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How do rising temperatures affect inflation expectations?

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Abstract:

Global temperatures are rising at an alarming pace and public awareness of climate change is increasing, yet little is known about how these developments affect consumer expectations. We address this gap by conducting a series of experiments within a large-scale, population-representative survey of euro area consumers. We randomly assign consumers to hypothetical global temperature change scenarios, after which we elicit their expectations for inflation and key macroeconomic indicators under these conditions. We find that a 0.5°C rise in global temperatures leads to a 0.65 percentage point increase in five-year-ahead inflation expectations, with effects particularly pronounced among consumers with greater awareness of climate change. Additionally, respondents expect adverse impacts of global warming on economic growth, employment, public debt, tax burdens, and their well-being. Despite these pessimistic expectations, many consumers demonstrate limited willingness to pay for mitigating further temperature increases. Instead, they place primary responsibility for climate action on governments. Our findings underscore the interplay between climate change and economic expectations, highlighting the potential implications for monetary and fiscal policy in a warming world.

***JEL* Classifications:** D12, E31, E52, H31, Q54

Keywords: Climate change, Global Warming, Consumer expectations, Randomized Control Trial (RCT), Consumer Expectations Survey (CES)

Non-technical summary

Rapidly rising global temperatures and growing public awareness of climate change raise concerns about its economic consequences. Global climate change is accelerating, producing profound and far-reaching consequences for economies and consumers worldwide.

At the same time, little is known about how climate change influences consumer expectations. We address this gap by conducting a series of experiments within a large-scale, population-representative survey (Consumer Expectations Survey – CES) across 11 euro area countries. We randomly assign consumers to hypothetical global temperature change scenarios, after which we elicit their expectations for inflation and key macroeconomic indicators under these conditions. Understanding how different climate change scenarios influence consumer expectations is important given the far-reaching implications of these expectations for economic behaviour.

We find significant effects of higher temperature scenarios on inflation expectations. A large impact is observed for overall inflation, with many consumers expecting that rising global temperatures will increase food prices, energy prices, and prices of other goods and services. Respondents most often attribute higher food prices to supply-side factors, such as crop failures, higher production costs and supply chain disruptions, and to a lesser extent to demand and cost-push factors. Consumers with greater climate knowledge report stronger upward revisions in inflation expectations, suggesting that awareness amplifies perceived risks.

In addition, higher temperature scenarios reduce expected GDP growth and stock prices, while increasing expectations of unemployment, taxes, debt, and housing prices. Respondents also anticipate negative impacts on biodiversity and larger immigration flows. We also document some non-linearities across different temperature scenarios, indicating consumers believe climate change effects have already partly materialised. Despite pessimistic expectations, we find that many consumers demonstrate limited willingness to pay for mitigating further temperature increases. Consumers primarily consider the government responsible for taking climate actions and this may be also reflected in their increasing tax expectations in response to higher global temperatures.

Our findings underscore the interplay between climate change and economic expectations, highlighting the potential implications for monetary and fiscal policy in a warming world.

"[…] extreme weather events, and the unfolding climate crisis more broadly, could drive up food prices by more than expected." **Christine Lagarde** – president of the European Central Bank (press conference, 12.12.2024)

"*Present trends are racing our planet down a dead-end 3C temperature rise.*" **Antonio Guterres** – U.N. Secretary-General (Reuters, 13.11.2024)

1. Introduction

Global climate change is accelerating, producing profound and far-reaching consequences for economies and consumers worldwide. The year 2024 marked the warmest year in over a century and a half, underscoring the risk of not achieving the 1.5°C target set by the Paris Agreement. Europe, for instance, endured its hottest summer on record, with recurrent wildfires sweeping across Portugal, France, and Greece, along with devastating floods in Austria, Spain, and several Eastern European countries.[1] These escalating extreme weather events not only challenge governmental policy responses but also raise critical questions for central banks. In particular, they might pose risks to price stability and financial stability, highlighting the urgent need to understand the macroeconomic consequences of global warming – including its potential to shape inflation and other macroeconomic expectations.[2]

The public is generally sensitive to climate change, with growing concern and awareness about its repercussions. A representative survey among European consumers, which we will discuss in detail below, reveals that 44 percent witnessed extreme weather events in the past five years. Moreover, three-quarters of consumers pay attention to the news on climate change, while a similar fraction is concerned about climate change affecting their own financial situation. Despite this high level of consumer awareness regarding climate change, surprisingly little is known about how these changes affect consumer inflation expectations and their beliefs and expectations about their own financial well-being and the macroeconomy more broadly.

The present paper aims to address this gap by estimating the effect of various temperature change scenarios, a concept that most people are familiar with and can relate to, on consumers' expectations.

[1] Beyond Europe, new research suggests revising the classification of hurricanes due to increasing wind intensities, unprecedented wildfires recently engulfed Los Angeles in the US, and floods caused tragic death in central Texas. See also recent reporting on "World breaches 1.5°C global warming target for first time in 2024" (Financial Times, January 10th, 2025), reporting on "Deadly 'early summer' heatwave moves across Europe as climate scientists ring alarm bells" (Financial Times, July 3rd, 2025) and Wehner and Kossin (2024).

[2] See also Campiglio et al. (2025) who show that central banks around the world increasingly engage in climate change related communication and Eickmeier and Petersen (2024) for consumers perceptions about central banks adopting climate-related responsibilities.

Specifically, we implement an experiment within a population-representative survey, randomly assigning respondents to different scenarios of increasing and decreasing global temperatures over the next five years. We then elicit their inflation expectations along with other macroeconomic expectations (including economic growth, unemployment, and tax burden) and some household-specific expectations. The random assignment to different scenarios ensures that the average differences in expectations between groups are driven by the varying intensity of temperature scenarios and are not confounded by differences in observed and unobserved respondents' characteristics, which net out on average.

Understanding how different climate change scenarios influence consumer expectations is important given the far-reaching implications of these expectations for economic behaviour. Expectations can affect consumers' consumption choices, wage demands, risk attitudes and investment choices, beliefs about the long-term economic outlook of the country, and support for climate policies or voting behaviour (see, for example, D'Acunto et al. 2024 for a review of studies on how inflation expectations impact consumer behaviour).

To further explore these dynamics, we implemented a series of special-purpose questions alongside survey experiments fielded in different waves of the ECB Consumer Expectations Survey (CES). The survey provides representative data covering the eleven largest euro area countries. Our experimental design comprises four distinct groups of respondents, each randomly assigned to one of four average global temperature change scenarios. In our baseline survey experiment, fielded in June 2025, we compare responses in scenarios where global temperature increases by 0.5°C or 1.5°C against a baseline group with only a minimal 0.01°C change (which essentially represents the no temperature change control group). The fourth scenario involves a 0.5°C decline in global temperature. This scenario also serves as a consistency check and a reference point for potential asymmetries in response to positive and negative temperature changes. Respondents report their inflation expectations, expectations about GDP growth, stocks and house prices, government debt and taxes, as well as their financial well-being, all subject to the scenario they have been assigned to. Beyond economic variables, we measure the impact on variables such as immigration and biodiversity. As a placebo test, we examine the effects of temperature changes on the number of Oscar-winning movies.

We gain further insights from another survey module in September 2024, using more extreme temperature scenarios (ranging from a 1.5°C decrease to a 3.0°C increase) which allows for the identification of potential non-linearities in the transmission of temperature changes to expectation. Overall, the results from both experiments are qualitatively consistent, strengthening the robustness of our conclusions. Additionally, the time gap between the two surveys (the first conducted after summer

2024 and the second before summer 2025) reduces concerns about seasonal effects influencing our results.

We report several novel findings. First, consumers who are randomly assigned to scenarios with higher temperatures increase their inflation expectations due to climate change. According to our findings, a 0.5°C rise in global temperatures induces a 0.65 percentage point increase in the five-year-ahead inflation expectations. In follow-up questions, consumers attribute increases in, for example, food prices to supply-side factors (crop failures, higher production costs and supply chain disruptions) and to a lesser extent to demand and cost-push factors. Moreover, we document that rising global temperature also affects other macroeconomic expectations. For instance, higher temperatures induce lower expectations about economic growth and stock prices and higher expectations about unemployment, tax burden, government debt, and housing prices. Consumers also expect rising temperatures to worsen their financial well-being. Furthermore, they expect global warming to be detrimental to biodiversity and lead to increased immigration. On the other hand, and as a further validation of the experiment's effectiveness, we estimate negligible and statistically insignificant effects of temperature changes on our placebo outcome - the number of Oscar-winning movies.

Second, there is considerable heterogeneity in the estimated effects on inflation expectations, notably with respect to climate knowledge. Consumers who have a better understanding of basic scientific facts and evidence on the effects of climate change, form higher inflation expectations in response to a given temperature increase relative to their less knowledgeable counterparts. This is likely because consumers with greater awareness of the consequences of climate change are better positioned to grasp its far-reaching implications – such as disruptions to food production and supply chains – recognizing that even a modest increase in global temperatures could exert upward pressure on prices.

Third, the perceived impact of global temperature change is nonlinear. For example, the downward effects on inflation expectations from a 0.5°C temperature decline tend to be larger in absolute terms than the counterpart positive effects of a 0.5°C temperature increase. One plausible explanation for this difference may be that many consumers believe that at least part of the effects due to global warming may have materialized already and are therefore built into current expectations. Furthermore, a global warming of 3.0°C or 1.5°C have the largest effects, but most of the estimated impact on expectations already materialises under the smaller 0.5°C temperature increase scenario. For the average consumer, the increase of 0.5°C is already seen as quite damaging for most of the outcomes under study.

Fourth, most consumers are willing to pay a monthly amount to the government to finance measures that will prevent temperature increases. The unconditional average payment accumulates to about

€3,060 over five years. While non-negligible, these amounts are considerably lower than what consumers would have been willing to pay to smooth business cycle fluctuations or to bring inflation down to their desired levels (see Georgarakos et al. 2025). Consumers primarily consider the government responsible for taking climate actions and this may be also reflected in their increasing tax expectations in response to higher global temperatures.

Our findings have several policy implications. First, the economic consequences of global temperature changes extend beyond their direct impact through economic damages caused by extreme weather events, as inflation and other economic expectations and attitudes are also impacted and, in turn, via these channels influence consumer behaviour and the broader macroeconomy.

Second, these results have implications for monetary policy and the anchoring of inflation expectations. As climate change intensifies the frequency and severity of extreme weather events, disruptions to agricultural production, supply chains, and energy markets can lead to persistent upward pressure on prices. If consumers tend to anticipate higher future inflation as a result, their expectations may become embedded in wage and price-setting behaviour, potentially intensifying inflationary pressures. Existing research suggests that consumers with better knowledge of the economy and monetary policy tend to trust more the central bank and hold better anchored inflation expectations (Ehrmann et al. 2025). However, our findings suggest that consumers with greater awareness about climate change associate rising global temperature with higher longer-term inflationary pressures, pointing to some risk of de-anchoring. This could pose challenges to central banks and present new communication challenges, especially in view of climate-induced uncertainties and global warming.

Third, these findings are important because they relate to public support for climate action and highlight that climate change is already affecting the economy through household expectations and beliefs. These results suggest consumers will continue to view climate change as a key priority for policymakers. While there is considerable heterogeneity in these views, higher-educated, more financially literate, and higher-income respondents are more likely to prioritize climate change. However, hand-to-mouth consumers, who are more vulnerable to rising prices and more concerned about climate change, also report other policy priorities that they consider more urgent.

Our paper contributes to several strands of literature on the impact of climate change on the economy. A rapidly growing body of research aims to quantify these effects. Many studies have focussed on estimating the aggregate monetary impact of climate change, with more recent findings indicating sizeable and persistent economic losses (e.g., Carleton et al. 2022, Bilal and Känzig 2024, Kotz et al. 2024a) due to rising temperatures through climate change. These effects are likely to vary across

countries because of heterogenous and geographic exposure to the materialisation of climate-related risks (Cruz and Rossi-Hansberg 2024). While earlier work, as reviewed by Tol (2009), largely overlooked certain broader costs, more recent studies emphasize additional economic costs in the form of biodiversity loss which can reduce output today and limit growth opportunities for the future (Giglio et al. 2024).

Studies on consumers have primarily shown that they pay attention to and are generally concerned about climate change (Whitmarsh and Capstick 2018, Crispino and Loberto 2024).[3] Work by Dechezleprêtre et al. (2025) investigates how attitudes towards climate policies are formed and demonstrates that educational videos highlighting policy mechanisms can increase support for such policies. Moreover, there is growing evidence that beliefs about climate change also matter for asset prices (Bernstein et al. 2019, Baldauf et al. 2020, Giglio et al. 2021, Fairweather et al. 2024) and might become more important in the future. Stroebel and Wurgler (2021) find in a survey that different economic experts believe climate risks are underpriced in asset markets. Similarly, a survey of investors by Giglio et al. (2023) suggests that risks from biodiversity loss may be inadequately reflected in equity prices. A small but growing literature also studies how financial analysts perceive climate change risks. Faralli (2024) provides evidence that among equity analysts extreme weather events can lead to improved earnings forecast accuracy indicating that analysts incorporate climate change only when it becomes salient. Chan (2024) indicates that only a minority of analysts cover climate risks in their reports. Professional forecasters' expectations for the broader economy following an extreme weather event seem to be associated with lower growth and higher inflation expectations, consistent with a supply shock interpretation (Martinez 2025). Notably, very few studies have examined what consumers think will be the macroeconomic effects of climate change. Yet previous work by Andre et al. (2022, 2024b), highlights that consumers' narratives about the economy and asset markets can differ substantially from those of experts. Meinerding et al. (2023) find based on observational data for German consumers that higher concerns about climate change correlate with lower inflation expectations. The authors suggest that consumers might feature a demand side view expecting decreasing aggregate demand and lower inflation expectations are associated with climate change risks. To this end, we also shed light on the underlying channels for how consumers think future prices will be affected by global temperature change. Dietrich et al. (2024) show that news about climate change related disasters affects consumers growth expectations. The authors find evidence that consumers perceive a high probability of costly, rare disasters with a modest negative effect on overall growth. In this paper, we provide novel evidence

[3] See Baiardi (2023) for a review of global climate change awareness and concerns.

on what the authors coin *the expectations channel of climate change* that goes beyond the effect on GDP growth expectations.

We make three distinct contributions to the literature. First, we document several key facts about consumers' expectations about future temperatures as well as their experiences with climate change, their knowledge, attention, and concerns. Second, we estimate the causal effect of rising temperatures on consumer inflation expectations, other macroeconomic expectations, and beliefs about own financial well-being. Moreover, we show that the relative effect on inflation expectations is stronger among consumers with better awareness of environmental risks. Third, we elicit consumers' willingness to pay to avoid the effects of rising temperatures.

To establish causality, we implement an RCT in a population-representative survey and leverage recent advances in survey methodology, as reviewed by Stantcheva (2023) and Haaland et al. (2023). As we explain in detail below, we randomly assign different scenarios of future (positive and negative) global temperature change to survey respondents to estimate how rising temperatures affect consumers' expectations.

The remainder of this paper is structured as follows. Section 2 presents the data and describes the experimental design that we use for identification. Section 3 presents the empirical analysis on inflation expectations, including robustness tests to ensure the integrity of the experimental design. Section 4 reviews results for other macroeconomic expectations. Section 5 presents results on consumers' willingness to pay for climate change mitigation. Finally, Section 6 concludes and discusses implications of our findings.

2. Data and experiment design

2.1 The Consumer Expectations Survey

We use micro-level data from the ECB's Consumer Expectations Survey (CES). This internet-based survey is fielded every month over a sample of about 19,000 consumers in the eleven largest euro area countries, offering nationally representative data of the underlying populations.[4] The flexible survey design, the very large number of observations, and its online nature make the CES especially suitable for our research purposes. We field two experiments and combine them with additional special-purpose

[4] The CES was launched in a pilot phase in January 2020 interviewing households every month in the six largest euro area economies (Belgium, France, Germany, Italy, the Netherlands, Spain). Since January 2022, the survey has been expanded to cover five additional countries (Austria, Greece, Finland, Ireland, and Portugal). For details see Christelis et al. (2024), Georgarakos and Kenny (2022) and ECB (2021).

and background questions collected in the survey. Specifically, we use information from waves in August and December 2024, and two experiments fielded in September 2024 and June 2025 for which we provide details below.[5]

2.2 Survey information on climate change and experimental design

Average global land and ocean temperature have increased considerably since 1850. The current global temperature is nearly 1.5°C above the 1901-2000 average, and a clear acceleration in global temperatures can be observed over the last four decades (see Appendix Figure A1). Higher average global temperatures also go hand in hand with an increasing frequency and severity of extreme weather events affecting more consumers around the world.[6] Notably, as global temperatures increase, the topic of global warming has received a vastly increasing amount of attention in the media as is evident from the number of articles containing the word "global warming".[7]

Consumers interviewed in August 2024 believe that there is on average a 22 percent chance that extreme weather events will affect the economic situation of their country over the next five years (median: 15). Similar to evidence found by Dietrich et al. (2024) for the U.S, consumers in the euro area expect costly extreme weather events to affect their economy. Such concerns can be due to various reasons, as the economic consequences extend beyond the tragic loss of life caused by extreme weather events. Real global damages from weather-related events have more than doubled over the past twenty years and concern output, productive capital, real estate, or infrastructure (Mauderer and Talbot 2024; Banerjee et al. 2023). Climate change exerts upward pressure on inflation, particularly on food prices, especially in the short run when supply constraints and additional costs drive prices higher. In the long run, the overall impact depends on whether supply effects dominate or if lower demand – resulting from reduced wealth – offsets inflationary pressures. The total effect on inflation depends on the nature of the event, the level of insurance coverage, and the government's response. Additionally, the mere expectation of climate change and extreme weather events can influence consumer expectations and behaviour. This naturally raises the question of how consumers form their inflation and other expectations in response to the economic repercussions of climate change they perceive.

[5] Appendix C provides details and the exact wording of questions and response options. Throughout our analysis, we make use of programs developed by Stepner (2013), Jann (2014), and Correia (2023).
[6] See Robinson et al. (2021); IPCC 2021 (https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/), BBC "A year of extreme weather that challenged billions" on December 29th 2025, and the 2024 report on European Climate Risk Assessment (https://www.eea.europa.eu/publications/european-climate-risk-assessment).
[7] Figure A2 shows the increasing news coverage of climate change related news and particularly articles related to the topic of global warming (panel a) and recent cost estimates for European countries (panel b). See Bilal and Stock (2025) for a review of the likewise expanding literature on climate change and its economic costs.

Consumers' expectations about the effects of climate change on the macroeconomy may be influenced by their socioeconomic characteristics, as well as by idiosyncratic, unobserved factors and beliefs that are likely time varying (e.g., concerns about the future in general, political beliefs, knowledge about the effects of climate change, etc.). Such unobserved traits most likely also correlate with consumers' awareness about climate change. As a result, estimating the causal effect of different climate change scenarios on consumers' beliefs about the macroeconomy is empirically challenging and cannot be addressed with standard econometric methods.

To address this empirical challenge, we implement two RCTs in the September 2024 and June 2025 rounds of the CES as part of special purpose modules fielded after the regular surveys.[8] Respondents are randomly divided into four different groups stratified at the country and recruitment type level. Each of the groups is assigned to a different hypothetical scenario for global temperature change. Before this, respondents are informed that "According to historical data, the annual average global temperature in 2023 has increased significantly by about 1 degree Celsius compared to 50 years ago". This information helps putting the total change in temperature in perspective.

Thereafter the June 2025 survey presents one of the following four scenarios, i.e., "Suppose that in the next 5 years, the average global temperature will [decrease considerably by 0.5/increase only slightly by 0.01/increase considerably by 0.5/increase considerably by 1.5] degrees Celsius compared to today". In our empirical analysis, we are particularly interested in the scenarios with a temperature increase of 0.5°C and 1.5°C. The scenario with 0.01°C temperature increase serves as the (almost) no change base category (i.e., it is like a control group in an RCT). Responses to the 0.5°C temperature decline scenario serve as a validity check and can be used to test the symmetry of effects of higher/lower temperature expectations. The choice of 1.5°C temperature change is chosen as this increase has become a focal point in public discussions and the media after the 2015 Paris agreement to limit the global temperature rise to well below 2°C and ideally to 1.5°C above pre-industrial levels. While the 1.5°C change is tied to a specific reference point in that climate agreement, the public may recognize that a 1.5°C increase represents a significant change in temperature. The September 2024 survey includes a 3.0°C increase scenario to present an even more extreme case, allowing us to investigate potential nonlinear effects of temperature change on consumer expectations. This 3.0°C increase scenario in September 2024 was complemented with -1.5°C, +0.01° and +1.5°C scenarios, but it was otherwise identical to the June 2025 experiment. In the remaining of the paper, we primarily discuss the June 2025 findings and refer to the September 2024 results where relevant.[9]

[8] See Table B1 in the Appendix for sample summary statistics of socio-demographics in June 2025.
[9] Table B9 summarises the results for September.

Given the scenario they are assigned to, respondents are asked to report how this scenario will change their inflation and several other expectations about the economy and own financial well-being over the next five years. Answer categories are “decrease a lot”, “decrease a little”, “no effect”, “increase a little” and “increase a lot”. We are particularly interested on the effects of rising temperatures on inflation and growth expectations and for these two concepts respondents are also asked, following their qualitative answer, to provide a quantitative response. As the price of certain categories like food may respond more directly to extreme weather events (Ciccarelli et al. 2024, Kotz et al. 2024b), we also ask in September 2024 for (qualitative) responses to specific components, such as food prices, energy prices, and prices of other goods and services. Moreover, respondents expecting higher food prices are asked a follow-up question where they can indicate the (perceived) reason for higher food prices.

Next to the consequences for consumer prices, respondents indicate the expected consequences for the macroeconomy (economic growth and unemployment), asset prices (stock prices and house prices), public finances (government debt and taxes) as well as their household financial well-being. In addition, we ask for the consequences for biodiversity as a plausibility check and immigration to study the likely effects beyond standard economic expectations. Finally, we ask for the consequences for “the number of Oscar-winning movies” over the next five years which is included as a placebo outcome item as there is no reason to expect a systematic change related to global temperature changes. To minimise any ordering effects influencing our results, we block-randomized the order of the outcome variables, grouping together those that logically relate, such as the three items related to price expectations.

Properly designed scenario questions can help uncovering causal relationships that are hard to identify in observational data. Yet, it is instructive these scenarios to refer to situations that many respondents could relate to or find plausible and thus can conceptualise their possible implications. For example, is a scenario that involves a 1.5°C increase in temperature over the next five years, compared to today, a situation that (some) respondents find possible or at least not completely unrealistic? To this end, we elicit in June 2025 survey (prior to scenario questions) expectations about global temperature changes over the next five years using a probabilistic question format (cf. Manski 2004). Figure 1 displays the implied distribution of respondents expected mean change in global temperatures. Two key patterns emerge. First, the vast majority of respondents (more than 80%) expect an increase in global temperatures, and a sizable one-third of the sample expects a quite significant increase of 1.5°C or more. Moreover, most households expect an average temperature increase of the order of 0.5°C, 1.5°C, 2.5°C and 3.0°C. This suggests that the scenarios shown to respondents are seen as realistic and that many consumers have likely thought about them and can easily conceptualise their implications. Second, while the vast majority of consumers expects a significant rise in global temperatures over the next five years,

there is considerable disagreement across them and idiosyncratic uncertainty about future temperature changes. Thus, the use of scenarios is quite appropriate in this context.

Moreover, we ask a number of special-purpose questions to measure respondents' concerns about climate change, their climate knowledge, experiences, expectations, and attention to climate news that we analyse in the next section.

3. Empirical results

3.1 Consumers climate change experiences, knowledge, attention, and concerns

To assess consumers' awareness of climate change, we first ask respondents how much attention they pay to climate change news themselves. Figure 2 (panel b) shows that about 6 in 10 consumers pay some or much attention and 14 percent pays a great deal of attention to climate change news. This demonstrates that a significant number of people pay attention to climate news, in line with earlier evidence by Andre et al. (2024a), who also show considerable willingness to act among consumers.

Moreover, we ask seven true/false statements to measure climate change knowledge (all including an "I do not know" option). These questions follow the dimensions set out in Tobler et al. (2012), i.e., physical knowledge about CO2 and the greenhouse effect; knowledge concerning climate change and causes; knowledge concerning expected consequences of climate change; and action-related knowledge. Appendix C contains the precise wording of the questions and appendix B reports the results for each individual question.[10] Figure 2 (panel a) reports the distribution of the total number of correct responses to the climate knowledge questions. While there is considerable heterogeneity in climate knowledge, two-thirds of respondents answered at least five knowledge questions correctly.

The above suggest that the majority of consumers is aware about climate change. At the same time, consumers show some concern, though most are not overly concerned, about the impact of climate change on the financial situation of their household over the next five years (Figure 2, panel c). The distribution of responses on a scale from 0 (not concerned at all) to 10 (extremely concerned) shows some skewness to the right, with about half of the consumers falling within the categories from 5 to 8, and one in ten in the highest two categories (9-10). On the other hand, one in ten consumers reports having very little concerns (categories 0 and 1). There is a strong association between these concerns

[10] Questions 1, 3, 4, 6 and 7 follow a more extensive item list by Tobler et al. (2012). See Table B2.

about climate change affecting the household financial situation and the perceived importance of climate change as one of the major issues facing their country (Figure A3, panel b and c).

Awareness of climate change may be linked to whether individuals have personally experienced its consequences. One key indicator of this is whether extreme weather events or natural disasters have affected a household's financial situation in the past five years. Figure A4 shows that a significant share of consumers per country has faced financial losses due to extreme weather. The most common events impacting consumers financially are droughts (22%), floods (18%), storms (15%), and wildfires (10%). Across all eleven countries, 44 percent of consumers have been financially affected in the past five years by one or more extreme weather events.

However, there are notable cross-country differences. Greek respondents most frequently report a financial impact, particularly from floods, droughts, and wildfires, each of which has affected more than a third of households. In addition to Greece, households in Portugal, France, and Spain have also been disproportionately affected. These cross-country variations are supported by official data on the economic damage caused by extreme weather events (European Environment Agency 2024). While the survey does not assess whether respondents attribute these events to climate change, it is noteworthy that temperature-related events, such as droughts and wildfires, frequently result in financial losses.

To further investigate the heterogeneity among consumers in their knowledge and attitudes, we run multivariate regression linking these variables to socio-demographic characteristics of respondents. Table 1 present the results and reveals a clear age gradient. The elderly have more knowledge about the causes and consequences of climate change and pay more attention to climate change news. At the same time, they are less often concerned about climate change affecting the economic situation of their country or their own household. Respondents with higher levels of education or financial literacy have more knowledge, pay more attention to climate change news, and expect climate change to have consequences for the economic situation of their country. This translates into a higher proportion believing that climate change is one of the most important policy issues facing their country.

This contrasts with hand-to-mouth consumers who are also concerned about climate change affecting the economic situation of their country and their household financial situation, yet more often consider other policy issues to be more urgent. Additionally, hand-to-mouth consumers have lower levels of climate knowledge and pay less attention to climate change news in the media. Thus, despite their concerns about the negative consequences of climate change for the national economy and their household financial situation, they less often report climate change as a major policy priority. This may

be linked to hand-to-mouth consumers having more immediate concerns that they prioritize as policy issues for their country.

The pattern is different for consumers in the highest household income quartiles. Compared to consumers with less household income, they are more knowledgeable on climate change, less worried about the consequences for the national economy or their household's financial situation, yet more often judge climate change as an issue of major policy importance. Finally, homeowners are less worried about the impact of climate change on the national economy but more worried about their household financial situation.

Does experience affect consumer beliefs about climate change? Commentators on recent extreme weather events have suggested that those might shape how consumers think more generally about the impact of climate change.[11] Earlier research by Choi et al. (2020) indicates that warmer-than-normal local temperatures coincide with more information acquisition by households about climate change. Our results provide additional empirical evidence that supports this argument (see Table B3). Specifically, we find that experiencing any extreme weather event over the past five years is associated with higher attention to climate change, elevated concerns regarding the implications of climate change for a household's financial situation and a higher probability of future detrimental extreme weather events. We also separate the association between "hot" (wildfire, heatwave, or drought) and "wet" (flooding or extreme rainfall, storm, coastal erosion) events. Generally, heat-related events exhibit a more substantial impact on consumers. In particular, such events increase expectations about changes in global average temperatures, which suggests some extrapolation by consumers based on their personal experiences and local conditions.

3.2 How do regional temperatures and extreme weather events correlate with inflation expectations?

Data from the monthly CES questionnaires show a positive correlation between consumer inflation expectations and regional temperatures in the month these surveys are fielded. Figure A5 shows the correlation between mean expected inflation one- and three-years ahead and monthly deviations of regional (NUTS-1) temperatures from their long-term average. Clearly, in months with relatively higher temperatures, expected inflation is higher, which demonstrates that temperature and inflation

[11] See, for instance, "Does catastrophe affect how we think about climate change?" (Cass Sunstein, Financial Times July 20th, 2025).

expectations are likely interconnected. This interconnection does not necessarily imply a causal relation. To investigate causation, we have fielded an RCT with different temperature scenarios.

Moreover, we correlate the perceived likelihood of extreme weather events and 1-, 3- and 5-year-ahead inflation expectations (Figure A6). We find a positive correlation across all horizons, suggesting that consumers who expect a higher likelihood of extreme weather events affecting their country's economy also expect higher inflation, especially for the longer-term (5-year-ahead) horizon.

3.3 The impact of global warming on inflation expectations

Our survey elicits qualitative as well as quantitative inflation expectations due to temperature changes. Before discussing regression results, it is worth illustrating two testable features of our experimental design. Recall that we randomly assign respondents to one of four different scenarios with a temperature change of -0.5°C, +0.01°C, +0.5°C or +1.5°C. A first feature is whether responses across the four scenarios display a monotonic pattern in that progressively higher global temperatures induce a unidirectional change (either increase or decrease) in the underlying expectation. Figure 3 below illustrates that the qualitative 5-year-ahead inflation expectations indeed monotonically increase with the different temperature change scenarios (i.e., an increasing fraction of consumers expect inflation to increase a lot or a little for higher global temperature change). Given that each respondent answers only one of the four scenarios, this monotonic pattern illustrates that the consumers respond consistently to the different temperature changes presented to them.

A second feature is whether consumers react symmetrically to a 0.5°C temperature decline or increase relative to the base scenario (no change in temperature). This comparison shows whether consumers believe the impact of similar temperature decreases and increases has similar or asymmetric (opposite) effects. We will formally test for monotonicity and symmetry in the regression analysis below.

We estimate ordered logit models (Eq. 1) to assess the effect of different global warming scenarios on inflation expectations and a number of other macroeconomic expectations ($Y_{k,i}$) that take the values 1 "decrease", 2 "no effect" or 3 "increase" (i.e., "increase (decrease) a lot" and "increase (decrease) a little" responses are grouped as "increase (decrease)"). Specifically, we estimate average marginal effects on the likelihood of each of these three outcomes due to different (randomly assigned) global temperature scenarios (0.5°C decline, 0.5°C and 1.5°C increase) relative to the baseline scenario of a 0.01°C of virtually no further temperature change, using the following model:

$$\Pr\left(Expected\ inflation = j\right) = \frac{exp\left(\beta T_{m,i} + \omega X_i + \delta_c - \tau_{j-1}\right)}{1+\exp\left(\beta T_{m,i} + \omega X_i + \delta_c - \tau_{j-1}\right)} - \frac{exp\left(\beta T_{m,i} + \omega X_i + \delta_c - \tau_j\right)}{1+\exp\left(\beta T_{m,i} + \omega X_i + \delta_c - \tau_j\right)} \quad \text{(Eq. 1)}$$

where $T_{m,i}$ is the treatment with m treatment levels varying randomly across individuals i. X_i is a vector of socio-economic control variables (age, education, gender, household size, hand-to-mouth, homeownership, financial literacy, income), δ_c is a vector of country and recruitment-type dummies, and τ_j are the cut-off parameters. Table 2 (columns 1 to 6) displays the results. In addition, we report the outcome of two Wald tests for the null hypothesis of an equal impact of the 0.5°C and 1.5°C scenarios, as well as the null hypothesis that the impact of a 0.5°C decline and a 0.5°C increase are equal in absolute value (i.e., the effect of a decline or an increase in global temperature on household inflation expectations is symmetric).[12]

Higher global temperatures increase consumer inflation expectations over the next 5 years. Specifically, the 0.5°C increase scenario, relative to the baseline, implies a 15.8 percentage points higher likelihood in the expectation that prices will increase. A 1.5°C global temperature increase has a relatively larger impact (17.7 percentage points). Although, according to the Wald test this differs statistically from the impact of the 0.5°C increase scenario (p-value 0.03), it also confirms that consumers anticipate that the bulk of the estimated impact would materialise under the smaller 0.5°C temperature increase scenario. Compared with the 0.5°C temperature increase scenario, a 0.5°C temperature decline has an opposite but larger (in absolute terms) effect, implying a 19.9 percentage points lower likelihood of expecting prices to increase. This difference between the impact size of a 0.5°C decline and a 0.5°C increase (p-value=0.01) suggests that consumers are more likely to expect an inflation increase when the average global temperature increases. These effects are based on the June 2025 survey, but they are corroborated by the findings from the September 2024 survey that involves more extreme temperature scenarios (3°C increase) and asks about different bundles of goods and services (see below).

To estimate the numerical impact on inflation expectations, we included a follow-up in the qualitative question where respondents are asked to estimate the impact on five-year-ahead expected inflation (see Appendix C).[13] We use this continuous measure as the dependent variable in equation (1) and estimate it, instead, via OLS (see columns 7 and 8 of Table 2). The 0.5°C (1.5°C) increase scenario increases 5 years ahead inflation expectations by 0.65bp (0.85bp). These effects are quite sizeable, taking into account that the median of the unconditional five-year-ahead inflation expectations collected in the regular survey stood at 2% in June 2025. Our estimates also suggest a monotonic pattern, where the inflation increase out of the 1.5°C increase scenario significantly exceeds the one from the 0.5°C increase scenario. On the other hand, we fail to reject the null of symmetry.

[12] See also Figure A7.
[13] For respondents, answering there is no effect in the qualitative expectation, we assign 0 in the quantitative inflation question.

3.4 The impact of global warming on different bundles of goods and the perceived channels

Do consumers differentiate between the impact of temperature change on different bundles of goods? Findings from the September 2024 survey help us to address this question as we had included separate questions on prices of food, prices of energy (including gasoline) and prices of other goods and services in response to global warming scenarios. Figure A8 and Table B4 show that temperature change leads to higher expected prices for all these bundles.

Higher (lower) global temperature scenarios do lead to higher (lower) expected food prices, energy prices, and prices for other goods and services (Table B4, panel a). Yet, the impact on food prices is relatively larger than on the other two categories. Overall, global temperature increases are expected to mainly impact food prices and also have broad-based upward price effects.

Increases in prices can have many causes. For food prices, consumers who expect rising prices were further asked to report the (perceived) driving factors (see Figure A9). The most commonly reported cause for increasing food prices is environmental factors (crop failures). In general, supply-side factors (crop failures, higher production costs, and supply chain disruptions) dominate over demand factors (consumer demand or firm's desire for profits) and cost-push factors (taxes or tariffs) as determinants of higher food prices. The prevalence of supply-side explanations varies across temperature scenarios, with more consumers citing such factors in the context of a temperature increase rather than decrease (see Table B5).

3.5 Heterogeneous treatment effects: climate knowledge and inflation expectations

Consumers differ in their knowledge about climate change. While we generally find a high level of knowledge, there is substantial variation among euro area consumers in their understanding of climate change (Figure 2, panel a). In view of this, we examine the extent to which our estimated treatment effects vary by knowledge about climate change. Specifically, we estimate the baseline ordered logit model (equation 1), including interactions with a binary indicator of climate change knowledge (respondents who answered more than the median number of questions -five- correctly versus the rest).

Table 3 present the results for the qualitative and quantitative inflation expectation variables. Consumers with higher levels of knowledge are more likely to perceive rising temperatures as having detrimental effects on inflation. For instance, the effects of a 0.5°C temperature increase for consumers with high climate change knowledge are more than 34% larger than for those with low levels of knowledge. The results in Table 3 and Figure 4 highlight that the inflation effects documented in our previous analysis

remain qualitatively similar in subsamples of respondents with different climate knowledge, but they are clearly stronger for consumers with a relatively high understanding of climate change.

Interestingly, our results show that knowledgeable consumers expect relatively higher inflation with rising temperatures. This highlights that as consumers may build up knowledge along with an increased exposure to increasing temperatures, inflation expectations may increase as well. This highlights a striking contrast; while more knowledge about monetary policy leads to better-anchored inflation expectations (Ehrmann et al. 2025), more knowledge about climate change may make it more difficult to maintain price expectations in line with the price stability target of central banks.

3.6 Experimental integrity and robustness

Our experiment uncovers the causal effect of global temperature change on inflation expectations, while below we show that it also impacts various other macroeconomic expectations. However, these effects differ across concepts. For example, we asked respondents about the impact of global temperature change on "the number of Oscar-winning movies". This so-called placebo variable has no reason to be related to global temperature change. Indeed, the estimation results reported in Figure A12 show that this is not the case; the coefficients are numerically close to zero and statistically insignificant at the five percent level. On the other hand, we asked respondents about the impact of temperature change on biodiversity (the variety of animals, plants, and animal life) to see whether they recognise rising temperatures as harmful for the environment. We find that higher global temperatures increase the likelihood to expect a decline in biodiversity compared to the baseline scenario.[14] This plausible link with biodiversity – a concept not necessarily familiar to the average consumer – suggests that people have a relatively good sense of environmental issues and challenges.[15]

In addition to knowledge about climate change, the attention paid by respondents to questions is an important indicator of survey response quality. We take advantage of the survey's para-data and assess the distribution of response times for the one of our main outcome questions across the different temperature scenarios.[16] Time distributions of the qualitative expectation question show a similar shape across all scenarios. The peak is 45 seconds, with the median response time being 48 seconds in June 2025. While some respondents take considerably less time, the majority appear to take ample time to

[14] See Table B7.
[15] Predicting the exact impact of rising global average temperatures on regional biodiversity might be a topic of ongoing research. However, recent studies on biodiversity and temperature changes already highlight risks of rising temperatures for biodiversity, see Pinsky et al. (2025). In addition, for marine and coastal ecosystems (two-thirds of the planet) the impact of rising temperatures is particularly devastating, see Cooley et al. (2023).
[16] See Figure A13.

answer without any sign of a fat tailed distribution which might have indicated issues of understanding or respondents leaving the survey screen. These results suggest that respondents are paying attention and taking the time to carefully read and respond to the given global temperature condition.

The causal interpretation of our findings hinges on the random assignment of consumers to the four different global temperature scenarios. This ensures that any (observed or unobserved) factors potentially confounding the relation between consumer expectations and climate change are evenly distributed across the four groups and net out on average. To verify that the randomization was successful, we conduct balance tests for scenario assignment using a wide range of variables that may influence consumer expectations. We find no evidence of a systematic difference between treatment and the baseline of no change control groups across countries or along key characteristics such as age, education, gender, income or financial literacy.[17] In particular, we find no meaningful differences in climate concern, climate attention, or experiences with extreme weather events across the four scenario groups. Overall, we conclude from these tests that the randomisation of scenarios has worked as intended.

The successful randomization ensures that it is sufficient to analyse differences in responses across the four scenarios without accounting for additional control variables. As a robustness check, we re-estimate our baseline specification while controlling for a large set of socio-demographic variables (see Tables 2, B4, B6 and B7). We find that the results remain virtually unchanged, supporting the validity of the identification method and our causal interpretation.

4 The impact of global warming scenarios on other economic expectations

Using the same logit model (Eq. 1), we assess the impact of temperature rises on several macroeconomic expectations. Results are summarised in Table 4.[18]

A first notable finding is that expected economic growth is lower in scenarios where global temperatures rise (see Figure 5). This suggests that consumers perceive rising temperature as a supply shock, where higher temperatures have a qualitatively different effect on prices (increasing) and output (decreasing). In particular, a 0.5°C temperature increase leads to 5.0 percentage points lower likelihood of economic growth, while a similar reduction in global temperature results in 8.7 percentage points higher likelihood of economic growth (see Table B6). In line with the expectation of lower economic growth, increasing

[17] See Table B8.
[18] See Table B6 and Table B7 for a full summary of the regression results.

global temperatures are also expected to lead to higher unemployment. Compared to the effect on inflation, consumers expect growth to be relatively less affected by increasing global temperatures (see Figure A10) indicating that they view the transmission of temperature increases working primarily through prices.

Similarly, consistent with the negative impact of rising global temperatures on economic growth, the impact on stock prices is negative. Instead, we estimate opposing effects for house prices, the results suggest that the impact is the other way around. Higher global temperatures cause more consumers to expect higher house prices, with a nonlinear effect for a temperature increase of 0.5°C and 1.5°C. Specifically, an assumed 0.5°C and 1.5°C increase in global temperatures increase by 8.0 and 10.7 percentage points, respectively the likelihood of a house price appreciation. While this may seem surprisingly at first, it is consistent with global temperature change raising construction costs (as houses need to incorporate measures to adapt, such as protection from flooding) and reduced housing supply (e.g., wildfires or floods limit the availability of locations where new houses can be safely built). Note that the upward impact of temperature change is also consistent with houses perceived as a sort of safe investment haven when macroeconomic uncertainty increases.

Given the expected impact of rising global temperatures on prices, economic growth, and unemployment, it is not surprising that consumers also anticipate a negative effect on their own financial well-being. Temperature increases by 0.5°C and 1.5°C decrease by 4.3 and 5.2 percentage points respectively the likelihood of an improved financial well-being. While these effects are not negligible, it is notable that they are relatively modest in relation to those estimated for inflation and some other macroeconomic variables. While this might reflect consumers anticipating a slower 'pass-through' from macroeconomic indicators to their own financial situation, it is also possible that they underestimate the consequences of climate change for their personal well-being.

Many consumers also expect global temperature changes will affect public finances. Compared to the baseline scenario, we estimate an additional 15.3 and 18.2 percentage points likelihood of an increase in government debt under the 0.5°C and 1.5°C temperature rise scenarios, respectively. These represent the largest effects among the variables considered (alongside with the impact on taxes). Although we do not ask consumers about the reasons for the expected rise in government debt, it is plausible that they foresee additional government spending on adaptation measures or on addressing damages from extreme weather events including financial support to offset losses and shield households from economic hardship.

Consumers also expect that taxes that they, as well as firms, have to pay will increase in scenarios with rising global temperatures. For instance, in the 0.5°C higher temperature scenario, we estimate an additional 13.7 percentage points higher likelihood of increasing taxes. Thus, the increase in government debt will partially be financed through higher taxation. Taken together, this may suggest that consumers believe that even if governments step in to shield the most affected individuals from the direct effects of climate change, the broader cost will still be borne by the society as a whole in the form of higher taxes. In view of this, it is again surprising that consumers anticipate a relatively modest negative effect of higher global temperatures on their personal financial well-being.

For all the expectation variables, the estimation results indicate larger effects for the 1.5°C increase scenario than for the 0.5°C scenario. With the exception of economic growth and immigration, these differences are statistically significant at the 5 percent level according to the Wald tests. This demonstrates that, in general, consumers anticipate more negative effects as the rise in global temperature becomes more severe.

Turning to the scenario of a 0.5°C decline in global temperature, the estimates indicate an impact in the opposite direction compared to a 0.5°C increase in temperature. Thus, the relationships revealed by the regression estimates remain consistent across scenarios.

There are two important takeaways from this. First, when considered alongside the increase in global temperature observed so far, this suggests that consumers believe that it has already impacted the economy in adverse ways. Second, consumers believe the impact is likely reversible, meaning that a decline in global temperature would undo much of the economic impact caused by the increase.

Last, the perceived impact of global temperature change extends beyond economic effects and has broader political implications. An additional 12.2 and 13.7 percentage points of consumers expect higher immigration when global temperatures rise by 0.5°C and 1.5°C, respectively. Consumers perceive even stronger effects in a scenario where temperatures decrease by 0.5°C, with 20.3 percentage points fewer expecting an increase in immigration compared to the baseline scenario. Thus, it appears that consumers attribute part of ongoing immigration to climate change.

5 Willingness to pay for addressing temperature change and the environment as policy priority

Our experiment reveals that consumers anticipate rising global temperatures to be accompanied by increased inflation and broader negative consequences for the economy, the labour market, and own

financial well-being. Clearly, consumers stand to benefit from measures aimed at preventing or mitigating temperature increases. To explore this further, we asked respondents how much they would be willing to pay each month over the next five years to the government for environmental policies designed to prevent temperature increases per (randomly) assigned scenario - or to achieve a temperature decline in the lower-temperature scenario. Results are shown in Table 5.

Several findings stand out. First, there is considerable heterogeneity among consumers.[19] About two out of three consumers are willing to contribute some amount per month over the five-year period. The unconditional mean willingness to pay is approximately €51 per month, amounting to about €3,060 over the five years.[20] Second, differences in willingness to pay across temperature scenarios are slightly higher in the 1.5°C scenario, but overall differences - while statistically significant - are relatively small (see Table 5). This suggests that willingness to pay is a more intrinsic characteristic, likely driven by concern about global warming, rather than by the intensity of the presented scenario. At the individual level, we observe that the younger, those who express greater concern about climate change, the higher educated and those with higher financial literacy are also willing to pay more while hand-to-mouth consumers report lower willingness to pay.

One may ask whether this level of willingness to pay is high or low. The average contribution, when including all respondents, corresponds to approximately 1.5% of average net household income.[21] Another metric to assess this is the so-called "sacrifice ratio": in this case, households would need to give up 2.2% of their consumption expenditures to finance their stated willingness to pay. However, compared to other recent studies, this sacrifice ratio is relatively low. For example, Georgarakos et al. (2025) report a sacrifice ratio of 5% or more for eliminating business cycle fluctuations or achieving desired inflation levels. In conclusion, while the willingness to pay to address global warming is certainly not negligible, it remains on the low side, especially if one considers the broader repercussions of climate change that consumers perceive.[22] Yet, as recent evidence for Italy by Guiso and Jappelli (2024) shows targeted communication campaigns about the risks of natural disasters might increase consumers' willingness to pay for specific measures and increase support for public funding.

[19] We also document in the Appendix (Figure A14) some heterogeneity across countries with consumers in Ireland and the Netherlands showing on average the highest willingness to pay.
[20] We exclude less than 1.5 percent of responses who report a monthly willingness to pay above their monthly household income and winsorize the willingness to pay at the most extreme two percentiles.
[21] In comparison, Andre et al. (2024a) find that about 69% of consumers would be willing to contribute 1% of their monthly household income to "fight global warming". Bernard et al. (2025), in a survey experiment, find a willingness to pay of about €51 to offset carbon omissions for a flight (US to Germany) and document this can be increased considerably to €67 by activating social norms.
[22] Providing additional information about the consequences of climate change, according to recent findings by Bernard et al. (2025), might increase consumers' willingness to pay.

Further insights into the importance consumers attach to preventing rising temperatures can be gained by examining the priority they assign to climate issues and whom they consider responsible for addressing climate change. When asked to identify the most pressing issues facing their country, consumers consistently rank "the environment and climate change" among the top three, closely following concerns such as rising prices and healthcare (see Figure A3, panel a).

When asked who should take responsibility for addressing climate change, respondents most frequently cite national governments, followed by businesses and industries, with individual citizens mentioned less often (see Figure A11, panel a). This indicates that while people assign high priority to climate action, they primarily view it as the responsibility of governments, which can implement collective measures and policies. This perspective is further reinforced in the scenario analysis, where tax increases are expected as global temperatures rise. Through this fiscal channel governments may raise collective funds to finance measures to mitigate temperature change. Although consumers primarily assign governments the responsibility for addressing climate change, they identify the ECB and national central banks (alongside governments) as responsible for maintaining price stability – a concern that they prioritise for their own country (see Figure A11, panel b). To the extent that climate change can impact inflation expectations and future price dynamics, central banks have also a crucial role to play in addressing climate-related risks.

6 Conclusion

Heat records, droughts, wildfires, and floods in Europe and worldwide signal that global warming has significant consequences for everyday life. Such extreme weather events come with casualties, disrupt society, and cause severe economic damages. According to the findings of various studies and the present paper, consumers are increasingly concerned and aware about the broader repercussions of climate change. About three-quarters of consumers pay attention to climate change news, a number that is relatively close to those following inflation news - a topic relevant to daily expenses and the ease or difficulties households face in making ends meet. Many consumers express concern about climate change with a very substantial 44 percent of them reporting actual losses due to one or multiple extreme weather events in the past five years.

It is almost inevitable that global warming also influences households' attitudes and economic expectations, their behaviour, and thereby broader macroeconomic developments. Nevertheless, there is very little empirical evidence on this topic. We address this gap by conducting a survey experiment in

which consumers assigned to different global temperature change scenarios, indicate how these changes affect their economic expectations.

We find significant effects on inflation expectations as well as on a broad range of macroeconomic expectations, including economic growth, unemployment, asset prices, taxation, and government debt. A large impact is observed for a broad set of prices, with many consumers expecting that rising global temperatures will lead to higher food prices, energy prices, and prices of other goods and services. When asked, respondents most often attribute higher food prices to supply-side factors, such as crop failures, higher production costs and supply chain disruptions, and to a lesser extent to demand and cost-push factors. In the light of global temperature trends and expert expectations, this suggests that global warming will impact the economy not only directly through the economic damages caused by extreme weather events but also indirectly through consumers' expectations and attitudes.

Our findings also clearly indicate that the impact of global warming is nonlinear. Although a global temperature increase of 1.5°C has a greater effect on many consumer expectations under study than a 0.5°C increase, most of the estimated impact already materialises under the smaller 0.5°C temperature increase scenario. In other words, consumers already perceive a smaller increase in global temperature as highly damaging to most of the macroeconomic variables under study. Furthermore, we find that the negative effects on inflation expectations (and other macroeconomic outcomes) from reversing a 0.5°C temperature rise are larger in absolute terms than the corresponding positive effects of an additional 0.5°C increase. This suggests that the effects of global warming on expectations may have already partially materialized, resulting in very substantial changes in expectations in the scenario where global warming could be reversed rather than merely halted.

For central banks in particular, a relevant finding is that higher global temperatures contribute to higher price expectations. One should note that consumers already pay relatively high attention to climate change news and, on average, possess a reasonably good level of knowledge about climate issues. Our findings show that those with greater awareness of climate risks expect a higher increase in inflation for a given temperature rise scenario, which is relevant for anchoring inflation expectations. Strikingly, while more knowledge about monetary policy has been shown to lead to better-anchored inflation expectations (see, Ehrmann et al. 2025), more knowledge about climate change may make it more difficult to maintain price expectations in line with the price stability target of central banks.

Despite widespread concern about climate change and its perceived economic consequences, we find that consumers' willingness to pay to prevent further temperature increases is relatively modest. While a majority of respondents express some willingness to contribute financially, and the unconditional

willingness to pay totals approximately €3,060 over a five-year period, these amounts represent only a relatively small share of household income or consumption. One possible explanation is that, although consumers anticipate substantial macroeconomic consequences of global warming, they perceive the direct impact on their own personal financial situation to be more limited. Another explanation is that consumers predominantly assign responsibility for climate mitigation to governments and for price stability to central banks, underscoring the importance of fiscal and monetary policy in addressing climate risks.

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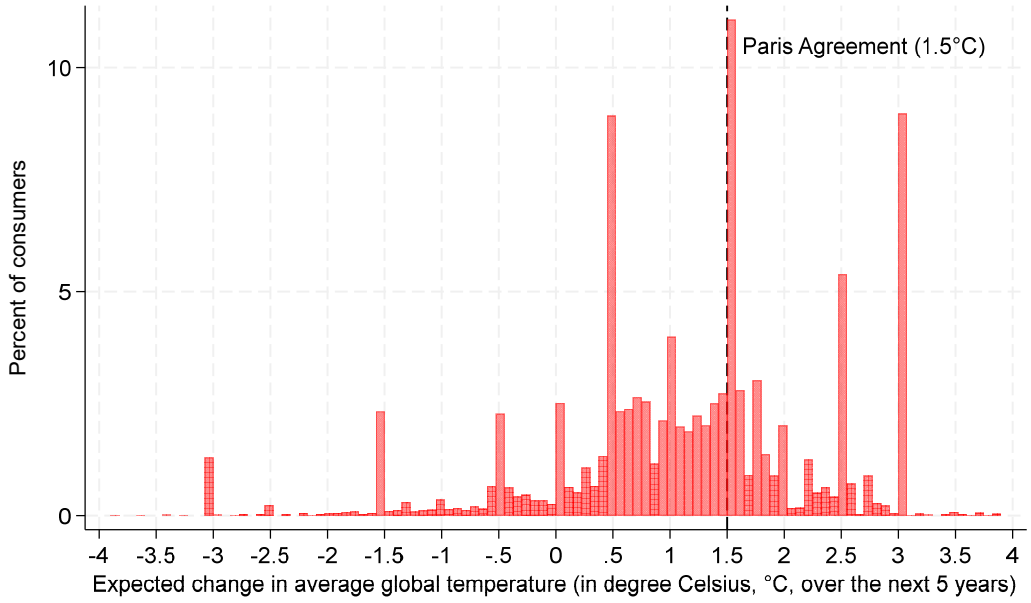
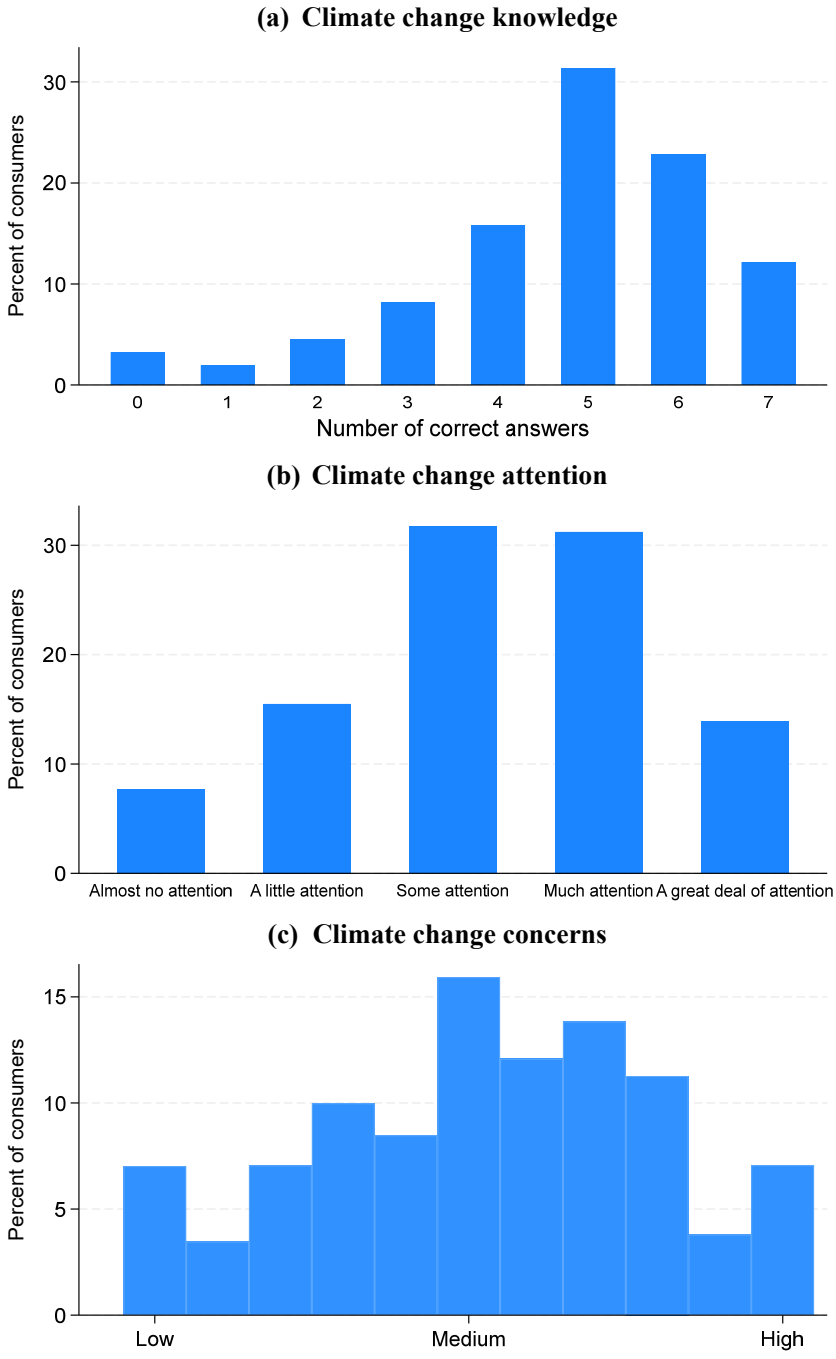
Figures

Figure 1. Consumer expectations about average global temperature change until 2030



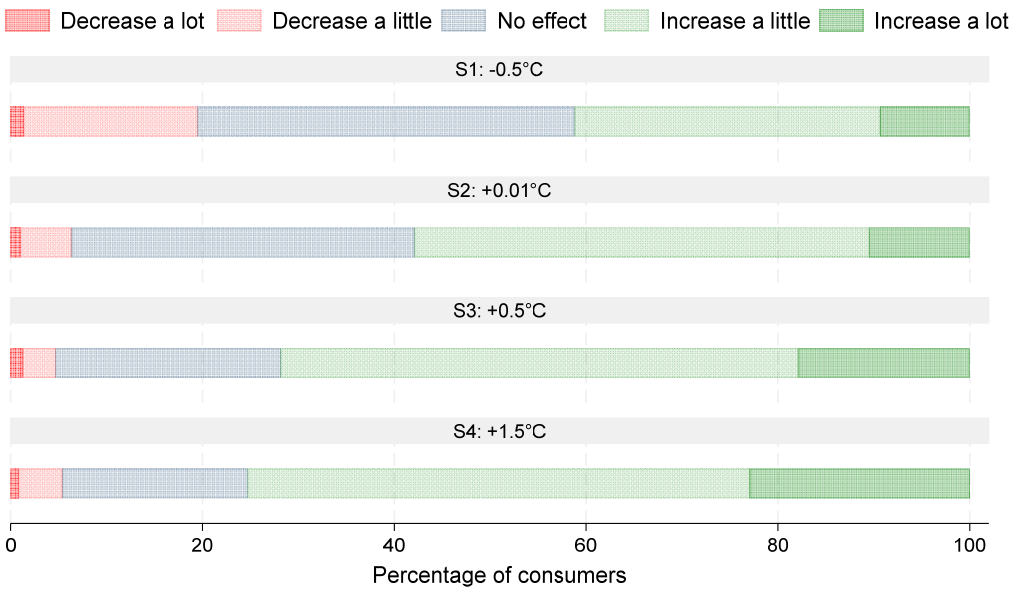
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025 – population-weighted statistics. The figure shows the distribution of individual forecasts about average global temperature change over the next 5 years. Consumers beliefs are computed as implied means of their subjective belief distributions across a range of possible temperature changes ranging from -2°C (or less) to +2°C (or more). See Appendix C for the detailed question wording.

Figure 2. Consumers' climate change knowledge, attention, and concerns



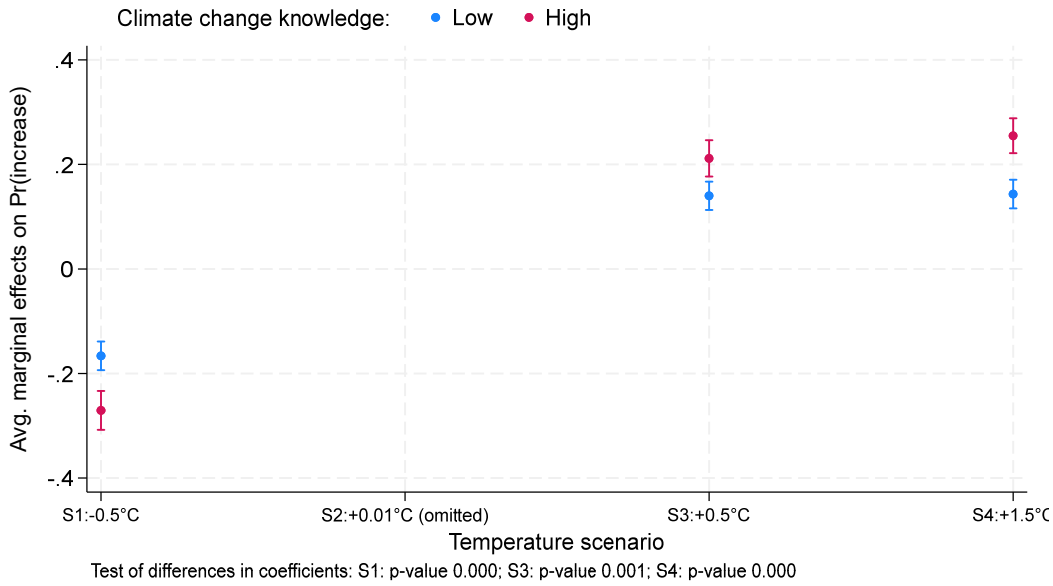
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from special-purpose modules in September (panel b and c) and December 2024 (panel a) – population-weighted statistics. Panel (a) shows the distribution of climate change knowledge among euro area consumers measured based on seven objective knowledge questions. Panel (b) and (c) depict consumers climate change attention today and their concerns about the impact of climate change on their household's financial situation respectively. See Appendix C for the detailed question wording.

Figure 3. Effects of rising temperatures on inflation expectations



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025 – population-weighted statistics. The figure shows the percentage of consumers expecting a given change in global average temperatures to decrease, not affect or increase *prices of goods and services (including food and energy)* over the next 5 years.

Figure 4. Heterogeneity in effects on inflation expectations



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025 – population-weighted statistics. The figure displays the average marginal effects of three temperature scenarios, each compared to the omitted baseline scenario (a 0.01°C increase in global average temperatures). The effects are estimated on the probability that respondents expect temperatures to increase. The analysis includes an interaction with individuals' climate change knowledge, measured six months prior, allowing us to assess how climate change knowledge changes the impact of different temperature scenarios relative to the baseline. We classify climate knowledge as high if it is above the median of correct answers (5).

Figure 5. Temperature scenarios and consumer expectations (June 2025)

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025 – population-weighted statistics. The figure shows the fraction of consumers expecting, for each of the different temperature scenarios, the different outcomes to decrease, not be affected or increase.

Tables

Table 1. Heterogeneity in climate change knowledge, beliefs, attention and concerns

	OLS			Logistic regression, average marginal effects		
Dependent variable	Climate change knowledge (0-7)	Prob. extreme weather event impacting country economic situation (next 5y) (0-100)	Expected change in average. global temperature (in °C)	Attention to climate change news (0/1)	Climate change concern for own households financial situation (0/1)	The environment as a perceived policy priority (0/1)
	(1)	(2)	(3)	(4)	(5)	(6)
Mean (dep. var.)	4.77	22.02	1.14	0.45	0.48	0.27
35-49 years	0.110***	-0.291	0.084***	-0.024**	0.009	-0.015*
	(0.033)	(0.469)	(0.025)	(0.010)	(0.010)	(0.009)
50-64 years	0.134***	-1.196**	0.181***	0.012	-0.002	-0.006
	(0.034)	(0.472)	(0.025)	(0.010)	(0.010)	(0.009)
65+ years	0.207***	-1.229**	0.285***	0.083***	-0.036***	0.009
	(0.039)	(0.560)	(0.029)	(0.012)	(0.013)	(0.011)
High school	0.159***	1.534***	0.105***	0.006	-0.004	0.022**
	(0.042)	(0.550)	(0.033)	(0.012)	(0.013)	(0.010)
College+	0.435***	2.096***	0.122***	0.073***	0.026**	0.059***
	(0.041)	(0.532)	(0.032)	(0.012)	(0.012)	(0.010)
Women	-0.117***	1.019***	0.244***	-0.018***	0.031***	0.022***
	(0.022)	(0.320)	(0.017)	(0.007)	(0.007)	(0.006)
Household size	-0.032***	-0.135	-0.028***	0.014***	0.025***	-0.012***
	(0.011)	(0.155)	(0.008)	(0.003)	(0.003)	(0.003)
Hand-to-mouth	-0.338***	1.511***	-0.075***	-0.035***	0.031***	-0.063***
	(0.029)	(0.391)	(0.023)	(0.008)	(0.008)	(0.007)
Homeowner	0.002	-0.675*	-0.096***	0.009	0.019**	0.000
	(0.027)	(0.379)	(0.020)	(0.008)	(0.008)	(0.007)
High financial literacy	0.598***	1.862***	0.044*	0.018**	-0.005	0.046***
	(0.024)	(0.341)	(0.026)	(0.007)	(0.007)	(0.006)
HH income Q2	0.085**	-0.477	0.030	-0.020**	-0.021**	-0.005
	(0.034)	(0.472)	(0.027)	(0.010)	(0.010)	(0.009)
HH income Q3	0.224***	-0.289	0.042	-0.014	-0.047***	0.007
	(0.034)	(0.494)	(0.028)	(0.010)	(0.011)	(0.009)
HH income Q4	0.355***	-1.090**	0.177***	-0.000	-0.111***	0.030***
	(0.036)	(0.517)	(0.018)	(0.011)	(0.011)	(0.010)
Adj. R-2	0.11	0.02	0.04	0.03	0.03	0.04
No. Obs.	20,182	21,106	19,428	21,037	20,565	21,135

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data. All columns include country and sample type dummies (not reported). The omitted categories are: 18-34, primary education, men, non-hand-to-mouth, homeowner, low financial literacy and the first income quartile. Hand-to-mouth consumers are identified as those who self-report not being able to finance an unexpected expense of the size of one monthly salary. Financial literacy is measured following Lusardi and Mitchell (2011) by asking three questions on consumers understanding of interest rate compounding, nominal vs. real values and portfolio risk diversification. Respondents who answer all three questions correct are classified as high financially literate. Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table 2. Effects of temperature scenarios on consumers inflation expectations

	Ordered logistic regression, average marginal effects						OLS	
Dependent variable	Change in prices							
Outcome	Decrease	No effect	Increase	Decrease	No effect	Increase	Point forecast	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temp. Scenario (base: S2: +0.01°C)								
S1: -0.5°C	0.089***	0.110***	-0.199***	0.090***	0.109***	-0.200***	-0.574***	-0.577***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)	(0.037)	(0.037)
S3: +0.5°C	-0.042***	-0.116***	0.158***	-0.042***	-0.116***	0.158***	0.646***	0.650***
	(0.003)	(0.007)	(0.009)	(0.003)	(0.007)	(0.009)	(0.038)	(0.037)
S4: +1.5°C	-0.046***	-0.131***	0.177***	-0.046***	-0.130***	0.176***	0.855***	0.852***
	(0.003)	(0.007)	(0.009)	(0.003)	(0.007)	(0.009)	(0.038)	(0.038)
Controls				Yes	Yes	Yes		Yes
No. obs.	19,759	19,759	19,759	19,617	19,617	19,617	19,747	19,605
Tests	(p-value)							
Symmetry: |S1|=|S3|	0.00	0.56	0.01	0.00	0.50	0.01	0.26	0.25
Monotonicity: S3 = S4	0.03	0.03	0.03	0.04	0.04	0.04	0.00	0.00

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025. All columns include country and sample type dummies (not reported). Control variables are identical to Table 1. Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table 3. Heterogeneous effects of temperature scenarios on inflation expectations

	Ordered logistic regression, average marginal effects			OLS
Dependent variable	Change in prices			
Outcome	Decrease	No effect	Increase	Point forecast
	(1)	(2)	(3)	(4)
Temp. Scenario (base: S2: +0.01°C)				
S1: -0.5°C # **low** climate knowledge	0.070***	0.096***	-0.166***	
	(0.006)	(0.008)	(0.014)	
S1: -0.5°C # **high** climate knowledge	0.122***	0.149***	-0.271***	
	(0.010)	(0.011)	(0.019)	
S3: +0.5°C # **low** climate knowledge	-0.042***	-0.116***	0.158***	
	(0.003)	(0.007)	(0.009)	
S3: +0.5°C # **high** climate knowledge	-0.046***	-0.165***	0.211***	
	(0.004)	(0.014)	(0.018)	
S4: +1.5°C # **low** climate knowledge	-0.046***	-0.130***	0.176***	
	(0.003)	(0.007)	(0.009)	
S4: +1.5°C # **high** climate knowledge	-0.053***	-0.202***	0.255***	
	(0.004)	(0.013)	(0.017)	
S1: -0.5°C				-0.494***
				(0.055)
S3: +0.5°C				0.553***
				(0.057)
S4: +1.5°C				0.627***
				(0.057)
S1: -0.5°C # **high** climate knowledge				-0.262***
				(0.091)
S3: +0.5°C # **high** climate knowledge				0.369***
				(0.093)
S4: +1.5°C # **high** climate knowledge				0.702***
				(0.093)
No. obs.	13,164	13,164	13,164	13,157
Tests		(p-value)		
S1: Low vs. High climate knowledge	0.00	0.00	0.00	0.00
S3: Low vs. High climate knowledge	0.11	0.00	0.00	0.00
S4: Low vs. High climate knowledge	0.01	0.00	0.00	0.00

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. Each model includes interactions of the country and sample type dummies with the climate change knowledge score (not shown). The table combines data from June 2025 with the measure of climate change knowledge collected in December 2024 and therefore features a lower number of observations. We classify climate knowledge as high if it is above the median of correct answers (5). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table 4. Other macroeconomic expectations

	Ordered logistic regression, average marginal effects							
Dependent variable	**Financial situation**	**Unemployment**	**Economic activity**	**Stock prices**	**House prices**	**Government debt**	**Taxes**	**Immigration**
Outcome				**Increase**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temp. Scenario (base: S2: +0.01°C)								
S1: -0.5°C	0.062***	-0.085***	0.087***	0.057***	-0.060***	-0.140***	-0.111***	-0.203***
	(0.005)	(0.008)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)
S3: +0.5°C	-0.043***	0.085***	-0.050***	-0.046***	0.080***	0.152***	0.136***	0.122***
	(0.004)	(0.009)	(0.006)	(0.006)	(0.010)	(0.009)	(0.010)	(0.009)
S4: +1.5°C	-0.051***	0.122***	-0.061***	-0.060***	0.107***	0.183***	0.176***	0.138***
	(0.004)	(0.009)	(0.006)	(0.006)	(0.010)	(0.009)	(0.010)	(0.009)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Obs.	19,617	19,617	19,617	19,617	19,617	19,617	19,617	19,617
Tests				(p-value)				
Symmetry: |S1|=|S3|	0.01	1.00	0.00	0.32	0.18	0.46	0.12	0.00
Monotonicity: S3 = S4	0.01	0.00	0.07	0.02	0.01	0.00	0.00	0.09

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. This table shows the average marginal effects of the different temperature scenarios relative to the baseline of almost no temperature change (+0.01°C) for the probability of expecting an increase in each of the macroeconomic variables during the next five years. All columns include country and sample type dummies (not reported). Control variables are identical to Table 1. Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table 5. Consumers' willingness to pay under different scenarios

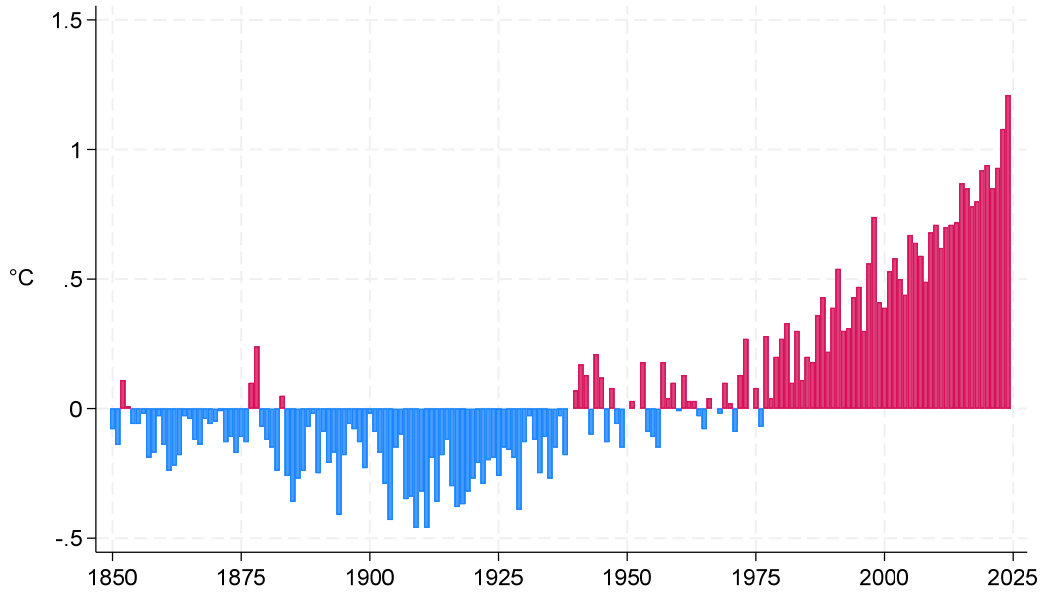
	Average Marginal Effects					
Dependent variable	Any willingness to pay (binary)		Willingness to pay (share of household income)		Willingness to pay (in €)	
	Probit		**Tobit (lower limit: 0, upper limit: 1)**		**Tobit (lower limit: 0)**	
	(1)	(2)	(3)	(4)	(5)	(6)
Mean (dep. var.)	0.66		0.02		50.55	
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.009	0.008	0.001	0.000	2.592	0.733
	(0.009)	(0.013)	(0.001)	(0.001)	(1.637)	(1.813)
S3: +0.5°C	0.018*	0.001	0.001*	0.000	3.439**	0.213
	(0.009)	(0.013)	(0.001)	(0.001)	(1.607)	(1.792)
S4: +1.5°C	0.020**	-0.002	0.003***	0.002	5.591***	2.231
	(0.009)	(0.013)	(0.001)	(0.001)	(1.670)	(1.878)
High trust in people	0.131***	0.127***	0.010***	0.007***	21.445***	14.839***
	(0.007)	(0.009)	(0.001)	(0.001)	(1.325)	(1.363)
High climate change knowledge		0.091***		0.003***		8.037***
		(0.010)		(0.001)		(1.388)
High climate change concerns		0.130***		0.007***		14.041***
		(0.009)		(0.001)		(1.399)
35-49 years	-0.097***	-0.081***	-0.012***	-0.008***	-23.958***	-12.417***
	(0.009)	(0.013)	(0.001)	(0.001)	(2.322)	(2.207)
50-64 years	-0.134***	-0.117***	-0.016***	-0.011***	-30.885***	-15.964***
	(0.010)	(0.013)	(0.001)	(0.001)	(2.453)	(2.216)
65+ years	-0.125***	-0.085***	-0.016***	-0.009***	-29.325***	-11.195***
	(0.012)	(0.016)	(0.001)	(0.002)	(2.879)	(2.644)
Secondary	-0.019	-0.023	-0.004***	-0.001	-5.131**	-1.715
	(0.013)	(0.017)	(0.001)	(0.001)	(2.005)	(2.096)
Tertiary	0.032***	0.006	-0.000	0.001	4.131**	5.848***
	(0.012)	(0.016)	(0.001)	(0.001)	(1.988)	(2.083)
Women	0.017**	0.011	-0.001	-0.002***	-2.610**	-4.905***
	(0.007)	(0.009)	(0.001)	(0.001)	(1.197)	(1.339)
household size	0.003	0.007	-0.001**	0.000	-1.857***	1.018*
	(0.003)	(0.004)	(0.000)	(0.000)	(0.674)	(0.590)
Hand-to-mouth	-0.055***	-0.021*	-0.004***	-0.001	-11.849***	-4.862***
	(0.008)	(0.012)	(0.001)	(0.001)	(1.288)	(1.517)
Homeowner	0.030***	0.042***	0.004***	0.003***	9.785***	6.788***
	(0.008)	(0.011)	(0.001)	(0.001)	(1.366)	(1.481)
High financial literacy	-0.020***	-0.047***	-0.004***	-0.002***	-7.866***	-4.358***
	(0.007)	(0.010)	(0.001)	(0.001)	(1.337)	(1.401)
HH income Q2	0.017*	0.012			7.467***	1.559
	(0.010)	(0.013)			(1.697)	(1.774)
HH income Q3	0.005	0.006			7.359***	1.465
	(0.011)	(0.014)			(1.811)	(1.888)
HH income Q4	0.050***	0.057***			13.423***	7.876***
	(0.011)	(0.015)			(1.836)	(2.131)
No. obs.	19,458	10,437	19,247	10,437	19,247	10,437
Tests			(p-value)			
Symmetry: |S1|=|S3|	0.32	0.70	0.41	0.80	0.60	0.76
Monotonicity: S3 = S4	0.86	0.84	0.06	0.20	0.20	0.26

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. In column (3) to (6) we do exclude individuals for which their monthly income is below the reported willingness to pay (less than 1.5% of observations). The willingness to pay in columns (5) and (6) has been winsorised at the most extreme two percentiles. All columns include country and sample type dummies (not reported). For columns (2), (4) and (6) data from September 2024 and December 2024 is used which reduces the effective sample size. The mean reported is calculated as the weighted average based on the entire sample. Climate concerns are defined as high when they are above the median (5) out of a scale from 0 to 10. We classify climate knowledge as high if it is above the median of correct answers (5). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Online Appendix

Appendix A – Additional Figures

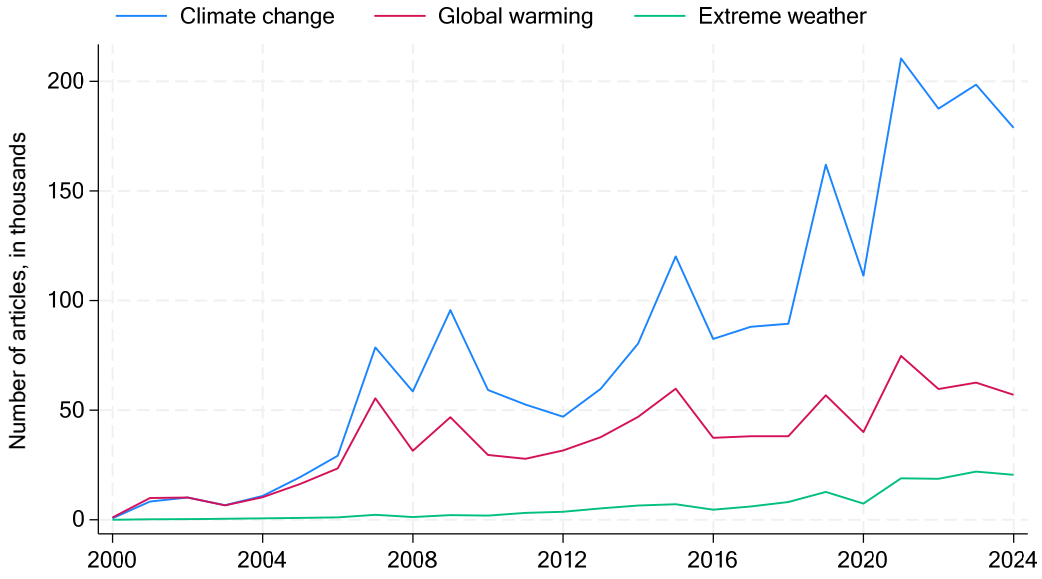
Figure A1. Global land and ocean average temperature anomalies



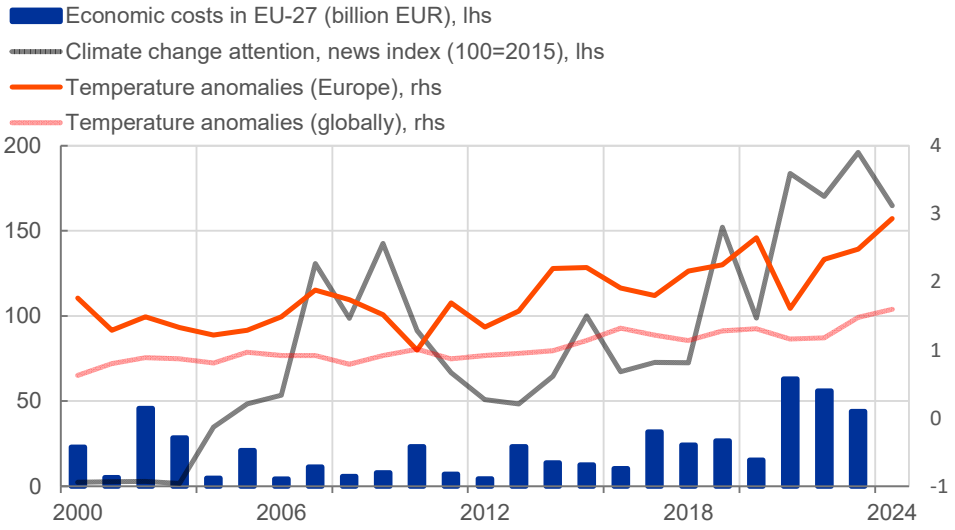
Note: NOAA National Centers for Environmental information, Climate at a Glance: Global Time Series, published June 2025, retrieved on 25th of July, 2025 from https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series. The figure shows anomalies for average global land and ocean temperatures from 1850 to 2024. The global and hemispheric temperature anomalies are calculated with respect to the 1901-2000 average.

Figure A2. News coverage of different climate topics

(a) Global news coverage about different climate change topics



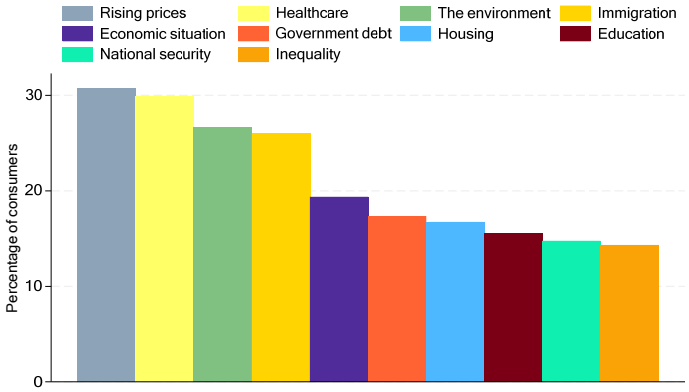
(b) Economic costs, climate change attention and temperature anomalies



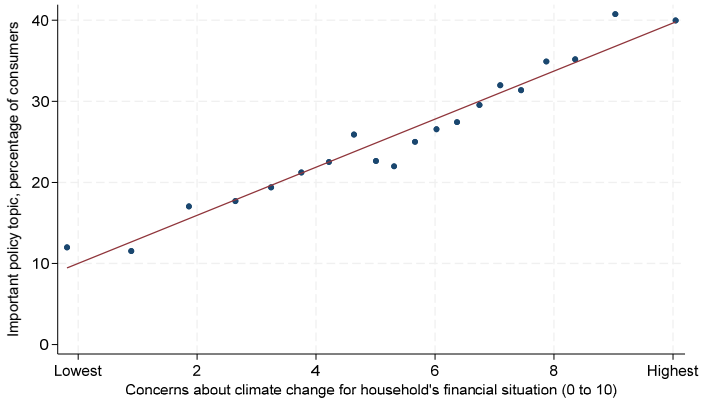
Note: Authors' calculations based on Factiva data (retrieved on 25.07.2025), European Environmental Agency (EEA) and Copernicus (ERA-5), latest data: 2024 except for economic cost estimates (2023 latest data). Panel (a) shows the global news coverage for different topics commonly related with climate change. We retrieve data on worldwide news coverage using keyword search from *Factiva Dow Jones* by using the open-text search on all available news sources. To make sure we identify relevant articles and minimise spurious classification we make use of the Factiva pre-classification and select only articles under the category "climate change". Trends remain, however, comparable when performing a search on the entire database. We use the following keywords in the open-text search: climate change (blue line); "global warming" or ("temperature" and "climate change") or ("warming" and "climate change") (red line); "extreme weather" (green line). Panel (b) shows the economic costs of climate-related disasters in the EU-27 obtained from the European Environment Agency (EEA). Cost estimates include costs of storms, floods, heatwaves (incl. droughts) and wildfires. Geophysical activities are excluded by the EEA. The climate change attention index is based on a manual download of articles from Factiva using the keywords climate change and global warming. Annual average near-surface temperature anomalies (Europe and globally) are calculated relative to the pre-industrial period 1850-1900.

Figure A3. Perceived policy priorities among consumers,climate change concerns and extreme weather event expectations

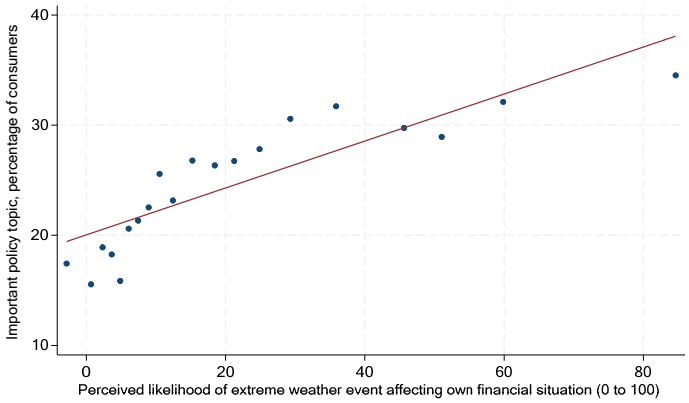
(a) Perceived policy priorities (August 2024)



(b) The environment and climate change as policy priority and climate change concerns

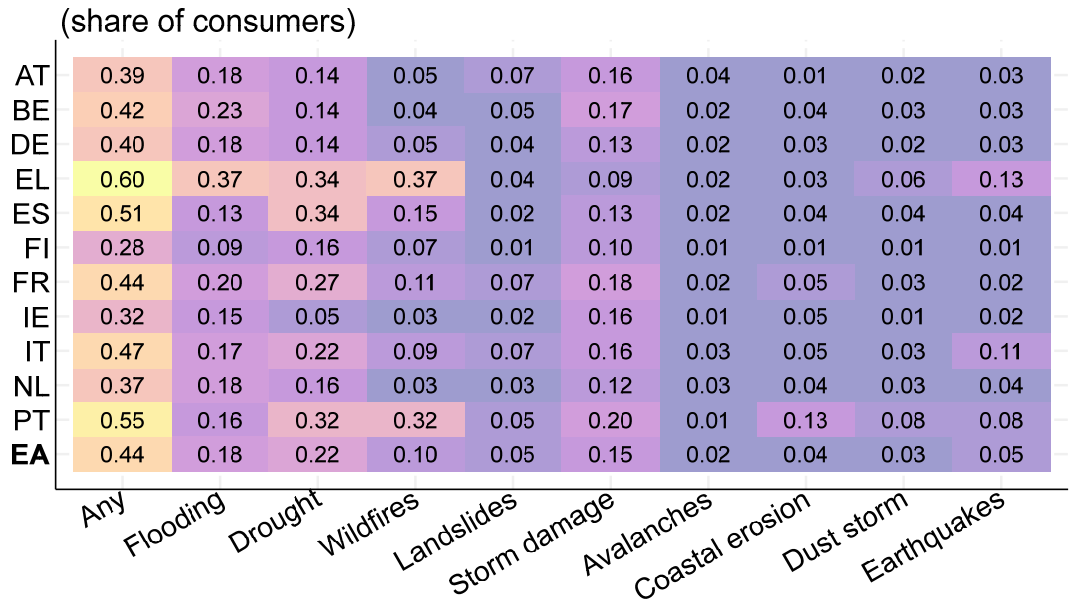


(c) The environment and climate change as policy priority and perceived likelihood of extreme weather event



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from August and September 2024 – population-weighted statistics. The figure shows in panel (a) the percentage of consumers who report that a given topic is among their top three policy topics for their country (multiple choice possible) in August 2024. Panel (b) shows the association between the environment as a policy priority (y-axis) and concerns about climate change for a household's financial situation in form of a binscatter plot. Panel (c) shows a similar association instead with the perceived likelihood of an extreme weather event affecting the respondent's household's financial situation over the next 5 years. The linear fit in both panels accounts for country and recruitment type dummies as well as socio-demographic characteristics (e.g. age, gender, education) included in Table 1. See Appendix C for the detailed question wording.

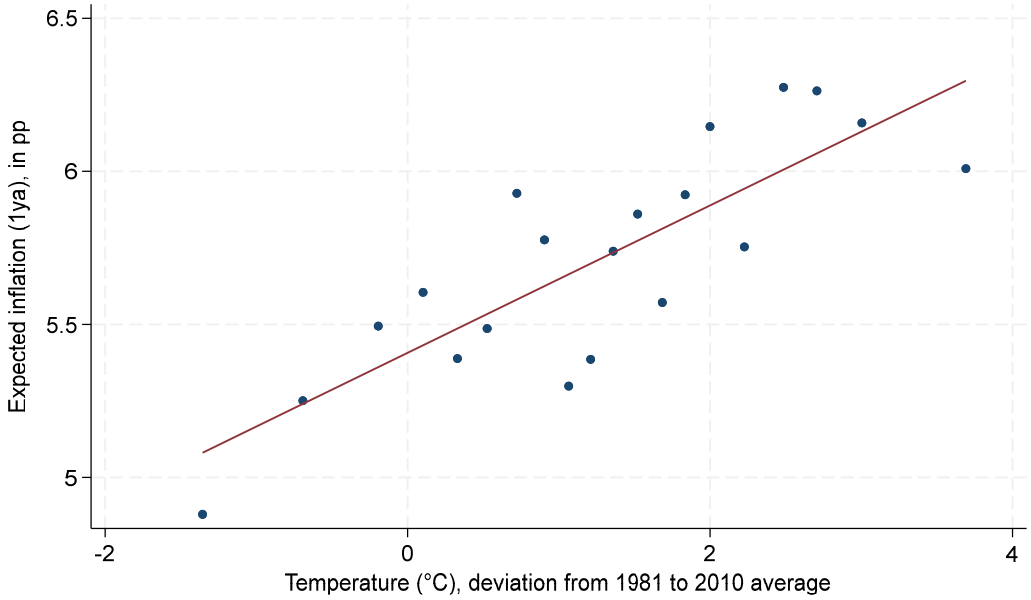
Figure A4. Consumers financially affected by extreme weather events in the past 5 years



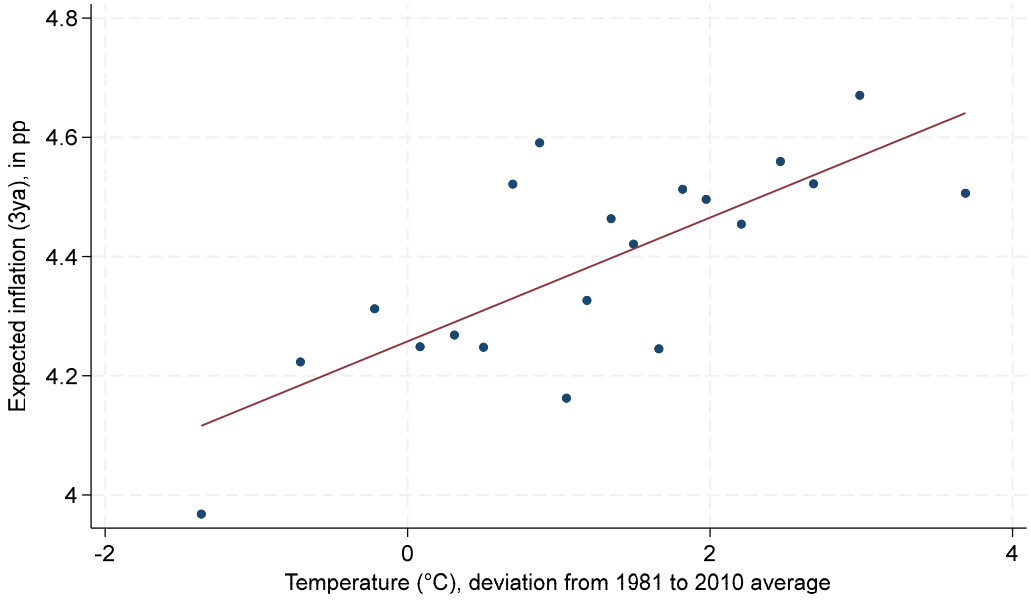
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from August 2024 – population-weighted statistics. The figure shows the share of consumers who report that their financial situation has been affected by an extreme weather event (multiple responses possible). The first column shows the share of consumers who report *any* of the extreme weather events affecting their financial situation. Flooding also includes heavy rainfall. The category "other" is omitted for brevity and consists only of less than 3 percent in each of the countries. See Appendix C for the detailed question wording.

Figure A5. Regional temperature and inflation expectations

(a) One year ahead inflation expectations

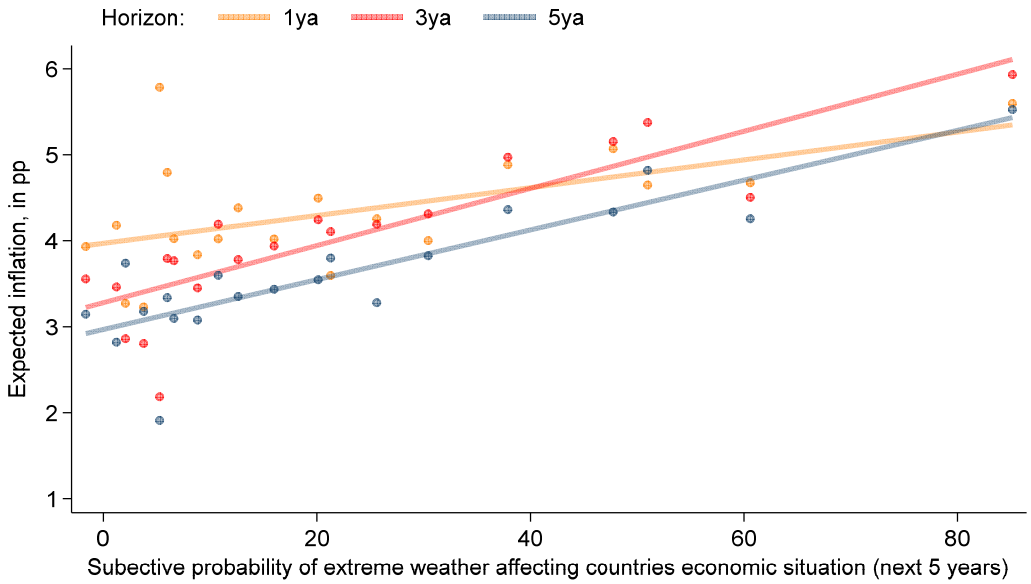


(b) Three years ahead inflation expectations



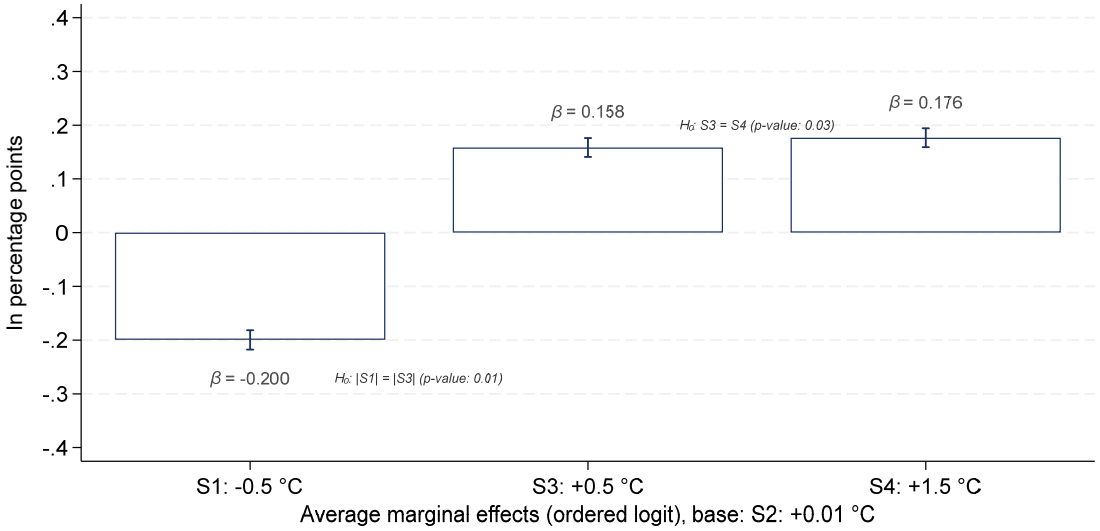
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from January 2020 to December 2023. Data on temperature deviations is obtained from ERA5 (Copernicus Climate Change Services) and population weighted on the respective NUTS-1 level matching CES regional identifiers.

Figure A6. Extreme weather events and consumers inflation expectations



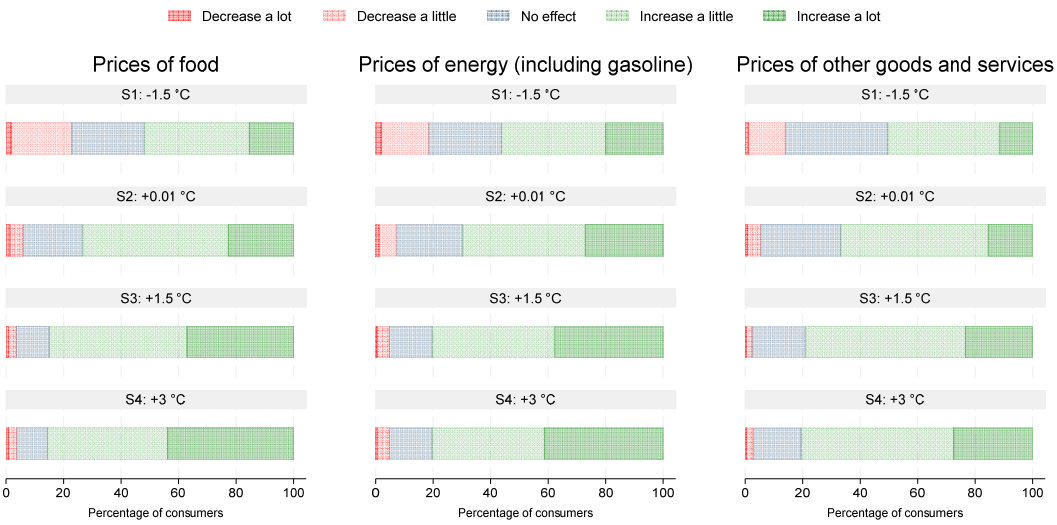
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from August 2024 – the linear fit accounts for country dummies. Inflation expectations are winsorised by the most extreme two percentiles on the country and survey wave level.

Figure A7. Average marginal effects of a change in temperatures on inflation expectations



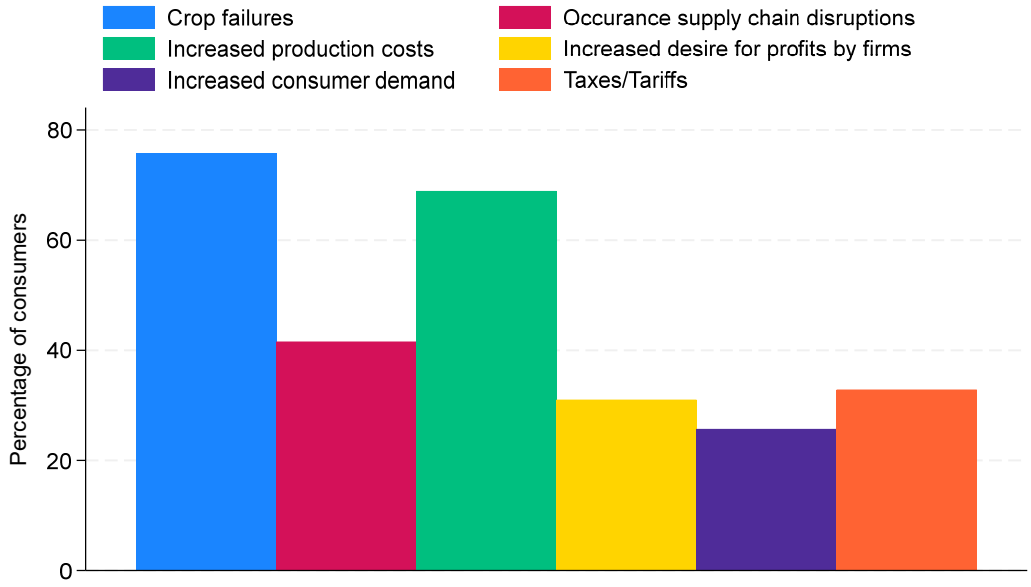
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from special-purpose modules in June 2025.

Figure A8. Expected effect on inflation, by components



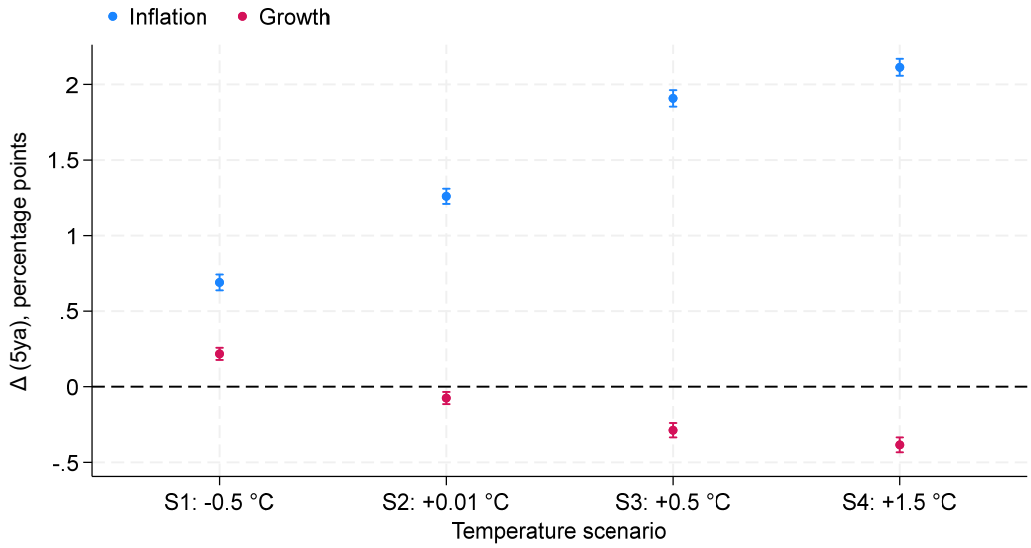
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in September 2024 – population-weighted statistics. See Appendix C for the detailed question wording.

Figure A9. Channels: Perceived drivers of price increases



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in September 2024 – population-weighted statistics. See Appendix C for the detailed question wording.

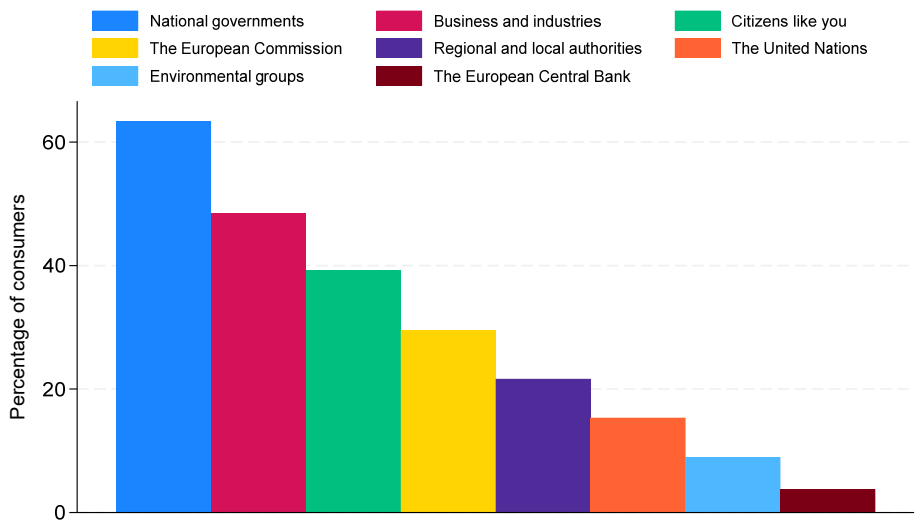
Figure A10. Inflation and Growth expectations by temperature scenario



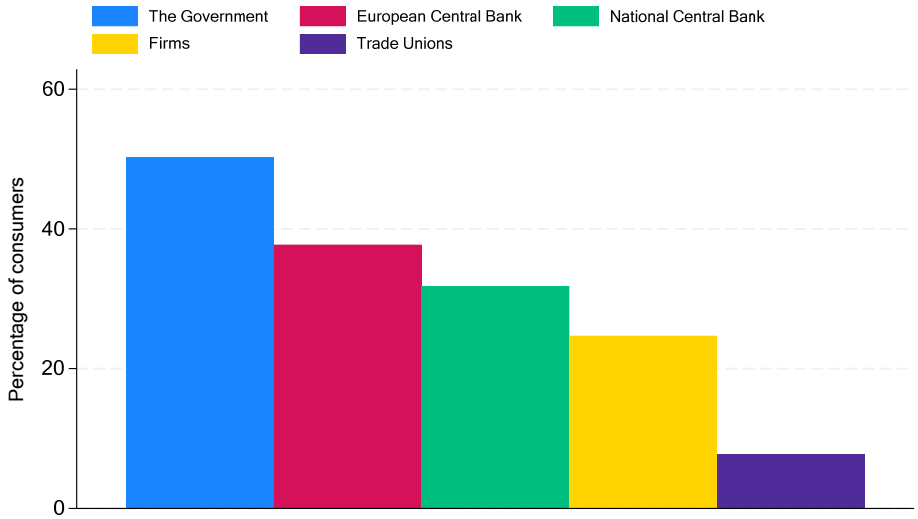
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025. The Figure shows the average expected inflation and growth rate 5 years ahead elicited as a point forecast. See Appendix C for the detailed question wording.

Figure A11. Consumers perceived responsibilities for climate change and maintaining price stability

(a) Institutions responsible for addressing climate change

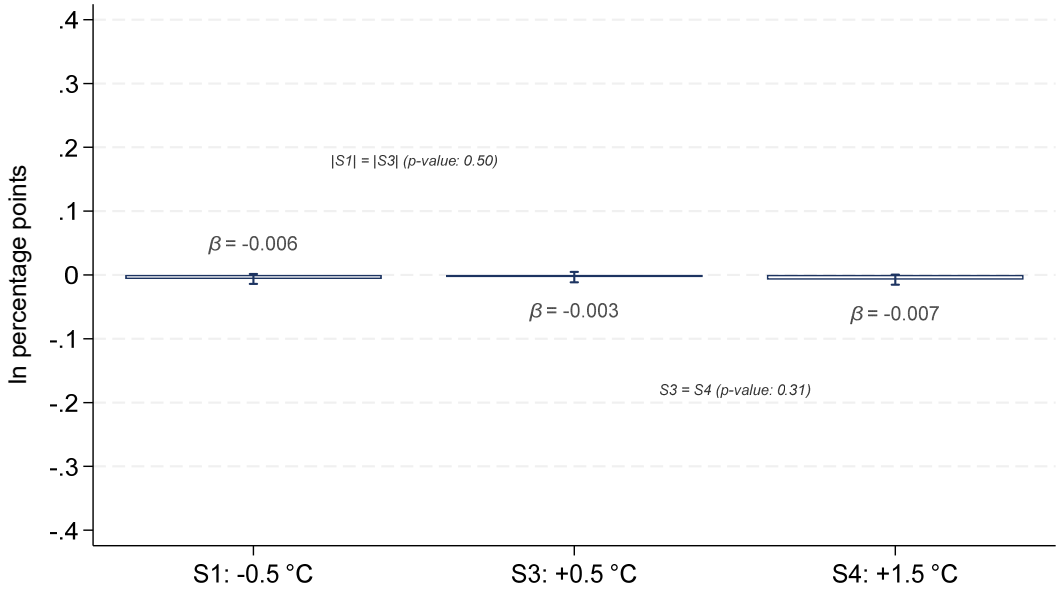


(b) Institutions responsible for maintaining price stability



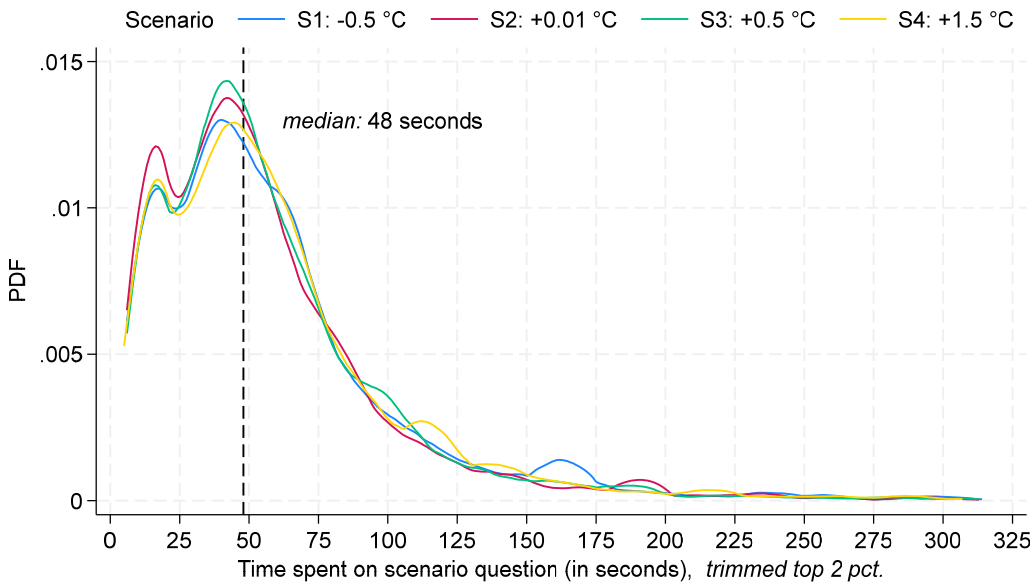
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from August 2024 (panel b) and a special-purpose module in December 2024 (panel (a)) – population-weighted statistics. In both questions multiple choice was possible. See Appendix C for the detailed question wording.

Figure A12. Global temperature change scenario question (placebo item), regression estimates (June 2025)



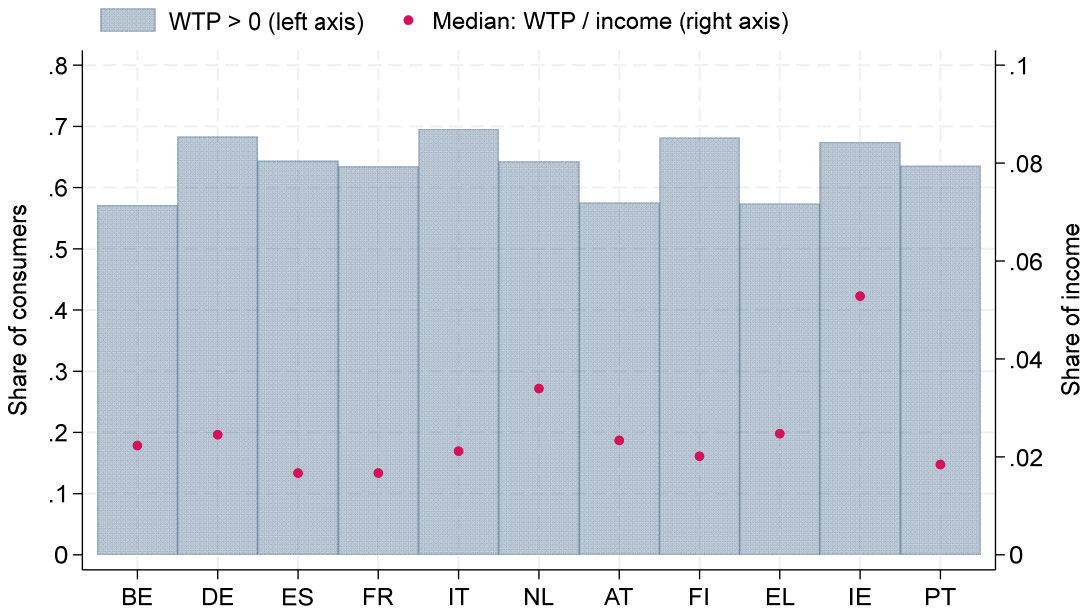
Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025. See Appendix C for the detailed question wording.

Figure A13. Response time distribution for scenario questions in June 2025



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025.

Figure A14. Willingness to pay across countries



Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025. The Figure plots the average share of consumers being willing to pay anything under any of the temperature change scenarios (left axis). It also depicts the average share of monthly household net income consumers are willing to pay (right axis). We omit a small fraction of consumers (less than 2%) who report a higher willingness to pay than their current (net) monthly household income. See Appendix C for the detailed question wording.

Appendix B – Additional Tables

Table B1. Sample summary statistics June 2025

Variable	Type	Mean	N
Age	categorical		
18-34 years		0.246	19,698
35-49 years		0.239	19,698
50-64 years		0.268	19,698
65+ years		0.247	19,698
Gender: Women	binary	0.516	19,698
Education	categorical		19,698
Primary		0.118	19,698
Secondary		0.317	19,698
Tertiary		0.565	19,698
Household size	binary	2.485	19,698
Hand-to-mouth	binary	0.277	19,698
Homeowner	binary	0.670	19,698
Household net income (in thousand €)	continuous	39.521	19,698
High financial literacy (Big-3 correct)	binary	0.558	19,556
Countries	categorical		
Belgium		0.035	19,698
Germany		0.260	19,698
Spain		0.149	19,698
France		0.194	19,698
Italy		0.185	19,698
The Netherlands		0.054	19,698
Austria		0.028	19,698
Finland		0.017	19,698
Greece		0.032	19,698
Ireland		0.015	19,698
Portugal		0.031	19,698

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in June 2025 – population-weighted statistics.

Table B2. Climate change knowledge (detailed overview)

		Response options (correct answer in green)		
Dimension	**Wording of each item**	**False**	**True**	**Don't know**
		(% of consumers, correct in green)		
Climate change and causes	*(1) The ozone hole is the main cause of the greenhouse effect.*	**43.11**	41.59	15.30
	(2) Higher concentration of carbon dioxide (CO_2) in the atmosphere leads to higher temperatures	8.14	**79.93**	11.93
	(3) The increase of greenhouse gases is mainly caused by human activities.	11.40	**80.80**	7.81
	(4) The annual average global temperature in 2023 has increased by about 1 degree Celsius compared to 50 years ago.	15.74	**71.17**	13.09
Expected consequences of climate change	*(5) For the next few decades, the majority of climate scientists expect the climate to change evenly all over the world.*	**44.12**	41.70	14.18
	(6) For the next few decades, the majority of climate scientists expect a warmer climate to increase the melting of polar ice, which will lead to an overall rise of the sea level.	6.15	**87.22**	6.63
Action-related knowledge	*(7) The production of 1 kg of beef produces more greenhouse gases than the production of 1 kg of wheat*	10.53	**71.15**	18.31

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES) data from a special-purpose module in December 2024 – population-weighted statistics. Subitems (1), (3), (5), (6) and (7) are drawn from previous research by Tobler et al. (2012).

Table B3. Effects of consumers' extreme weather event experiences

	OLS													
Dependent variable	Climate change knowledge (0-7)		Attention to climate change news (0/1)		Climate change concern for own households financial situation (0/1)		Expected change in average, global temperature (in °C)		Prob. extreme weather event impacting household financial situation (next 5y) (0-100)		Prob. extreme weather event impacting country economic situation (next 5y) (0-100)		The environment as a perceived policy priority (0/1)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Sample mean of dependent variable	0.35		0.46		0.49		1.14		16.05		22.02		0.27	
Any extreme weather event (past 5y)	-0.011		0.088***		0.156***		-0.089***		6.187***		5.291***		0.011*	
	(0.008)		(0.008)		(0.008)		(0.023)		(0.286)		(0.332)		(0.006)	
Wildfire, heatwave or drought		0.048***		0.095***		0.143***		0.080***		4.582***		5.378***		0.052***
		(0.009)		(0.010)		(0.009)		(0.029)		(0.367)		(0.413)		(0.007)
Flooding, storm or coastal erosion		-0.021**		0.043***		0.097***		-0.034		4.420***		4.157***		-0.003
		(0.009)		(0.009)		(0.009)		(0.029)		(0.346)		(0.392)		(0.007)
35-49 years	0.006	0.005	-0.026**	-0.030***	0.009	0.002	0.073**	0.074**	0.534	0.263	0.020	-0.209	-0.015*	-0.016*
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.036)	(0.036)	(0.404)	(0.403)	(0.468)	(0.464)	(0.008)	(0.008)
50-64 years	-0.012	-0.012	0.020*	0.016	0.011	0.003	0.147***	0.154***	-0.359	-0.736*	-0.664	-0.937**	-0.004	-0.004
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.035)	(0.035)	(0.403)	(0.401)	(0.472)	(0.467)	(0.009)	(0.008)
65+ years	-0.016	-0.015	0.102***	0.098***	-0.021	-0.029**	0.234***	0.243***	-0.943**	-1.289***	-0.609	-0.831	0.013	0.013
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.041)	(0.041)	(0.471)	(0.469)	(0.560)	(0.555)	(0.011)	(0.011)
High school	0.034***	0.033**	0.010	0.009	-0.013	-0.012	0.091**	0.084*	0.864*	0.862*	1.504***	1.478***	0.022**	0.021**
	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.045)	(0.045)	(0.487)	(0.484)	(0.549)	(0.544)	(0.010)	(0.010)
College+	0.131***	0.129***	0.073***	0.071***	0.022	0.019	0.101**	0.094**	1.168**	1.092**	2.062***	1.967***	0.059***	0.057***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.043)	(0.043)	(0.468)	(0.465)	(0.530)	(0.525)	(0.010)	(0.010)
Women	-0.062***	-0.061***	-0.013*	-0.014*	0.033***	0.031***	0.217***	0.220***	0.454*	0.348	1.307***	1.247***	0.022***	0.022***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.023)	(0.023)	(0.273)	(0.273)	(0.319)	(0.317)	(0.006)	(0.006)
Household size	-0.009**	-0.010***	0.015***	0.016***	0.018***	0.019***	-0.027**	-0.031***	-0.026	0.046	-0.265*	-0.232	-0.013***	-0.013***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.012)	(0.012)	(0.134)	(0.134)	(0.155)	(0.154)	(0.003)	(0.003)
Hand-to-mouth	-0.101***	-0.101***	-0.044***	-0.039***	0.008	0.017*	-0.155***	-0.162***	2.191***	2.333***	1.048***	1.121***	-0.060***	-0.060***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.032)	(0.032)	(0.350)	(0.349)	(0.392)	(0.389)	(0.007)	(0.007)
Homeowner	-0.007	-0.007	-0.007	-0.004	0.010	0.015	-0.066**	-0.070**	0.164	0.280	-0.899**	-0.817**	-0.000	0.001
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.028)	(0.028)	(0.325)	(0.323)	(0.377)	(0.375)	(0.007)	(0.007)
High financial literacy	0.145***	0.145***	0.026***	0.023***	-0.001	-0.007	0.174***	0.177***	0.771***	0.498*	2.070***	1.847***	0.047***	0.047***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.025)	(0.025)	(0.296)	(0.294)	(0.340)	(0.337)	(0.006)	(0.006)
HH income Q2	-0.002	-0.001	-0.015	-0.015	-0.013	-0.014	0.036	0.041	-0.159	-0.296	-0.486	-0.595	-0.004	-0.004
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.036)	(0.036)	(0.422)	(0.420)	(0.471)	(0.467)	(0.008)	(0.008)
HH income Q3	0.026**	0.028**	-0.006	-0.008	-0.025**	-0.029**	0.026	0.036	-0.804*	-1.029**	-0.184	-0.345	0.008	0.008
	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)	(0.037)	(0.037)	(0.425)	(0.424)	(0.493)	(0.489)	(0.009)	(0.009)
HH income Q4	0.072***	0.076***	0.015	0.013	-0.071***	-0.075***	0.006	0.022	-1.405***	-1.667***	-0.965*	-1.107**	0.033***	0.034***
	(0.013)	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)	(0.038)	(0.038)	(0.451)	(0.449)	(0.520)	(0.516)	(0.010)	(0.010)
Adj. R-2	0.12	0.12	0.04	0.05	0.07	0.08	0.03	0.03	0.05	0.05	0.04	0.05	0.05	0.05
No. obs.	14,343	14,343	16,830	16,830	16,452	16,452	10,624	10,624	21,060	21,060	21,070	21,070	21,119	21,119

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). All columns include country dummies (not reported). The table shows for each variable two specifications. We first explore the effect of having experienced any extreme weather event (over the past 5 years) elicited in August 2024. In a second specification, we separate heat related extreme weather events (wildfires and droughts) and events related to rain, storm or flooding and compare those against having experienced another extreme weather event or none (see Figure A4 for a complete overview on the prevalence of extreme weather events). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table B4. Effects of temperature scenarios on consumers expectations

(a) Prices of food

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C°C	0.110***	0.114***	-0.224***	0.112***	0.113***	-0.225***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +1.5°C	-0.040***	-0.074***	0.113***	-0.040***	-0.073***	0.113***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.007)
S4: +3°C	-0.042***	-0.080***	0.122***	-0.042***	-0.079***	0.122***
	(0.003)	(0.005)	(0.007)	(0.003)	(0.005)	(0.007)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.23	0.23	0.23	0.19	0.19	0.19

(b) Prices of energy (including gasoline)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.072***	0.089***	-0.161***	0.074***	0.089***	-0.163***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +1.5°C	-0.033***	-0.064***	0.098***	-0.033***	-0.063***	0.097***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.008)
S4: +3°C	-0.032***	-0.062***	0.094***	-0.032***	-0.061***	0.094***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.008)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
Symmetry: |S1|=|S3|	0.00	0.01	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.65	0.65	0.65	0.71	0.71	0.71

(c) Price of other goods and services

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.060***	0.118***	-0.178***	0.061***	0.118***	-0.179***
	(0.004)	(0.006)	(0.009)	(0.004)	(0.006)	(0.009)
S3: +1.5°C	-0.027***	-0.088***	0.114***	-0.027***	-0.087***	0.114***
	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.008)
S4: +3°C	-0.029***	-0.097***	0.126***	-0.029***	-0.097***	0.126***
	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.008)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,149	21,149	21,149	20,988	20,988	20,988
Tests			(p-value)			
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.12	0.12	0.12	0.10	0.10	0.10

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in September 2024. All columns include country dummies (not reported). Columns (1) to (3) do not include any additional control variables. Columns (4) to (6) include the same set of control variables used in Table 1 (age, education, gender, household size, hand-to-mouth classification, homeownership, financial literacy, income). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table B5. Reasons for increasing prices of food and goods and services

	Logistic regression, average marginal effects					
	Crop failure	Supply chain disruptions	Production costs	Desire for profits by firms	Demand of consumers	Taxes or tariffs
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario						
(base: S2: +0.01°C)						
S1: -1.5°C	-0.072***	-0.021*	-0.045***	0.000	0.010	-0.012
	(0.011)	(0.012)	(0.012)	(0.012)	(0.011)	(0.012)
S3: +1.5°C	0.016*	0.025**	0.027***	-0.007	-0.005	-0.012
	(0.009)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
S4: +3°C	0.037***	0.034***	0.036***	-0.027***	0.028***	-0.016
	(0.009)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
No. Obs.	15,606	15,606	15,606	15,606	15,606	15,606
Tests			(p-value)			
Symmetry: |S1|=|S3|	0.00	0.81	0.33	0.74	0.81	0.93
Monotonicity: S3 = S4	0.02	0.39	0.35	0.04	0.00	0.74

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in September 2024. All columns include country and sample type dummies (not reported). All columns include the same set of control variables used in Table 1 (age, education, gender, household size, hand-to-mouth classification, homeownership, financial literacy, income). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table B6. Effects of temperature scenarios on consumers economic activity expectations

	Ordered Logistic Regression, average marginal effects						OLS	
Outcome	Decrease	No effect	Increase	Decrease	No effect	Increase	Point forecast	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temp. Scenario (base: S2: +0.01°C)								
S1: -0.5°C	-0.077***	-0.010***	0.087***	-0.077***	-0.010***	0.087***	0.295***	0.292***
	(0.006)	(0.002)	(0.007)	(0.006)	(0.002)	(0.007)	(0.029)	(0.029)
S3: +0.5°C	0.063***	-0.013***	-0.050***	0.063***	-0.013***	-0.050***	-0.213***	-0.216***
	(0.008)	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.032)	(0.032)
S4: +1.5°C	0.080***	-0.019***	-0.061***	0.080***	-0.018***	-0.061***	-0.312***	-0.313***
	(0.008)	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.032)	(0.032)
Controls				Yes	Yes	Yes		Yes
No. obs.	19,759	19,759	19,759	19,617	19,617	19,617	19,752	19,610
Tests				(p-value)				
Symmetry: |S1|=|S3|	0.25	0.26	0.00	0.25	0.23	0.00	0.12	0.15
Monotonicity: S3 = S4	0.07	0.07	0.07	0.07	0.07	0.07	0.00	0.01

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. All columns include country and sample type dummies (not reported). Control variables are identical to Table 1. Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table B7. Effects of temperature scenarios on additional consumer expectations (June 2025)

(a) Biodiversity (the variety of animals, plants and animal life)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	-0.262***	0.016***	0.246***	-0.263***	0.017***	0.246***
	(0.008)	(0.003)	(0.008)	(0.008)	(0.003)	(0.008)
S3: +0.5°C	0.121***	-0.048***	-0.073***	0.124***	-0.049***	-0.075***
	(0.009)	(0.004)	(0.006)	(0.009)	(0.004)	(0.006)
S4: +1.5°C	0.141***	-0.057***	-0.084***	0.141***	-0.057***	-0.084***
	(0.009)	(0.004)	(0.006)	(0.009)	(0.004)	(0.005)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.04	0.04	0.04	0.06	0.06	0.06

(b) Your household's financial wellbeing

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	-0.086***	0.024***	0.062***	-0.086***	0.024***	0.062***
	(0.007)	(0.002)	(0.005)	(0.007)	(0.002)	(0.005)
S3: +0.5°C	0.097***	-0.054***	-0.043***	0.097***	-0.054***	-0.043***
	(0.009)	(0.005)	(0.004)	(0.009)	(0.005)	(0.004)
S4: +1.5°C	0.124***	-0.073***	-0.052***	0.123***	-0.072***	-0.051***
	(0.009)	(0.006)	(0.004)	(0.009)	(0.006)	(0.004)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.43	0.00	0.01	0.39	0.00	0.01
Monotonicity: S3 = S4	0.01	0.01	0.01	0.01	0.01	0.01

(c) Unemployment

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.043***	0.043***	-0.086***	0.043***	0.043***	-0.085***
	(0.004)	(0.004)	(0.008)	(0.004)	(0.004)	(0.008)
S3: +0.5°C	-0.027***	-0.059***	0.086***	-0.027***	-0.059***	0.085***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S4: +1.5°C	-0.035***	-0.086***	0.121***	-0.036***	-0.087***	0.122***
	(0.003)	(0.007)	(0.009)	(0.003)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.01	0.07	0.99	0.01	0.07	1.00
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(Table B7 cont.)

(d) Economic Growth

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	-0.077***	-0.010***	0.087***	-0.077***	-0.010***	0.087***
	(0.006)	(0.002)	(0.007)	(0.006)	(0.002)	(0.007)
S3: +0.5°C	0.063***	-0.013***	-0.050***	0.063***	-0.013***	-0.050***
	(0.008)	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)
S4: +1.5°C	0.080***	-0.019***	-0.061***	0.080***	-0.018***	-0.061***
	(0.008)	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.25	0.26	0.00	0.25	0.23	0.00
Monotonicity: S3 = S4	0.07	0.07	0.07	0.07	0.07	0.07

(e) Stock prices and other financial assets

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	-0.043***	-0.014***	0.056***	-0.043***	-0.014***	0.057***
	(0.005)	(0.002)	(0.007)	(0.005)	(0.002)	(0.007)
S3: +0.5°C	0.049***	-0.003**	-0.046***	0.050***	-0.003**	-0.046***
	(0.007)	(0.001)	(0.006)	(0.007)	(0.001)	(0.006)
S4: +1.5°C	0.068***	-0.008***	-0.060***	0.068***	-0.008***	-0.060***
	(0.007)	(0.002)	(0.006)	(0.007)	(0.002)	(0.006)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.54	0.00	0.35	0.55	0.00	0.32
Monotonicity: S3 = S4	0.02	0.02	0.02	0.02	0.02	0.02

(f) House prices

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.021***	0.038***	-0.060***	0.021***	0.038***	-0.060***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S3: +0.5°C	-0.021***	-0.058***	0.080***	-0.022***	-0.059***	0.080***
	(0.003)	(0.007)	(0.010)	(0.003)	(0.007)	(0.010)
S4: +1.5°C	-0.028***	-0.080***	0.107***	-0.028***	-0.080***	0.107***
	(0.002)	(0.007)	(0.010)	(0.003)	(0.007)	(0.010)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.96	0.07	0.20	0.93	0.06	0.18
Monotonicity: S3 = S4	0.01	0.01	0.01	0.01	0.01	0.01

(Table B7 cont.)

(g) Government debt

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.057***	0.084***	-0.141***	0.057***	0.083***	-0.140***
	(0.004)	(0.005)	(0.009)	(0.004)	(0.005)	(0.009)
S3: +0.5°C	-0.035***	-0.117***	0.152***	-0.035***	-0.117***	0.152***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
S4: +1.5°C	-0.041***	-0.142***	0.183***	-0.041***	-0.143***	0.183***
	(0.002)	(0.008)	(0.009)	(0.002)	(0.008)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.45	0.00	0.00	0.46
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(h) Taxes paid by consumers and firms (incl. VAT)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.039***	0.074***	-0.112***	0.038***	0.073***	-0.111***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S3: +0.5°C	-0.029***	-0.107***	0.137***	-0.029***	-0.107***	0.136***
	(0.002)	(0.008)	(0.010)	(0.002)	(0.008)	(0.010)
S4: +1.5°C	-0.036***	-0.141***	0.176***	-0.036***	-0.140***	0.176***
	(0.002)	(0.008)	(0.010)	(0.002)	(0.008)	(0.010)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.04	0.00	0.13	0.05	0.00	0.12
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(i) Immigration

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -0.5°C	0.099***	0.104***	-0.203***	0.099***	0.104***	-0.203***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +0.5°C	-0.033***	-0.089***	0.122***	-0.033***	-0.088***	0.122***
	(0.003)	(0.007)	(0.009)	(0.003)	(0.007)	(0.009)
S4: +1.5°C	-0.037***	-0.101***	0.137***	-0.037***	-0.101***	0.138***
	(0.003)	(0.007)	(0.009)	(0.003)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	19,759	19,759	19,759	19,617	19,617	19,617
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.14	0.00	0.00	0.14	0.00
Monotonicity: S3 = S4	0.10	0.10	0.10	0.10	0.09	0.09

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. All columns include country dummies (not reported). Columns (1) to (3) do not include any additional control variables. Columns (4) to (6) include the same set of control variables used in Table 1 (age, education, gender, household size, hand-to-mouth classification, homeownership, financial literacy, income). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Table B8. Balance tests for scenario assignment (June 2025)

	Global average temperature change scenario				
Factor	**-0.5°C**	**+0.01°C**	**+0.5°C**	**+1.5°C**	**p-value**
N	4951	4946	4934	4935	
High climate concern	1410 (49.9%)	1382 (49.6%)	1460 (51.1%)	1399 (49.4%)	0.56
High climate attention	1311 (45.4%)	1271 (44.6%)	1329 (45.5%)	1317 (45.6%)	0.87
High climate knowledge	1226 (36.9%)	1177 (36.1%)	1135 (34.8%)	1209 (36.5%)	0.32
Age					
18-34 years	960 (19.4%)	949 (19.2%)	941 (19.1%)	932 (18.9%)	0.89
35-49 years	1543 (31.2%)	1586 (32.1%)	1560 (31.6%)	1532 (31.0%)	
50-64 years	1623 (32.8%)	1568 (31.7%)	1609 (32.6%)	1654 (33.5%)	
65+ years	825 (16.7%)	843 (17.0%)	824 (16.7%)	817 (16.6%)	
Gender					
Men	2701 (54.6%)	2701 (54.6%)	2742 (55.6%)	2745 (55.6%)	0.56
Women	2250 (45.4%)	2245 (45.4%)	2192 (44.4%)	2190 (44.4%)	
Education					
Primary	491 (9.9%)	509 (10.3%)	484 (9.8%)	477 (9.7%)	0.41
Secondary	1479 (29.9%)	1490 (30.1%)	1550 (31.4%)	1560 (31.6%)	
Tertiary	2981 (60.2%)	2947 (59.6%)	2900 (58.8%)	2898 (58.7%)	
Household size, median (IQR)	2 (2, 4)	2 (2, 4)	2 (2, 4)	2 (2, 4)	0.45
Hand-to-mouth	1273 (25.7%)	1287 (26.0%)	1274 (25.8%)	1274 (25.8%)	0.99
Homeowner	3483 (70.3%)	3500 (70.8%)	3489 (70.7%)	3483 (70.6%)	0.97
High financial literacy	2850 (58.0%)	2795 (56.9%)	2783 (56.9%)	2873 (58.6%)	0.21
HH Income (thousands), median (IQR)	36 (24, 51.6)	36 (23.16, 50.4)	36 (23.76, 50.4)	36 (22.8, 51.6)	0.38
Country					
BE	221 (4.5%)	251 (5.1%)	251 (5.1%)	248 (5.0%)	0.36
DE	802 (16.2%)	761 (15.4%)	771 (15.6%)	758 (15.4%)	
ES	791 (16.0%)	764 (15.4%)	799 (16.2%)	769 (15.6%)	
FR	801 (16.2%)	768 (15.5%)	804 (16.3%)	768 (15.6%)	
IT	852 (17.2%)	863 (17.4%)	833 (16.9%)	851 (17.2%)	
NL	210 (4.2%)	244 (4.9%)	272 (5.5%)	255 (5.2%)	
AT	247 (5.0%)	263 (5.3%)	234 (4.7%)	244 (4.9%)	
FI	254 (5.1%)	250 (5.1%)	231 (4.7%)	283 (5.7%)	
EL	287 (5.8%)	258 (5.2%)	261 (5.3%)	248 (5.0%)	
IE	226 (4.6%)	261 (5.3%)	217 (4.4%)	257 (5.2%)	
PT	260 (5.3%)	263 (5.3%)	261 (5.3%)	254 (5.1%)	
Experience extreme weather					
Flood	431 (15.8%)	431 (16.1%)	470 (17.4%)	483 (18.0%)	0.096
Drought	630 (23.0%)	592 (22.1%)	657 (24.4%)	630 (23.4%)	0.27
Wildfire	288 (10.5%)	274 (10.2%)	288 (10.7%)	290 (10.8%)	0.93
Landslide	132 (4.8%)	101 (3.8%)	124 (4.6%)	124 (4.6%)	0.25
Storm	375 (13.7%)	391 (14.6%)	431 (16.0%)	378 (14.1%)	0.087
Avalanches	66 (2.4%)	62 (2.3%)	69 (2.6%)	58 (2.2%)	0.80
Coastal erosion	123 (4.5%)	114 (4.3%)	103 (3.8%)	121 (4.5%)	0.57
Dust storms	76 (2.8%)	80 (3.0%)	74 (2.7%)	94 (3.5%)	0.35
Earthquakes	132 (4.8%)	140 (5.2%)	135 (5.0%)	125 (4.6%)	0.78
Other	62 (2.3%)	63 (2.4%)	52 (1.9%)	43 (1.6%)	0.18

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in June 2025. Information on extreme weather experiences over the past 5 years was collected in August 2024. Continuous variables are compared using the Wilcoxon rank-sum (2 groups) or Kruskal-Wallis (>2 groups) test, categorical and binary are compared using a Pearson's chi-squared. Climate concerns are defined as high when they are above the median (5) out of a scale from 0 to 10. Climate attention is defined as high if people pay "much" or "a great deal" of attention. We classify climate knowledge as high if it is above the median of correct answers (5).

Table B9. Effects of temperature scenarios on consumers expectations

(September 2024)

(a) Prices of food

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C°C	0.110***	0.114***	-0.224***	0.112***	0.113***	-0.225***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +1.5°C	-0.040***	-0.074***	0.113***	-0.040***	-0.073***	0.113***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.007)
S4: +3°C	-0.042***	-0.080***	0.122***	-0.042***	-0.079***	0.122***
	(0.003)	(0.005)	(0.007)	(0.003)	(0.005)	(0.007)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.23	0.23	0.23	0.19	0.19	0.19

(b) Prices of energy (including gasoline)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.072***	0.089***	-0.161***	0.074***	0.089***	-0.163***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +1.5°C	-0.033***	-0.064***	0.098***	-0.033***	-0.063***	0.097***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.008)
S4: +3°C	-0.032***	-0.062***	0.094***	-0.032***	-0.061***	0.094***
	(0.003)	(0.005)	(0.008)	(0.003)	(0.005)	(0.008)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.01	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.65	0.65	0.65	0.71	0.71	0.71

(c) Price of other goods and services

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.060***	0.118***	-0.178***	0.061***	0.118***	-0.179***
	(0.004)	(0.006)	(0.009)	(0.004)	(0.006)	(0.009)
S3: +1.5°C	-0.027***	-0.088***	0.114***	-0.027***	-0.087***	0.114***
	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.008)
S4: +3°C	-0.029***	-0.097***	0.126***	-0.029***	-0.097***	0.126***
	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)	(0.008)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,149	21,149	21,149	20,988	20,988	20,988
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.12	0.12	0.12	0.10	0.10	0.10

(Table B9 cont.)

(d) Number of Oscar winning movies (*placebo*)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	-0.001	-0.001	0.002	-0.001	-0.000	0.001
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
S3: +1.5°C	0.002	0.001	-0.003	0.002	0.001	-0.003
	(0.003)	(0.002)	(0.005)	(0.003)	(0.002)	(0.005)
S4: +3°C	0.005	0.002	-0.007	0.004	0.002	-0.006
	(0.003)	(0.001)	(0.004)	(0.003)	(0.002)	(0.004)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,152	21,152	21,152	20,991	20,991	20,991
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.89	0.91	0.90	0.82	0.85	0.83
Monotonicity: S3 = S4	0.36	0.36	0.36	0.51	0.51	0.51

(e) Biodiversity (the variety of animals, plants and animal life)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	-0.197***	0.004***	0.193***	-0.198***	0.005***	0.193***
	(0.008)	(0.001)	(0.008)	(0.008)	(0.001)	(0.008)
S3: +1.5°C	0.059***	-0.013***	-0.047***	0.062***	-0.013***	-0.049***
	(0.009)	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)
S4: +3°C	0.083***	-0.019***	-0.064***	0.082***	-0.018***	-0.063***
	(0.009)	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.01	0.01	0.01	0.03	0.03	0.03

(f) Your household's financial wellbeing

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	-0.077***	0.014***	0.063***	-0.077***	0.014***	0.063***
	(0.007)	(0.002)	(0.006)	(0.007)	(0.002)	(0.006)
S3: +1.5°C	0.091***	-0.039***	-0.052***	0.092***	-0.039***	-0.054***
	(0.009)	(0.004)	(0.005)	(0.009)	(0.004)	(0.005)
S4: +3°C	0.120***	-0.054***	-0.066***	0.120***	-0.053***	-0.067***
	(0.009)	(0.004)	(0.005)	(0.009)	(0.004)	(0.005)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.30	0.00	0.26	0.24	0.00	0.32
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(Table B9 cont.)

(g) Unemployment

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.043***	0.045***	-0.088***	0.044***	0.045***	-0.089***
	(0.004)	(0.004)	(0.008)	(0.004)	(0.004)	(0.008)
S3: +1.5°C	-0.030***	-0.057***	0.087***	-0.030***	-0.057***	0.086***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S4: +3°C	-0.039***	-0.081***	0.120***	-0.038***	-0.081***	0.119***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,151	21,151	21,151	20,990	20,990	20,990
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.03	0.15	0.96	0.02	0.19	0.87
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(h) Economic Growth

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	-0.107***	0.005***	0.102***	-0.106***	0.005***	0.101***
	(0.007)	(0.001)	(0.007)	(0.007)	(0.001)	(0.007)
S3: +1.5°C	0.104***	-0.032***	-0.072***	0.106***	-0.033***	-0.074***
	(0.009)	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)
S4: +3°C	0.137***	-0.046***	-0.091***	0.136***	-0.045***	-0.091***
	(0.009)	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,152	21,152	21,152	20,991	20,991	20,991
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.85	0.00	0.01	0.97	0.00	0.01
Monotonicity: S3 = S4	0.00	0.00	0.00	0.00	0.00	0.00

(i) Stock prices and other financial assets

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	-0.055***	-0.008***	0.063***	-0.054***	-0.008***	0.062***
	(0.006)	(0.001)	(0.007)	(0.006)	(0.001)	(0.007)
S3: +1.5°C	0.065***	-0.010***	-0.055***	0.067***	-0.010***	-0.057***
	(0.007)	(0.002)	(0.006)	(0.007)	(0.002)	(0.006)
S4: +3°C	0.090***	-0.017***	-0.072***	0.088***	-0.017***	-0.072***
	(0.008)	(0.002)	(0.006)	(0.008)	(0.002)	(0.006)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,151	21,151	21,151	20,990	20,990	20,990
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.35	0.42	0.51	0.26	0.28	0.64
Monotonicity: S3 = S4	0.01	0.01	0.01	0.01	0.02	0.01

(Table B9 cont.)

(j) House prices

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.019***	0.025***	-0.044***	0.019***	0.025***	-0.044***
	(0.004)	(0.005)	(0.008)	(0.004)	(0.005)	(0.008)
S3: +1.5°C	-0.018***	-0.031***	0.050***	-0.019***	-0.031***	0.050***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S4: +3°C	-0.019***	-0.032***	0.051***	-0.019***	-0.032***	0.051***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.95	0.48	0.69	0.92	0.49	0.71
Monotonicity: S3 = S4	0.94	0.94	0.94	0.91	0.91	0.91

(k) Government debt

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.057***	0.086***	-0.143***	0.058***	0.086***	-0.144***
	(0.004)	(0.005)	(0.009)	(0.004)	(0.005)	(0.009)
S3: +1.5°C	-0.036***	-0.101***	0.137***	-0.036***	-0.102***	0.138***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
S4: +3°C	-0.040***	-0.118***	0.158***	-0.040***	-0.117***	0.158***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.15	0.68	0.00	0.13	0.72
Monotonicity: S3 = S4	0.02	0.02	0.02	0.03	0.03	0.03

(l) Taxes paid by consumers and firms (incl. VAT)

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.053***	0.104***	-0.158***	0.054***	0.104***	-0.158***
	(0.003)	(0.006)	(0.009)	(0.003)	(0.006)	(0.009)
S3: +1.5°C	-0.022***	-0.072***	0.094***	-0.022***	-0.074***	0.096***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
S4: +3°C	-0.024***	-0.081***	0.105***	-0.024***	-0.082***	0.106***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,151	21,151	21,151	20,990	20,990	20,990
Tests			(p-value)			
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.01	0.00
Monotonicity: S3 = S4	0.23	0.23	0.23	0.27	0.27	0.27

(Table B9 cont.)

(m) Immigration

	Ordered logistic regression, average marginal effects					
Level of dep. var.	Decrease	Same	Increase	Decrease	Same	Increase
	(1)	(2)	(3)	(4)	(5)	(6)
Temp. Scenario (base: S2: +0.01°C)						
S1: -1.5°C	0.099***	0.129***	-0.228***	0.100***	0.130***	-0.230***
	(0.004)	(0.005)	(0.009)	(0.005)	(0.005)	(0.009)
S3: +1.5°C	-0.024***	-0.065***	0.089***	-0.024***	-0.065***	0.089***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
S4: +3°C	-0.028***	-0.080***	0.108***	-0.028***	-0.080***	0.109***
	(0.002)	(0.007)	(0.009)	(0.002)	(0.007)	(0.009)
Controls	No	No	No	Yes	Yes	Yes
No. Obs.	21,153	21,153	21,153	20,992	20,992	20,992
Tests				(p-value)		
cut(1) = cut(2)	0.00	0.00	0.00	0.00	0.00	0.00
Symmetry: |S1|=|S3|	0.00	0.00	0.00	0.00	0.00	0.00
Monotonicity: S3 = S4	0.02	0.02	0.02	0.02	0.02	0.02

Note: Authors' calculations are based on the ECB Consumer Expectations Survey (CES). in September 2024. All columns include country dummies (not reported). Columns (1) to (3) do not include any additional control variables. Columns (4) to (6) include the same set of control variables used in Table 1 (age, education, gender, household size, hand-to-mouth classification, homeownership, financial literacy, income). Robust standard errors are in parentheses. Statistical significance level: *** p<.01, ** p<.05, * p<.1.

Appendix C – Special purpose survey questions

August 2024

Variable: X4211
Filtering**: All respondents**
Label: Probability of extreme weather event
Question wording:
Over the next 5 years, what do you think is the **percentage chance** of an extreme weather event that will worsen …
Instruction: *Please provide your best guess.*
Question type: [numeric box]

Suffix	Question Wording	Value field / box **Range: 0-100**
1	**the financial well-being of your household**?	___%
2	**your country's economic situation**?	___%

Coding: Show a box. Range: 0-100
Scripting instruction**:**

- Add a percentage sign next to the numerical box
- Please randomise the order items 1 and 2 are shown include a version variable X4211version: X4211version=1 for the display order 1, 2; and X4211version=2 for the display order 2, 1
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

-999	Don't know

Translation instruction: replace "the country you currently live in" by the actual country name (Belgian for BE FR/NL, French for FR, German for DE, Italian for IT, Dutch for NL, Spanish for ES, similar for the new countries).
Skipped notification: Please provide a number to answer this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: X5211
Label: Perceived important political topics – current
Filtering: **All respondents**
Question wording:
What do you think are the most important issues facing the country you currently live in at present?
Instruction: *Please select up to three responses.*

1	Healthcare
2	General economic situation
3	Unemployment
4	Rising prices in general and cost of living
5	Income differences across the population
6	The environment and climate change
7	Government debt
8	The educational system
9	Pensions
10	Immigration
11	Crime
12	Corruption in public services or the government
13	Housing
14	Taxation
15	Terrorism
16	National security and international conflict
17	Energy supply
18	Other issues, not mentioned above

Question type: [multiple response]
Coding:

1	Yes
0	No

Scripting instruction 1: Max 3 answers allowed.
Scripting instruction 2: Randomise items 1 to 17 appear. Item 18 should always be ordered last.
Translation instruction: replace "the country you currently live in" by the actual country name (Belgian for BE FR/NL, French for FR, German for DE, Italian for IT, Dutch for NL, Spanish for ES, similar for the new countries).
Error message: Show if more than 3 answers selected: Please select a maximum of 3 responses.
Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: X4310
Label: Environment – past experiences
Filtering: **All respondents**
Question wording:
Which of the following extreme weather events or natural disasters (if any) in the country you currently live in have affected **your household's financial situation over the past 5 years**?

Instruction: *Please select all that apply.*

1	Flooding (incl. heavy rain)
2	Droughts or heatwaves
3	Wildfires
4	Landslides / mudslides
5	Storm damage (incl. strong winds and tornadoes)
6	Avalanches
7	Coastal erosion / storm surges
8	Dust storms
9	Earthquakes (incl. volcanic eruptions)
10	Other
11	None of the above

Question type: [multiple response]
Coding:

0	No
1	Yes

Scripting instruction:
- Include question as a tick all that apply list
- Randomise the order items 1-9 appear. Items 10 and 11 should be fixed in order with item 11 shown separately (exclusive)

Skipped notification: Please provide an answer to this question. All your answers will be treated confidentially.
Hard check: respondent cannot proceed without answering

Variable: X8310

Label: Change in prices in general – responsibility
Filtering: **All respondents**
Question wording:
Who do you think is mainly responsible for maintaining price stability in the country you currently live in?

Instruction: *Please select all that apply.*

1	The government/national politicians

2	The <National Central Bank>
3	The European Central Bank
4	Trade unions
5	Firms/shop owners/vendors
6	Don't know

Question type: [multiple response]

Coding:

0	No
1	Yes

Scripting instruction:

- Tick all that apply list
- Randomise items 1 to 5. Items 6 should be fixed in order and displayed as last items. Item 6 should be exclusive.

Info button text:

- <National Central Bank> : The national central bank of the country you currently live in and that is a member of the European System of Central Banks.

A0020	Text insert for option 7 <National Central Bank>
BE	If language=11 : Nationale Bank van België / if language =12 : Banque Nationale de Belgique / if language =70 : National Bank of Belgium
FR	Banque de France
DE	Deutsche Bundesbank
IT	Banca d'Italia
NL	De Nederlandsche Bank
ES	Banco de España
AT	Oesterreichische Nationalbank
FI	Suomen Pankki
EL	if language =100 : Trapeza tis Ellados / if language =70 : Bank of Greece
IE	Central Bank of Ireland
PT	Banco de Portugal

Translation instruction: replace "the country you currently live in" by the actual country name (Belgium for BE FR/NL, France for FR, Germany for DE, Italy for IT, Netherlands for NL, Spain for ES, similarly for five new countries).

Skipped notification: Please provide an answer to this question. All your answers will be treated confidentially.

Hard check: respondent cannot proceed without answering

September 2024

Variable: AN1010
Label: Climate change attention
Filtering: **All respondents**
Question wording:
Some people are interested in following news and developments related to climate change while others are less interested in this topic. That is some people might follow the news and search for information about climate change regularly while others don't.

Thinking about yourself, how much attention do you pay to climate change news?

Question type: [single response]
Coding:

1	Almost no attention
2	A little attention
3	Some attention
4	Much attention
5	A great deal of attention

Scripting instruction:
- Randomise the order of the response options in two versions. Include a variable version AN1010version indicating either version 1, shows: "Almost no attention" to "A great deal of attention"; version 2: "A great deal of attention" to "Almost no attention".

Skipped notification: Please provide an answer to this question. There is no right or wrong answer
Hard check: Respondent cannot proceed without answering.

Variable: AN1020

Label: Climate change concerns – household financial situation
Filtering: **All respondents**
Question wording:
How concerned are you about the impact of climate change on the **financial situation of your household**, over the next five years?
Question type: [single response]
Coding:

0	0 – Not concerned at all
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10 – Extremely concerned
-999	Do not know

Skipped notification: Please provide an answer to this question. There is no right or wrong answer
Hard check: Respondent cannot proceed without answering.

Variable: AN1030
Label: Climate change responsibility
Filtering: **All respondents**
Question wording:
In your opinion, who is primarily responsible for addressing climate change and its consequences in Europe?
Instruction: *Please select up to three that are the most responsible.*
Question type: [multiple response]

1	The United Nations

2	The European Commission
3	The European Central Bank
4	National governments
5	Regional and local authorities
6	Business and industries
7	Citizens like you
8	Environmental groups
9	Other
10	None of the above

Coding:

0	No
1	Yes

Scripting instruction:

- Up to three items should be possible to select.
- Block-randomize the order of options shown.
    - Include a variable version AN1030version indicating either version 1, shows: 1,2,3,4,5,6,7,8; or version 2, shows: 4,5,6,1,2,3,7,8; or version 3 shows: 7,8, 4,5,6,1,2,3.
    - option 10 should be exclusive, that is when option 10 is selected all other options should be unselected.
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

-666	Prefer not to answer
-999	Don't know

Error message: Show if more than 3 answers selected: Please select a maximum of 3 responses.
Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: AN1000
Label: Insert for AN1110
Filtering: **All respondents**
Coding: [Single value]

Group	Dynamic Insert in AN1110: **Z**
1	**decrease** considerably by **1.5**
2	**increase** only slightly by **0.01**
3	**increase** considerably by **1.5**
4	**increase** considerably by **3**

Random assignment of groups, with equal groups for **country** (DE, FR, IT, ES, NL, BE, FL, EL, IE, PT, AT) x recruitment **method** (CATI/CAWI).

Variable: AN1110
Label: Temperature change – Scenario question
Filtering: **All respondents**
Question wording:
According to historical data, the annual average global temperature in 2023 has increased significantly by about 1 degree Celsius compared to 50 years ago.

Suppose that **in the next 5 years**, the average **global temperature** will Z degrees Celsius compared to today.

How do you think this will affect, if at all, each of the following **in the country you currently live in** over the next 5 years?
Question type: [grid question]

1	Prices of food
2	Prices of energy (including gasoline)
3	Prices of other goods and services
4	Number of Oscar winning movies

5	Biodiversity (the variety of animals, plants and animal life)
6	Your household financial wellbeing
7	Unemployment
8	Economic growth
9	Stock prices and other financial asset values
10	House prices
11	Government debt
12	Taxes paid by consumers and firms (incl. VAT)
13	Immigration

Coding:

1	Decrease a lot
2	Decrease a little
3	No effect
4	Increase a little
5	Increase a lot

Translation instruction: replace "the country you currently live in" by the actual country name (Belgium for BE FR/NL, France for FR, Germany for DE, Italy for IT, Netherlands for NL, Spain for ES, similarly for five new countries).
Scripting instruction:

- Unfolding grid with labelled response options
- Block-randomize the order of items grouped together (do not include a variable indicating order), randomize the groups not the order of items within each group.
    - Items are grouped as follows:
        - Group 1: 1,2,3
        - Group 2: 4,5,6
        - Group 3: 7,8,9,10
        - Group 4: 11,12,13

Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: AN1120
Label: Reason for food price increases
Filtering: If AN1110_1 = 4 or AN1110_1 = 5
Question wording:
You said before that food prices will increase in the next 5 years because of the change in global temperature.

Which of the following do you think will be responsible for this increase in food prices?

Instruction: *Please select all that apply.*
Question type: [multiple response]

1	Increased crop failures
2	Increased occurrence of supply chain disruptions
3	Increased production costs
4	Increased desire for profits by firms
5	Increased demand of consumers for certain goods
6	Increased taxes or tariffs
7	Other

Coding:

0	No
1	Yes

Scripting instruction:

- Randomise the order items 1 to 6 are displayed (do not include a version variable)

- option 7 should be always ordered last
- Don't know options should be recorded per item (i.e. not per extra variable)
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

-666	Prefer not to answer
-999	Don't know

Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

December 2024

Variable: AO1010
Label: Climate change knowledge
Filtering: **All respondents**
Question wording:
Now we would like to ask you some questions concerning the environment.
Which of the statements below regarding **climate change** do you think are true or false?
Instruction: *A don't know option is available in case you do not know the answer.*

1	The ozone hole is the main cause of the greenhouse effect.
2	Higher concentration of carbon dioxide (CO_2) in the atmosphere leads to higher temperatures
3	The increase of greenhouse gases is mainly caused by human activities.
4	For the next few decades, the majority of climate scientists expect the climate to change evenly all over the world.
5	The annual average global temperature in 2023 has increased by about 1 degree Celsius compared to 50 years ago.
6	For the next few decades, the majority of climate scientists expect a warmer climate to increase the melting of polar ice, which will lead to an overall rise of the sea level.
7	The production of 1 kg of beef produces more greenhouse gases than the production of 1 kg of wheat

Question type: [grid question]
Coding:

1	True
0	False
3	Don't know

Scripting instruction:
- Randomize order of statements 1 to 7

Skipped notification: Please provide an answer to this question. All your answers will be treated confidentially.
Hard check: respondent cannot proceed without answering

June 2025

Variable: AS2010
Label: Expectation for future temperatures – probabilistic
Filtering: **All Respondents**
Question wording:
Now, we would like you to think about how much average global temperatures (in degree Celsius, °C) might change **over the next 5 years** compared to today.

Below you see possible ways in which the average global temperatures could change **until 2030**. Please distribute 100 points among them, to indicate how likely you think it is that each temperature change will happen. The sum of the points you allocate should total 100.
Instruction: *You can allocate points by typing a number in each box. (Note that your answers should add up to 100 – if the total exceeds 100, you should first decrease the points again in one option before you can add points in another).*
Question type: [numeric grid]

1	Average global temperatures will **increase** by 2 °C or more
2	Average global temperatures will **increase** by 1 °C or more but less than 2 °C
3	Average global temperatures will **increase** by 0 °C or more but less than 1 °C

4	Average global temperatures will **decrease** by more than 0 °C but less than 1 °C
5	Average global temperatures will **decrease** by 1 °C or more but less than 2 °C
6	Average global temperatures will **decrease** by 2 °C or more

Coding:
Numeric box with range 0-100
Scripting instruction:

- Show the grid items (text) to the left and the associated numeric entry box on the right-hand side.
- Randomise order of items 1 to 8 in two ways: version 1 show 1 to 6, version 2 show 6 to 1 (reverse order). Include a version variable AS2010_version.
- Display a final column at the bottom with "**Total** (the points should sum to 100)" and a running total to the right of it.
- Cells in the table should not be pre-filled, hard check on entering a value in at least one cell of the table, soft check for values summing to 100.

Skipped notification: This question takes a little more effort, but please be assured there is no right or wrong answer. Please try to distribute 100 points among the rows in the table.
Hard check: respondent cannot proceed without answering (show if no fields answered); respondent can proceed of at least one field answered.
Error message: The points do not sum to 100. Please check your answer, or click "Next" if you are happy with your answer.
Soft check: Error notification shown once, if respondent clicks 'next' again, move to next question

Variable: AS2100
Label: Insert for AS2110 and AS2120
Filtering: All respondents
Coding: [Single value]

Group	Dynamic insert in AS2110, AS2120 and AS2130: **Z**
1	**decrease** considerably by **0.5**
2	**increase** only slightly by **0.01**
3	**increase** considerably by **0.5**
4	**increase** considerably by **1.5**

Random assignment of groups, with equal groups for **country** (DE, FR, IT, ES, NL, BE, FL, EL, IE, PT, AT) x recruitment **method** (CATI/CAWI).

Variable: AS2110
Label: Temperature change – Scenario question
Filtering: **All respondents**
Question wording:
According to historical data, the annual average global temperature in 2023 has increased significantly by about 1 degree Celsius compared to 50 years ago.

Suppose that **in the next 5 years**, the average **global temperature** will {Z} degrees Celsius compared to today.

How do you think this will affect, if at all, each of the following **in the country you currently live in** over the next 5 years?
Question type: [grid question]

1	Prices of goods and services (including food and energy)
2	Number of Oscar winning movies
3	Biodiversity (the variety of animals, plants and animal life)
4	Your household financial wellbeing
5	Unemployment
6	Economic activity
7	Stock prices and other financial asset values
8	House prices
9	Government debt
10	Taxes paid by consumers and firms (incl. VAT)
11	Immigration

Coding:

1	Decrease a lot

2	Decrease a little
3	No effect
4	Increase a little
5	Increase a lot

Translation instruction: replace "the country you currently live in" by the actual country name (Belgium for BE FR/NL, France for FR, Germany for DE, Italy for IT, Netherlands for NL, Spain for ES, similarly for five new countries).
Scripting instruction:

- Unfolding grid with labelled response options
- Block-randomize the order of items grouped together (do not include a variable indicating order), randomize the groups not the order of items within each group. No version variable to be included.
    - Items are grouped as follows:
        - Group 1: 1
        - Group 2: 2,3,4
        - Group 3: 5,6,7,8
        - Group 4: 9,10,11

Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: AS2120
Label: Temperature change – Prices – Quantitative response
Filtering: **If AS2110_1 = 1 OR AS2110_1 = 2 OR AS2110_1 = 4 OR AS2110_1 = 5**
Question wording:
You said that you expect the **prices of goods and services** to [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] over the next 5 years in the country you currently live in as a result of [SCRIPTER: if AS2100 = 1, show: a considerable decrease of 0.5 degrees Celsius; if AS2100 = 2 show: a slight increase by 0.01 degrees Celsius; if AS2100 = 3 show: a considerable increase by 0.5 degrees Celsius; if AS2100 = 4 show: a considerable increase by 1.5 degrees Celsius] in average global temperatures.

By about what percentage do you think the **prices of goods and services** will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] between June 2029 and June 2030 because of this change in temperatures?
Question type: [Single response]
Coding:

1	Will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] by 3% or more
2	Will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] by 2% or more but less than 3%
3	Will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] by 1% or more but less than 2%
4	Will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] by 0.5% or more but less than 1%
5	Will [SCRIPTER: if AS2110_1 = 4 or 5, show: **increase;** if AS2110_1 = 1 or 2, show: **decrease**] by less than 0.5%

Translation instruction: replace "the country you currently live in" by the actual country name (Belgium for BE FR/NL, France for FR, Germany for DE, Italy for IT, Netherlands for NL, Spain for ES, similarly for five new countries).
Scripting instruction:

- Randomise the order of the items with two versions, version 1: item 1 to 5, version 2 (reverse): item 5 to 1. Include a version variable AS2120_version.
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

-999	Don't know

Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: AS2130
Label: Temperature change – Economic growth – Quantitative response
Filtering: **If AS2110_6 = 1 OR AS2110_6 = 2 OR AS2110_6 = 4 OR AS2110_6 = 5**
Question wording:

You said that you expect **economic activity** to [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] over the next 5 years in the country you currently live in as a result of [SCRIPTER: if AS2100 = 1, show: a considerable decrease of 0.5 degrees Celsius; if AS2100 = 2 show: a slight increase by 0.01 degrees Celsius; if AS2100 = 3 show: a considerable increase by 0.5 degrees Celsius; if AS2100 = 4 show: a considerable increase by 1.5 degrees Celsius] in average global temperatures.

By about what percentage do you think **economic activity** will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] between June 2029 and June 2030 because of this change in temperatures?
Question type: [Single response]
Coding:

1	Will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] by 3% or more
2	Will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] by 2% or more but less than 3%
3	Will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] by 1% or more but less than 2%
4	Will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] by 0.5% or more but less than 1%
5	Will [SCRIPTER: if AS2110_6 = 4 or 5, show: **increase;** if AS2110_6 = 1 or 2, show: **decrease**] by less than 0.5%

Scripting instruction:
- Randomise the order of the items with two versions, version 1: item 1 to 5, version 2 (reverse): item 5 to 1. Include a version variable AS2130_version.
- If the respondent clicks next without answering, show the question again, but add a "don't know" option. Show the skipped notification.

-999	Don't know

Translation instruction: replace "the country you currently live in" by the actual country name (Belgium for BE FR/NL, France for FR, Germany for DE, Italy for IT, Netherlands for NL, Spain for ES, similarly for five new countries).
Skipped notification: Please provide an answer to this question. There is no right or wrong answer.
Hard check: respondent cannot proceed without answering

Variable: AS2140
Label: Temperature change – Willingness to pay
Filtering: **All respondents**
Question wording:
Governments have to undertake significant investments in environmental projects over the next 5 years in order to [SCRIPTER: if AS2100 = 1, show: achieve a considerable decrease of 0.5 degrees Celsius; if AS2100 = 2 show: achieve only a slight increase of 0.01 degrees Celsius; if AS2100 = 3 show: prevent a considerable increase of 0.5 degrees Celsius; if AS2100 = 4 show: prevent a considerable increase of 1.5 degrees Celsius] compared to today. How much of your own money **would you be willing to pay every month** to the government for this purpose **over the next 5 years**?
Question type: [numeric entry]
Coding:
Numeric box with **valid range: 0 – 100000000**
___ €

-666	Prefer not to answer
-999	Don't know

Skipped notification: Please provide an answer to this question. All your answers will be treated confidentially.

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