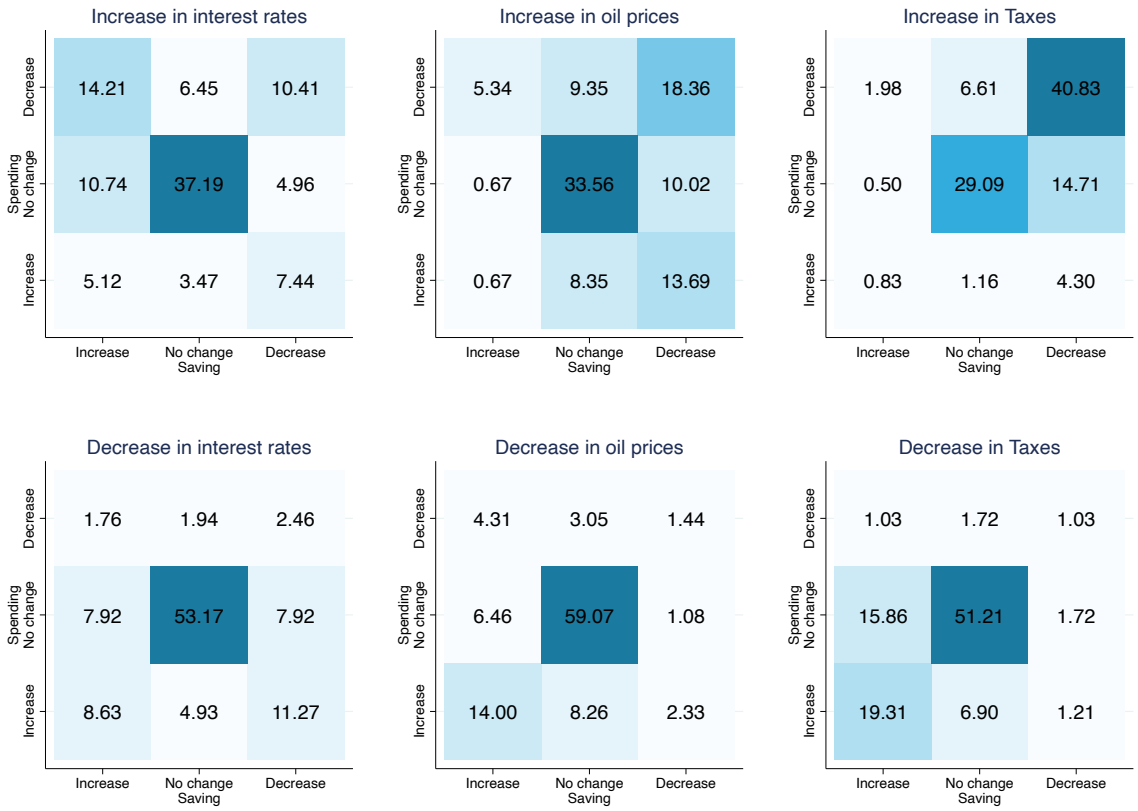


Figure 9: **Joint distribution of spending and saving responses by shock scenario.** This figure presents heatmaps of the joint distribution of household responses to macroeconomic shocks. Each cell indicates the percentage of respondents selecting a specific combination of spending and saving behavior (increase, no change, or decrease) in response to each of six scenarios. Darker shades correspond to more frequently chosen combinations.

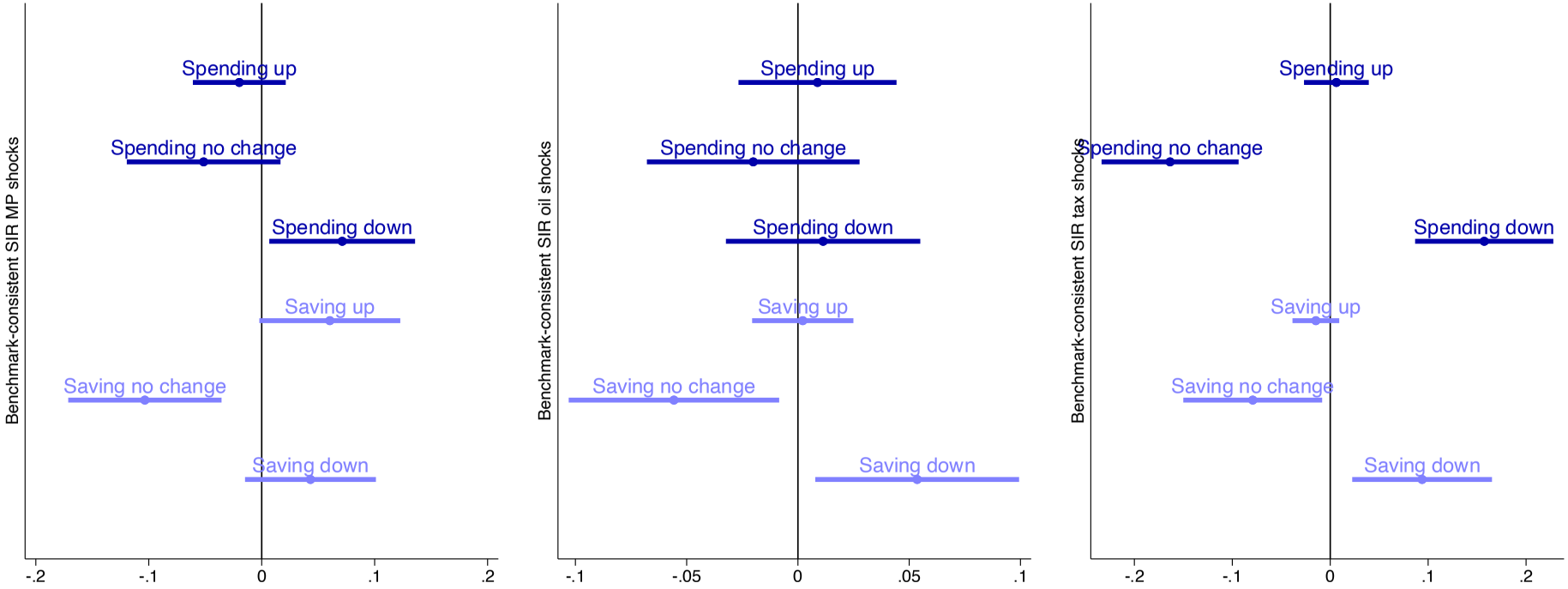


Figure 10: **Benchmark-consistent interpretation of shocks and spending/saving choices.** Coefficients from separate linear probability models relating benchmark-consistent SIR to reported saving and spending responses to monetary policy, oil price, and tax shocks. Benchmark-consistent SIR equals one if respondents identify the benchmark effects of a shock on inflation and unemployment. Panels correspond to shocks; outcomes are increasing, decreasing, or not changing saving or spending. Positive coefficients indicate a higher likelihood of that response. Controls include demographics, income, employment, homeownership, financial expectations, education, a placebo comprehension score, and scenario randomization. Robust SEs; 90% confidence bands.

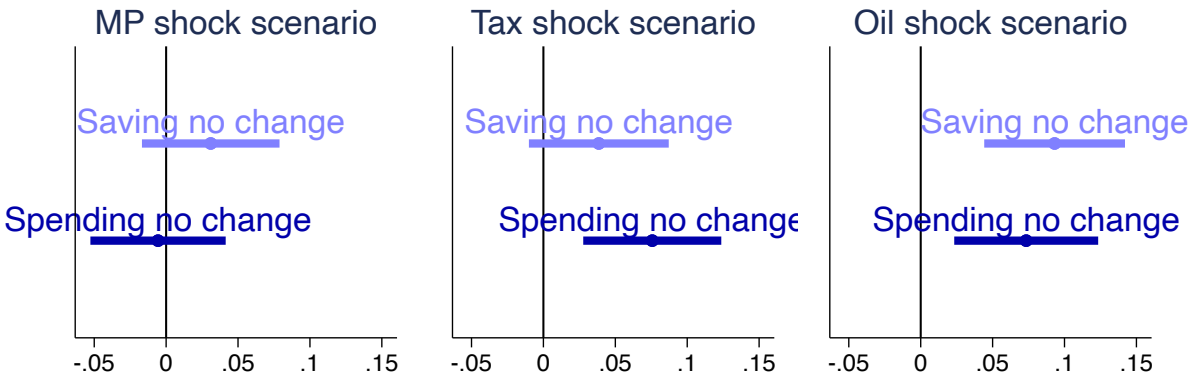


Figure 11: **Belief inertia and inertia in spending and saving choices.** This figure reports coefficients from linear probability models (equation 2) in which the dependent variable equals one if the respondent would leave spending (dark) or saving (light) unchanged in response to the shock, and the key regressor equals one if the respondent does not revise their expectation of inflation or unemployment ($\text{SIR}^{\pi} = 0$ or $\text{SIR}^{u} = 0$). Regressions are estimated separately for each shock. Responses in the positive scenarios are sign-reversed, so that each shock is analyzed as a negative event. All regressions control for gender, age, marital status, presence of children, personal net income, employment status, homeownership, expectations about personal finances, education (above median), a placebo comprehension score, and the randomization group (positive vs. negative scenario). Robust standard errors; 90% confidence bands.

Online Appendix

Appendix A: Additional Tables and Figures

Variable	Negative shock arm	Positive shock arm
Subsample size	674	644
Gender (female)	50%	48%
Age (median)	57	58
Personal net income (in Euros, median)	2266	2158
Education (years, median)	16	16
N. children	.64	.67
Homeownership	72%	73%
Employed	57%	53%

Table A1: **Balance in individual characteristics across treatment groups.** Comparison of the distributions of individual characteristics between respondents assigned to negative and positive hypothetical shocks. Respondents were randomly allocated to the two groups by the LISS platform.

Variable	Our Survey	DNB 2024
Gender (female)	50%	51%
Age (median)	56	52
Personal net income (in Euros, median)	2224	2447
Education (years, median)	16	16

Table A2: **Summary statistics in the survey's sample**. Comparison between the distributions of individual characteristics in the survey with those in the sample of the Dutch National Bank Household Survey.

Shock	**Outcome variable**	**Benchmark**	**Survey variable**	**Expected sign/value**
Monetary policy shock	Inflation	Decrease	IRFπ	<0
	Unemployment	Increase	IRFu	>0
Oil price shock	Inflation	Increase	IRFπ	>0
	Unemployment	Increase	IRFu	>0
Tax shock	Inflation	Decrease	IRFπ	<0
	Unemployment	Increase	IRFu	>0

Table A3: **Benchmark and consistent survey answers for each shock.**

	(1) MP shock	(2) Oil shock	(3) Tax shock	(4) Always consistent	(5) Never consistent	(6) Always inertia
Gender: female	0.042*	-0.024	0.061***	0.018**	-0.017	0.001
	(0.025)	(0.034)	(0.023)	(0.008)	(0.034)	(0.027)
Age over 50	-0.043	-0.041	-0.068**	-0.044***	0.048	0.030
	(0.028)	(0.039)	(0.028)	(0.013)	(0.040)	(0.029)
Income	0.027**	0.021	0.012	0.008*	-0.025	0.021
	(0.012)	(0.016)	(0.011)	(0.004)	(0.016)	(0.013)
Homeownership	-0.032	0.060	-0.008	-0.001	-0.041	-0.007
	(0.028)	(0.038)	(0.026)	(0.010)	(0.039)	(0.030)
Education above median	0.039	0.032	0.028	0.005	-0.051	-0.007
	(0.025)	(0.037)	(0.023)	(0.008)	(0.036)	(0.027)
Financial assets	-0.013	0.015	0.000	0.011	0.022	0.002
	(0.029)	(0.041)	(0.027)	(0.013)	(0.041)	(0.032)
Political views	-0.004	0.000	-0.005	-0.002	0.004	-0.002
	(0.005)	(0.007)	(0.005)	(0.002)	(0.007)	(0.005)
Borrower	-0.005	0.042	-0.001	-0.005	-0.039	-0.032
	(0.024)	(0.034)	(0.023)	(0.009)	(0.034)	(0.025)
Self employed	-0.058	-0.051	0.015	0.002	0.088	0.102*
	(0.040)	(0.067)	(0.047)	(0.018)	(0.069)	(0.060)
Observations	1032.000	1032.000	1032.000	1032.000	1032.000	1032.000
R-squared	0.035	0.033	0.028	0.043	0.028	0.022

Table A4: **Determinants of benchmark-consistent interpretations of macroeconomic shocks: additional controls.** This table reports coefficients from linear probability models (OLS), where the dependent variable equals one if the respondent's subjective impulse responses for inflation and unemployment match the sign predictions implied by the benchmark (see Section 5). The additional control variables included in this specification are a dummy for financial asset ownership, a 0–10 Likert scale for political views (0 = far left, 10 = far right), a borrower dummy (1 if any debt), and a dummy for self-employment. All regressions also control for marital status, presence of children, employment status, expectations about personal finances, a placebo comprehension score, and randomization group (positive vs. negative shock scenario). Robust standard errors in parentheses. */**/*** denote significance at the 10/5/1 percent levels, respectively.

	Difference in means	SE	p-value	Reject symmetry?
Monetary policy shock				
Saving increase	-.07	.02	0	Yes
Saving no change	.13	.03	0	Yes
Saving decrease	-.05	.02	.02	Yes
Spending increase	-.1	.02	0	Yes
Spending no change	.16	.03	0	Yes
Spending decrease	-.06	.03	.02	Yes
Oil shock				
Saving increase	-.02	.01	.22	No
Saving no change	.19	.03	0	Yes
Saving decrease	-.18	.03	0	Yes
Spending increase	-.14	.02	0	Yes
Spending no change	.23	.03	0	Yes
Spending decrease	-.09	.03	0	Yes
Tax shock				
Saving increase	0	.01	.66	No
Saving no change	.23	.03	0	Yes
Saving decrease	-.23	.03	0	Yes
Spending increase	-.03	.01	.02	Yes
Spending no change	.25	.03	0	Yes
Spending decrease	-.22	.03	0	Yes

Table A5: **Test for asymmetry in behavioral responses.** The table reports results from t-tests comparing mean responses across positive and negative scenarios for each shock and action. Responses are recoded so that opposite answers across scenarios are treated as equivalent (e.g., an increase under a positive shock is coded as a decrease under the corresponding negative shock). Reported are the differences in means, standard errors, and p-values. Symmetry is rejected when $p \leq 0.05$.

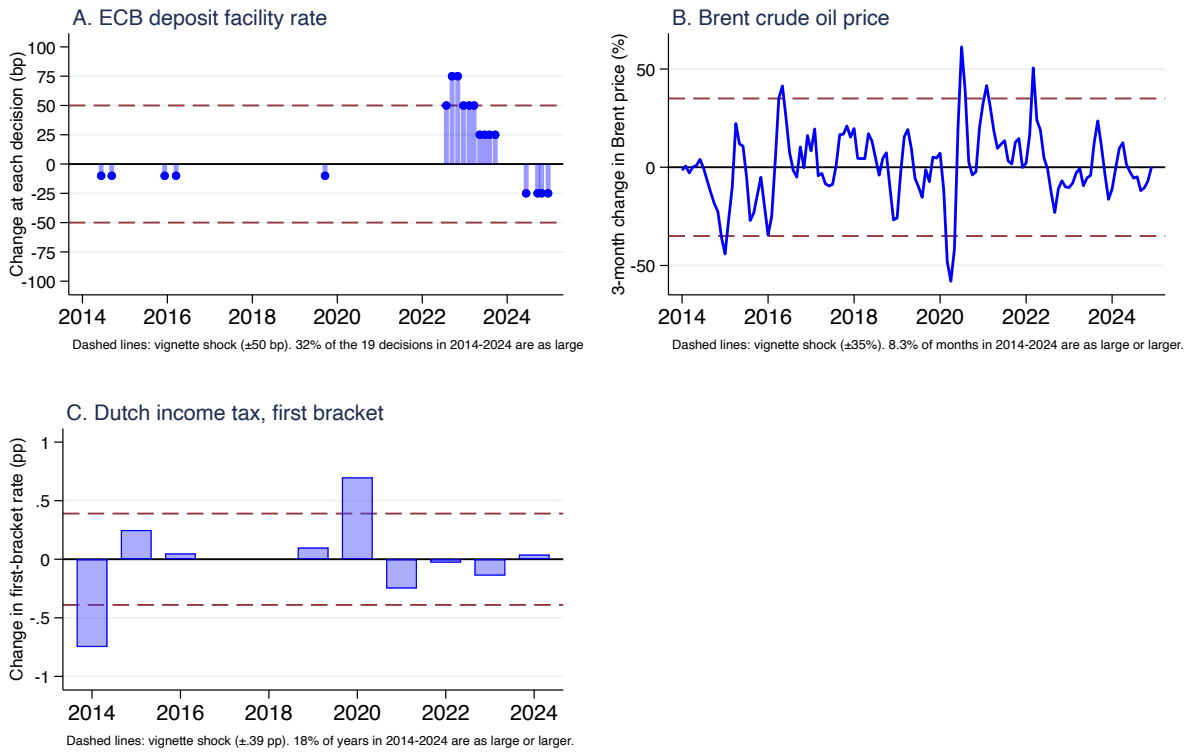


Figure A1: **Vignette shock sizes and observed changes, 2014—2024.** Dashed lines mark the size of the shock in the vignettes. Panel A: change in the ECB deposit facility rate at each policy decision, in basis points. Panel B: three-month percentage change in the monthly average Brent crude oil price. Panel C: annual change in the Dutch box-1 first-bracket income tax rate, including national insurance premiums, for taxpayers below state-pension age, in percentage points; the vignette shock (€150 per year) corresponds to about 0.39% of 2024 median gross personal income (€38,700). Sources: European Central Bank, ECB Deposit Facility Rate for the Euro Area [ECBDFR], and International Monetary Fund, Global Price of Brent Crude [POILBREUSDM], both retrieved from FRED, Federal Reserve Bank of St. Louis (https://fred.stlouisfed.org); Belastingdienst (Dutch Tax and Customs Administration), "Tarieven voor personen die de AOW-leeftijd nog niet hebben bereikt" (https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/werk_en_inkomen/bijzondere_situaties/teruggaaf_door_middeling_berekenen/aow-leeftijd-middeling/tarieven-voor-personen-die-de-aow-leeftijd-nog-niet-hebben-bereikt).



Figure A2: **Joint distribution of Signs of SIR for inflation and unemployment, separately for negative and positive scenarios.** This figure displays the joint distribution of households' subjective impulse responses (SIR) for inflation and unemployment following the three macroeconomic shocks (monetary, oil price, tax). The top panel shows responses to negative scenarios (i.e., rate hikes, oil price increases, tax hikes), while the bottom panel presents responses to positive scenarios (rate cuts, oil price declines, tax cuts). For comparability, the signs of SIR in the positive scenario group are flipped, so all responses can be interpreted as reactions to negative shocks. Each panel reports the share of respondents in each sign combination quadrant, with additional percentages indicating those who report no change in one variable (pink labels at the top) or in both (center label).

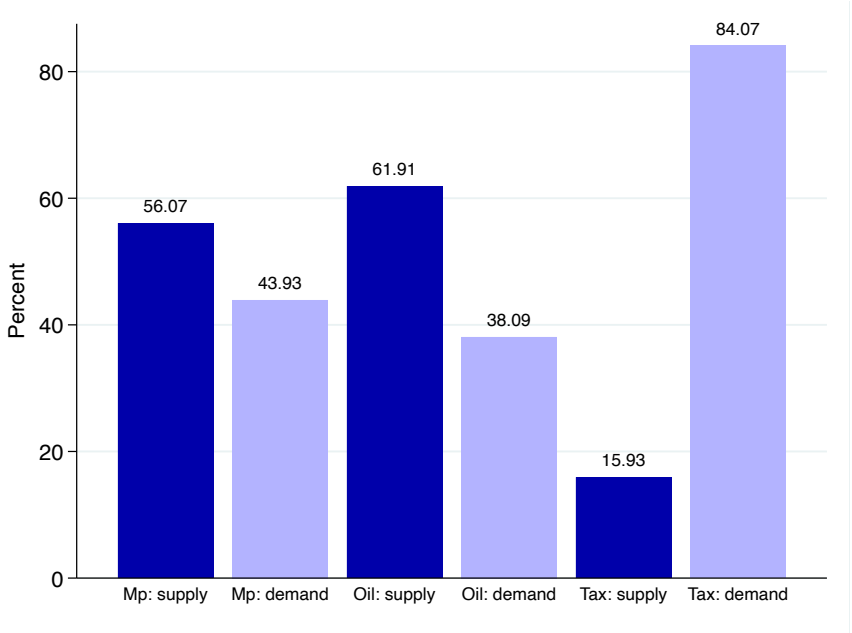


Figure A3: **Variable most affected by the shock: household expenditures or firms' costs.** This figure shows the share of households attributing each shock's primary effect to either the supply side (firms' costs) or demand side (household expenditure).

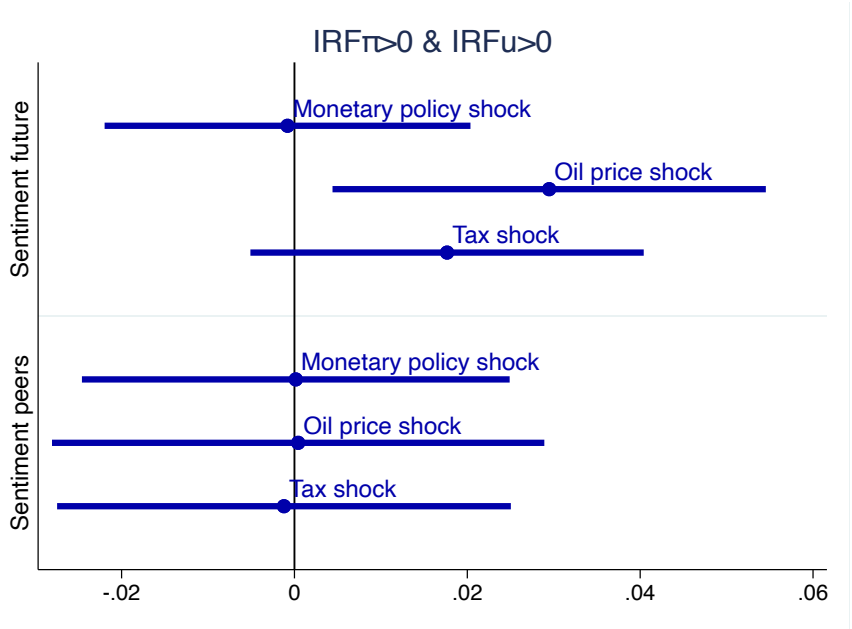


Figure A4: **Correlation between stagflationary beliefs and economic sentiment.** This figure plots the coefficients from separate OLS regressions where the dependent variable is a dummy equal to 1 if the respondent expects both inflation and unemployment to increase in response to the shock. The independent variables are two sentiment indicators: one measuring whether respondents expect their financial situation to improve over the next 12 months, and the other measuring whether they consider themselves financially better off than their peers. Both are measured on a 1–5 Likert scale. Regressions are estimated separately for each of the three shocks. All regressions control for gender, age, marital status, presence of children, personal net income, employment status, homeownership, expectations about personal finances, education (above median), a placebo comprehension score, and the randomization group (positive vs. negative shock scenario). Robust SE; 90% confidence bands.

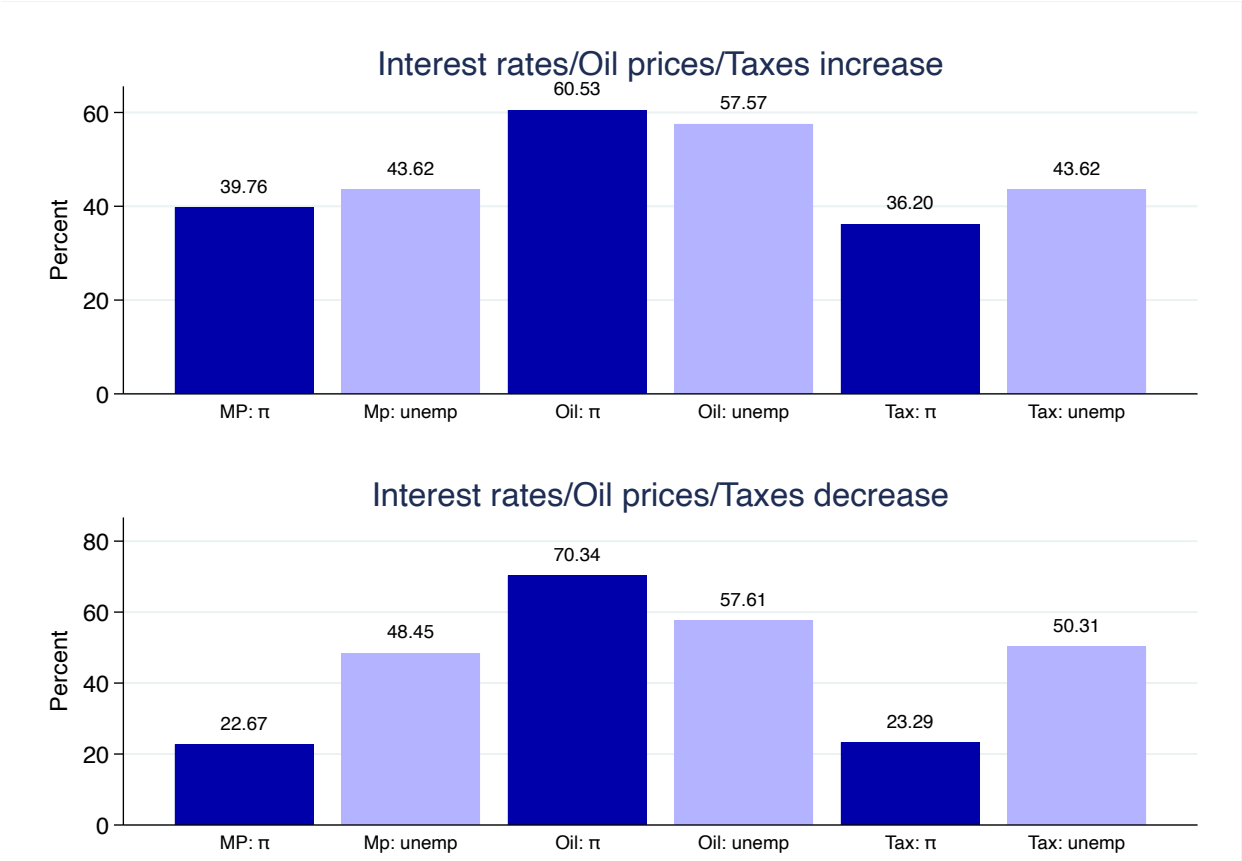


Figure A5: **Share of households with benchmark-consistent SIR sign, by variable and shock, separating between positive and negative scenarios.** This figure shows the percentage of households predicting a benchmark-consistent direction of the shock's impact on inflation and unemployment, separately for each macroeconomic shock and by shock sign.

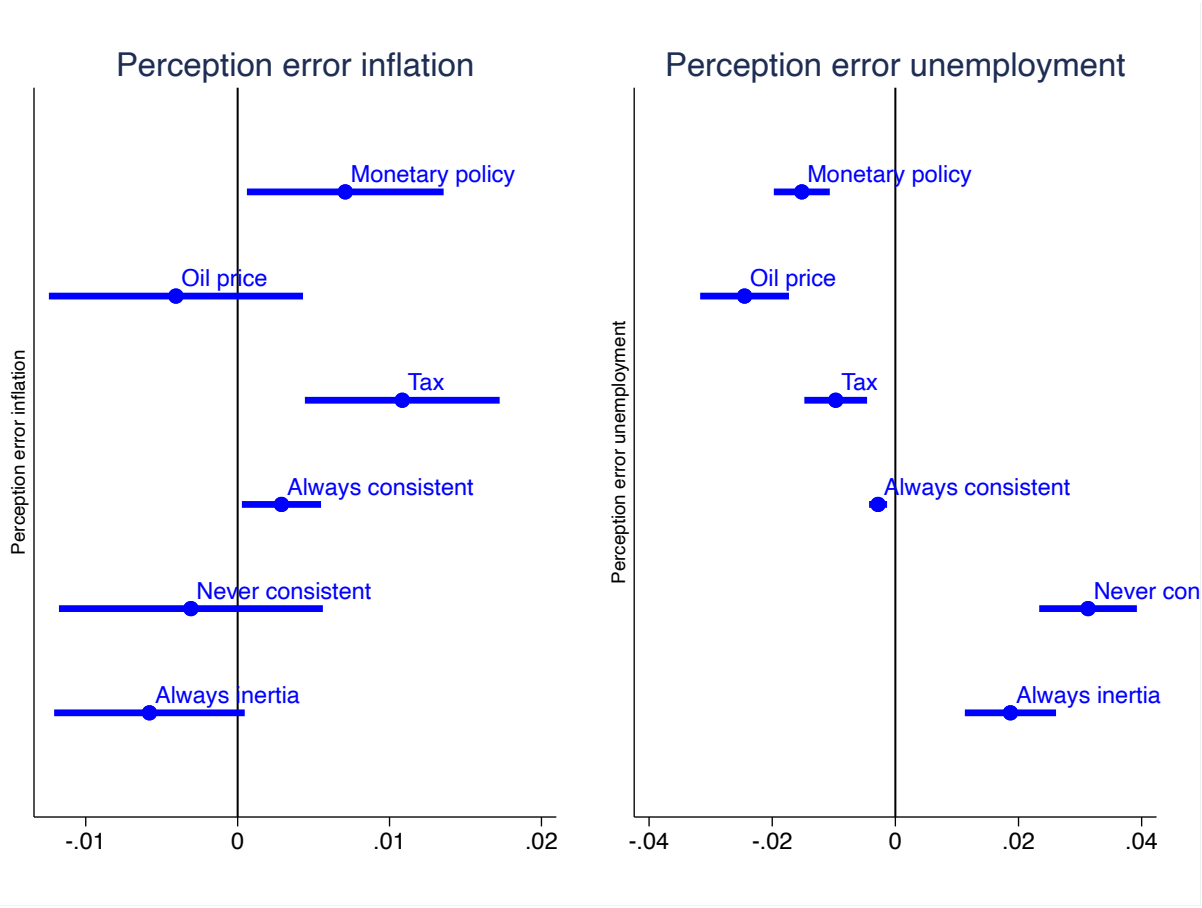


Figure A6: **Perception errors and benchmark-consistent interpretations of macroeconomic shocks.** This figure reports the coefficients from linear probability models regressing various indicators of belief consistency on perception errors for inflation and unemployment. Belief consistency is measured by dummy variables equal to one if the respondent's subjective impulse response (SIR) signs for inflation and unemployment match those implied by the benchmark, separately for each of the three shocks (monetary, oil, tax). Additional indicators include: "always consistent" (consistent with the benchmark for all shocks), "never consistent" (never consistent with the benchmark), and "always inertia" (reporting no change for at least one variable in each vignette). Perception errors are computed as the absolute difference between the respondent's perception of the current value of inflation and unemployment and the actual value observed in May 2024 (2.7% for inflation, 3.6% for unemployment). All regressions control for gender, age, marital status, presence of children, personal net income, employment status, homeownership, expectations about personal finances, education (above median), a placebo comprehension score, and the randomization group (positive vs. negative shock scenario). Robust SE, and 90% confidence bands.

Appendix B: Support analysis

B1 Random guessing probabilities

In the survey, participants provide point estimates for inflation and unemployment in each shock scenario. By computing the difference between these expectations—referred to as posteriors—and the unconditional forecasts recorded at the beginning of the survey, I derive the subjective impulse responses (SIR). I use the sign of each SIR (positive, negative, or zero) to assess whether respondents' expectations align with benchmark predictions. Simplifying, this task can be viewed as a "guessing game," where respondents must identify whether the IRF of each variable is positive, negative, or zero. Under random guessing, each possibility has a probability of 1/3.

Assuming independence across responses, I can compute the probability that a respondent would produce a fully consistent answer set purely by chance.

- IRF inflation: 3 options $\Rightarrow P_{IRF\pi}(\text{correct}) = \frac{1}{3}$, $P_{IRF\pi}(\text{wrong}) = \frac{2}{3}$
- IRF unemployment: 3 options $\Rightarrow P_{IRFu}(\text{correct}) = \frac{1}{3}$, $P_{IRFu}(\text{wrong}) = \frac{2}{3}$

Therefore, the probability of being consistent with the benchmark in any of the vignette scenarios equates to the probability of answering both questions correctly.

- Probability of being benchmark consistent for one vignette $= \frac{1}{3} \times \frac{1}{3} = \frac{1}{9} \approx 11\%$
- Probability of wrong interpretation of each vignette: $= 1 - \frac{1}{9} = \frac{8}{9} \approx 89\%$

Considering the three vignettes jointly, I get that

- Probability of being benchmark consistent in all three vignettes jointly $= \left(\frac{1}{9}\right)^3 \approx 0.137\%$
- Probability of being benchmark consistent for two vignettes out of three $= \binom{3}{2}\left(\frac{1}{9}\right)^2\left(\frac{8}{9}\right) \approx 3.292\%$
- Probability of being benchmark consistent for one vignette only $= \binom{3}{1}\left(\frac{1}{9}\right)\left(\frac{8}{9}\right)^2 \approx 26.337\%$
- Probability of not being benchmark consistent for any vignettes $= \left(\frac{8}{9}\right)^3 \approx 70.233\%$

Summary:

Outcome	Random guessing	Observed
All vignettes benchmark consistent	0.137%	1.44%
Benchmark consistent for 2 vignettes	3.291%	3.5% (mp & oil); 5.2% (mp & tax); 1.9% (oil & tax)
Benchmark consistent for 1 vignette	26.339%	4% (m.p. and tax); 34% (oil)
Never benchmark consistent	70.233%	46%

The third column of the table reports the share of respondents whose interpretations are consistent with the benchmark across all three vignettes, in two out of three, in only one, or in none—corresponding to the data shown in Figure 5. The probability of providing benchmark-consistent responses in all three cases is an order of magnitude higher than would be expected under random guessing, while the share of respondents with fully inconsistent answers (46%) is notably lower than the random benchmark. This pattern indicates that respondents are not simply guessing: rather, many appear to rely on internally coherent, though not necessarily benchmark-consistent, mental models.

B2 Robustness check: winsorizing at the 99th percentile

This appendix reports the main results of the paper using an alternative treatment of outliers, where point estimates are winsorized at the 99th percentile rather than at the 95th percentile, as in the main text. In practice, values above the 99th percentile are replaced with the 99th percentile itself.

The main conclusions remain unchanged. In particular:

- The distribution of subjective impulse responses (SIR) across shocks displays the same patterns documented in Section 6.1.
- The demographic correlates of benchmark-consistent interpretations remain stable.
- The relationship between forecast errors and benchmark-consistent interpretations is robust.
- The link between benchmark-consistent interpretations and households' saving and spending choices continues to hold.

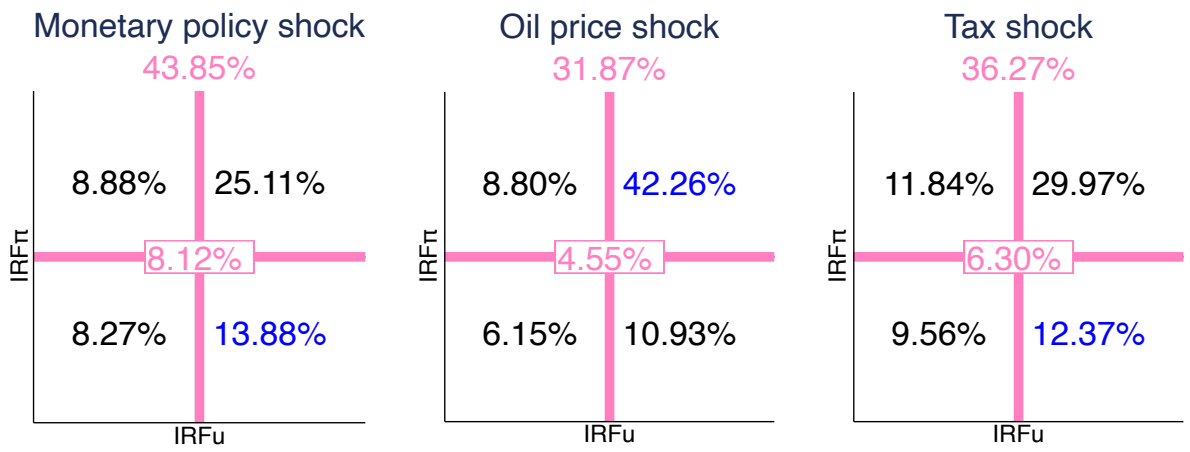


Figure B1: **Joint distribution of signs of SIR for inflation and unemployment. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 4.

	(1)	(2)	(3)	(4)	(5)	(6)
	MP shock	Oil shock	Tax shock	Always consistent	Never consistent	Always inertia
Gender: female	0.042*	-0.014	0.053**	0.022***	-0.015	0.004
	(0.022)	(0.031)	(0.021)	(0.007)	(0.031)	(0.024)
Age	-0.023	-0.034	-0.049**	-0.029***	0.034	0.019
	(0.024)	(0.035)	(0.024)	(0.010)	(0.035)	(0.026)
Married	0.014	-0.006	0.029	0.012	-0.018	-0.019
	(0.022)	(0.030)	(0.020)	(0.009)	(0.031)	(0.023)
Number of children	-0.006	0.024*	0.000	0.002	-0.028*	-0.018*
	(0.009)	(0.015)	(0.009)	(0.004)	(0.015)	(0.011)
Income	0.020**	0.039***	0.009	0.006**	-0.037***	0.007
	(0.010)	(0.014)	(0.010)	(0.003)	(0.013)	(0.011)
Employed	-0.026	-0.112***	-0.008	-0.002	0.125***	0.023
	(0.023)	(0.033)	(0.023)	(0.007)	(0.033)	(0.026)
Homeownership	-0.022	0.057*	-0.022	-0.000	-0.028	0.004
	(0.024)	(0.033)	(0.023)	(0.008)	(0.034)	(0.025)
Sentiment future	-0.004	0.029*	-0.007	0.000	-0.015	0.000
	(0.010)	(0.015)	(0.010)	(0.004)	(0.015)	(0.011)
Education	0.036*	0.008	0.028	0.005	-0.026	0.017
	(0.021)	(0.032)	(0.021)	(0.006)	(0.032)	(0.023)
Placebo score	-0.013*	0.010	-0.005	0.001	-0.000	0.021***
	(0.007)	(0.009)	(0.006)	(0.002)	(0.010)	(0.007)
Positive scenario	0.058***	-0.037	0.041**	0.004	-0.008	-0.019
	(0.020)	(0.028)	(0.018)	(0.006)	(0.028)	(0.021)
Observations	1237	1237	1237	1237	1237	1237
R-squared	0.021	0.026	0.019	0.025	0.019	0.016

Table B1: **Determinants of benchmark-consistent interpretations of macroeconomic shocks. Winsorizing at the 99th percentile.** Results closely replicate those shown in Table 5.

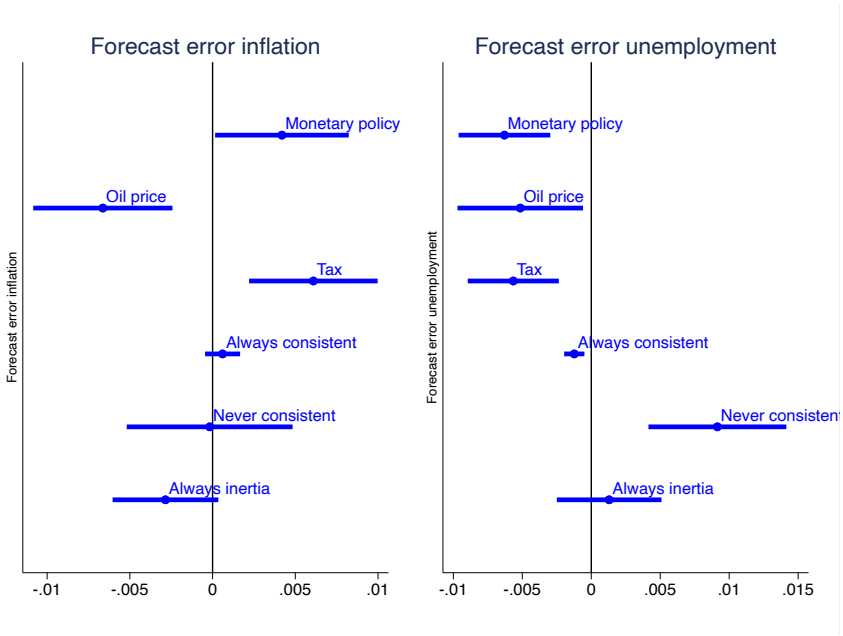


Figure B2: **Forecast errors and benchmark-consistent interpretations of macroeconomic shocks. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 8.

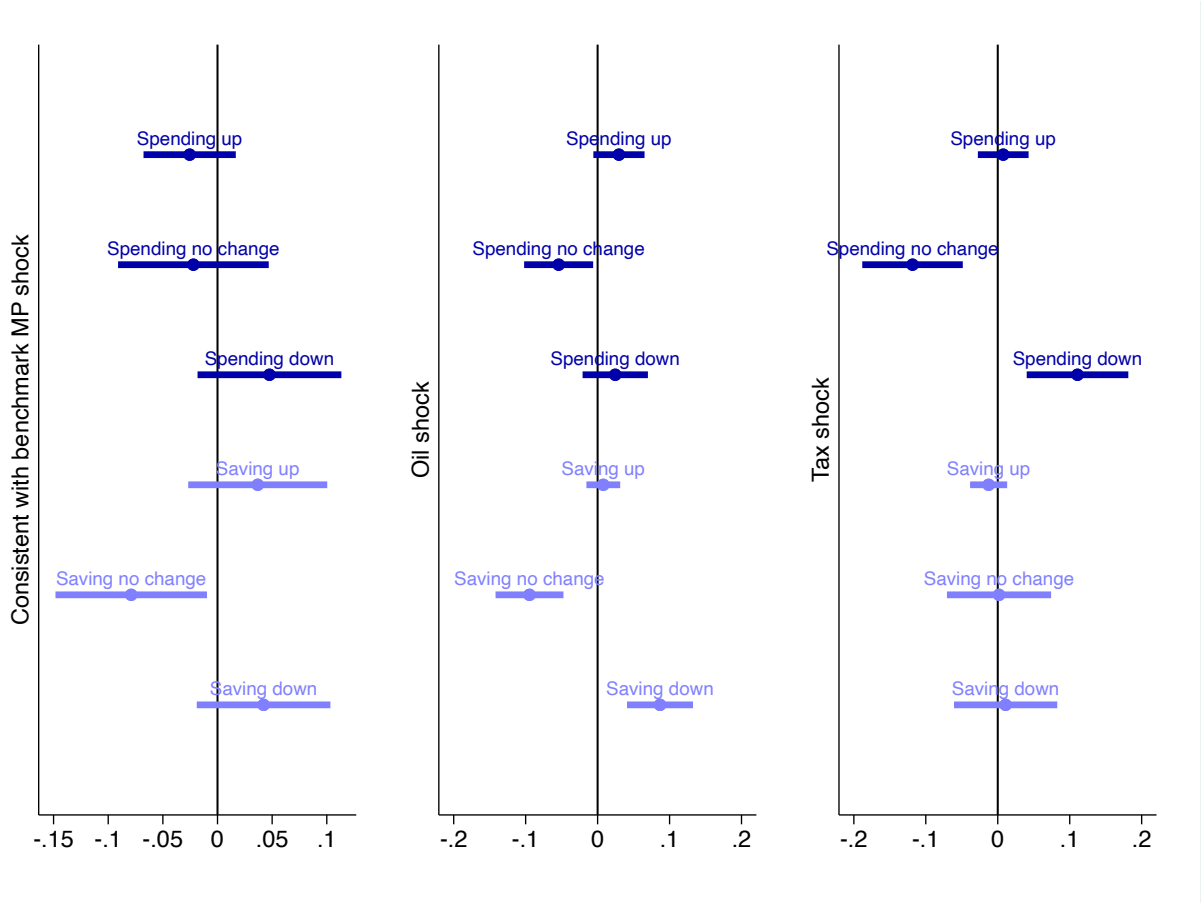


Figure B3: **Benchmark-consistent interpretation of shocks and spending/saving choices. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 10.

Appendix C: Survey questions

This appendix reports the questionnaire as fielded to the LISS panel in May 2024. The survey was administered in Dutch; the text below is an English translation. Only the questions used in this paper are reported. The full questionnaire is available from the author upon request.

Note: Section headings are added for clarity of presentation and were not shown to respondents.

Introduction

This questionnaire is about how you view important parts of the economy. Some questions may be difficult to answer. There are no right or wrong answers. We are interested in your opinion and how you experience it.

Financial situation

Q1. Do you agree or disagree with the following statements?

	1 Completely disagree	2	3	4	5 Completely agree
When I compare myself to my peers (such as family, friends or neighbors), I generally think I am better off financially.	◯	◯	◯	◯	◯
My financial situation will be better in 12 months than my financial situation is now.	◯	◯	◯	◯	◯

Inflation

The following questions are about inflation. Inflation is the general increase in the prices of goods and services. For example: if inflation is 2%, this means that the goods and services that you can buy for €100 today will cost €102 in a year. In the Netherlands, the lowest inflation in the past 20 years was 0.2%, while the highest inflation was 14.5%.

Q2. Do you think inflation is higher or lower today (May 2024) compared to 12 months ago (May 2023)?

- ◯ Definitely higher
- ◯ Probably higher
- ◯ Has remained the same
- ◯ Probably lower
- ◯ Definitely lower

Q3. 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.

_____ %

Q4. Do you think inflation will be higher or lower in 12 months (May 2025) than it is now (May 2024)?

- ◯ Definitely higher
- ◯ Probably higher
- ◯ Will remain the same
- ◯ Probably lower
- ◯ Definitely lower

Q5. What do you think the inflation rate will be in the Netherlands in the next 12 months (between May 2024 and May 2025)? Try to give as accurate an estimate as possible.

_____ %

Unemployment

The following questions concern unemployment. Someone is unemployed if they do not have a job, but are actively looking for work. The unemployment rate is the percentage of unemployed people in the total working population. In the past 20 years, the unemployment rate in the Netherlands has fluctuated between 3.2% and 9%.

Q6. Do you think the unemployment rate is higher or lower today (May 2024) than it was 12 months ago (May 2023)?

- ◯ Definitely higher
- ◯ Probably higher
- ◯ Has remained the same
- ◯ Probably lower
- ◯ Definitely lower

Q7. What do you think the unemployment 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.

_____ %

Q8. Do you think the unemployment rate will be higher or lower in 12 months (May 2025) than it is now (May 2024)?

- ◯ Definitely higher
- ◯ Probably higher
- ◯ Will remain the same
- ◯ Probably lower
- ◯ Definitely lower

Q9. What do you think the unemployment rate will be in the next 12 months (between May 2024 and May 2025)? Please try to give as accurate an estimate as possible.

_____ %

Hypothetical scenarios

The following questions are about situations or events in the economy. Answer the questions based on information and your personal assessment. There are no right or wrong answers: give your best estimate.

Copper mine in Australia

The Netherlands does not import copper from Australia. Imagine a new copper mine is discovered in Australia.

Q10. What happens then with the following matters?

	Rise	Fall	No change
The costs of Dutch companies	◯	◯	◯
The expenditure of Dutch households	◯	◯	◯
The prices of goods in the Netherlands	◯	◯	◯
Unemployment in the Netherlands	◯	◯	◯

ECB lowers the interest rate

Imagine that the European Central Bank unexpectedly **lowers** the interest rate from 4.5% to 4%.
No other major economic events occur at the same time.

Q11. Do you think you will do the following more or less if interest rates fall?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q12. What do you think will be most affected by the drop in interest rates?

- ◯ The costs of companies
- ◯ Household expenditure

Q13. *[If Q12 = Household expenditure]* What do you think: what changes in household spending when interest rates fall?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

[If Q12 = The costs of companies] What do you think: how will companies' costs change when interest rates fall?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

Q14. How do you think the prices of goods and services will change if interest rates fall?

- ◯ They will definitely rise
- ◯ They will probably rise
- ◯ They are not affected by the fall in interest rates
- ◯ They will probably fall
- ◯ They will definitely fall

Q15. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q16. What do you think: will companies hire more people or lay off more people in this situation?

- ◯ Definitely hire more people
- ◯ Probably hire more people
- ◯ This is not affected by the fall in interest rates
- ◯ Probably lay off more people
- ◯ Definitely lay off more people

Q17. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %

ECB raises the interest rate

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.

Q18. Do you think you will do the following more or less if interest rates rise?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q19. What do you think will be most affected by the rise in interest rates?

- ◯ The costs of companies
- ◯ Household expenditure

Q20. *[If Q19 = The costs of companies]* What do you think: how will companies' costs change when interest rates rise?

- ◯ Definitely increase
- ◯ Likely to increase

◯ Likely to decrease
◯ Definitely decrease

[If Q19 = Household expenditure] What do you think: what changes in household spending when interest rates rise?

◯ Definitely increase
◯ Likely to increase
◯ Likely to decrease
◯ Definitely decrease

Q21. How do you think the prices of goods and services will change if interest rates rise?

◯ They will definitely rise
◯ They will probably rise
◯ They are not affected by the increase in interest rates
◯ They will probably fall
◯ They will definitely fall

Q22. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q23. What do you think: will companies hire more people or lay off more people in this situation?

◯ Definitely hire more people
◯ Probably hire more people
◯ This is not affected by the increase in interest rates
◯ Probably lay off more people
◯ Definitely lay off more people

Q24. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %

Oil price falls

Imagine a political crisis being resolved in the Middle East, causing the price of oil **to drop** from $85 a barrel to $55 a barrel.

Q25. Do you think you will do more or less of the following if the oil price falls?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q26. What do you think will be most affected by the drop in oil prices?

◯ The costs of companies
◯ Household expenditure

Q27. *[If Q26 = The costs of companies]* What do you think: how will companies' costs change when oil prices fall?

◯ Definitely increase
◯ Likely to increase
◯ Likely to decrease
◯ Definitely decrease

[If Q26 = Household expenditure] What do you think: what changes in household spending when oil prices fall?

◯ Definitely increase
◯ Likely to increase
◯ Likely to decrease
◯ Definitely decrease

Q28. How do you think the prices of goods and services will change if the price of oil falls?

- ◯ They will definitely rise
- ◯ They will probably rise
- ◯ They are not affected by the drop in oil prices
- ◯ They will probably fall
- ◯ They will definitely fall

Q29. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q30. What do you think: will companies hire more people or lay off more people in this situation?

- ◯ Definitely hire more people
- ◯ Probably hire more people
- ◯ This is not affected by the drop in oil prices
- ◯ Probably lay off more people
- ◯ Definitely lay off more people

Q31. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %

Oil price rises

Imagine a sudden political crisis in the Middle East, causing the price of oil **to rise** from $85 a barrel to $115 a barrel.

Q32. Do you think you will do more or less of the following if oil prices rise?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q33. What do you think will be most affected by the rise in oil prices?

- ◯ The costs of companies
- ◯ Household expenditure

Q34. *[If Q33 = The costs of companies]* What do you think: how will companies' costs change when oil prices rise?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

[If Q33 = Household expenditure] What do you think: what changes in household spending when oil prices rise?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

Q35. How do you think the prices of goods and services will change as the price of oil rises?

- ◯ They will definitely rise
- ◯ They will probably rise
- ◯ They are not affected by the increase in oil prices
- ◯ They will probably fall
- ◯ They will definitely fall

Q36. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q37. What do you think: will companies hire more people or lay off more people in this situation?

- ◯ Definitely hire more people
- ◯ Probably hire more people
- ◯ This is not affected by the increase in oil prices
- ◯ Probably lay off more people
- ◯ Definitely lay off more people

Q38. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %

Income tax cut

Imagine that the Netherlands decides to withdraw from an agreement with the European Union. The agreement stated that the Dutch government must spend money to reduce carbon emissions. Because the Netherlands withdraws, the government has to spend less money. The government decides to reduce income tax by €150 from now on. As a result, the average Dutch citizen will pay 1% **less** tax on his/her salary each year.

Q39. Do you think you will do the following more or less if income tax is reduced?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q40. What do you think will be most affected by the income tax cut?

- ◯ The costs of companies
- ◯ Household expenditure

Q41. *[If Q40 = Household expenditure]* What do you think: what will change in household spending if income taxes are lowered?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

[If Q40 = The costs of companies] What do you think: how will the costs of companies change if income taxes are lowered?

- ◯ Definitely increase
- ◯ Likely to increase
- ◯ Likely to decrease
- ◯ Definitely decrease

Q42. How do you think the prices of goods and services will develop if income tax is reduced?

- ◯ They will definitely rise
- ◯ They will probably rise
- ◯ They are not affected by the tax reduction
- ◯ They will probably fall
- ◯ They will definitely fall

Q43. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q44. What do you think: will companies hire more people or lay off more people in this situation?

◯ Definitely hire more people
◯ Probably hire more people
◯ This is not affected by the tax reduction
◯ Probably lay off more people
◯ Definitely lay off more people

Q45. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %

Income tax increase

Imagine that the Netherlands enters into an agreement with the European Union. This agreement states that the Dutch government must spend money to reduce CO_2 emissions. In order to pay for this, the government decides to increase income tax by €150 from now on. As a result, the average Dutch citizen will pay 1% **more** tax on his/her salary every year.

Q46. Do you think you will do the following more or less if income tax increases?

	More	Equally	Less	*Does not apply*
Spending money (excluding mortgage and rent)	◯	◯	◯	◯
Save money	◯	◯	◯	◯

Q47. What do you think will be most affected by the income tax increase?

◯ The costs of companies
◯ Household expenditure

Q48. *[If Q47 = The costs of companies]* What do you think: how will the costs of companies change if income taxes are increased?

◯ Definitely increase
◯ Likely to increase
◯ Likely to decrease
◯ Definitely decrease

[If Q47 = Household expenditure] What do you think: what will change in household spending if income taxes are increased?

◯ Definitely increase
◯ Likely to increase
◯ Likely to decrease
◯ Definitely decrease

Q49. How do you think the prices of goods and services will change if income taxes are increased?

◯ They will definitely rise
◯ They will probably rise
◯ They are not affected by the tax increase
◯ They will probably fall
◯ They will definitely fall

Q50. What do you think inflation would be in 12 months if this event happened today?

_____ %

We have a few additional questions about this event. [Vignette repeated.]

Q51. What do you think: will companies hire more people or lay off more people in this situation?

◯ Definitely hire more people
◯ Probably hire more people
◯ This is not affected by the tax increase
◯ Probably lay off more people
◯ Definitely lay off more people

Q52. What do you think the unemployment rate would be in 12 months if this event happened today?

_____ %