People's Understanding of Macroeconomic Shocks *

Jessica Piccolo

University of Padova

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Abstract

How do households' beliefs respond to macroeconomic shocks? I design and field a novel survey experiment that elicits expectations about inflation and unemployment following three canonical shocks associated with unexpected changes in the monetary policy rate, oil prices, and income taxes. I compare responses to predictions from standard macroeconomic models and find substantial deviations: only 1% of respondents align with theory across all shocks. Alignment with textbook models varies by shock, and is systematically related to gender, education, income, age, and homeownership. Most households interpret all shocks as both inflationary and recessionary. Many display belief inertia, failing to revise expectations in response to the shock. Crucially, those with mental models in line with textbook frameworks are more likely to adjust their saving and spending. These findings suggest that heterogeneity in macroeconomic understanding may hinder policy transmission and exacerbate the distributional consequences of 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 and Gorodnichenko (2015a)), and subject to significant cognitive (D'acunto et al. (2023)) and informational constraints (Mankiw and Reis (2002), Coibion and Gorodnichenko (2012)). 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 muting or distorting the intended effects of policy. For instance, do households recognize a monetary tightening as disinflationary? Do they perceive an oil price surge as simultaneously inflationary and recessionary? Do they view a tax cut as stimulative? And, most importantly, do such beliefs actively guide their financial decisions?

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 elicit respondents' expectations about inflation and unemployment (measured as point forecasts), 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 aggregate demand and supply (AD-AS) models, as pre-

sented in widely used macroeconomics textbooks such as Blanchard (2020) and Mankiw (2018).[1] These theoretical predictions are further supported by the empirical literature, particularly vector autoregressive (VAR) and local projections (LP) 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 textbook 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 survey yields four main findings. First, most households do not interpret macroeconomic shocks in line with textbook models. Just 1% of respondents provide sign-consistent expectations for both inflation and unemployment across all three shocks. Disaggregating by shock, 14% correctly interpret the monetary policy shock, 41% the oil shock, and 12% the tax shock.

Analyzing the expected effects of each shock on inflation and unemployment separately, I find that all three shocks are commonly perceived as both inflationary and recessionary: most respondents anticipate simultaneous increases in inflation and unemployment. While this pattern aligns with textbook predictions in the case of oil shocks, it is particularly striking for monetary policy shocks. This suggests that many households adopt a "supply-side" view of the economy (Kamdar, 2019), overlooking the demand-channel trade-off that underpins standard monetary theory. Further evidence of this interpretation comes from how respondents understand the transmission channels of shocks. When asked whether a shock primarily affects firm costs (a supply-side channel) or household expenditure (a demand-side channel), most classify the oil price shock as a supply shock and the tax shock as a demand shock —consistent with standard macroeconomic reasoning. In the case of monetary policy, however, the majority perceive it as a supply-side shock. This suggests that households tend to interpret interest rate hikes not as a brake on aggregate demand, but as a direct burden on firms, raising production costs and

[1] July 20, 2025 - I asked ChatGPT the following question: "What were the record-selling textbooks for a Macro 101 course worldwide in 2024?". Here's an extract of ChatGPT's answer: "The top-selling macroeconomics textbooks used in Macro 101 (introductory macroeconomics) courses worldwide in 2024 were: 1) Principles of Economics by N.Gregory Mankiw. This is the flagship Principles book used widely in introductory economics courses globally, including macroeconomic portions. With over one million lifetime copies sold and a reputation as the "most popular economics textbook," it remains the foremost choice for Macro101 classes in 2024. 2) Macroeconomics by Olivier Blanchard (global edition). Blanchard's Macroeconomics is a dominant undergraduate macro textbook, reaching its 9th edition published in 2024 and translated into many languages. It is a staple in Macro101 curricula around the world [...]"

contributing to inflation in line with a "cost-channel" view of monetary policy (Christiano et al., 2005).

Second, the ability to interpret shocks varies systematically with demographic characteristics, and the patterns differ by shock type. Being a woman and having a higher level of education is strongly associated with theory-consistent interpretation of monetary policy shocks, while home-ownership predicts a better understanding of oil shocks, likely reflecting greater attentiveness to energy prices. Higher income is associated with greater alignment with theoretical models across all three shocks. Instead, age is negatively correlated with accuracy across the board: older respondents are systematically less likely to interpret shocks in line with textbook models. Moreover, households whose unconditional expectations are closer to realized values—that is, who make smaller forecast errors—also display greater theory-consistency.

Third, a substantial share of the population appears inert in the face of macroeconomic shocks. Between 34% and 44% of respondents give identical point estimates before and after the vignette, indicating no revision in their inflation or unemployment expectations. Inertia is even more pronounced on the behavioral side: most households report no planned change in saving or spending, even when confronted with a sizable hypothetical shock.

Lastly, a closer look at spending and saving responses reveals an important asymmetry. Households are more reactive to negative shocks—such as interest rate hikes, oil price increases, or tax increases—than to positive ones. In the case of expansionary (e.g., rate cuts, oil price decreases, or tax relief), the vast majority opt to "do nothing." In contrast, when facing negative scenarios, a nontrivial share of households (up to 40% of the sample in the tax increase scenario) report reductions in both spending and saving, suggesting that they perceive these shocks as tightening their budget constraints. To better understand how belief formation shapes intended behavior, I examine whether providing inflation and unemployment forecasts which are sign-consistent with standard macroeconomic models is associated with distinct patterns of spending and saving. I find that macroeconomic beliefs more in line with textbook models are systematically linked to a lower likelihood of reporting "no change" in behavior.

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 "supply-side" or 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. Models that combine a small share of theory-consistent agents with larger groups of inert and heuristic households would better capture the muted, asymmetric, and heterogeneous responses observed in practice. 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. Beliefs about the effects of policy on inflation and unemployment shape budgeting, saving, and consumption decisions, and thereby condition the actual transmission of policy. Communication strategies that clearly explain how policies affect prices, employment, and household finances—and measures that operate through salient cash-flow channels—are likely to achieve stronger and more equitable real-world effects than those relying solely on expectation management. This perspective aligns with calls for central banks and fiscal authorities to improve the clarity and accessibility of their communication with the public (Haldane & McMahon, 2018), and to complement such efforts with broader initiatives to strengthen financial and economic literacy (Lusardi & Mitchell, 2023). By fostering a more accurate understanding of policy channels, such measures may narrow the gap between intended and realized effects of policy.

2 Literature review

This paper is closely related to Andre et al. (2022), who study how individuals form beliefs about macroeconomic shocks using vignette-based experiments embedded in households and experts surveys. While both studies share a core interest in expectations about inflation and unemployment in response to canonical macroeconomic shocks—and rely on survey vignettes as the main empirical tool—they differ in several fundamental respects. Andre et al. (2022) focus on the structure of belief formation, introducing the concept of subjective models and examining how associative memory and cognitive heuristics shape expectations. Their contribution lies in mapping how people reason about the macroeconomy and in comparing these reasoning patterns across laypeople and experts. In contrast, my paper centers on belief consistency with theory and its behavioral implications. I evaluate whether households interpret macroeconomic shocks in a way that is aligned with textbook economic models and investigate how this alignment affects intended spending and saving responses. In addition, I contribute new evidence on the heterogeneity of macroeconomic understanding by examining how characteristics such as gen-

der, education, income, and homeownership predict differences in interpretation—a dimension not addressed in Andre et al. (2022). This analysis also draws on the rich set of demographic information available through the linkage with the LISS panel datasets.

This work is also related to Piccolo et al. (2025), which uses the same original dataset to study how individuals interpret the impact of a monetary policy shock on inflation and unemployment. The two papers differ along several dimensions. The present paper investigates whether households' beliefs align with the predictions of benchmark macroeconomic models, whose implications for the effects of monetary, oil, and tax shocks are also supported by empirical evidence from the existing literature. I then examine whether consistency with these benchmark predictions is systematically associated with intended economic behavior, such as adjustments in spending and saving. In doing so, I also document how demographic characteristics—including education, income, and age—relate to adherence to standard theoretical frameworks. Differently, Piccolo et al. (2025) focuses on monetary policy shocks, investigating the belief formation and behavior of households with a focus on education.

Beyond these contributions, this paper also speaks to a growing literature that investigates how households interpret macroeconomic phenomena and how such interpretations vary across individuals. Much of this work has focused on beliefs and narratives about the origins and causes of inflation (e.g., Andre et al. (2024), Trebbi (2024), Binetti et al. (2024)) and on the conduct of monetary policy (Carvalho and Nechio (2014)); other contributions have documented heterogeneity in the interpretation of specific policy shocks by examining which groups update their beliefs most strongly in response to monetary policy (Claus and Nguyen (2020)) or trade policy and tariffs (Hirs Garzón et al. (2025)). While this line of research has yielded important insights into the public's understanding of inflation and policy interventions, far less is known about how households interpret other macroeconomic shocks, such as oil price increases or fiscal changes, and whether they perceive these shocks as personally relevant. This paper contributes to filling that gap by comparing interpretations across three distinct types of shocks—monetary, oil price, and tax—within a unified survey framework, allowing for a systematic assessment of both belief alignment with theory and behavioral responsiveness.

This paper also explores how individual characteristics predict variation in macroeconomic expectations, contributing to a growing literature on the demographic determinants of belief formation. Prior work has documented systematic differences in expectations based on financial literacy and age (Bruine de Bruin et al., 2010), gender (D'Acunto et al., 2020; Reiche, 2024), political orientation (O. Bachmann et al., 2021), cognitive ability (D'acunto et al., 2023), saving

and borrowing status (Masolo & Monti, 2024), homeownership (Minina et al., 2024), and personal experience (Malmendier & Nagel, 2015). While most of this literature focuses on the level or persistence of inflation expectations, my contribution shifts the focus to the interpretation of macroeconomic shocks. I examine how individual characteristics predict whether respondents form beliefs that are aligned with textbook macroeconomic theory, providing new insight into the sources of heterogeneity in how households process and react to economic news.

The finding that oil price shocks are more widely understood than monetary or tax shocks connects to the literature on salience and attention in economic reasoning (Bordalo et al., 2020; Gennaioli & Shleifer, 2010). Salient shocks—those that are personally visible or frequently highlighted in public discourse—are easier for households to process and integrate into their macroeconomic reasoning (D'Acunto et al., 2021; Shiller, 1997). A growing body of evidence shows that households often associate inflation with energy and gasoline prices, which are purchased frequently (Georganas et al., 2014) and thus highly salient (Binder, 2018; Coibion & Gorodnichenko, 2015b). This paper contributes to that literature by providing novel evidence on how households rank the relevance of different macroeconomic shocks and which ones are behaviorally consequential.

This paper also adds to the extensive literature examining the relationship between expectations and household spending behavior. Much of this work has focused on the link between inflation expectations and consumption decisions (e.g., R. Bachmann et al. (2015); Crump et al. (2022); D'Acunto et al. (2016); Burke and Ozdagli (2023); Dräger and Nghiem (2021)), often using innovative survey designs and randomized information treatments to causally identify the role of beliefs (e.g., Armantier et al. (2016); Cavallo et al. (2017); Armona et al. (2019); Roth and Wohlfart (2020); Binder and Rodrigue (2018); Coibion, Georgarakos, et al. (2023)). Building on this foundation, I extend the analysis in several directions. I examine how households respond to macroeconomic shocks—rather than to beliefs alone—by embedding those shocks directly into vignette scenarios and eliciting intended adjustments in behavior. This approach allows me to simulate an exogenous shock environment and assess its impact on reported decisions, bypassing the challenge of belief endogeneity that often complicates observational studies. In addition to consumption, I also study saving responses, which remain relatively underexplored in this literature. I find that individuals whose interpretations of the consequences of shocks on inflation and unemployment align with textbook models are significantly less likely to report behavioral inertia and more likely to adjust either spending or saving in response to the shock. Finally, I document an asymmetry in these choices: households are more prone to adjust saving

and spending in response to recessionary shocks, while expansionary shocks often elicit no reported change. This connects to the literature on negativity bias, whereby adverse events exert disproportionately larger effects on cognition and action than favorable ones (Baumeister et al., 2001; Rozin & Royzman, 2001), and to evidence from studies showing that personal experiences of downturns shape expectations and financial behavior (Kuchler & Zafar, 2019; Malmendier & Nagel, 2011).

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: one comparing their outlook on personal finances to their past, and the other relative to their peers.

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.[2]

The second section introduces all respondents to three vignettes, describing hypothetical yet plausible macroeconomic shocks: a monetary policy shock (unexpected change in the policy

[2]The placebo vignette describes an hypotetical scenario in which 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 firm costs, household consumption, 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 firm 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 as a control in the regression analysis. For further discussion of the placebo design and scoring rationale, see Piccolo et al. (2025).

rate), an oil price shock (driven by a sudden geopolitical crisis in the Middle East), and a fiscal shock (stemming from revised environmental agreements 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, debt status, and income.

Following each vignette, respondents report how they would adjust a set of economically relevant behaviors, in particular non-housing consumption and savings: 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 whether the primary effect occurs via household consumption or 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 expectations measured before and after the vignette allows me to identify the causal effect of macro shocks on households' beliefs.

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 2 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 (the vignette highlights this corresponds to roughly 1% of the median salary in the Netherlands), 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. In the tax shock scenario, this framing signals to respondents that the additional tax revenue is transferred abroad without domestic compensation. Specifically, the funds are described as a capital outflow not offset by increases in public spending or domestic investment, thereby ensuring that the scenario represents a pure tax shock. 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 Karadi (2020) yield to 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 five 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 three to four times smaller than the 1% shock featured in the vignette. 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 historically observed policy actions and are therefore empirically plausible and unlikely to be perceived by households as unrealistic.

3.3 Sample and data collection

The survey was fielded during the month of 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 1, 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,[3] 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 Core Study, enabling analyses of heterogeneity along dimensions such as income, personality, political preferences, and values. The survey analyzed in this study is one such ad-hoc modules.

3.4 Data cleaning

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.[4] 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, which 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.

[3]The sample of the survey presented in this paper was randomly selected from among the LISS Panel participants.
[4]The 5th percentile of completion time in the original sample corresponds to 5 minutes and 33 seconds.

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.[5] This is a standard data-cleaning practice, also adopted in Kim and 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 this 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. I interpret this difference as the subjective impulse response function (SIRF) of households' beliefs regarding inflation and unemployment.

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

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

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 SIRFs for inflation and unemployment, while Table 3 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, the median expected effect is close to zero for both monetary and fiscal shocks, regardless of the shock's direction, suggesting that respondents generally do not anticipate large labor market effects from the changes described in the vignettes. Oil shocks elicit a somewhat larger—but still symmetric—response: the median respondent expects unemployment to rise by 0.5 percentage points when oil prices increase and to fall by the same amount

[5] Results are robust to winsorizing at the 99th percentile; see Appendix .2

when they decrease. Inflation expectations are also symmetric in the case of oil shocks, with a median change of 1 percentage point following an oil price rise and a decline of equal magnitude when oil prices fall. For monetary and tax shocks, point estimates suggest slightly larger median declines in inflation in the case of easing or tax cuts than the corresponding increases in the tightening or tax hike scenarios, but the differences are small. The variance of the SIRFs is broadly similar across positive and negative scenarios for all shocks.

To formally test for asymmetry, I regress the SIRFs (with the sign reversed for respondents assigned to the positive-shock group) on a dummy for the randomization group (=1 for negative scenario), along with demographic controls and interactions. The coefficient on the randomization dummy (reported in figure 3) is never statistically significant, confirming that the SIRFs are symmetric with respect to the sign of the shock. I therefore proceed by pooling positive and negative scenarios, reversing the sign of SIRFs from the positive-shock group so that all observations can be interpreted as responses to a negative shock. Robustness checks by shock sign are reported in the Appendix.

5 Benchmark: theoretical frameworks

I now consider the predictions of reference theoretical models about the responses of inflation and unemployment to the three shocks in my analysis. These benchmark models are drawn from standard macroeconomics textbooks such as Blanchard (2020) and Mankiw (2018), which present the core logic of the New Keynesian framework, and represent a broad consensus among macroeconomists on the typical transmission mechanisms through which shocks affect prices and real activity. Moreover, the predictions of these models are supported by an extensive empirical literature using time series data and structural VAR and local projection methodologies to estimate the effects of macroeconomic shocks on inflation and unemployment. In this sense, the transmission mechanisms outlined here reflect how macroeconomics is commonly taught and applied in theoretical settings, providing a well-established benchmark with which household expectations can be meaningfully compared.

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).[6] 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 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 benchmark 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

[6]The contributions by Miranda-Agrippino and Ricco (2021) and Jarociński and Karadi (2020) address a critical challenge in identifying monetary policy shocks—namely, that conventional instruments often conflate true policy surprises with information about the underlying state of the economy. To overcome this, the authors develop novel high-frequency instruments that account for informational rigidities. Both Miranda-Agrippino and Ricco (2021)'s and Jarociński and Karadi (2020)'s instruments are now widely adopted in empirical macroeconomic research.

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.[7] 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 textbook macroeconomic theories if their SIRFs 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 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 theory-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 theory-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 theory-consistent expectations.

Figure 4 and table A1 summarize these benchmark classifications.

[7]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)

6 Households understanding of the shocks

6.1 Belief consistency with textbook theories

6.1.1 Signs of the Impulse Response Functions

With the benchmark models established, I turn to the empirical core of the analysis: assessing whether households' expectations about inflation and unemployment move in the directions predicted by theory. I begin by examining the signs of respondents' subjective impulse responses (SIRFs) to the three macroeconomic shocks.

Figure 5 displays the joint distribution of subjective IRFs for inflation (IRF_π) and unemployment (IRF_u) in response to the three negative macroeconomic shocks: the monetary tightening, the oil price increase, and the tax hike described in the vignettes. The signs of IRFs are reversed for respondents assigned to the positive-shock group, so that all observations reflect expectations under a negative shock. Each panel partitions respondents into four quadrants, defined by the sign of their IRFs. The upper-right quadrant captures those expecting both inflation and unemployment to rise; the upper-left, those expecting lower unemployment and higher inflation; the lower-left, both variables decreasing; and the lower-right, higher unemployment and lower inflation. Percentages shown at the top of each panel refer to respondents who report a zero response for either inflation or unemployment, while the central percentage corresponds to those reporting no change in both.

Several patterns emerge from the figure. First, the proportion of households whose expectations are consistent with textbook predictions regarding the sign of the IRFs varies substantially across shocks. As shown more clearly in Figure 6, only 14% of respondents select the theoretically correct sign combination for the monetary policy shock, compared to 41% for the oil shock and 12% for the tax shock. This suggests that, among the three, the inflationary and contractionary nature of oil shocks is most readily understood by households. One likely explanation is that oil price changes translate quickly and visibly into household bills—such as energy or fuel costs—which are incurred regularly and are highly salient. In contrast, the effects of income taxes are recorded only once a year and are typically processed through complex tax statements, making them less transparent. Monetary policy shocks, meanwhile, operate through less direct channels and are possibly salient just for households directly affected—such as mortgagors or

those holding interest-sensitive assets.[8]

Second, across all three shocks, the most commonly selected quadrant is the one in which both inflation and unemployment are expected to rise.[9] This joint response—interpreting the shocks as both inflationary and recessionary—is consistent with a supply-side narrative in which inflation and unemployment are perceived to move in the same direction, a pattern which has also been documented in studies of households' unconditional expectations (see, e.g., Candia et al. (2020); Bhandari et al. (2025); Zhang (2024); Ferreira and Pica (2024); Gonçalves Raposo (2025): Kamdar (2019)). I find that this interpretation dominates even when households are presented with specific shock-based scenarios. For oil shocks, this aligns with standard macroeconomic benchmark discussed in section 5: rising production costs reduce output and drive up prices. Interestingly, several respondents adopt the same interpretation for the monetary policy shock. This response pattern corresponds non-standard, more sophisticated cost-channel models of monetary transmission, where firms' working capital requirements or cash-in-advance constraints lead higher interest rates to raise production costs, shifting the supply curve and resulting in stagflation-like dynamics (i.e., Christiano et al. (2005), Barth and Ramey (2001), Ravenna (2007)). A related explanation is provided by the "cost-of-living" hypothesis formulated by Bolhuis et al. (2024), which emphasizes the role of mortgage rates as a salient component of households' expenses. When interest rates rise, higher mortgage payments can be perceived as direct increases in the cost of living, fueling inflation expectations and deteriorating economic sentiment—potentially leading respondents to associate monetary tightening with both rising prices and worsening labor market conditions.[10] A further, though more theoretical, perspective that aligns with households' stagflationary views in response to monetary shocks is provided by

[8]Disaggregating by the sign of the shocks (refer to figure A1), some differences appear when comparing responses to positive and negative scenarios. For monetary policy and tax shocks, households are more likely to provide textbook-consistent responses when exposed to negative shocks: consistency reaches 17% for interest rate hikes versus 10% for rate cuts, and 14% for tax increases versus 10% for tax cuts. In contrast, for oil shocks, consistency is slightly higher in the positive scenario (43%) than in the negative one (39%). Importantly, however, the ranking across shocks remains unchanged: oil shocks are consistently interpreted more in line with textbook macroeconomic models than monetary policy shocks, which in turn outperform tax shocks.

[9]Figure A1 shows that the expectation for inflation and unemployment to move in the same direction as the shock is the most commonly selected option in both positive and negative scenarios.

[10]To explore this hypothesis, Figure A2 examines whether perceiving a shock as simultaneously inflationary and recessionary is correlated with respondents' economic sentiment. I construct a dummy equal to 1 if a respondent expects both inflation and unemployment to increase (i.e., positive SIRFs for both variables), and regress this indicator on two sentiment measures elicited in the survey: one comparing the respondent's current financial situation to the past, and another comparing it to that of their peers. The results show no statistically significant relationship in most cases, with the only exception being the oil price shock and sentiment relative to one's own finances. Overall, these findings suggest that general sentiment is not a primary driver of households' stagflationary views.

the fiscal theory of the price level (Cochrane (2023)). In this framework, when fiscal policy is "active" and does not adjust primary surpluses, a rate hike raises the government's debt-servicing costs; if these costs are not offset by future fiscal tightening, the adjustment occurs through higher prices, so that monetary contractions can be inflationary rather than disinflationary.

Overall, the interpretation of all the shocks as both inflationary and recessionary may reflect a more general heuristic among households that any macroeconomic disturbance—regardless of origin—tends to move inflation and unemployment in the same direction of the shock (both increasing when interest rates, oil prices, or taxes increase, and both falling when the shock variables fall). This reasoning is also consistent with a partial-equilibrium perspective, in which households focus on the immediate cost implications of shocks—higher borrowing costs, energy prices, or taxes—leading them to expect both rising prices and weaker economic activity. In contrast, textbook models adopt a general-equilibrium perspective, where demand and supply forces interact and offset, generating the conventional trade-offs between inflation and unemployment.

Third, a sizable share of respondents show no change between their baseline expectations and the expectations elicited in the shock scenarios. Specifically, nearly 44% do so for the monetary policy shock, 34% for the oil shock, and 37% for the tax shock. Among these, a nontrivial proportion—8%, 5%, and 6%, respectively—expect no impact on either variable.[11] The monetary policy shock appears to have particularly limited traction on expectations, which challenges the rational-expectations assumption that policy signals are promptly incorporated into forecasts. This prevalence of "no effect" responses is consistent with the experimental findings of Binetti et al. (2024), who show that households' inflation expectations are difficult to shift. It may also reflect perceptions that the hypothetical shocks are too small to matter, or a broader belief that such shocks have limited macroeconomic consequences.

More generally, the distribution of responses across all four quadrants highlights the absence of consensus among households regarding the transmission mechanisms of macro shocks. The fact that respondents provide divergent signs for the same shock—some expecting inflation and unemployment to move in opposite directions, others expecting them to move together—indicates not only heterogeneity in magnitude but also in qualitative understanding.

Figure 7 shows how many respondents correctly predict the sign of the impulse responses for both inflation and unemployment across the three macroeconomic shocks jointly. The results are striking. Only about 1% of households correctly interpret the effects of all three shocks on both

[11] Figure A1 shows that the share of respondents expecting no change in one or both variables is similar across positive and negative scenarios

variables in a manner consistent with textbook macroeconomic models. Roughly 10% get two out of three shocks correct, while a substantial 34% correctly interpret only the oil price shock but not the monetary or tax shocks. Most notably, nearly half of the sample interprets all three shocks in a nonstandard way.[12]

Figure 8 disaggregates forecast accuracy by variable, showing the share of households correctly predicting the sign of each shock's effect on inflation and unemployment. For monetary and tax shocks, respondents demonstrate a better grasp of labor market dynamics: around 46% correctly anticipate the unemployment response, compared to just over 30% for inflation. In contrast, oil shocks show the reverse pattern: 65% correctly identify the inflationary impact, while 58% get the unemployment response right.[13] These results suggest that households' ability to interpret macro shocks depends both on the shock's nature and the variable being forecasted. The relatively high accuracy in inflation predictions for oil shocks likely reflects the salience of fuel and energy prices in household experience (Binder, 2018; Coibion & Gorodnichenko, 2015b; Georganas et al., 2014). By contrast, the lower accuracy for inflation in response to monetary and tax shocks may indicate weaker understanding of how policy measures transmit to the price level. A growing literature suggests that households often fail to internalize the implications of complex monetary policy announcements, as their high level of complexity makes them inaccessible to large segments of the population (Haldane & McMahon, 2018). For example, D'Acunto et al. (2019) show that households react strongly to simple and salient fiscal measures, but forward guidance and other abstract policy tools leave most households' expectations and choices unchanged, because understanding their transmission requires economic sophistication. Similarly, Coibion, Gorodnichenko, et al. (2023) document that even after the Federal Reserve's highly publicized shift to average inflation targeting, most households remained unaware of the change and did not adjust their inflation expectations, underscoring the difficulty of communicating monetary policy to the general public. Conversely, the stronger performance on unemployment may reflect more intuitive links between interest rates or taxation and job market conditions.

[12]To contextualize these results, Appendix B compares them to a random-guessing benchmark, where respondents are assumed to choose at random whether the IRF of each variable is positive, negative, or zero. The share of respondents who interpret all shocks in a non–theory-consistent way (46%) is well below the probability of always selecting incorrect answers by chance (70.2%). This indicates that many households hold systematic—albeit nonstandard—beliefs, rather than simply guessing.

[13]Figure A3 disaggregates responses by the sign of the shocks. While the overall pattern remains—households' expectations for unemployment are more theory-consistent than those for inflation in response to monetary and tax shocks, and the opposite holds for oil shocks—some differences emerge between positive and negative scenarios. In particular, the share of households aligned with textbook predictions for inflation is noticeably lower in response to monetary and tax cuts (around 23%) than in response to hikes (around 40%).

Taken together, the results reveal an asymmetry in households' economic reasoning: respondents are more likely to get one margin right—either inflation or unemployment—depending on the shock, but rarely both.

6.1.2 Interpretation as supply and demand shocks

Figure 9 examines how households perceive the transmission channels of macroeconomic shocks, based on their response to the survey question asking which aspect of the economy would be most affected by each shock. Respondents were asked to choose between two options: whether the shock primarily affects company costs—interpreted as a supply-side channel—or household expenditure—interpreted as a demand-side channel. This design allows me to evaluate whether households associate each type of shock with the transmission mechanism predicted by standard macroeconomic theory.

A clear majority interpret the oil price shock as a supply shock, in line with standard macroeconomic models: 62% associate the shock with firm-side cost increases, while only 38% point to household demand. Similarly, the tax shock is most often understood as a demand shock, with approximately 84% of the sample attributing the impact to household expenditure. In contrast, interpretations of the monetary policy shock deviate from the theoretical benchmark. The majority of respondents (around 56%) view it as operating through the supply side—via firm costs—rather than through household demand. This suggests that many households may hold a cost-channel view of monetary policy transmission, where interest rate changes directly affect firms' production costs and prices, rather than influencing aggregate demand. This interpretation is coherent with the pattern identified in households' joint SIRFs for inflation and unemployment, where monetary tightening is frequently perceived as both inflationary and recessionary. For tax shocks, however, this coherence is absent: although most respondents classify them as demand-driven—emphasizing the direct impact on household demand—many still predict stagflationary outcomes. This suggests that households apply different heuristics depending on the framing of the question, corroborating the view that they do not reason in general-equilibrium terms.

6.2 Households' characteristics

6.2.1 The role of demographic characteristics

Figure 10 explores which household characteristics are associated with an understanding of the effects of macroeconomic shocks in line with standard models' predictions. I define a binary outcome variable equal to one if a respondent's inflation and unemployment subjective impulse response signs match those implied by the textbook reference models discussed in section 5, and estimate separate linear probability models by shock type. I also consider broader classifications: always correct (theory-consistent for all three shocks), always incorrect (never theory-consistent), and "stubborn" (reporting no change for at least one variable in all shock scenarios). I regress each of these binary indicators on a vector of demographic controls, including gender, age, marital status, number of children, personal net income, employment status, homeownership, expectations about personal finances, education, a placebo comprehension score, and the randomization group (positive vs. negative shock scenario). The regression results are reported in table 4. Several patterns emerge.

First, I find that women are significantly more likely than men to interpret both monetary policy and tax shocks in line with the predictions of textbook macroeconomic models. This difference also emerges when considering the joint measure of alignment across all three shocks, with women displaying a higher probability of theory-consistent interpretations. One possible explanation is that women may exhibit greater survey attentiveness or exercise more caution in forming responses. In the context of economic expectations, prior studies have often documented gender gaps in the level or precision of forecasts—e.g., women reporting higher inflation expectations or greater uncertainty (D'Acunto et al., 2020; Reiche, 2024). These findings indicate that, at least when interpreting macroeconomic shocks, women's responses may be more in line with textbook macroeconomic reasoning.

A second characteristic playing a significant role in consistency with textbook prediction is education, measured as a dummy equal to one if the respondent's years of schooling exceed the sample median of 16 years (see Table 1), which corresponds roughly to a college degree in the Dutch education system. Education is positively associated with theory-consistent interpretations of both the monetary policy and tax shocks, and significantly increases the probability of correctly interpreting all three shocks jointly. These results are consistent with recent findings by Piccolo et al. (2025), who show that education makes households' predictions regarding the impact of monetary shocks on macro aggregates more aligned with the prescriptions of macroe-

conomic models. They also echo evidence from Lusardi and Mitchell (2023), which links education to higher levels of financial literacy. The association is not significant in the case of oil shocks.

Third, age (measured as a dummy indicating respondents aged 50 or older) is negatively associated with theory-consistent interpretations across all three shocks, with particularly pronounced effects for tax shocks. One possible explanation is that older individuals may rely on outdated mental models when reasoning about the effects of macroeconomic events. This interpretation aligns with the experience effects literature, particularly the work of Malmendier and Nagel (2015), which shows that individuals' macroeconomic expectations are shaped by the economic conditions they have personally experienced—such as the inflation they have cumulatively observed over their lifetimes. While this literature has primarily focused on inflation forecasts, a similar mechanism may operate in how people interpret the causes of macroeconomic outcomes. Older respondents may anchor their reasoning in paradigms that reflected past economic environments—such as the stagflation of the 1970s or fiscal policy regimes of earlier decades—even if those mechanisms are no longer relevant under current institutional frameworks. As a result, their interpretations of how contemporary shocks propagate through the economy may be misaligned with modern macroeconomic theory.

Fourth, homeownership is positively associated with interpreting the effects of oil price shocks in line with textbook predictions, but shows no clear association with the other two shocks. One interpretation is that homeowners—who are more exposed to inflation through housing maintenance and energy costs—may be more attuned to the inflationary implications of oil shocks. This is consistent with Piccolo and Gorodnichenko (2025), who document heightened inflation sensitivity among homeowners.

Finally, income is positively associated with correct interpretations of all three shocks, particularly for monetary policy and oil price shocks. While the coefficient for income remains positive in the regression for the tax shock, it is not statistically significant. Higher income is also associated with a greater likelihood of interpreting all shocks consistently and a lower probability of not interpreting any shock as textbooks prescribe. These patterns suggest that higher-income respondents may be more attentive to economic policy due to greater financial exposure. For monetary policy, this may reflect sensitivity to interest-bearing assets; for oil shocks, heightened awareness of inflationary pressures of energy prices; and for tax shocks, larger expected tax liabilities.

Overall, the results suggest that understanding of macroeconomic shocks is not randomly distributed: it is systematically related to gender, education, income, age, and homeownership.

The possibility of linking the responses in my survey with the LISS Core Study surveys enables me to explore heterogeneity across a broader set of individual characteristics. Table A2 presents results for additional controls—such as ownership of financial assets, borrower status, self-employment, and political orientation. Once standard demographics are accounted for (as in Table 4), none of these variables are significantly associated with the likelihood of providing theory-consistent responses. Importantly, including these additional controls does not alter the direction of the effects for gender, age, education, homeownership, and income previously discussed.

6.2.2 Forecast errors and consistency with textbook theories

Does greater awareness of inflation and unemployment dynamics increase the likelihood of interpreting macroeconomic shocks in line with textbook models? To investigate this, I exploit the first part of the survey, which elicits respondents' expectations for inflation and unemployment one year ahead. I compute forecast errors as the absolute difference between each respondent's expectation and the actual value observed in May 2025 (2.9% for inflation and 3.8% for unemployment).[14] Larger forecast errors thus indicate a greater distance from actual outcomes.

Figure 11 reports results from linear probability models, where I regress the indicators of belief consistency used throughout the previous section—dummies for theory-consistent signs of SIRFs for each of the three shocks, as well as dummies for being always correct (theory-consistent across all shocks), always incorrect (never theory-consistent), and always stubborn (reporting no change for at least one variable in every vignette)—on forecast errors. The regressions are estimated separately by shock and belief consistency measure.

Interestingly, the respondents who are less accurate in their unemployment forecasts are significantly less likely to provide theory-consistent interpretations of each of the three shocks, are more likely to misinterpret all shocks, and more frequently exhibit complete belief inertia (i.e., expecting no change across all scenarios). These findings highlight a strong correlation between knowledge of labor market conditions and the ability to understand how shocks affect macroeconomic outcomes in a way that aligns with benchmark economic models. In other words, being aware of unemployment dynamics appears to be an important foundation for forming more structured and theory-aligned expectations.

[14]Sources: https://data.ecb.europa.eu/data/datasets/ICP/ICP.M.NL.N.000000.4.ANR for inflation, and https://www.cbs.nl/en-gb/figures/detail/80590eng for unemployment.

The relationship between inflation forecast errors and belief consistency is less straightforward. While higher errors are associated with a lower likelihood of textbook-consistent interpretations for oil shocks (as one might expect), the opposite holds for monetary and tax shocks: respondents who are further off in their inflation forecasts are, somewhat surprisingly, more likely to provide textbook-consistent responses for those shocks. In both cases, the textbook prediction involves a fall in inflation and a rise in unemployment—suggesting that those with overly high inflation expectations may be more inclined to anticipate disinflationary effects when confronted with monetary tightening or tax hikes.[15]

7 Households' choices in response to shocks

7.1 Distribution of spending and saving choices

A distinctive feature of this survey is the ability to link households' expectations about macroeconomic variables—elicited after each shock vignette—with their self-reported behavioral responses. In particular, I ask respondents whether they would increase, decrease, or not change a set of economically relevant decisions. Focusing here on saving and spending behavior, I classify households based on their stated intentions.

Figures 12 and 13 report these responses separately and jointly. Figure 12 shows the marginal distribution of responses by action (spending or saving) and by shock scenario, while Figure 13 depicts the joint distribution of saving and spending responses across all six scenarios (positive and negative versions of interest rate, oil price, and tax shocks).

A first pattern is the asymmetry in behavioral responses to positive versus negative shocks. Across all three negative shocks (increases in interest rates, oil prices, or taxes), behavioral responses are more pronounced. Looking at the joint distributions (figure 13), the response "no change" in both saving and spending accounts for about 30–40% of answers; in contrast, in the positive shock scenarios (reductions in interest rates, oil prices, or taxes), the "no change" response dominates more clearly, accounting for over 50% of households in every case. This asymmetry suggests that households are more likely to adjust behavior in response to negative

[15]Figure A4 replicates the analysis using perception errors—defined as the absolute difference between the respondent's elicited perception of current inflation and unemployment (collected in the first part of the survey) and their actual values in May 2024. The results closely mirror those obtained with forecast errors, reinforcing the link between general macro awareness and theory-consistent interpretations of shocks.

economic news and tend to "do nothing" when shocks are perceived as beneficial. The asymmetry is also evident in the marginal response distributions (figure 12). For positive shocks, the share of "no change" responses consistently ranges between 60–70% for both saving and spending. For negative shocks, this share is notably lower—often below 50%—particularly for the tax shock.[16] On the spending margin, such asymmetry is well anticipated by standard macroeconomic models: the concavity of the consumption function implies that income losses are associated with larger marginal propensities to consume (MPCs) than income gains (Bunn et al., 2018; Christelis et al., 2019; Kaplan & Violante, 2022). This asymmetry in responsiveness is also consistent with the negativity bias documented in psychology, whereby adverse events have disproportionately larger effects on cognition and action than favorable ones (Baumeister et al., 2001; Rozin & Royzman, 2001). In behavioral economics, loss aversion and ambiguity aversion similarly predict that negative or uncertain outcomes weigh more heavily in decision-making than positive ones (Tversky & Kahneman, 1991). Empirical work in macroeconomics echoes this pattern: households tend to overweight negative experiences—such as recessions, job losses, or inflation spikes—when forming expectations and making financial choices (Kuchler & Zafar, 2019; Malmendier & Nagel, 2011).

Another interesting aspect emerges when comparing results across the three types of shocks. The tax increase scenario elicits the strongest behavioral reaction. In marginal terms, 60% of households report reducing saving and 50% report cutting consumption. In the joint distribution (Figure 13), 41% of respondents report doing both—saving less and spending less. This pattern suggests that households do not perceive a trade-off between saving and consumption in this context, but rather face tighter budget constraints that force cutbacks on both margins. A similar, though less pronounced, tendency is observed in the oil price increase scenario, where 18% of respondents report reducing both spending and saving in response to the shock. By contrast, in the negative monetary policy and oil price scenarios, the majority of respondents report taking no

[16]Table A3 reports formal tests of symmetry in saving and spending responses across positive and negative versions of each shock. To perform the test, I recode actions so that opposite responses across scenarios are treated as equivalent (e.g., an "increase" under a positive shock is recoded as a "decrease" under the corresponding negative shock). This creates a unified measure that is directly comparable across treatment groups. I then compute the mean of this recoded variable separately for respondents in the positive and negative scenarios and perform a t-test of the difference in means. The table shows the estimated differences, standard errors, and p-values, where statistical significance ($p < 0.05$) indicates asymmetric behavior across shock signs. This procedure is applied to both saving and spending responses and repeated for all three shocks. The results indicate widespread asymmetry in household behavior. The only exceptions are saving responses to oil and tax shocks, where the share of respondents reporting an increase in savings under the negative scenario is not statistically different from the share reporting a decrease under the corresponding positive scenario.

action—indicating that these shocks are not perceived as directly relevant for their personal financial decisions. This highlights a possible disconnect between the macroeconomic importance of these shocks and their perceived salience at the household level.

Among the less frequent but economically meaningful responses, 14% of households report increasing saving while decreasing spending in response to a rise in interest rates. Overall, 29% indicate they would save more in that scenario. This behavior is consistent with intertemporal substitution: higher interest rates may discourage consumption and incentivize saving, particularly for forward-looking respondents or those with exposure to interest-bearing assets.

7.2 Textbook interpretation of shocks and choices

Does a theory consistent understanding of the macroeconomic consequences of a shock lead to more appropriate behavioral responses in terms of saving and spending? To investigate this, I estimate a set of linear probability models, where the dependent variables are dummies indicating whether a respondent reports increasing, decreasing, or not changing their spending or saving in response to each of the six shock scenarios. For interpretability, I bunch the positive and negative shock treatments by flipping the sign of responses to the positive scenarios—e.g., a report of "increasing saving" under a tax cut is coded as "decreasing saving" in the corresponding tax hike scenario. Each shock is thus analyzed as a negative event (i.e., interest rates, oil prices, or taxes increasing). I include a control for the randomization group (positive vs. negative scenario) to account for the asymmetries in behavioral responses documented above, and I control for demographic covariates.

The key independent variable is a dummy equal to one if the respondent's interpretation of the shock is consistent with textbook macroeconomic predictions - that is, the respondent correctly identifies the direction of the shock's effect on both inflation and unemployment and the transmission channel.

Results are shown in Figure 14. In the case of the monetary policy shock, respondents with a correct interpretation are significantly less likely to report "no change" in saving.

For the oil price shock, respondents who correctly assess the shock's effect on inflation and unemployment are less likely to report "no change in savings", and indeed they are about 8 percentage points more likely to reduce their saving. This may reflect perceived budget constraints due to higher energy prices: respondents anticipate increased living costs and reduce saving to smooth consumption.

Finally, for the tax shock, those with theory consistent macro expectations are significantly more likely to reduce spending, and correspondingly less likely to report no change in their consumption. This behavior is consistent with a sharper awareness of the income effect of tax hikes and a more responsive adjustment in discretionary spending.

Taken together, these results suggest that individuals whose understanding of macroeconomic shocks aligns more closely with textbook models are less likely to remain inactive and more likely to adjust their behavior in response to shocks. In other words, the main difference between households who do or do not hold textbook-aligned beliefs lies in whether they react at all. A possible explanation is that respondents with textbook-consistent beliefs have a clearer mental framework—an internal model of how the economy works—that helps them decide how to act when faced with new information. By contrast, those without such a framework may struggle to connect the shock to their own circumstances, and as a result, choose not to change their behavior simply because they are unsure of what to do.

8 Conclusion

This paper investigates how households perceive and respond to macroeconomic shocks by combining a novel vignette-based survey with benchmark predictions from standard macroeconomic models. I document four central findings. First, most households do not interpret shocks in line with textbook models: only 1% provide theory-consistent expectations across all three shocks, with oil price shocks understood best, monetary policy shocks less so, and tax shocks the least. Second, beliefs are heterogeneous and systematically related to demographics—gender, education, income, and homeownership improve alignment with theory, while older respondents are less likely to interpret shocks correctly. Third, a large share of households display inertia, neither revising expectations nor adjusting saving and spending in the face of shocks. Finally, households with beliefs more aligned with textbook models are significantly more likely to respond, reducing the prevalence of "do nothing" behavior.

The findings of this paper carry important implications for both macroeconomic modeling and the design of stabilization policy.

From a modeling perspective, the survey evidence discussed in this paper highlight that heterogeneous and nonstandard beliefs are a first-order feature of the macroeconomy. Only a very small share of households interpret monetary, oil, and tax shocks in a manner consistent with

textbook macroeconomic models, and the majority either apply simplified "supply-side" heuristics—expecting both inflation and unemployment to rise—or remain entirely inert in the face of shocks. Standard representative-agent or rational-expectations frameworks cannot account for this heterogeneity in belief formation, nor for the systematic patterns documented here. This calls for incorporating belief heterogeneity explicitly into modern macroeconomic models, for instance through heterogeneous-agent New Keynesian structures with subjective expectations, or models featuring inattention, or state-dependent heuristics.

The observed behavioral patterns also highlight the value of embedding behavioral expectation blocks into otherwise standard models. Many households appear to rely on partial-equilibrium reasoning or fail to connect macroeconomic shocks to their personal outcomes, failing to modify their behaviors in response to shocks. In a modeling context, this suggests representing households as a mix of inert agents—who display sticky expectations and limited belief updating, heuristic users—who rely on simplified rules such as "all shocks are stagflationary", and a smaller group of theory-consistent agents whose expectations align with standard macroeconomic models and respond accordingly. Such frameworks would naturally generate smaller or delayed aggregate responses to policy interventions, helping to explain why macroeconomic multipliers may be attenuated in practice relative to rational-expectations predictions. Moreover, the asymmetric responses observed in the survey—where negative shocks trigger reductions in spending and saving, while positive shocks are largely ignored—point to nonlinear and state-dependent policy transmission. A behavioral model in which adverse shocks are salient but favorable shocks are disregarded could replicate this asymmetry and shed light on how recessions amplify through pessimistic belief formation.

The policy implications are equally important. The transmission of macroeconomic policy depends critically on how households interpret it: if they view a monetary tightening as inflationary rather than disinflationary, the expected effect on demand may be dampened or even reversed. In such cases, forward guidance loses effectiveness, highlighting the need for central bank communication that clearly explains the demand-side mechanisms through which policy operates. Similarly, the limited understanding of tax shocks revealed in this study suggests that the effectiveness of fiscal measures depends in part on whether households recognize the impact of policy changes on their disposable income and demand. In this sense, fiscal authorities might enhance policy traction by providing clear and salient information about the direct and immediate consequences of tax changes.

Belief heterogeneity also has distributional consequences. Individuals who are women, have

higher education, higher income, and homeowners are more likely to form theory-consistent beliefs and to adjust their behavior in response to shocks, whereas others remain passive. As a result, some groups actively smooth consumption or exploit policy opportunities, while others absorb shocks passively, potentially exacerbating the unequal incidence of macroeconomic fluctuations. Targeted communication and financial literacy initiatives could help narrow these gaps, improving both the equity and the aggregate effectiveness of stabilization policies.

Moreover, the finding that households react more decisively to adverse macroeconomic developments than to positive surprises indicates that policy transmission is typically stronger in downturns than in expansions. From an optimal-policy perspective, this asymmetry suggests that expansionary measures may need to be larger in magnitude than contractionary ones to produce comparable effects on household behavior.

Finally, the results suggest that in environments where many households do not internalize the intended effects of policy, purely expectation-based instruments may be insufficient to stabilize the economy. Direct tools—such as fiscal transfers, automatic stabilizers, and policies that operate through salient cash-flow channels—may be more effective than measures that rely heavily on forward guidance or the expectation channel. Incorporating belief heterogeneity and behavioral inertia into macroeconomic models is thus essential not only for a more realistic depiction of household behavior, but also for designing policies that are robust to the cognitive and informational frictions that shape the real-world transmission of macroeconomic 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 misperceptions or inertia dampen the transmission of macroeconomic shocks. Such evidence would complement the present study by moving beyond stated intentions to observed behavior, sharpening both the empirical foundations of behavioral macroeconomics and its policy relevance.

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Tables

Variable	Our survey	DNB 2023
Gender (female)	49%	51%
Age (median)	57	53
Personal net income (in Euros, median)	2,216	2,394
Education (years, median)	16	16

Table 1: **Summary statistics in the survey's sample**. Comparison between the distributions of individual characteristics in our survey with those in the sample of the Dutch National Bank Household Survey.

Positive scenario	Negative 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 2: **Verbatim of the vignettes.**

SIRF inflation			
Shock	Mean	Median	SD
Monetary policy shock			
Negative scenario	-.38	0	2.78
Positive scenario	-1.07	-.5	2.88
Oil price shock			
Negative scenario	.78	1	3.02
Positive scenario	-1.7	-1	2.98
Tax shock			
Negative scenario	-.04	0	2.91
Positive scenario	-1.51	-.95	3.06
SIRF unemployment			
Shock	Mean	Median	SD
Monetary policy shock			
Negative scenario	-.1	0	2.4
Positive scenario	-.57	0	2.24
Oil price shock			
Negative scenario	.51	.5	2.65
Positive scenario	-.77	-.5	2.43
Tax shock			
Negative scenario	-.14	0	2.8
Positive scenario	-.64	-.1	2.5

Table 3: **Moments of subjective IRFs for inflation and unemployment by shock type and sign.** This table reports the mean, median, and standard deviation of subjective impulse response functions (SIRFs) 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 SIRFs are computed as the difference between respondents' expectations under the shock and their baseline forecasts.

	(1) Mp shocks	(2) Oil shocks	(3) Tax shocks	(4) Always correct	(5) Always wrong	(6) Always stubborn
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	-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)
Income	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 future	-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	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)
Positive 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 4: **Determinants of theory-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 textbook macroeconomic models, 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 bachelor degree in the Dutch education system). Robust standard errors in parentheses. */**/*** refer to p-values lower than 0.10/0.05/0.01, respectively.

Figures

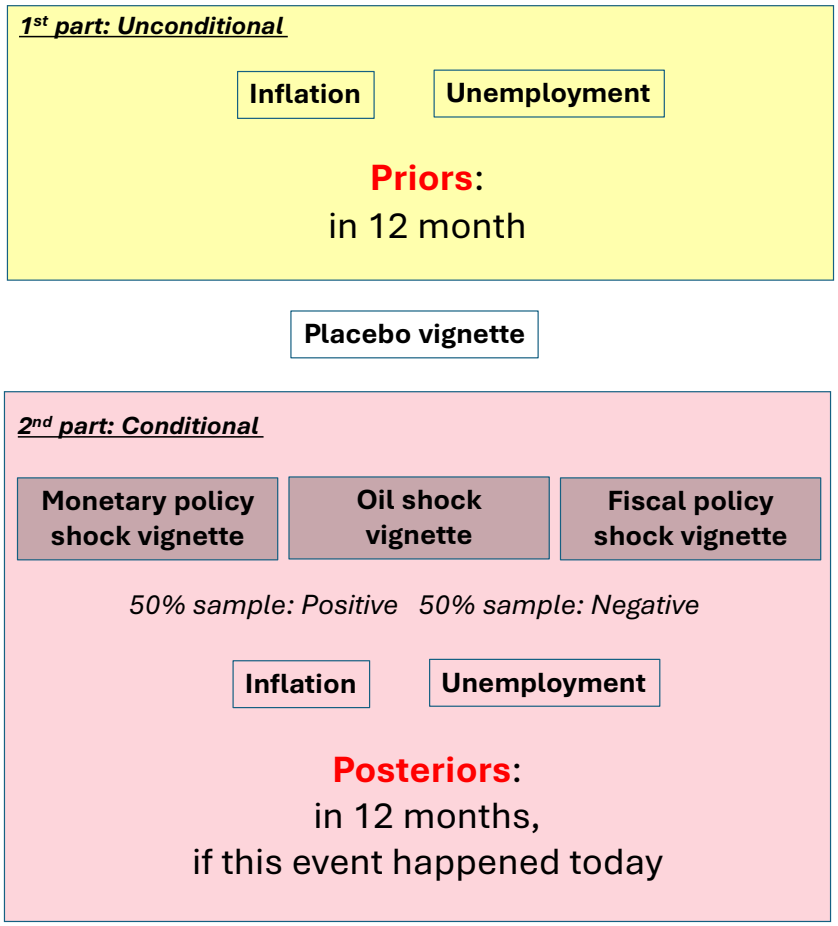

Figure 1: **Overview of the survey structure.**

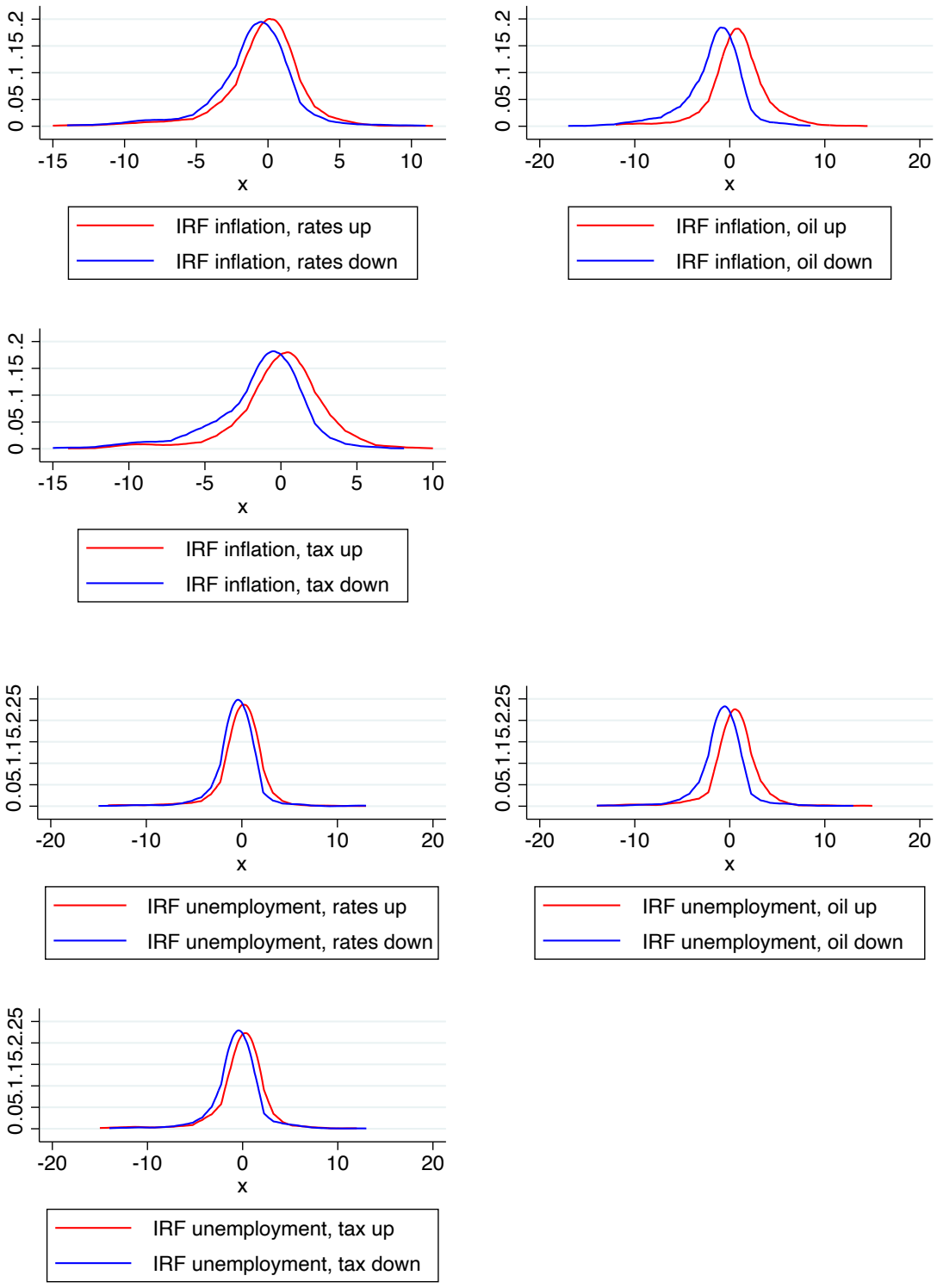

Figure 2: **Distribution of one-year-ahead subjective impulse Response Functions (SIRFs) of inflation and unemployment to monetary, oil price, and tax shocks**. Each panel shows the distribution of SIRFs following the positive and negative versions of each shock scenario: a 50 basis point monetary tightening or easing, a €30 change in oil prices, and a €150 change in annual taxes. SIRFs 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.

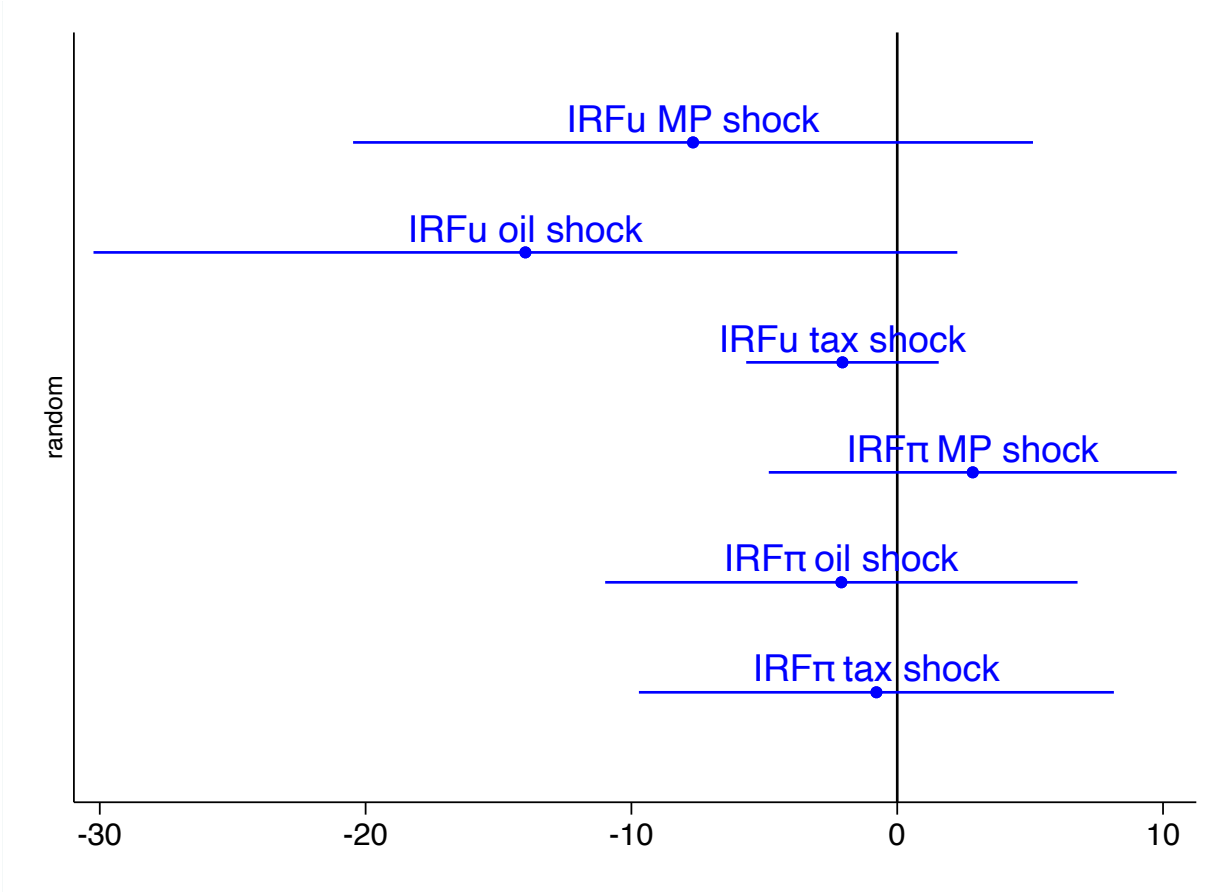

Figure 3: **Test for asymmetry in SIRFs by shock sign.** Coefficients on the randomization group dummy (=1 for negative-shock scenario) from regressions of subjective impulse responses (SIRFs) for inflation and unemployment on the randomization dummy, demographic controls (gender, age, marital status, presence of children, personal net income, employment status, homeownership, expectations about personal finances, education, a placebo comprehension score), and their interactions. The sign of SIRFs for respondents assigned to the positive-shock group is reversed for comparability. Across all shocks and variables, coefficients are statistically insignificant, indicating no systematic differences between positive and negative scenarios. Robust SE, and 90% confidence bands.

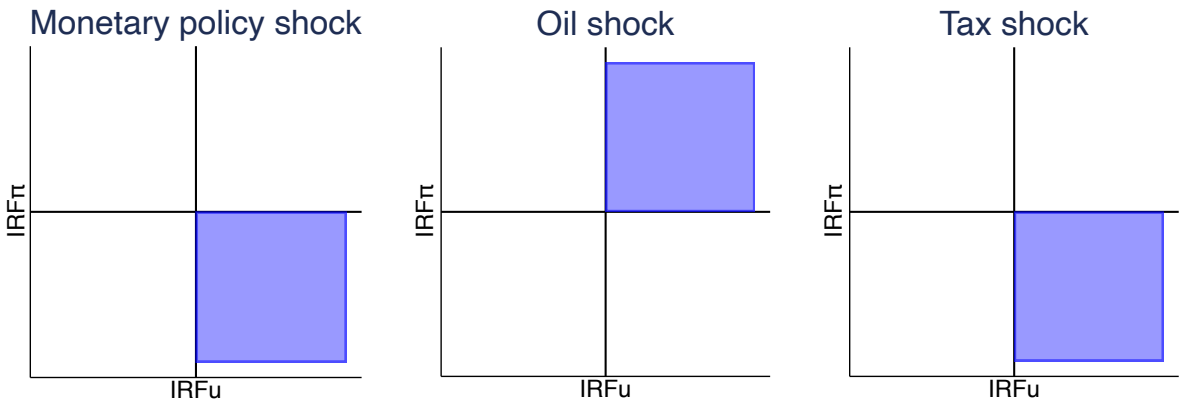

Figure 4: **Signs of IRFs for inflation and unemployment in bechmark textbook models.** The highlighted quadrants are the combinations of signs for the impulse responses (IRFs) of inflation and unemployment that are consistent with the theoretical framework and empirical evidence presented in Section 5. These sign combinations serve as benchmarks for evaluating whether households' expectations about the impact of macroeconomic shocks align with standard macroeconomic theory.

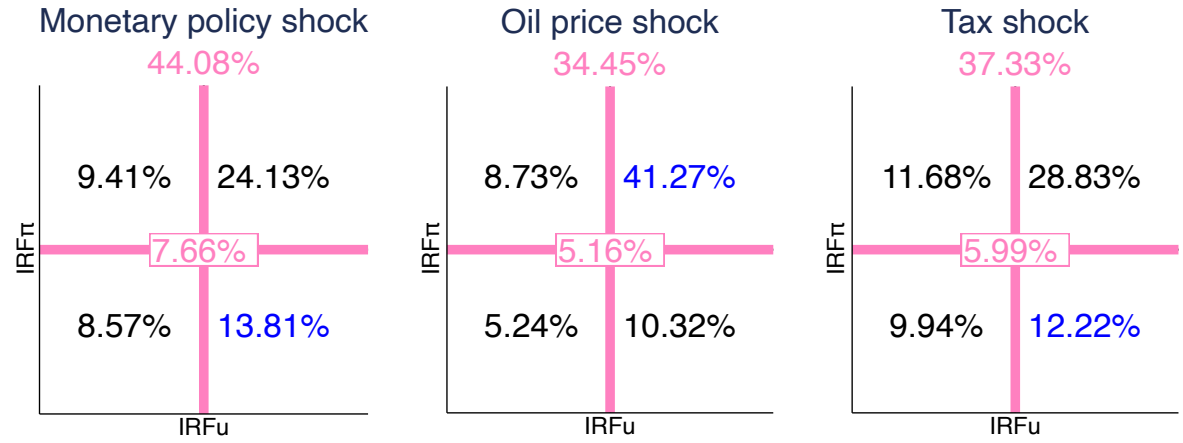

Figure 5: **Joint distribution of signs of SIRFs for inflation and unemployment.** This figure shows the distribution of households' subjective impulse responses (SIRFs) for inflation and unemployment following three negative macroeconomic shocks: a monetary tightening, an oil price increase, and a tax hike. SIRFs 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 one variable (pink % on the top) or both variables (% in the center).

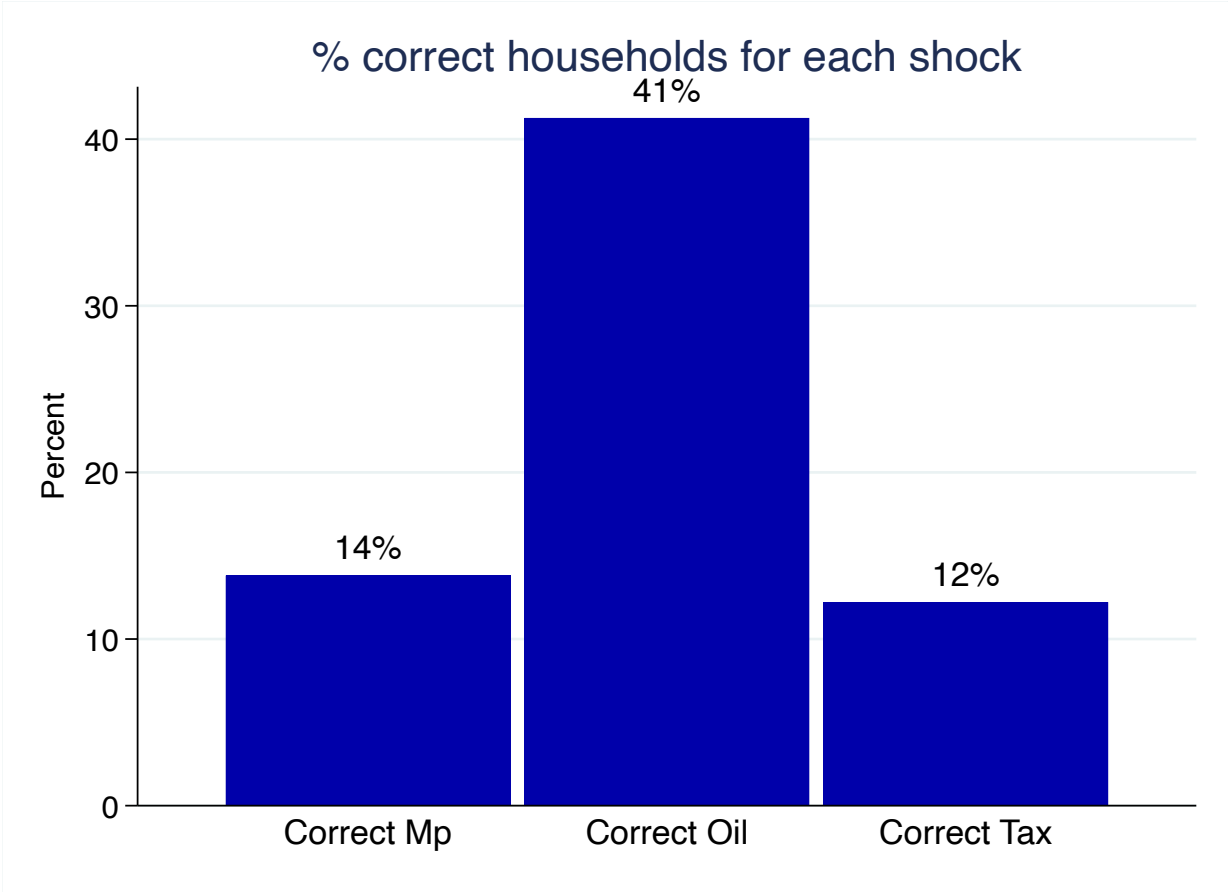

Figure 6: **Share of theory-consistent households for each macroeconomic shock scenario**. A theory-consistent interpretation is defined as providing inflation and unemployment impulse responses (SIRFs) with signs consistent with theoretical benchmarks. SIRFs are sign-adjusted so that all shocks are analyzed as negative (i.e., increases in interest rates, oil prices, or taxes).

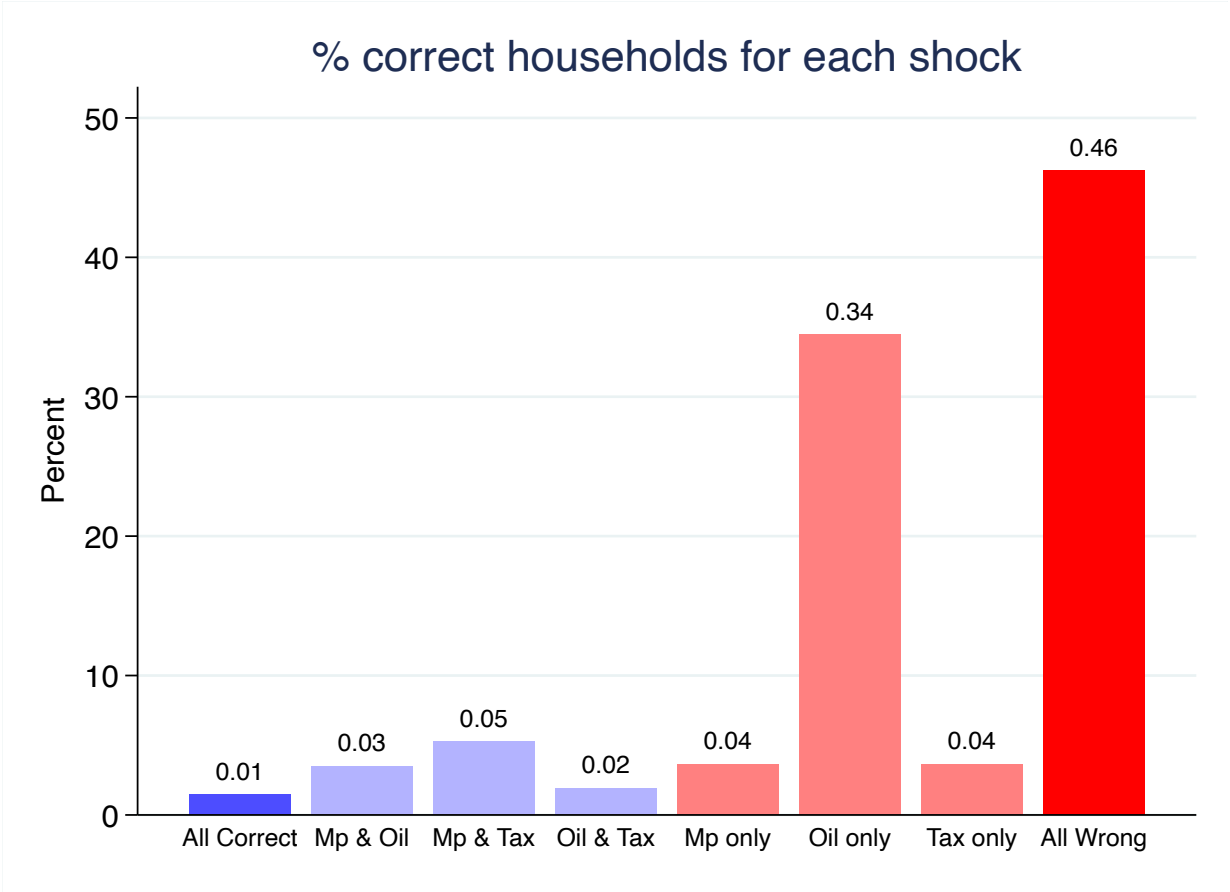

Figure 7: **Joint consistency of beliefs across shocks**. This figure shows the percentage of households whose sign expectations for inflation and unemployment are theory-consistent across different combinations of shocks. SIRFs are sign-adjusted so that all shocks are analyzed as negative (i.e., increases in interest rates, oil prices, or taxes).

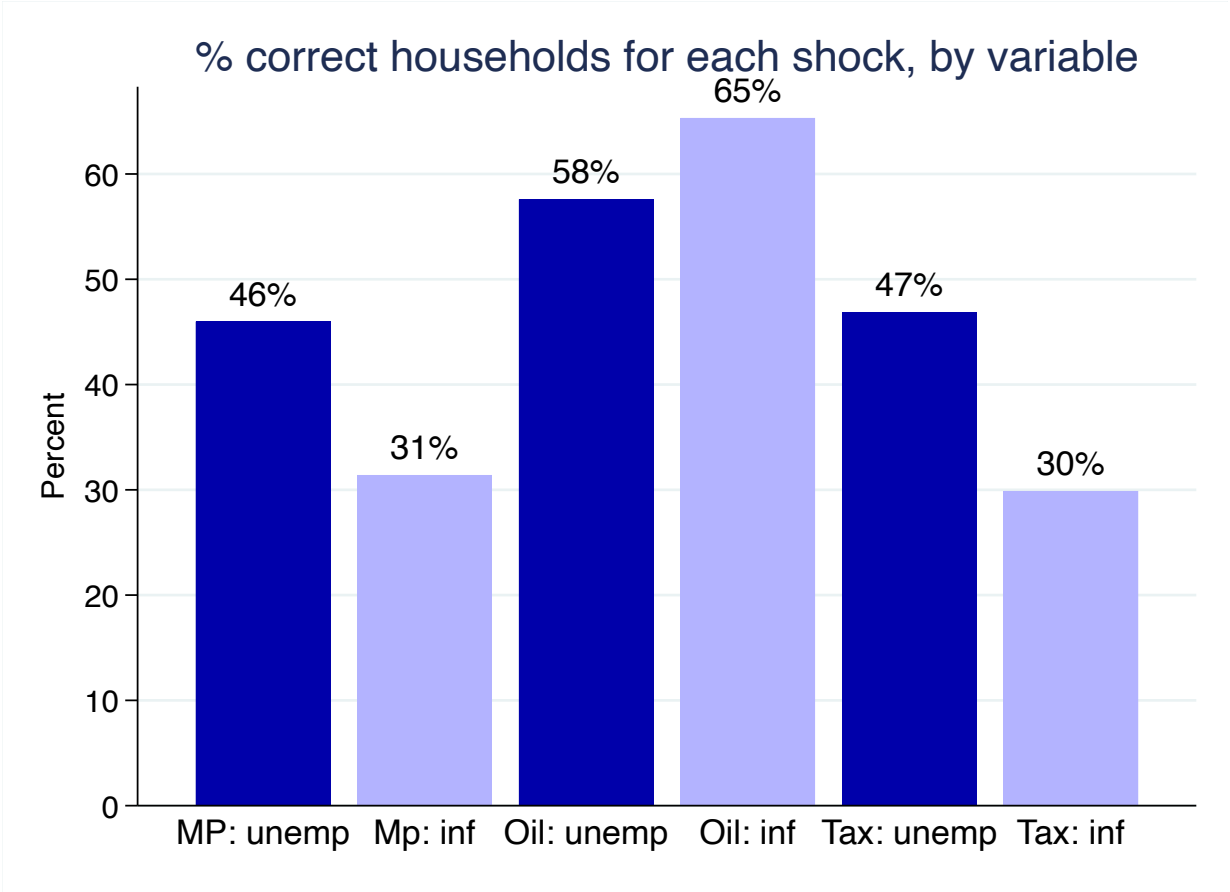

Figure 8: **Share of households with theory-consistent SIRF sign, by variable and shock.** This figure shows the percentage of households predicting a theory-consistent direction of the shock's impact on inflation and unemployment, separately for each macroeconomic shock. SIRFs are sign-adjusted so that all shocks are analyzed as negative (i.e., increases in interest rates, oil prices, or taxes).

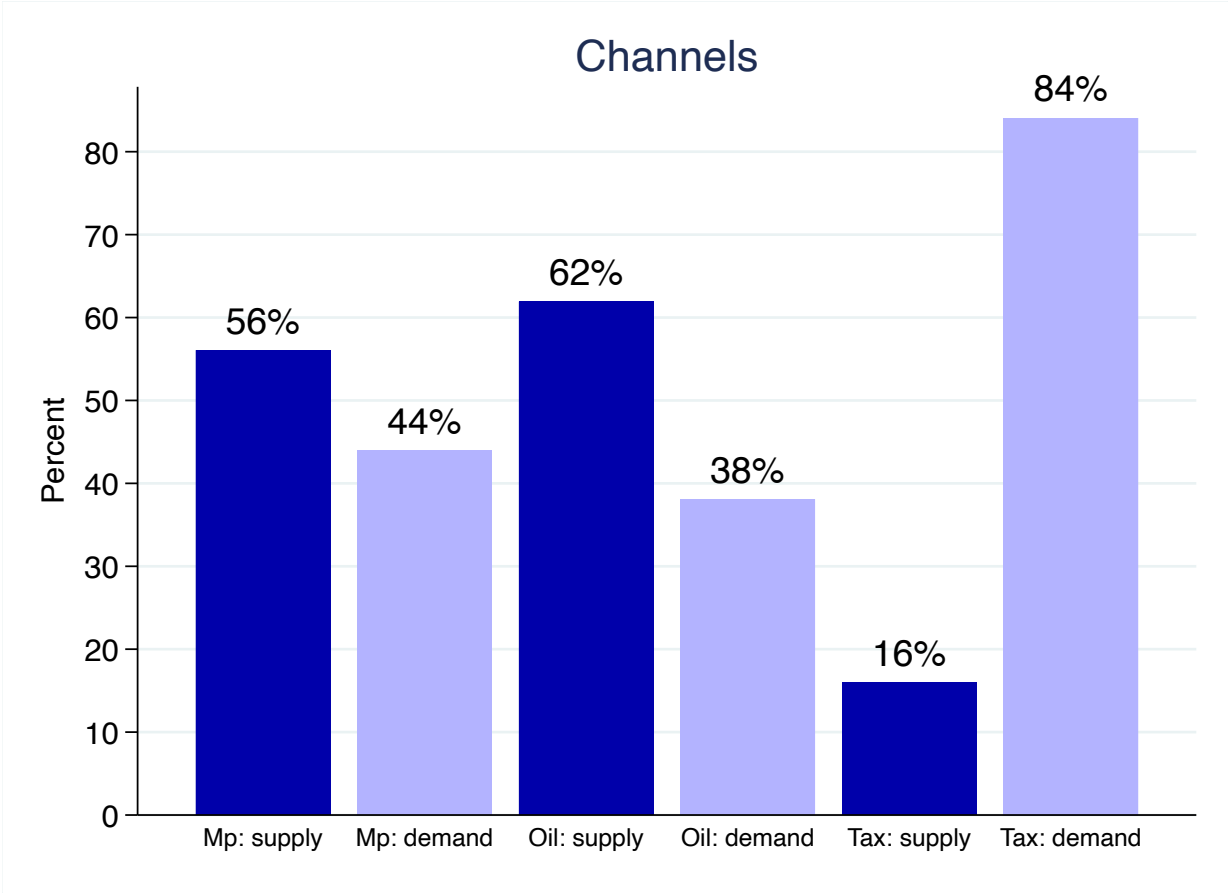

Figure 9: **Perceived transmission channels of macroeconomic shocks.** This figure shows the share of households attributing each shock's primary effect to either the supply side (firm costs) or demand side (household expenditure).

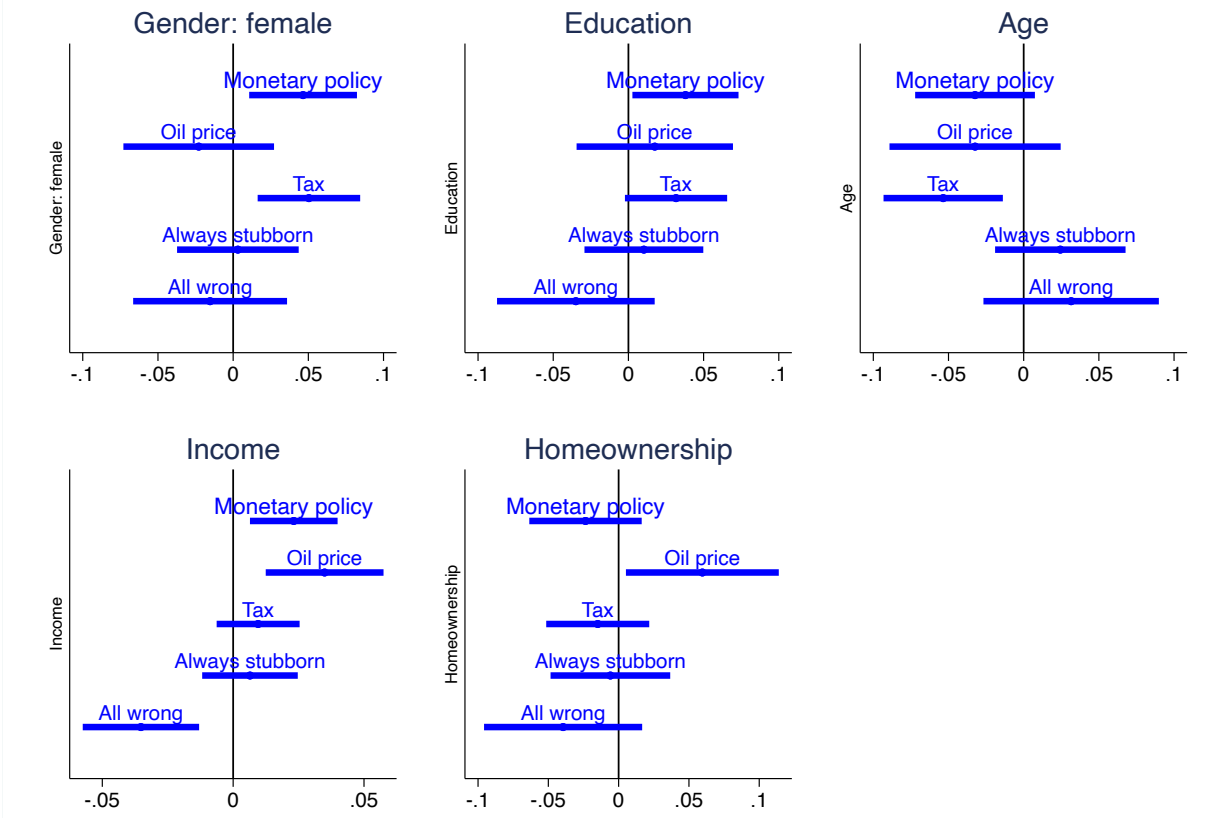

Figure 10: **Determinants of theory-consistent interpretations of macroeconomic shocks.** This figure reports marginal effects from linear probability models estimating the relationship between respondent characteristics (education, age, income, and homeownership) and the likelihood of correctly interpreting the inflation and unemployment effects of three macroeconomic shocks. Additional outcomes include the probability of getting all shocks right, all wrong, or consistently reporting no change in at least one of the variables ("always stubborn"). 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.

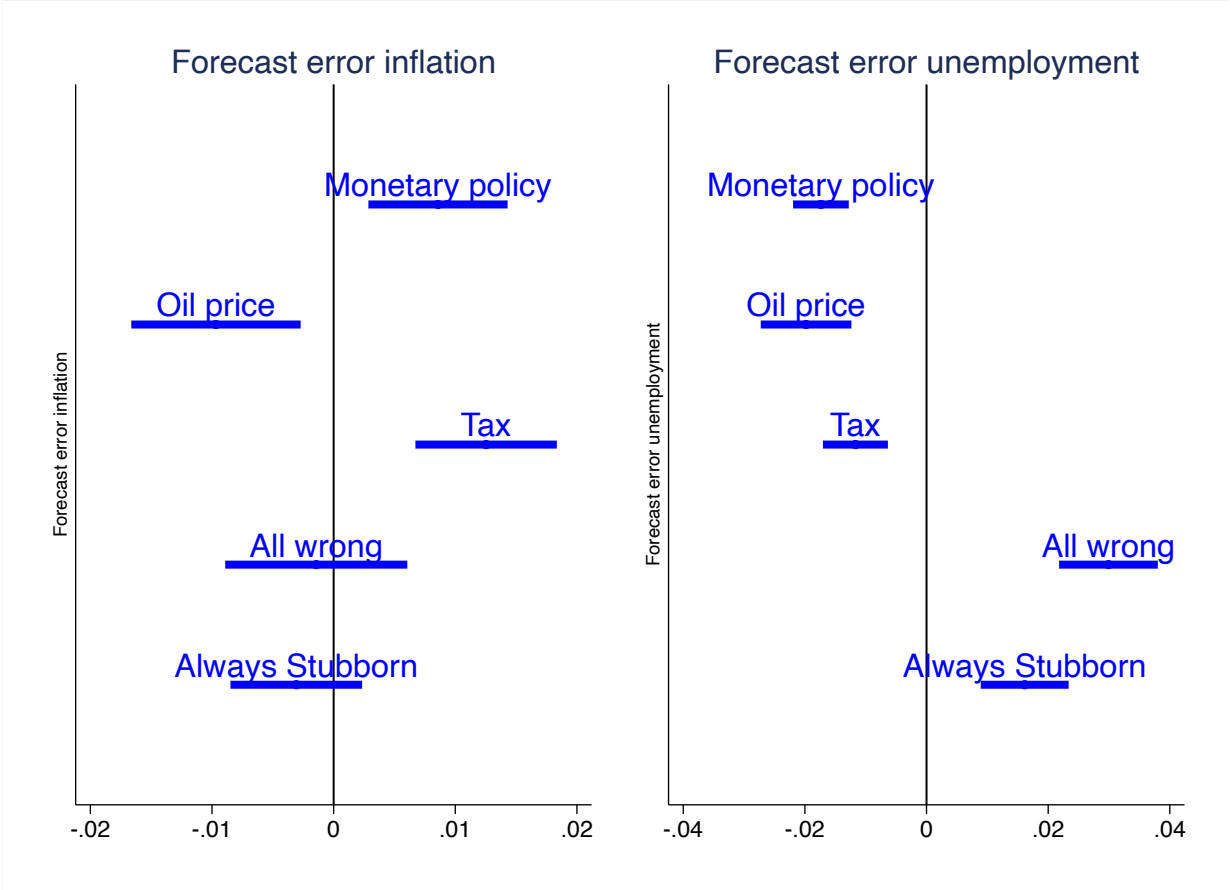

Figure 11: **Forecast errors and theory-consistent interpretations of macroeconomic shocks.** This figure reports the coefficients from linear probability models regressing various indicators of belief consistency on forecast errors for inflation and unemployment. Belief consistency is measured by dummy variables equal to one if the respondent's subjective impulse response (SIRF) signs for inflation and unemployment match those implied by textbook models, separately for each of the three shocks (monetary, oil, tax). Additional indicators include: "always correct" (theory-consistent for all shocks), "always incorrect" (never theory-consistent), and "always stubborn" (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.

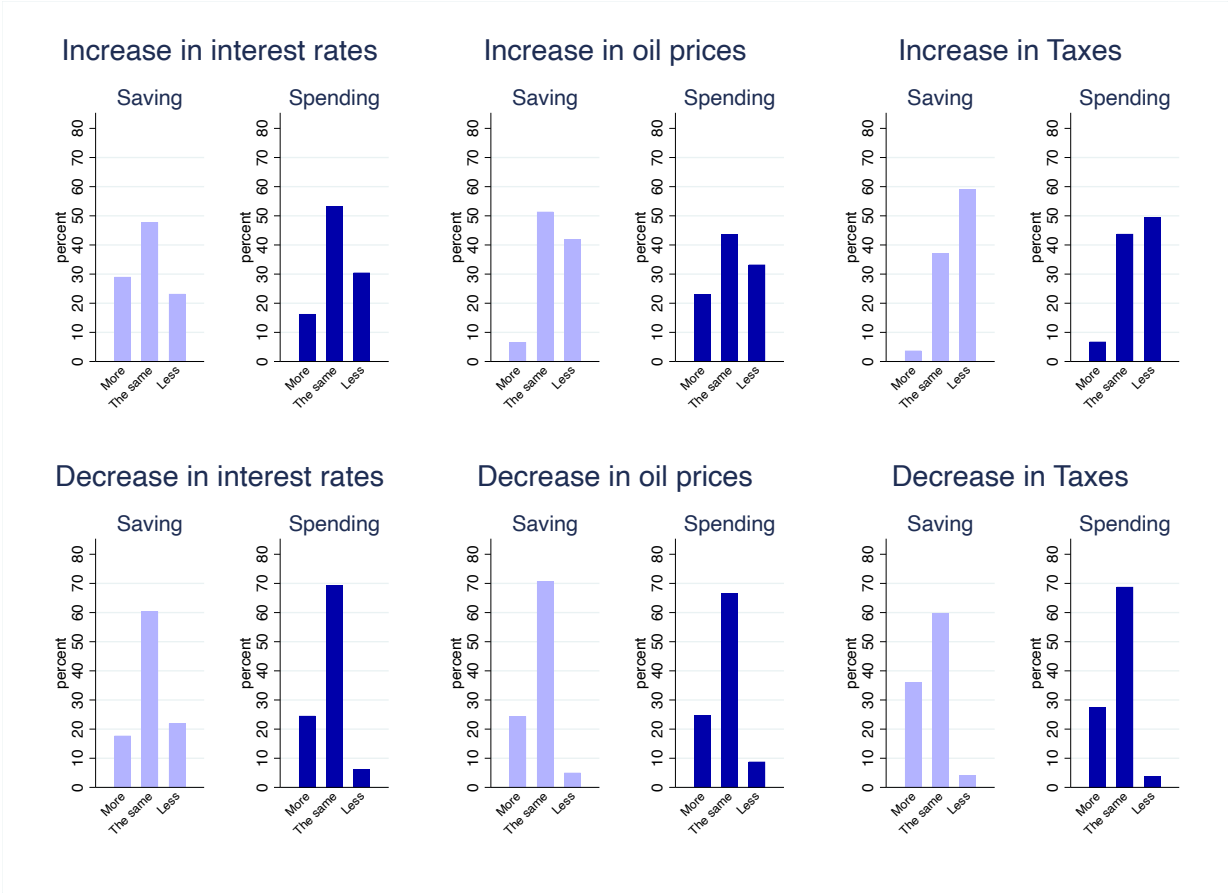

Figure 12: **Marginal distribution of spending and saving responses by shock scenario.** This figure shows the share of households reporting an increase, decrease, or no change in spending and saving in response to six macroeconomic shock scenarios: increases and decreases in interest rates, oil prices, and taxes. Each bar represents the percentage of respondents selecting a given option.

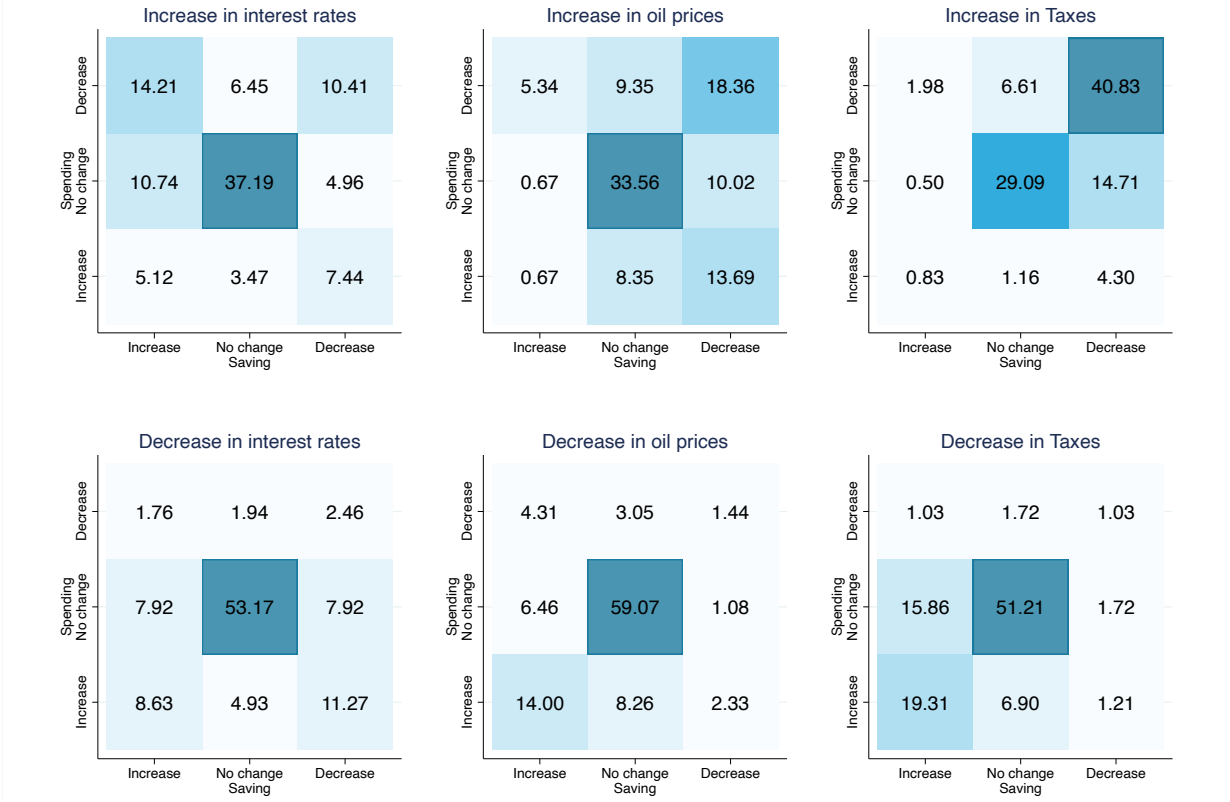

Figure 13: **Joint distribution of spending and saving responses by shock scenario.** This figure presents heatmaps of the joint distribution of household responses to macroeconomic shocks. Each cell indicates the percentage of respondents selecting a specific combination of spending and saving behavior (increase, no change, or decrease) in response to each of six scenarios. Darker shades correspond to more frequently chosen combinations.

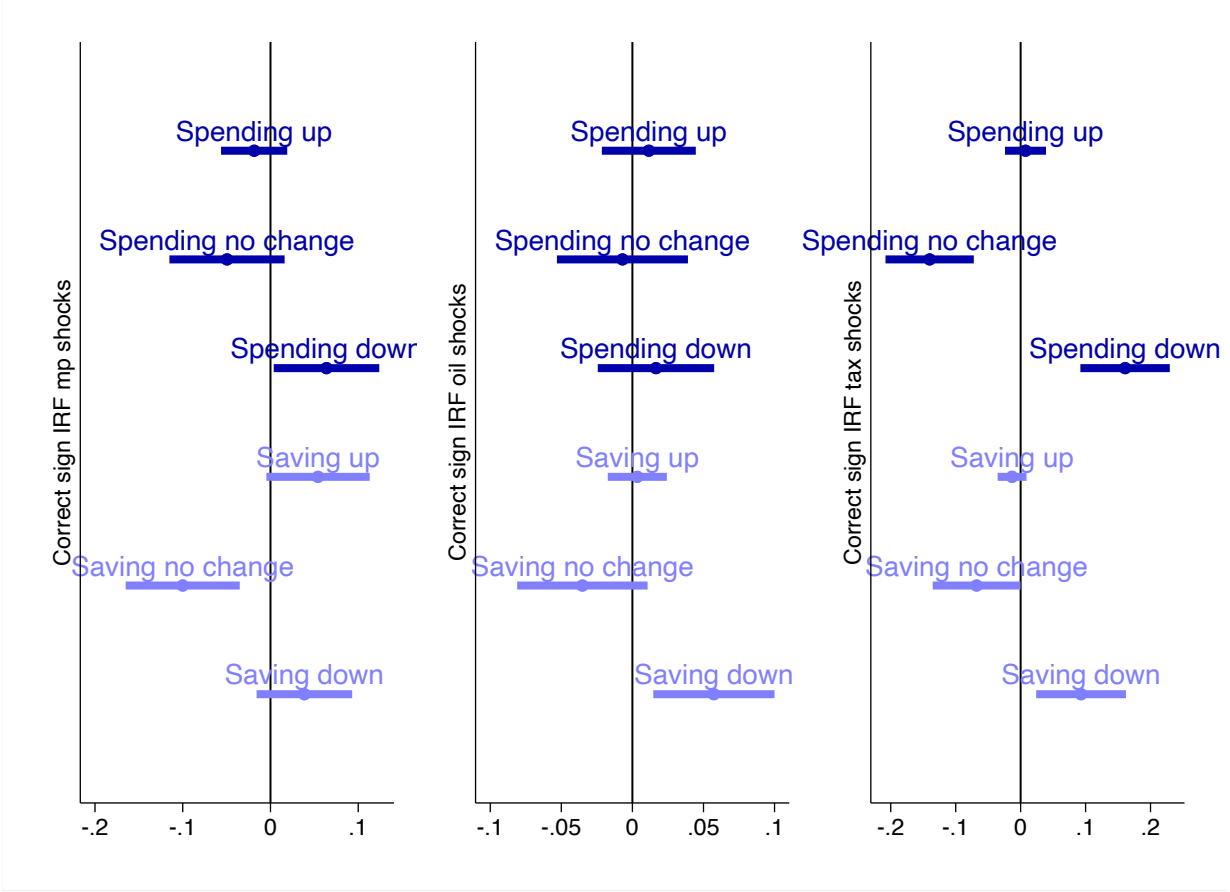

Figure 14: **Textbook interpretation of shocks and spending/saving choices.** This figure shows estimated coefficients from separate linear probability models examining the effect of correct macroeconomic understanding on households' self-reported saving and spending responses to three types of shocks: monetary policy, oil prices, and taxes. The key independent variable is a dummy equal to one if the respondent correctly identified the direction of the shock's effect on both inflation and unemployment. Each panel presents coefficients for a given shock, with outcomes indicating whether the respondent reports increasing, decreasing, or not changing saving or spending behavior. Positive coefficients indicate a higher likelihood of selecting that option when the shock is correctly understood. 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.

Online Appendix

Appendix A: Additional Tables and Figures

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 A1: **Theoretical benchmark and consistent survey answers for each shock.**

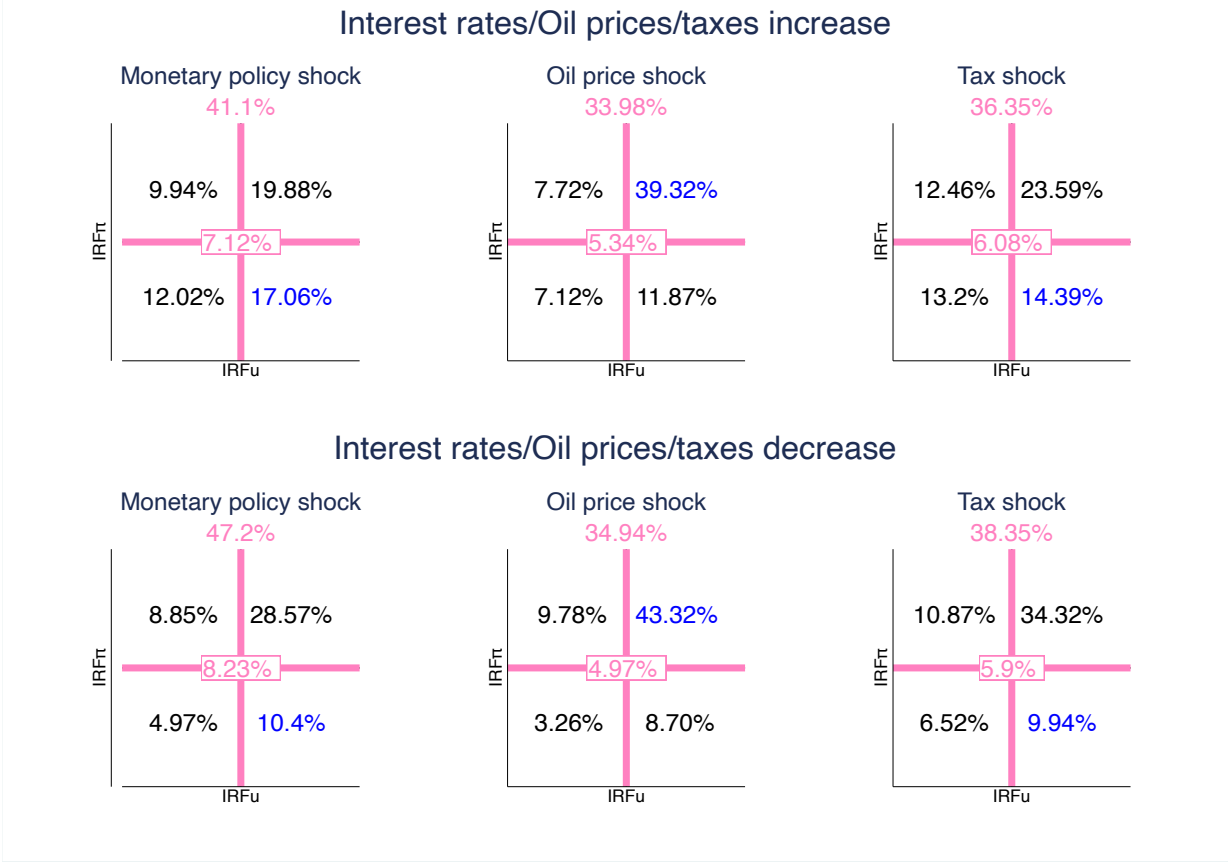

Figure A1: **Joint distribution of Signs of SIRFs for inflation and unemployment, separately for negative and positive scenarios.** This figure displays the joint distribution of households' subjective impulse responses (SIRFs) for inflation and unemployment following the three macroeconomic shocks (monetary, 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 SIRFs 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).

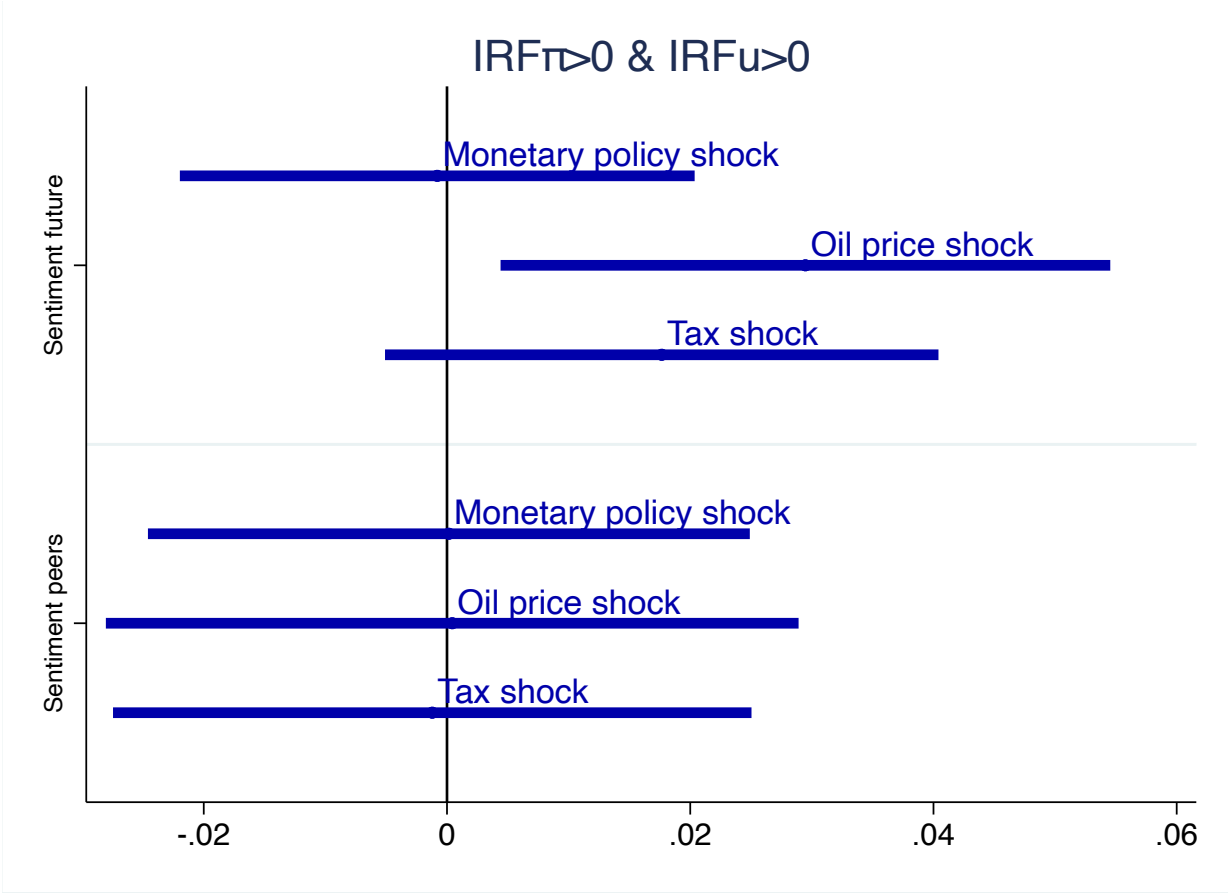

Figure A2: **Correlation between stagflationary beliefs and economic sentiment.** This figure plots the coefficients from separate OLS regressions where the dependent variable is a dummy equal to 1 if the respondent expects both inflation and unemployment to increase in response to the shock. The key independent variables are two sentiment indicators: one comparing the respondent's current financial situation to the past, and another comparing it to the financial situation of peers, 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, and 90% confidence bands.

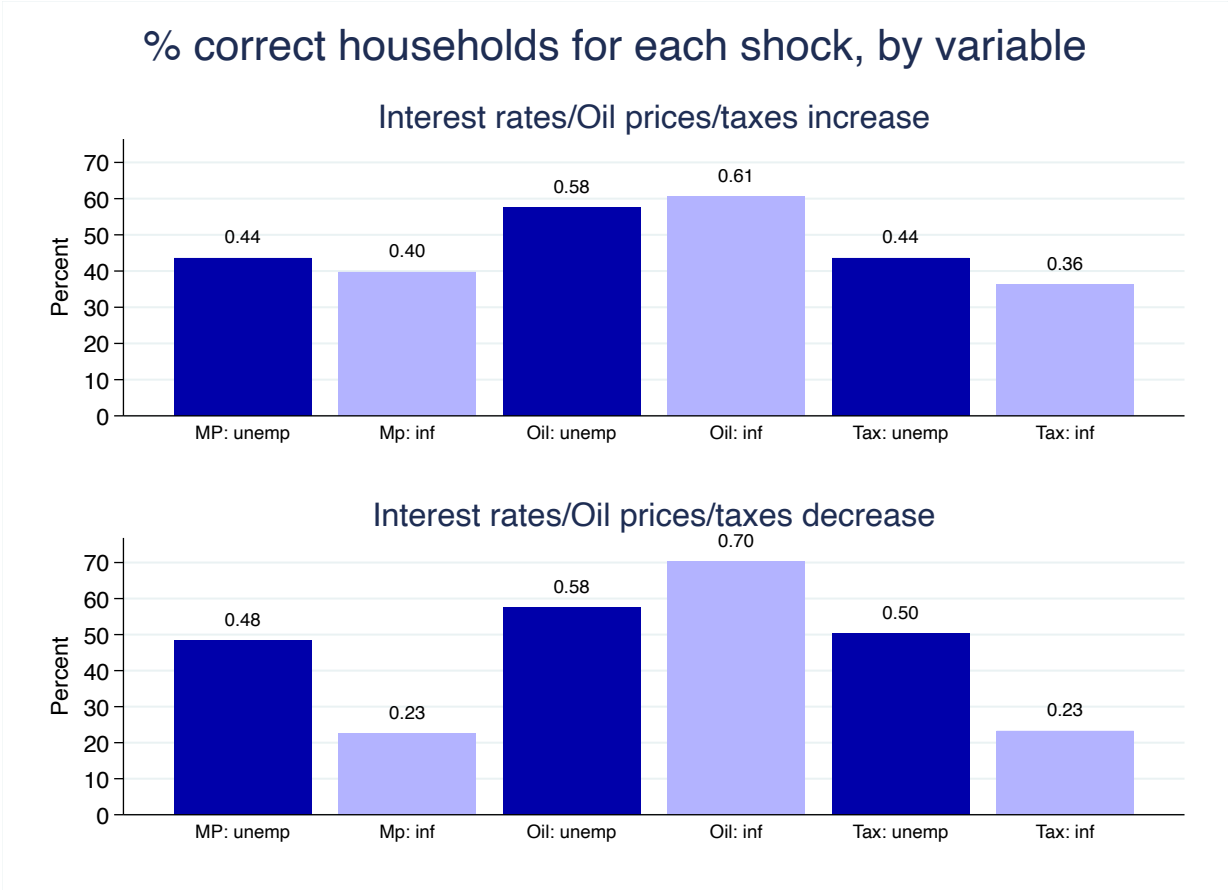

Figure A3: **Share of households with theory-consistent SIRF sign, by variable and shock, separating between positive and negative scenarios.** This figure shows the percentage of households predicting a theory-consistent direction of the shock's impact on inflation and unemployment, separately for each macroeconomic shock and by shock sign.

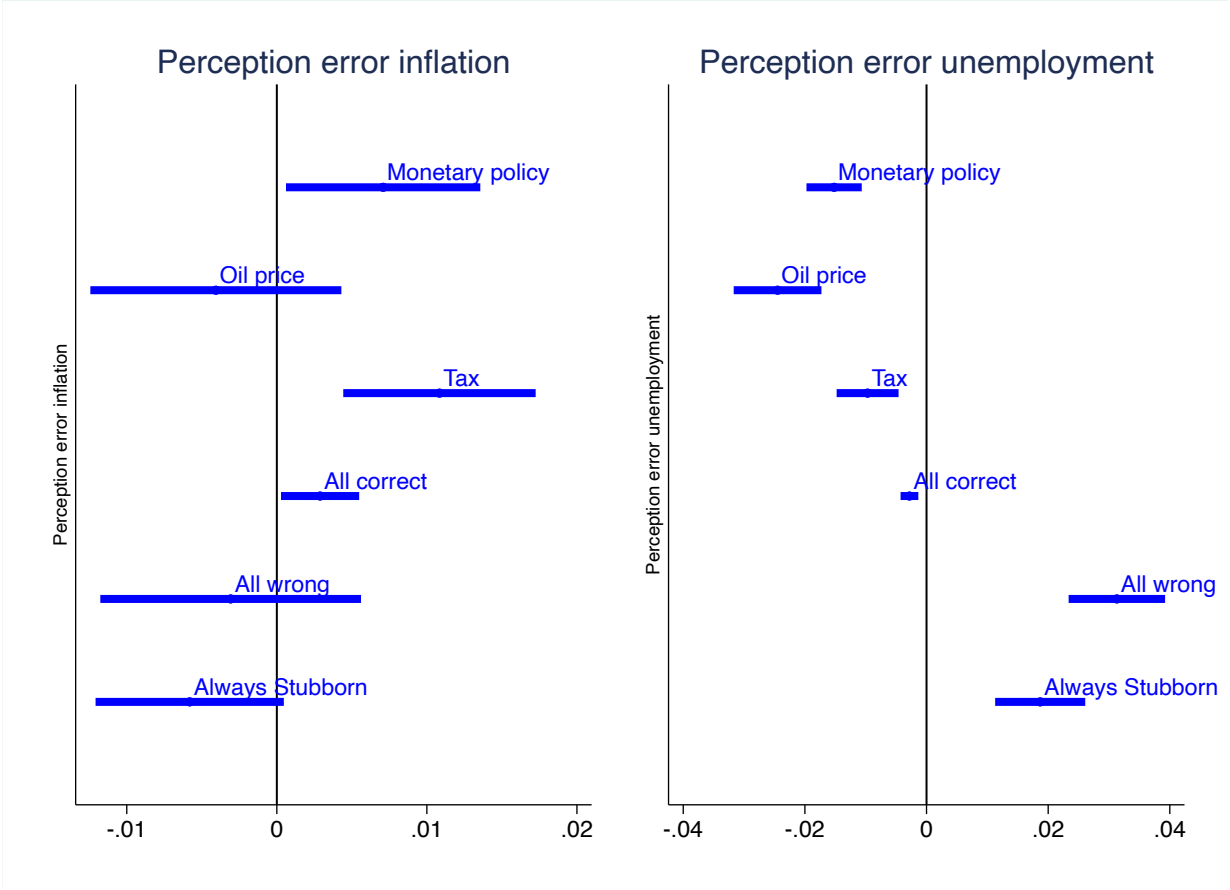

Figure A4: **Perception errors and theory-consistent interpretations of macroeconomic shocks.** This figure reports the coefficients from linear probability models regressing various indicators of belief consistency on forecast errors for inflation and unemployment. Belief consistency is measured by dummy variables equal to one if the respondent's subjective impulse response (SIRF) signs for inflation and unemployment match those implied by textbook models, separately for each of the three shocks (monetary, oil, tax). Additional indicators include: "always correct" (theory-consistent for all shocks), "always incorrect" (never theory-consistent), and "always stubborn" (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.

	(1) MP shocks	(2) Oil shocks	(3) Tax shocks	(4) Always correct	(5) Always wrong	(6) Always stubborn
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	-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	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	1032	1032	1032	1032	1032
R-squared	0.035	0.033	0.028	0.043	0.028	0.022

Table A2: **Determinants of theory-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 textbook macroeconomic models (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	is 0
Monetary policy shock				
Saving increase	-.07	.02	0	No
Saving no change	.11	.03	0	No
Saving decrease	-.05	.02	.01	No
Spending increase	-.09	.02	0	No
Spending no change	.14	.03	0	No
Spending decrease	-.06	.02	.02	No
Oil shock				
Saving increase	-.02	.01	.2	Yes
Saving no change	.17	.03	0	No
Saving decrease	-.16	.02	0	No
Spending increase	-.14	.02	0	No
Spending no change	.19	.03	0	No
Spending decrease	-.09	.02	0	No
Tax shock				
Saving increase	0	.01	.65	Yes
Saving no change	.21	.03	0	No
Saving decrease	-.21	.03	0	No
Spending increase	-.03	.01	.01	No
Spending no change	.22	.03	0	No
Spending decrease	-.21	.03	0	No

Table A3: **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. A significant difference ($p < 0.05$) indicates asymmetric behavior across shock signs.

Appendix B: support analysis

.1 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 (IRFs). I use the sign of each IRF (positive, negative, or zero) to assess whether respondents' expectations align with textbook 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 theory in any of the vignette scenarios equates to the probability of answering both questions correctly.

- Probability of being theory 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 theory consistent in all three vignettes jointly $= \left(\frac{1}{9}\right)^3 \approx 0.137\%$
- Probability of being theory consistent for two vignettes out of three $= \binom{3}{2}\left(\frac{1}{9}\right)^2\left(\frac{8}{9}\right) \approx 3.291\%$
- Probability of being theory consistent for one vignettes only $= \binom{3}{1}\left(\frac{1}{9}\right)\left(\frac{8}{9}\right)^2 \approx 26.339\%$
- Probability of not being theory consistent for any vignettes $= \left(\frac{8}{9}\right)^3 \approx 70.233\%$

Summary:

Outcome	Percent	In the sample
All vignettes theory consistent	0.137%	1.44%
Theory consistent for 2 vignettes	3.291%	between 2 and 5%
Theory consistent for 1 vignette	26.339%	4% (m.p. and tax); 34% (oil)
Never theory consistent	70.233%	46%

The third column of the table reports the share of respondents whose interpretations are theory-consistent across all three vignettes, in two out of three, in only one, or in none—corresponding to the data shown in Figure 7. The probability of providing theory-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 textbook-consistent, mental models.

.2 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 (SIRFs) across shocks displays the same patterns documented in Section 6.1.1.
- The demographic correlates of theory-consistent interpretations remain stable.
- The relationship between forecast errors and theory-consistent interpretations is robust.
- The link between textbook-consistent interpretations and households' saving and spending choices continues to hold.

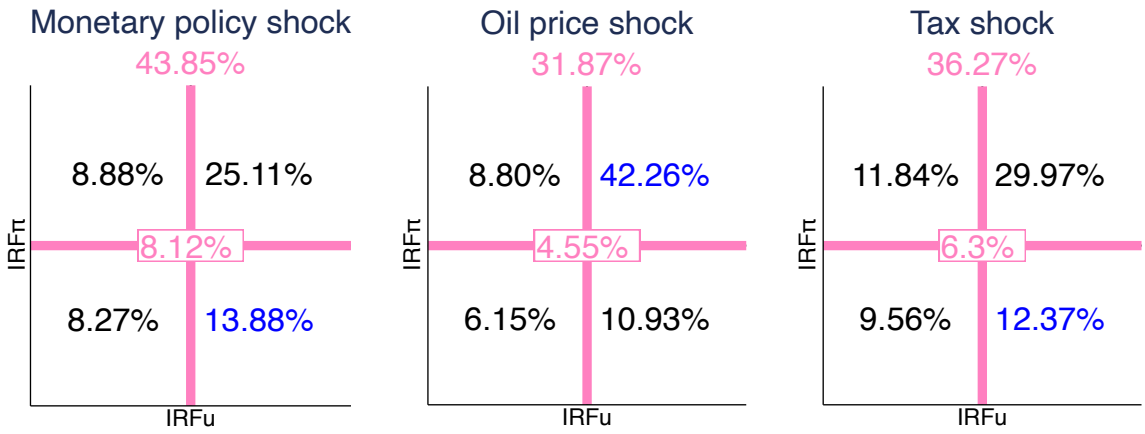

Figure A5: **Joint distribution of signs of SIRFs for inflation and unemployment. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 5.

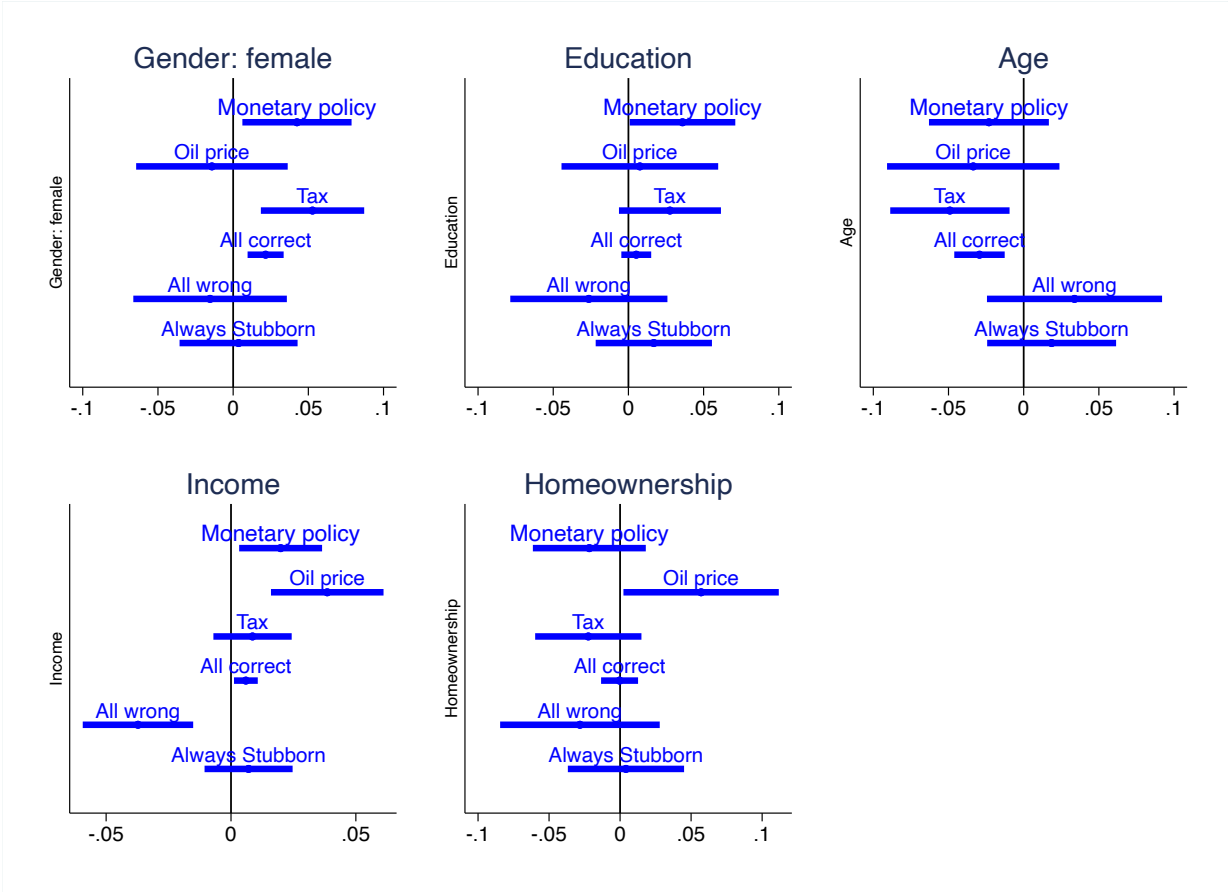

Figure A6: **Determinants of theory-consistent interpretations of macroeconomic shocks. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 10.

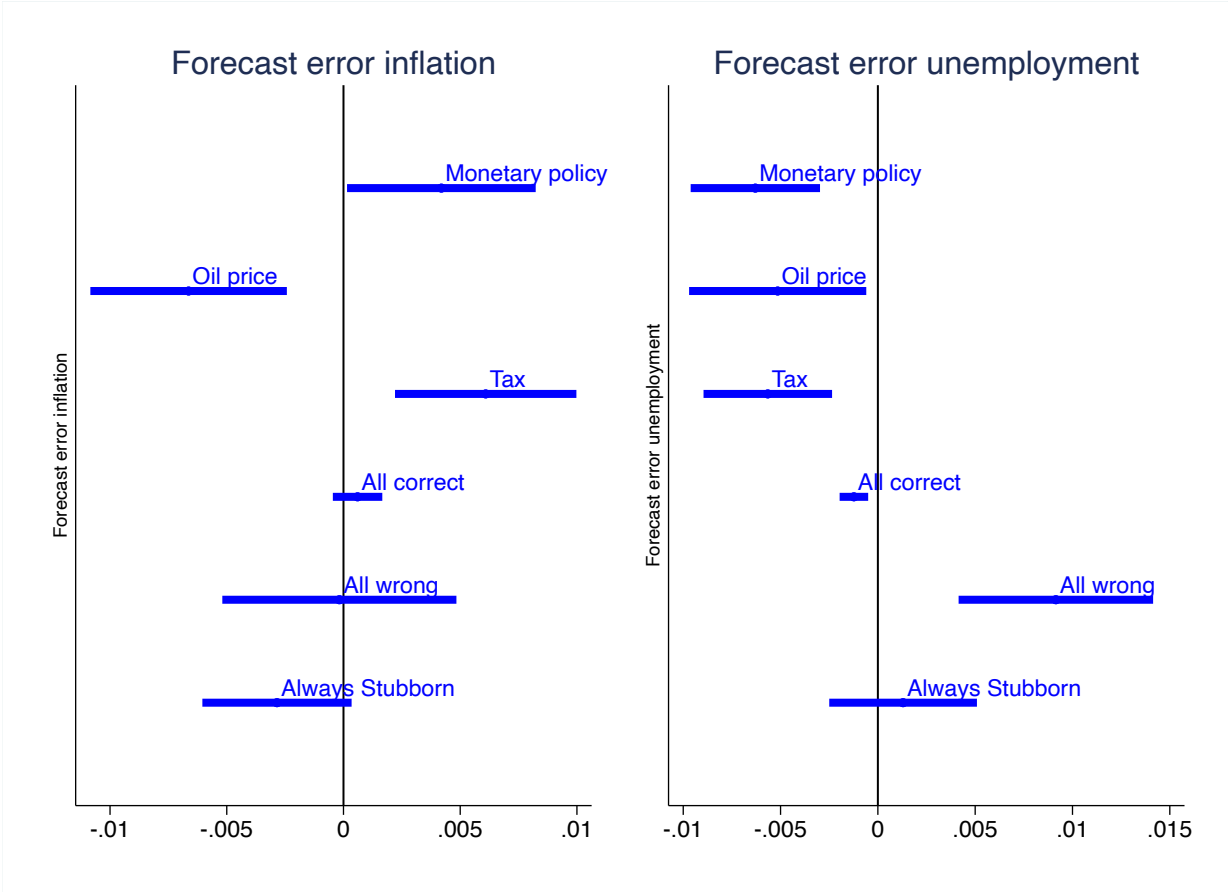

Figure A7: **Forecast errors and theory-consistent interpretations of macroeconomic shocks. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 11.

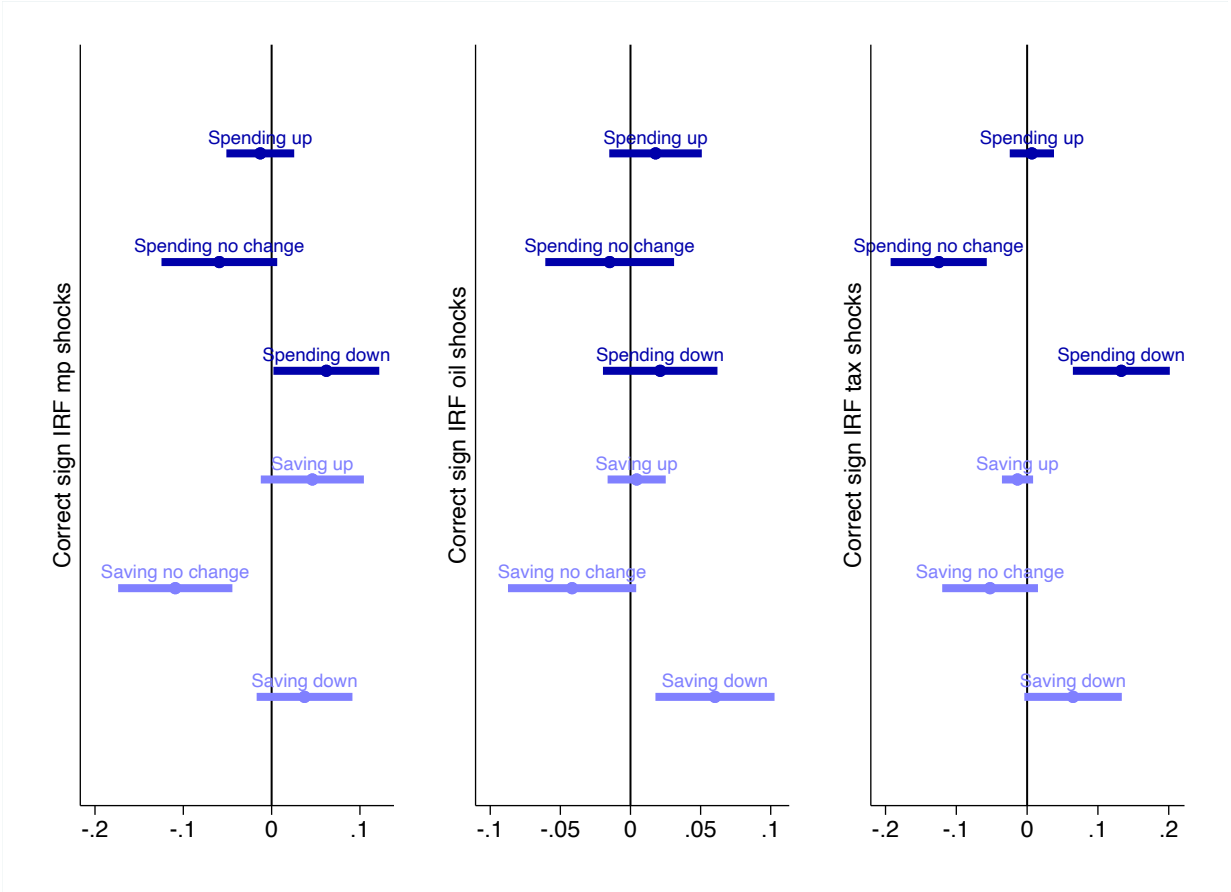

Figure A8: **Textbook interpretation of shocks and spending/saving choices. Winsorizing at the 99th percentile.** Results closely replicate those shown in Figure 14.

Appendix C: survey questions