Households' Response to the Wealth Effects of Inflation*

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Abstract

We study households' response to the redistributive effects of inflation combining bank data with an information experiment during historic inflation. Households are generally well-informed about inflation and concerned about its wealth impact; yet, while knowledge about inflation eroding nominal assets is widespread, most households are unaware of nominal-debt erosion. When informed about the latter, households view nominal debt more positively and increase estimates of their real net wealth. These changes causally affect actual consumption and hypothetical debt decisions. Our findings suggest real wealth mediates the sensitivity of consumption to inflation once households are aware of the wealth effects of inflation.

JEL codes: D12, D14, D83, D84, E21, E31, E52
Keywords: Inflation Beliefs, Information Treatment, Consumption, Monetary Policy

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1 Introduction

After having been dormant for decades, inflation in 2022 reached levels many households had not witnessed during their lifetime. Unexpected inflation erodes the real value of savings and debt with fixed nominal interest rates, redistributing wealth from savers to borrowers (Fisher, 1933).[1] These redistributive effects can be sizable because households hold large nominal positions (Doepke and Schneider, 2006); in fact, wealth effects dwarfed income effects of surprise inflation for households with significant net nominal positions during the 2021–22 inflation surge (Pallotti et al., 2024). Theoretically, this redistribution of wealth can also have sizable stimulative effects on aggregate demand, because those that benefit, consumers with large negative net nominal positions, have on average higher marginal propensities to consume (MPC) than consumers who lose (Auclert, 2019).

Yet, little is known about whether households are aware of the distributional consequences of surprise inflation and how they adjust their economic decisions to the induced wealth effects. Households might be unaware of the wealth effects of inflation because of money illusion (e.g., Cohen, Polk, and Vuolteenaho, 2005; Modigliani and Cohn, 1979). Moreover, even households that are aware of the wealth effects might primarily adjust their consumption to realized payments rather than unrealized capital gains (e.g., Di Maggio, Kermani, and Majlesi, 2020; Fagereng et al., 2019). Because nominal wages take time to adjust to inflation, it might also take time for households to adjust their consumption and other economic choices, even if they became wealthier in real terms.

We study the extent to which households are aware of the wealth effects of inflation, how awareness affects beliefs about nominal positions and own wealth, and how these beliefs feed into debt choices, consumption plans, and actual consumption decisions using administrative

[1] See also Bhamra et al., 2023; Kang and Pflueger, 2015; and Leombroni et al., 2020.

bank data. To study these questions, we run a large-scale randomized control trial (RCT) on customers of a major German bank in which participants receive information on inflation-induced erosion of either nominal assets, or nominal debt. We find participating households, on average, are well-informed about the current inflation rate and are concerned about its wealth impact. However, whereas households are largely aware of nominal-asset erosion, they have limited knowledge about the debt-erosion channel of surprise inflation. Consequently, respondents who receive information about nominal-debt erosion form more positive beliefs about debt and increase their estimates of their own real net wealth. Households' changes in beliefs have real effects: they plan to spend more, update actual consumption ex-post, and choose a higher share of debt financing in a hypothetical real-estate investment.

We implemented the RCT on more than 3,800 bank customers in July 2022 when inflation in Germany was at a 70-year high of 8.7%. We first ask questions on knowledge about the erosion channel. Respondents also estimate the recent change in their real net wealth and decompose their balance sheet, allowing us to calculate their net nominal position. The subsequent information experiment builds the core of the survey. We randomly assign respondents into two treatment groups and one control group. We inform all groups about prevailing inflation. One treatment additionally discusses the erosion of savings, whereas the other discusses the erosion of loans. Specifically, we explain that unexpected inflation hurts savers / benefits debtors because it erodes nominal positions and calculate the change in real value of a savings product / loan due to surprise inflation. By comparing the treatment groups to the control group, we thus isolate the effect of information about the erosion channel. Post-treatment, we elicit beliefs about nominal positions, own wealth, and the economy. Moreover, we ask respondents about their spending plans, they perform a hypothetical real-estate investment, and we track their actual spending using bank data.

We have three main findings. First, we document asymmetric awareness of the erosion channel. Households on average are well-informed about nominal-asset erosion. For example, 75% believe the impact of unexpected inflation on fixed-rate savings products is very negative or negative. However, knowledge about loan erosion is more limited. Only nine percent of respondents believe the impact of unexpected inflation on fixed-rate loans is very positive and 25% believe it is positive. Limited awareness of debt erosion, including of debtors, suggests muted short-run responses to the redistributive effects of inflation.

Limited awareness is surprising, because survey respondents are on average better educated than the average German, hold large nominal positions (e.g., 55% have outstanding debt), and state they care about inflation and its wealth effects. Which characteristics then predict awareness of the erosion channel? First, awareness only weakly varies by households' net nominal position. That is, debtors, for example, are not significantly more aware of the redistributive effects of inflation. Second, business education, wealth, and stock ownership correlate with awareness. Third, general knowledge about inflation, such as an accurate perception of current inflation, predicts awareness of the wealth effects of inflation.

Second, providing information on the erosion channel, in particular on debt, affects beliefs about nominal positions and own real net wealth. We ask respondents to rank household balance-sheet items in terms of their inflation protection. The savings-erosion treatment group assigns a slightly worse inflation-protection rank to savings products than the control group. Respondents who receive the loan treatment rank loans more favorably. In addition, learning about inflation-induced debt erosion reduces general debt aversion, suggesting that information effects extend beyond the narrow context of inflation. Knowledge about the wealth effects of inflation hence impacts beliefs about nominal positions.

Treated respondents also update their estimates of real net wealth. Conditioning on pre-

treatment estimates of wealth changes, we find respondents who receive the savings-erosion information on average estimate their wealth change over the past and next 12 months 1.6–1.8 percentage points lower than respondents in the control group, which is however not statistically significant. Learning about inflation-induced loan erosion, instead, increases wealth estimates relative to the control group by 2.5–2.9 percentage points. The latter effect is both statistically and economically significant: it corresponds to around 50% of the average estimate of -5.6% in the control group. Respondents also report they were less aware of the information provided in the loan as compared to the savings treatment, suggesting the differential treatment effects reflect asymmetric prior knowledge.

We then study heterogeneity in the treatment effect on perceived and expected real net wealth. Respondents with a positive net nominal position (net savers) drive the negative average effect of the savings treatment, but the economic magnitude remains modest. The positive wealth effect of the loan treatment comes from respondents with a negative net nominal position (net debtors), who on average estimate their past- and next-12-month change in real net wealth five percentage points higher. Furthermore, we study heterogeneity in respondents' ability to map the loan-treatment information into their own wealth situation. The sensitivity of the wealth effect of the loan treatment to net nominal positions is strongest for respondents with high cognitive abilities and strong interest in the topic of inflation (Agarwal and Mazumder, 2013; D'Acunto et al., 2022).

Third, learning about inflation-induced nominal-debt erosion has real effects both in survey data and in actual account-transaction data from our partner bank. We focus on the effects of the debt-erosion treatment because only this treatment generates significant effects on beliefs. We study households' spending plans as well as their actual spending over the weeks after our survey intervention compared to the previous weeks. Learning about

debt erosion leads to higher planned and actual spending, both in reduced-form and in instrumental-variable estimations, alleviating possible concerns about experimenter demand effects (Haaland, Roth, and Wohlfart, 2023). The estimates map into MPCs of close to three percent, in line with estimates from the literature on MPCs from unrealized capital gains (e.g., Chodorow-Reich, Nenov, and Simsek, 2021; Lettau and Ludvigson, 2004). Our results suggest changes in real net wealth affect households' consumption response to inflation, conditional on households being aware of the wealth effects of inflation.

We show another real effect of learning about debt erosion on hypothetical debt choices. In the survey, respondents engage in a hypothetical real-estate transaction. The transaction consists of choosing both the value of the property and the financing of it, using both equity and debt. Respondents in the loan-treatment group choose real estate of similar value compared to respondents in the control group. However, the two groups differ in their preferred debt/price ratio, which is significantly higher in the loan-treatment group. Moreover, the loan treatment tilts the mortgage choice towards fixed- rather than adjustable-rate mortgages, with longer fixation periods for nominal interest rates. These choices likely reflect treatment-induced shifts in beliefs about the inflation-hedging properties of long-maturity fixed debt and an associated reduction in debt aversion.

Overall, our results improve the understanding of redistributive effects of surprise inflation at the micro level and provide insights for models featuring heterogeneous consumers such as Heterogeneous-Agent New Keynesian (HANK) models (e.g., Kaplan, Moll, and Violante, 2018). Auclert (2019) shows wealth redistribution caused by surprise inflation can boost the economy because the beneficiaries of it, net debtors, have higher MPCs than the losers. Limited awareness of inflation-induced debt erosion suggests muted debtor responses in the short run. Extending the HANK framework by allowing for deviations from full information

rational expectations (FIRE), for example via information frictions, would be a fruitful avenue for future research. More generally, a positive covariance between individual MPCs and exposure to economic shocks is a core amplification mechanism in HANK models (e.g., Bilbiie, 2008; Patterson, 2023). Allowing additionally for heterogeneity in the awareness of these shocks might help to better understand their aggregate consequences (Laibson, Maxted, and Moll, 2023; Pfäuti and Seyrich, 2024; Pfäuti, Seyrich, and Zinman, 2024).

We focus on a sample of German households because this setting allows us to combine administrative data from a bank with a customized survey experiment. This combination is unique and enables us not only to study prior knowledge of consumers about inflation-induced wealth redistribution but also to provide causal estimates via an information provision experiment. The existing literature that we discuss below either assumes everyone is fully aware of the redistributive effects, or studies consumption-savings decisions in realized data that do not allow for distinguishing frictions from limited knowledge.

Nevertheless, our setting also has potential shortcomings. German households are notoriously concerned about inflation. Moreover, our sample consists of relatively educated and wealthy Germans who care about and have accurate perceptions of inflation. One might hence expect our sample is already well aware of the effects of inflation. Yet, Weber et al. (2023) show that German households update their expectations to information about inflation in a similar way to consumers in the U.S. and other European countries. In addition, we find even mortgagors and households with little debt aversion in our sample are largely unaware of nominal-debt erosion. Consumers might be learning about the Fisher channel as high inflation persists, yet Germans had been concerned about inflation even prior to its surge (Braggion et al., 2024). We therefore likely uncover a systematic failure of households in understanding inflation-induced nominal-debt erosion. Indeed, Shiller (1997) reports Ger-

mans have heard more often that debtors benefit from inflation than people in the U.S. and Brazil. Moreover, Stantcheva (2024) documents 39% of U.S. households believe recent inflation has increased the real value of their debt. Both results suggest systematic unawareness about debt erosion also in countries other than Germany and in other time periods. These papers, however, do not study how the lack of awareness and learning about inflation-induced debt erosion causally shapes subsequent economic choices.

Related literature We contribute to several strands of the literature. First, we build on work on inflation-induced debt erosion that goes back to at least Fisher (1933). Doepke and Schneider (2006) document the net nominal positions of different economic actors in the U.S. over time and study the redistributive effects of various inflation scenarios within and across these groups. A key finding is young households with large debt positions benefit at the expense of wealthy middle-aged households.[2] Auclert (2019) and Pallotti (2024) study theoretically the redistributive effects of monetary policy on spending based on differential MPCs of winners and losers of the wealth effects of inflation. Coibion et al. (2017) document inequality dynamics due to monetary policy, including by household net wealth. Brunnermeier et al. (2023) and Gomes, Jermann, and Schmid (2016) analyze how unanticipated inflation transmits to the real economy through nominal corporate debt. We are the first to study how households perceive and adjust to the redistributive effects of inflation, using an information provision experiment paired with administrative bank data.

Second, we contribute to a large literature on households' response to inflation. Most work is on the sensitivity of spending plans or realized future spending to inflation expectations, with mixed results. Bachmann, Berg, and Sims (2015) initiate the literature, reporting a weak correlation between inflation expectations and consumers' willingness to spend using

[2]Recent papers that underline the important role of the Fisher channel on the distributional impact of the post-pandemic inflation include Del Canto et al. (2023), Ferreira et al. (2024), and Yang (2023).

data from the Michigan Survey of Consumers. Burke and Ozdagli (2023) confirm this null result based on the New York Fed Survey of Consumer Expectations. D'Acunto, Hoang, and Weber (2022) argue large cross-sectional dispersion in quantitative inflation expectations can explain a weak correlation with spending. A qualitative elicitation of expectations, instead, results in a positive association between inflation expectations and spending plans for consumers across countries. They also show for German households that this association is likely causal, exploiting an unexpected increase in valued-added taxes paired with a matching strategy for identification. Coibion, Gorodnichenko, and Weber (2022) use information-provision experiments embedded in surveys to achieve identification. They find for survey data and realized spending from homescan data that exogenously higher inflation expectations increase subsequent non-durable spending, consistent with a consumer Euler equation. For planned spending on durables instead, they find a negative association.

The negative spending-inflation sensitivity can arise for various reasons. Kamdar (2018) shows households associate higher future inflation with worse economic outcomes and hence spend less. Using credit-card data from Malaysia, Galashin, Kanz, and Perez-Truglia (2022) document that a negative or insignificant sensitivity is partially due to consumers expecting sticky nominal wages so that higher inflation lowers real income. Georgarakos et al. (2024) report a positive correlation between households' first and second moment of inflation expectations. They then find higher inflation uncertainty lowers spending, whereas higher inflation expectations increase spending. Finally, D'Acunto et al. (2022) show that cognitive abilities can affect the association between inflation and spending plans. Unconditionally, they find no link between planned spending and inflation expectations among Finnish men. Yet, when they separate their sample by cognitive abilities measured using a standardized IQ test by the Finnish Defense Forces, they show high-IQ men engage in intertemporal substitution,

whereas other men do not.[3] Our contribution to this literature is to provide direct evidence on one of the key channels through which inflation affects spending in macro models: we show wealth effects of inflation mediate the consumption-inflation sensitivity once households are aware of the effects. Differences across studies in how consumers update their wealth estimates to inflation can possibly also rationalize part of the mixed results in the literature.

Beyond effects on spending, the literature studies how households seek protection from inflation. Botsch and Malmendier (2023) find that experiencing high inflation in the 1970s is associated with an aversion to adjustable-rate mortgages. Leombroni et al. (2020) use an asset-pricing model to link high inflation expectations in the 1970s to a portfolio shift toward housing. Braggion, von Meyerinck, and Schaub (2023) find investors purchase fewer stocks when facing higher inflation during the hyperinflation in Germany in the 1920s. Schnorpfeil, Weber, and Hackethal (2024) use an RCT to study the effects of beliefs about inflation on portfolio choices. We add to these papers by showing that learning about inflation-induced debt erosion has a positive effect on beliefs about debt and increases debt financing.

Finally, a growing literature in economics employs information-provision experiments to study how consumers, who make consumption, savings, and investment decisions in the field, perceive economic policies and phenomena, as well as their effects (e.g., Andre et al., 2022; D'Acunto et al., 2022).[4] We contribute to this literature by analyzing how households perceive the wealth effects of inflation, how they map information about these effects into their own economic situation in an experimental setting, and how exogenous changes in their economic situation feed into real-world choices. A methodological novelty of our paper is explaining an economic mechanism rather than purely providing information about a single

[3]See also D'Acunto, Malmendier, and Weber (2023), Jiang et al. (2024), and Weber et al. (2022) for recent reviews of the work on inflation expectations and spending.

[4]See Haaland et al. (2023) for a review on how to run surveys and implement information experiments.

variable, such as a point forecast for inflation, as is common in the macro literature (e.g., Coibion, Gorodnichenko, and Weber, 2022). We thereby shock the interpretation of the consequences of inflation instead of exogenously varying inflation expectations.

2 Experimental design and data

In this section, we discuss the survey design and characteristics of our sample. Section 2.1 focuses on the survey design, emphasizing the information-provision part of the survey, whereas Section 2.2 describes the bank data as well as the sample composition and characteristics.

2.1 Experiment

We implemented the RCT on more than 3,800 bank customers in July 2022. The survey consists of three sections: a pre-treatment section on demographics, respondents' balance sheet, and economic beliefs; an information-provision section; and a post-treatment section on economic beliefs, hypothetical and planned economic choices, and additional background characteristics. Online Appendix B contains the survey questions translated to English.

Pre-treatment section Respondents start by answering two questions on their educational background. We then assess respondents' marginal propensity to save, consume, and pay down debt in the three months following a hypothetical one-time payment of €10,000 (see, e.g., Fuster, Kaplan, and Zafar, 2020), framed as either a gain or a loss. In addition, respondents receive a slight variation of this question asking about their hypothetical response to noticing by chance that their own net wealth is €10,000 higher or lower than previously thought. We randomize the order of the two questions. The two questions allow us to infer differential hypothetical spending responses to unexpected actual payments versus

unexpected changes in perceived net wealth with no actual cash flows involved.

Respondents then answer questions about the economy and its impact on their net wealth. The questions include the importance of macroeconomic factors, such as inflation and GDP, for their own wealth; the consumption response to recent changes in these factors; the perception of current and forecasts of future inflation; and whether holding cash, fixed-rate savings products, stocks, real estate, and fixed-rate loans provide a hedge against an unexpected surge in inflation. These questions aim to elicit existing knowledge about inflation-induced erosion of nominal assets and liabilities.

Furthermore, we ask respondents to provide a decomposition of their balance sheet into nominal assets (we mention cash, bonds, and life insurances as examples), stocks, real estate, other assets (we mention vehicles and gold as examples), and nominal liabilities (divided into mortgages and consumer loans).[5] Respondents state the value of each balance-sheet item as a fraction of their gross wealth. Given the cognitive burden of this question, we carefully explain the concept of gross wealth and provide several examples. Moreover, we provide a warning message if the sum of respondents' assets differs from their gross wealth. The median time survey participants spent on the balance-sheet-decomposition screen is more than two minutes, indicating that they carefully answer the question.

Respondents also estimate the change in their real net wealth over the past 12 months. We follow the design in the New York Fed Survey of Consumer Expectations (Armantier et al., 2017) and first elicit a directional estimate before asking for a point prediction, on a scale from -60% to 60%. We familiarize respondents to net and gross wealth in the preceding balance-sheet task, by providing a simple sample balance sheet to differentiate between gross and net wealth and by stating their net wealth as a fraction of their gross wealth. As we

[5]We follow Adam and Zhu (2015) in classifying life insurances as nominal claims, as insurance companies in the euro area predominantly invest in nominal assets.

discuss in Section 2.2 below, the elicited responses appear meaningful.

Treatment section The second part of the survey contains the information provision experiment. The objective of the intervention is to generate exogenous variation in knowledge about inflation-induced erosion of nominal assets and liabilities. To generate this variation, we randomly split the sample into three equally-sized groups, two of which receive information and one serves as a control group. The two treatments are similar, but one focuses on the erosion of nominal assets, whereas the other focuses on the erosion of nominal liabilities. The savings-erosion treatment information is as follows:

> *The **current inflation rate in Germany is 8.7%**, the highest rate in more than 70 years. That is, goods and services priced at €100 one year ago now cost €108.7 on average. This price increase has a relatively **negative effect on savers**: the savings amount (e.g., checking account, bond, life insurance) is unchanged nominally or lower, but worth less in real terms as a consequence of money depreciation.*
>
> *As an example, consider a €50,000 savings product with a three-year maturity that you took out one year ago. The real value of the savings product has already fallen sharply, and will depreciate further if inflation remains high:*
>
> ***€50,000 savings value one year ago ⇓ €38,800 real value today***
>
> *The **inflation-induced savings depreciation** thus has a negative effect on the real net wealth of savers.*
>
> *Note: the numbers come from current calculations by the Universities of Chicago and Frankfurt (**calculation details**).*

Respondents in the loan-erosion treatment group read the following text:

> *The **current inflation rate in Germany is 8.7%**, the highest rate in more than 70 years. That is, goods and services priced at €100 one year ago now cost €108.7 on average. This price increase has a relatively **positive effect on borrowers**: the loan amount is unchanged nominally, but worth less in real terms as a consequence of money depreciation.*
>
> *As an example, consider a €50,000 loan with a three-year maturity that you took out one year ago. The real value of the loan has already fallen sharply, and will*

depreciate further if inflation remains high:

> ***€50,000 loan value one year ago ⇓ €38,800 real value today***
>
> *The **inflation-induced loan depreciation** thus has a positive effect on the real net wealth of borrowers.*
>
> *Note: the numbers come from current calculations by the Universities of Chicago and Frankfurt (**calculation details**).*

Respondents assigned to the control group receive only the first two sentences on inflation. We provide this information, instead of having a fully passive control group, because information on current inflation being historically high can have a confounding effect on beliefs and choices, for example via effects on income expectations or labor-supply decisions. By comparing respondents in the treatment groups with the control group, we can identify the effect of learning about the inflation-induced erosion of nominal positions and absorb any effect that the information about the current inflation level might have.

The real-value numbers in the treatments come from a simple present-value calculation. Real changes in the positions' present value occur because future nominal cash flows are discounted at higher interest rates. Discount rates increase linearly over the course of one year, because inflation in 2021–22 increased gradually, and stay elevated until maturity. We disregard any reallocation or reinvestment after the products' maturity. We thereby assume erosion ends at maturity, or that inflation suddenly drops back to its baseline level.[6] At the end of the treatment text, respondents can click on a button to see calculation details.[7]

Post-treatment section Following the information intervention, we first elicit 12-month-ahead expectations for real-estate prices, the unemployment rate, interest rates, and respondent's income. If the treatments affect some of these expectations, it might be through these

[6] This assumption resembles the lower-bound scenario by Doepke and Schneider (2006), who calculate wealth effects assuming households switch to inflation-indexed securities once their nominal positions expire.

[7] 19% of respondents click on the button; they do not differ in their survey responses.

shifts that respondents alter their economic choices. For example, Coibion et al. (2024) show that people's macroeconomic outlook causally affects their consumption. We investigate these possible alternative channels below.

We then ask survey participants about planned spending on nondurables and durables. Following Roth and Wohlfart (2020), respondents state their consumption plans for multiple nondurables categories over the next four weeks relative to the previous four weeks. Response options, on a five-point scale, range from "much less" to "much more." The short time window mitigates concerns that changes in inflation or other economic news confound the responses. On durables spending, we ask whether respondents plan to make major purchases over the next 12 months, such as buying a car or an apartment. If they do, we ask them to state the amount they plan to spend. These self-reported spending plans are useful because (i) we cannot observe actual account transactions for all respondents, (ii) we can distinguish between nondurables and durables spending, and (iii) we can corroborate treatment effects on actual spending with spending plans.

We again elicit respondents' perception about the past-12-month change in their real net wealth, as well as their expectation for the next 12 months. This time, respondents directly provide a point estimate, with answer options between -60% and 60%. We elicit posteriors for real net wealth changes in a different format compared to priors to mitigate concerns of survey fatigue and demand effects, following Coibion, Gorodnichenko, and Weber (2022).[8] We are therefore able to study the instantaneous revision in own-wealth perceptions and expectations in response to the provided information.

The final belief questions relate to nominal assets and debt. We elicit beliefs about the relative wealth protection that savings products, stocks, real estate, and fixed-rate loans

[8] De Quidt, Haushofer, and Roth (2018) show that demand effects tend to be small in settings like ours.

provide. In addition, we ask about debt aversion (Almenberg et al., 2021). Moreover, respondents engage in a hypothetical real-estate transaction. They choose a preferred purchase price and mode of financing, with up to €500,000 equity and a mortgage of up to €500,000. Respondents also choose whether they prefer an adjustable- or a fixed-rate mortgage, and if they choose the latter, the length of the fixation period.

The last section of the survey elicits respondents' risk tolerance, money illusion (Shafir, Diamond, and Tversky, 1997), and the value of their nominal positions. After completion, we ask respondents how interesting they found the survey and they can leave comments.

2.2 Data

Survey administration We run the survey experiment in partnership with a large German bank. The bank offers both retail-banking and brokerage services. In July 2022, the bank sent out a short email to around 215,000 customers, inviting them to participate in a survey on inflation administered by Goethe University Frankfurt. The survey was in the field for two weeks. After the first week, the bank sent out a reminder email, informing customers they have one week left to complete the survey. During the field period, inflation in Germany was at 8.7%, the highest rate in more than 70 years.

Overall, 3,846 bank customers complete the survey. 45% complete the survey within a day after the bank sent the invitation email, and 43% of the responses came in within a day after the reminder email. The overall response rate is 1.8%, which is comparable to other surveys of the bank, and the median response time is 18.3 minutes.[9]

Administrative bank data The partnering bank provides us with data on customer

[9]When compared to bank customers who receive a survey invitation but do not participate, respondents are more likely to be male, use the partnering bank's online banking, have outstanding loans with the bank, have a securities portfolio with the bank, and have higher income.

demographics and, importantly, categorized account transactions. Demographic information include age, gender, marital and employment status, and zip code. Account transactions come from the bank's personal-financial-management (PFM) tool, which registers customers' in- and outflows and classifies them into more than 50 categories.[10]

Broad spending categories include expenses on living (e.g., groceries and clothing); housing (e.g., rent and furniture); leisure (e.g., restaurants and events); mobility (e.g., cars and fuel); health (e.g., pharmacies and hospitals); occupation and education (e.g., office supplies and tuition fees); insurances, loans, and investments; cash withdrawals; credit cards; and online shopping. Income categories include salaries, other forms of regular income (e.g., pension and rental income), additional sources of income (e.g., tax refunds and children's allowances), and capital income (e.g., dividends).

Around one third of transactions are uncategorized. These transactions usually constitute payments to a party unknown to the categorization algorithm, such as peer-to-peer transactions or transfers between accounts. We omit uncategorized transactions for our main consumption measures, because we do not know whether these transactions reflect consumption. In a robustness test, we incorporate uncategorized transactions identified by the bank as likely representing consumption to our spending measures.

We consider three measures of consumption. Total spending subtracts from all categorized outflows those related to investments, insurances, and loans. We also split total spending into discretionary and nondiscretionary spending, following D'Acunto, Rossi, and Weber (2023). Discretionary spending includes categories such as clothing, leisure, cash withdrawals, and online shopping. Nondiscretionary spending is the difference between to-

[10]The bank defines categories based on the classification used by the German Federal Statistical Office. The tool is similar to personal-finance apps such as Mint; an important difference, however, is that the tool is embedded in the bank's online-banking environment.

tal and discretionary spending. Appendix Table A1 details all categories as well as the subcomponents of our different measures of consumption.

Sample selection We select the survey sample based on two criteria. First, because of the importance of observing actual consumption choices, all bank customers with an activated PFM tool and who had received any cash inflows over the past six months receive a survey invitation. We randomly incentivize survey participation with either a voucher, or participation in a lottery. All payoffs are in the form of online-shopping vouchers.[11] Second, bank customers who do not satisfy the above criteria but have an outstanding mortgage or consumer loan at the partnering bank receive a survey invitation, which comes with the lottery incentive (15% of the selected sample). Given their outstanding debt, these customers should be particularly exposed to inflation-induced debt erosion.

Given noise in survey data, we take two steps to filter respondents. First, we omit 563 respondents who make wrong or implausible entries in the balance-sheet-decomposition task: those who enter a negative share of a balance-sheet item relative to gross wealth; a share greater than one, that is, the value of a single balance-sheet item exceeds gross wealth; nominal assets equal to zero; or a value of an outstanding mortgage, consumer loan, or the sum of the two that is equal to gross wealth.[12] Second, we drop respondents who take less than seven minutes or more than 120 minutes to complete the survey, roughly corresponding to the 1.5th and 98.5th percentiles. After these two steps, 3,190 individuals remain in the baseline sample. The results are robust to not performing the two screening steps.

We observe actual spending data from the bank for 2,671 bank customers. We arrive

[11] Survey responses do not systematically differ by type of participation incentive.

[12] Most respondents (10%) we screen out enter mortgage and/or consumer-loan values that sum up to the value of their gross wealth. Because we ask respondents for the sum of assets to equal 100% of gross wealth, some respondents might mistakenly assume that the sum of all liabilities should also equal 100% gross wealth. We are unable to calculate the net nominal position of these survey respondents.

at this smaller sample because some survey participants with outstanding debt at the bank have not activated the PFM tool, and hence we cannot observe their account transactions. Moreover, we want to ensure that our bank-customer sample actively uses the observed bank accounts. We therefore require the sample to receive at least €100 as average regular income per month on observable accounts.[13]

Sample characteristics Table 1 reports summary statistics for our sample, with basic demographics in the top panel. 45% of respondents are female and the average age is 48 years. The educational level is relatively high, with 48% having completed college, around 20% of them in business. We benchmark our sample against the most recent (2017) wave of the Bundesbank's Panel on Household Finances (PHF), which is a representative survey of German households' finances and comprises the German data for the ECB's Household Finance and Consumption Survey. In the PHF, the share of the population with completed college education is 29%. 72% of our sample is employed (54% in the PHF).

Regarding household finances, respondents' average gross wealth is €386,000 (€238,000 in the PHF). Average nominal assets are 43% (37% in the PHF) and mean nominal debt is 17% of gross wealth (10% in the PHF). The average net nominal position is hence 26% of gross wealth. We follow Auclert (2019) and Doepke and Schneider (2006) by defining the net nominal position as all nominal assets minus all nominal liabilities. Similar to Auclert (2019), we exclude indirect nominal positions, which originate from investment intermediaries and the ownership of firms, to reduce complexity for respondents. We operationalize this measure by taking the sum of cash and fixed-rate savings products minus the sum of mortgage and consumer loans.[14] Respondents estimate the value of each balance-sheet position relative to

[13]The consumption results do not rely on the cutoff choice.

[14]We do not distinguish between fixed- and variable-rate loans in the balance-sheet-decomposition task to reduce complexity and because around 90% of loans in Germany have a fixed rate. Our bank partner only offers fixed-rate loans (though mortgagors in the prolongation period can have a variable rate).

their gross wealth, so the net nominal position is naturally scaled by gross wealth. 54% of respondents own stocks and 59% own real estate (20% and 44% in the PHF, respectively).

The middle panel of Table 1 presents statistics on average monthly spending and income. We calculate the individual-level average based on the six months preceding the survey. Total spending amounts to €1,844 for the average respondent, with around 50% of it being discretionary spending. Average regular income, constituting of, among other things, salaries, pensions, children's allowances, and rental income, is €2,862. Gross individual income in the PHF is €2,274 on average.[15]

The bottom panel of Table 1 reports statistics for respondents' beliefs, elicited prior to the information provision. The average perceived inflation rate is 8.8%, close to the actual inflation rate of 8.7%. 75% of respondents have a perception error of at most 1.5 percentage points, likely because they actively acquire information about inflation when it is high (Bracha and Tang, 2024; Cavallo, Cruces, and Perez-Truglia, 2017; Weber et al., 2023). Respondents expect inflation to remain high, with a mean one-year forecast of 10.4% and a five-year forecast of 10.7%. Cross-sectional dispersion increases with the forecast horizon. The estimated average change in the respondents' real net wealth over the past 12 months is -7.5%. Many respondents state that inflation matters for their own wealth, and relatively more so than GDP growth and the level of interest rates. Overall, respondents on average are relatively well-educated and wealthy, have accurate inflation perceptions, and are subjectively (given their beliefs) and objectively (given their large nominal positions) strongly exposed to changes in inflation.

Integrity of randomization Appendix Table A2 reports a balancing table for the two

[15]In our bank data, we observe net flows, such as salaries net of taxes. We restrict income to be at least €100 to ensure some account usage; nonetheless, our respondents can receive income on accounts unobservable to us. We include the same restriction in the PHF for consistency.

treatment groups and the control group. Our sample is largely well-balanced across groups for a wide array of demographic characteristics and perceptions and expectations. The three groups are also statistically indistinguishable from each other in terms of actual average spending and income. Overall, only a few imbalances occur, such as for gender and wealth. To address the slight imbalances, we include a set of control variables in all specifications.

Reliability of survey responses We try to alleviate concerns about inaccurate or untruthful reporting in our survey (Stantcheva, 2023). First, we attempt to mitigate inaccuracies in responses by carefully explaining the concepts we aim to elicit, tracking time spent on the questions, and filtering the sample. In addition, we test for reliability of survey responses using administrative data provided by the bank partner (Dutz et al., 2022). We focus on the reliability of reported outstanding debt because (i) these data are particularly important for our analysis, (ii) the balance-sheet-decomposition task is demanding, and (iii) holding debt in Germany may be stigmatized (e.g., D'Acunto, Schnorpfeil, and Weber, 2022).

Appendix Figure A1 shows the association between outstanding debt reported in the survey and at the partnering bank in the month of survey participation. For debt reported in the survey, we take the mid point of the debt-balance range respondents select. Outstanding debt at the partnering bank increases monotonically with survey-reported debt. Importantly, virtually no survey respondent has outstanding debt with the partnering bank when stating in the survey they have zero debt. The debt level we observe in the bank data is generally lower than what survey participants report, indicating that other lenders originated some of the debt and underscoring the importance of using surveys to elicit the overall household balance-sheet positions. The correlation between survey-reported and bank debt is 0.49.

3 Prior knowledge about the wealth effects of inflation

Level of knowledge We start by documenting respondents' prior knowledge of the wealth effects of inflation. Figure 1 shows a large share of respondents appears aware of inflation-induced erosion of nominal assets. Panel A displays the distribution of beliefs about how a surprise increase in inflation affects nominal positions. 88% of respondents believe that the impact on cash on hand is "very negative" or "negative," whereas that number is 75% for fixed-interest savings products. Panel B of Figure 1 reports respondents' relative ranking of nominal assets, stocks, real estate, and nominal loans in terms of wealth protection provided against unexpected inflation.[16] 70% of respondents ascribe relatively poor inflation protection (rank 3 or 4) to nominal assets.[17]

Pre-existing knowledge about the erosion of nominal debt appears more limited, however. 25% of respondents believe that the impact of unexpected inflation on those with a fixed-rate loan is "rather positive," and only nine percent believe it is "very positive" (top panel). Similarly, 62% assign a relatively poor inflation-protection rank, of 3 or 4, to fixed-rate loans (bottom panel). Overall, the findings indicate asymmetric knowledge about the erosion of nominal assets versus nominal debt. Incomplete knowledge is necessary for the information intervention to plausibly have scope to affect beliefs and hence choices. We thus expect stronger responses to the loan-erosion than to the savings-erosion treatment.

Heterogeneity in knowledge According to models of endogenous information acquisition, awareness of the wealth effects of inflation might vary with exposure to the effects (e.g., Kindermann et al., 2021; Maćkowiak, Matějka, and Wiederholt, 2023). Households with

[16] We show statistics for the control group only, because we ask this question post-treatment. We discuss how the treatments affect responses to this question below.

[17] The majority of respondents assign the best inflation protection (rank 1) to real estate, consistent with Malmendier and Wellsjo (2024), who show that inflation protection is a key motivation for homeownership.

larger nominal positions might hence exhibit greater awareness of the Fisher channel. Figure 2 documents how prior knowledge varies by respondents' net nominal position. Net debtors perceive the impact of unexpected inflation on fixed-rate loans only slightly more positively.[18] Beliefs about the impact on savings products do not vary by net nominal position. Appendix Table A3 confirms the pattern in a multivariate analysis, controlling for a wide array of demographics, perceptions and expectations, as well as wealth.[19]

Figure 3 illustrates the consumption change during the 2021–22 inflation surge by respondents' net nominal position. If consumers with negative net nominal positions understand that unexpectedly higher inflation benefits them relative to consumers with large positive net nominal positions and they behave like agents in standard HANK models, we would expect a relatively positive consumption response, even if they might not report so in the survey. To operationalize this analysis, we calculate the median inflation-adjusted change in discretionary spending between April–June of 2021 and April–June of 2022 using the bank data (left scale). Inflation increased from 2.2% to 8.3% during that period. We find real spending growth is negative and does not vary systematically by households' net nominal position. Similarly, the net nominal position does not predict respondents' self-reported last-12-month consumption response to inflation (right scale). Overall, limited differences in prior knowledge about the Fisher channel by net nominal position do not appear to manifest in a differential consumption response to the recent inflation increase.

Which other individual characteristics explain knowledge about the wealth effects of inflation? Table 2 shows results of regressing beliefs about the impact of unexpected inflation

[18] We abstain from analyzing differences in the inflation-protection ranking (bottom panel of Figure 1) by net nominal position because of the smaller sample size coming from a restriction to the control group.

[19] Consistent with limited variation in prior knowledge by net nominal position, Appendix Figure A2 shows that knowledge about the information provided in the treatments does not vary by net nominal position. If anything, knowledge about savings erosion is lower for respondents with a positive net nominal position.

on balance-sheet items, including nominal assets and debt.[20] Three results stand out. First, business education, higher wealth, and stockholdings predict knowledge about the inflation-induced erosion of nominal assets (Columns 1–2) and nominal debt (Column 5). Second, knowledge about and interest in inflation correlates with awareness about the wealth effects of inflation. Specifically, respondents who consider inflation to be important for their wealth, have an accurate perception of current inflation, or expect inflation to be lower in five years than they perceive it today appear more knowledgeable about the wealth effects of inflation. Third, even respondents with little aversion to debt are largely unaware of debt erosion.[21]

4 The effects of information treatments on beliefs

In this section, we investigate how providing information about the wealth effects of inflation in the survey experiment shifts beliefs of our participants. To characterize average effects of the information interventions, we estimate variants of the following equation:

$$posterior_i = const + \sum_{j=1}^{2} \beta_j \; I\{i \in treat \; j\} + \gamma \; prior \; rnw_i + controls_i + error_i, \qquad (1)$$

where $posterior_i$ is a post-treatment measure of beliefs of respondent i. $I\{i \in treat \; j\}$ indicates whether respondent i received treatment j. The omitted category is the control group, so coefficients $\{\beta_j\}_{j=1}^{2}$ can be interpreted as being relative to the control group. Because we randomize the treatments, controls help with the precision of the estimates but have no material effect on the estimates. $prior \; rnw_i$ refers to estimates of past real-net-wealth change. We control for two wealth estimates because the elicitation occurs in two steps, first

[20] The number of observations is lower than the 3,190 of the baseline sample because we trim the 1% tails of perceived and expected inflation, elicited as point estimates.

[21] Appendix Table A3 shows results for a more comprehensive set of correlates.

with a directional and then with a point estimate. Other $controls_i$ include a quadratic polynomial in the respondent's age, risk tolerance measured on a 1–5 ordinal scale, the log of gross wealth (one-percent tails winsorized), and indicators for a respondent's gender, marital status, educational level (equal to one for college degree or higher), a business degree, employment status, debt and stock holdings, net nominal position relative to gross wealth (<-50%, -50% to <-25%, etc.), accuracy of perceived current inflation (<1.5 percentage-point deviation from actual rate), expectation that inflation will be lower in five years (one-percent tails of inflation estimates trimmed), whether survey participation is based on the voucher or lottery incentive, and whether participation is after the reminder email sent by the bank.

4.1 Effects on beliefs about nominal positions

Table 3 presents the results of estimating Equation 1 with and without controls. In Columns 1–4, the dependent variable captures beliefs about relative inflation protection provided by nominal assets and debt. The survey question reads: "With which of the following financial instruments would you expect the most positive real-net-wealth impact in times of unexpectedly high inflation?" Respondents rank nominal assets, stocks, real estate, and nominal liabilities. Responses are hence on a 1–4 ordinal scale, which we reverse for simplicity so that a higher number indicates a better hedge against unexpectedly high inflation.[22] In Columns 5–6, the dependent variable proxies debt aversion, based on agreement with the statement "I am uncomfortable with taking on debt." Five possible responses range from "completely disagree" to "completely agree." We standardize the dependent variables.

Provision of information about the wealth effects of inflation impacts beliefs about nominal positions. Respondents who learn about inflation-induced erosion of nominal savings

[22] The reduced sample size is due to the fact that respondents were not required to respond to the question.

attach a significantly poorer inflation-protection ranking to nominal assets (Column 1–2). Provision of the loan-erosion treatment has a significantly positive effect on the ranking of nominal debt (Columns 3–4). We do not find strong evidence of cross-learning, that is, respondents who learn about the erosion of nominal assets due to unexpectedly high inflation do not infer high inflation also erodes nominal debt, and vice versa.[23] Moreover, learning about inflation-induced loan erosion reduces individuals' debt aversion, indicating that effects extend beyond the direct inflation context (Columns 5–6). Overall, knowledge about the wealth effects of inflation impacts beliefs about nominal assets and debt, opening up the possibility to affect economic choices, which we discuss in Section 5.2.

4.2 Effects on perceived and expected real net wealth

Average effects Table 4 quantifies the treatment effects on the perceived and expected change in real net wealth, again based on estimating Equation 1. Importantly, we control for the pre-treatment estimate of the past-12-month change in real net wealth. In Columns 1–6, results are from OLS estimations. The savings treatment has an insignificantly negative effect on the perceived wealth change over the past 12 months, the expectation over the next 12 months, and the sum of the two changes. The loan treatment, instead, significantly increases perceived and expected real net wealth. In Column 7, results are from Huber-robust regressions of perceived and expected wealth changes. Huber regressions systematically control for outliers and influential observations (see, e.g., Coibion, Gorodnichenko, and Ropele, 2019), which is useful because of rounding, heaping, mean reversion, and survey noise. We find that estimates are quite similar to the ones using OLS, with coefficients being more precisely estimated. The wealth effect is economically sizable, corresponding to nearly 50%

[23] A statistically weakly significant coefficient on the loan-treatment indicator in Columns 1–2 is partially mechanical, compensating for the treatment-induced effect on the ranking of nominal debt.

of the average estimate of -5.6% to -6.3% in the control group. In estimations below that involve perceptions and expectations of wealth changes, we focus on Huber regressions to mitigate the impact of extreme observations and for increased precision.[24]

In addition to quantitative wealth-change estimates, we analyze treatment effects on qualitative wealth perceptions. Appendix Table A4 shows survey respondents in the loan-treatment group have significantly more positive perceptions about their wealth in the context of unexpected inflation than survey participants in the control group. Specifically, the loan treatment induces more positive responses to a question on the effect of inflation on the respondents' real net wealth over the last twelve months (Columns 1–2). The loan treatment also increases agreement to the statement that with their current balance sheet, respondents are well-prepared for times of high inflation (Columns 4–5). The effects of the savings treatment, instead, are insignificant throughout.

To sum up, the loan-erosion treatment leads to higher perceived and expected real net wealth, whereas the effect of the savings-erosion treatment is limited. Success of the information provision in shaping wealth estimates likely reflects respondents' limited prior knowledge about inflation-induced erosion of nominal debt. Differential prior knowledge about the erosion of nominal assets versus debt also shows up in respondents' stated knowledge about the treatment information they receive. Appendix Figure A2 shows that respondents report less awareness of the loan- than the savings-erosion information. Our findings imply that consequences of the redistributive effects of unexpected inflation are likely muted in the short run in light of limited knowledge of inflation-induced erosion of nominal debt.

The information provision on nominal-debt erosion thus induces significant exogenous

[24]The variation in the number of observations across specifications is because (i) Huber regressions weight observations, with particularly influential observations receiving a weight of zero, and (ii) regressions with controls (Columns 2, 4, 6, and 7) include trimmed inflation perceptions (one-percent tails).

variation in perceptions and expectations of real-net-wealth changes. As a result, this treatment can serve as an instrument to help us identify how and whether wealth effects of inflation due to nominal-debt erosion affect spending. Information on nominal-savings erosion, instead, does not shift beliefs sufficiently to serve as a strong first stage. In Section 5.1, we thus focus on the effects of the loan treatment on spending, through changes in perceived and expected real net wealth.

Heterogeneity by net nominal position Do treatment effects on real-net-wealth estimates vary with net nominal exposure? Table 5 reports results of regressing changes in estimates of real net wealth on a treatment indicator interacted with respondents' net nominal position. Wealth changes again focus on the past 12 months (Columns 1–2), the next 12 months (Columns 3–4), and the sum of the two (Columns 5–6). The effect of the savings treatment is insignificant for respondents with a negative net nominal position and respondents with a positive net nominal position have a significantly lower wealth estimate than those with a negative net nominal position. Respondents in the loan-treatment group with a negative net nominal position relative to respondents in the control group with a negative net nominal position report significantly higher changes in real net wealth. In our preferred specification on perceived past and expected future wealth changes with the full set of controls (Column 6), the difference between the two groups amounts to five percentage points. This effect nearly fully offsets the reported average change in real net wealth of -5.8% of respondents with a negative net nominal position in the control group.

Figure 4 graphically illustrates treatment effects by net nominal position. Based on a regression of changes in real net wealth over the past and next 12 months, we plot coefficients and 95% confidence bounds on the interaction of a treatment indicator and respondents' net nominal position. We group the net nominal position into bins of less than -50% of gross

wealth, -50% to less than 0%, 0% to 50%, and more than 50%. The estimated change in real net wealth of respondents with a net nominal position of less than -50% of gross wealth is 7.1 percentage points higher in the loan-treatment group than in the control group, whose average estimate is -1.2% (Panel A). Moreover, the treatment effect monotonically falls as the net nominal position increases. The pattern is comparable albeit much weaker for the savings-erosion treatment: respondents with a net nominal position of more than 50% of gross wealth have a 2.9 percentage points lower estimate of real-net-wealth changes than similar respondents in the control group.[25] Appendix Figure A3 similarly shows treatment effects on wealth estimates, but decomposes the net nominal position into nominal debt and savings as a fraction of gross wealth. We find the loan treatment has a large, significant effect on wealth estimates for highly levered respondents, whereas the savings-treatment effect increases only modestly with the fraction of wealth held in nominal savings.

Two additional pieces of evidence corroborate the mediating role of net nominal exposure for the effects of the loan treatment. First, Appendix Table A4 documents respondents in the loan-treatment group with a negative instead of a positive net nominal position express a more positive qualitative perception about the effect of the recent rise in inflation on their real net wealth (Column 3). Similarly, agreement to the statement that with their balance sheet, respondents are well-positioned to cope with high inflation is stronger for those with a negative net nominal position (Column 6). In both cases, however, differences by net nominal position are not statistically significant.

Second, Appendix Figure A4 shows the cross-sectional raw-data relationship between respondents' prior estimate about the past-12-month change in real net wealth and posterior

[25] Positive coefficients for those with a negative net nominal position are unlikely to reflect cross-learning, because Table 3 shows that the savings-erosion treatment does not impact beliefs about nominal debt.

estimates about the past- and future-12-month change in real net wealth.[26] In Panel A, we restrict the sample to respondents with a positive net nominal position. The panel reveals that, among net savers, those who receive the savings treatment tend to have lower posterior estimates of wealth changes. In Panel B, the sample includes only respondents with a negative net nominal position. Among net debtors, posterior wealth-change estimates are higher in the loan-treatment than in the control group. Moreover, respondents with extreme prior real-net-wealth estimates do not appear to drive the effect of the treatment.

Comprehension of treatment information Incorporating information about inflation-induced nominal-debt erosion into estimates of changes in real net wealth is challenging. Two features of our study likely help respondents to map the treatment information into their own wealth situation. First, respondents are well-educated on average, interested in inflation, and take their time to go through the survey. Second, we carefully introduce concepts such as changes in real terms and net wealth, with respondents providing plausible responses on questions involving these concepts. Nonetheless, variation in respondents' ability to incorporate the treatment information into their estimates of real net wealth may exist. Specifically, differential treatment reactions may reflect heterogeneity in cognitive abilities and interest in the topic of inflation (Agarwal and Mazumder, 2013; D'Acunto et al., 2022).

We analyze heterogeneity in respondents' ability to map the loan-treatment information into their own wealth situation in Figure 5, displaying results of regressing real-net-wealth changes on the loan-treatment indicator for different subsamples. In Panel A, we limit the sample to respondents with a negative net nominal position. Importantly, we additionally split the sample by education and beliefs about inflation as proxies for cognitive abilities and interest in inflation. We argue respondents who completed higher education, expect inflation

[26] We do not elicit the expected 12-month change in real net wealth pre-treatment to avoid survey fatigue when asking the same question twice (Stantcheva, 2023).

to be lower in five years, have a relatively accurate perception of current inflation (deviation from the actual rate of at most 0.5 percentage points), or consider inflation to be relatively important should be better able to incorporate the loan-treatment information into beliefs about their own real net wealth. We indeed find treatment effects on real net wealth of highly educated respondents or those with general knowledge or interest in inflation are relatively high and significant (6.9–8.3 pp) compared to those without these characteristics (2.1–3.6 pp).[27] Importantly, on the subsample of respondents with a positive net nominal position (Panel B), the loan-treatment effects on real net wealth are close to zero, independent of the subsample we consider. These findings suggest that respondents with greater ability and with a higher relative interest in the topic are better able to map the implications of inflation-induced nominal-debt erosion to their own net nominal exposure.

5 Wealth effects of inflation and economic choices

In this section, we study the real effect of learning about the wealth effects of inflation on economic choices. In Section 5.1, we link exogenous variation in respondents' knowledge of the effect to planned and actual spending. In Section 5.2, we study how knowledge feeds into debt financing in a hypothetical real-estate investment.

5.1 Effects on spending

Spending data Do the changes in perceived and expected real net wealth generated by the loan-erosion information treatment have any effect on spending decisions? We investigate this question using two data sets. First, in the survey, we elicit planned changes in spending

[27] Appendix Table A5 displays the full regression output.

on a wide category of nondurable goods and services over the next four weeks relative to the previous four weeks, following Roth and Wohlfart (2020). We elicit these plans via a five-point Likert scale, ranging from "much less" to "much more." Respondents additionally state whether they plan to buy big-ticket items over the next 12 months, as in Coibion, Gorodnichenko, and Weber (2022). Second, the partnering bank provides us with categorized transaction-level account data. We use the bank data to study actual changes in spending in the 30–90 days after survey participation relative to the 30–90 days before.

The two data sets are complementary to each other. All respondents report spending plans, allowing us to test for effects of the information treatment on intended spending on both nondurable goods and services as well as larger durable goods. The survey data are useful because the administrative bank data (i) do not cover all respondents, (ii) do not necessarily comprise all spending decisions, as respondents may spend from accounts unobservable to us, and (iii) cannot fully distinguish between nondurable and large/durable spending because big spending categories are cash withdrawals, credit cards, and online shopping, which can entail both. However, the bank data provide a useful check on whether respondents actually follow through with their spending plans.

We first verify that spending plans and actual spending are positively related. Naturally, the correlation will be substantially below one because of survey noise, measurement error, spending in accounts at other banks, other news after our survey intervention that affect actual spending, and the fact that we elicit planned spending via a Likert scale. Appendix Table A6 shows results of regressing actual spending changes on planned changes in nondurable (Panel A) and large/durable spending (Panel B). We consider actual changes in spending over the 30 days (Columns 1, 4, and 7), 60 days (Columns 2, 5, and 8), and 90 days (Columns 3, 6, and 9) after survey participation relative to before. Planned changes in

nondurable spending are the average across categories such as groceries and restaurants. On durable spending, we take the sum across categories such as real estate and cars (the average sum is around one; that is, respondents plan to purchase one large/durable item over the next 12 months). We standardize both survey-based measures.

In regressions of actual total and discretionary spending, coefficients on planned spending tend to be significantly positive. Moreover, the association strengthens with the length of the event window, even for the four-week plan on nondurable goods and services as the independent variable, suggesting that changes in planned spending only gradually translate into actual changes in spending. In terms of economic magnitude, a one-standard-deviation increase in planned nondurable spending corresponds to €37 (60 days) and €98 (90 days) higher actual discretionary spending, and €59 (60 days) and €88 (90 days) for large/durable items. Overall, these results indicate that spending plans are consistent with actual measures of spending, which is comforting given that self-reported spending plans is the only type of information available for all respondents.

Planned spending Table 6 links the loan-erosion information treatment, through its effect on perceived and expected changes in real net wealth, to planned spending. We run regressions of spending plans for each nondurable category (Columns 1–4) and, because of its low frequency, the sum of planned purchases on durable goods (Column 5). To make nondurable and durable spending comparable, we standardize both measures. As a first step, we show that spending plans are significantly positively correlated with respondents' post-treatment estimates of changes in their real net wealth over the past and next 12 months (Panel A).[28] This result indicates that respondents who perceive and expect a more

[28]We include all respondents in the estimation sample. We account for this choice by adding a treatment indicator to the list of controls. Results are similar when restricting the sample to the control group. Moreover, we abstain from controlling for the pre-treatment estimate of the past-12-month change in real net wealth, because we do not want to relate spending plans to perceived and expected changes in real

positive change in their real net wealth plan to reduce spending by less, as we find that the control group on average intends to reduce spending on nondurables over the next four weeks. Groceries is the single nondurable-spending category not significantly correlated with wealth changes. Respondents on average do not plan to alter spending on groceries as a function of their real-net-wealth change, which likely reflects its largely non-discretionary nature.

In Panel B, we observe a positive reduced-form effect of the loan-erosion treatment on planned spending. Households in the loan-treatment group expect to spend significantly more on restaurants (Column 2) and leisure (Column 3) than comparable respondents in the control group. Economically, the treatment increases planned spending by 11% of a standard deviation. The effect on planned spending on clothing (Column 4) and durable items (Column 5) is positive but statistically insignificant. As expected, planned spending on groceries does not vary across groups (Column 1).

We then examine how treatment-induced knowledge about nominal-debt erosion caused by unexpected inflation affects planned spending through its impact on own real-net-wealth perceptions and expectations. We estimate the following specification:

$$spend_i = \beta\ posterior\ rnw_i + \gamma\ prior\ rnw_i + controls_i + error_i. \tag{2}$$

$spend_i$ measures either planned spending on nondurable or durable goods and services, or actual spending. $posterior\ rnw_i$ is the sum of the post-treatment estimate of past- and next-12-month change in real net wealth. We instrument this variable using Equation 1. By using the loan-erosion treatment as a source of exogenous variation in perceived and expected wealth, the instrumental-variables approach can resolve possible endogeneity. $prior\ rnw_i$

net wealth that arise as respondents go through the survey. When we add the pre-treatment estimate as a control, the coefficient on the post-treatment wealth-change estimate is still significantly positive but weaker.

again refers to the pre-treatment directional and point estimate of the past-12-month change in real net wealth. $controls_i$ are similar to Equation 1. We run Huber-robust regression in the first stage and OLS in the second stage when studying planned spending. Following Coibion, Gorodnichenko, and Weber (2022), we use Huber regression in the first stage and a jackknife approach in the second stage to control for outliers and influential observations in both stages when analyzing actual spending.

Panel C of Table 6 reports the results from estimating Equation 2. The Kleibergen-Paap F-statistic for the first stage is 10.3, which is non-homoskedasticity robust in settings like ours with a single endogenous regressor (Andrews, Stock, and Sun, 2019). The coefficient on posterior real-net-wealth changes is significantly positive for the planned change in spending on restaurants (Column 2) and leisure (Column 3). A one-percentage-point increase in real net wealth causes planned spending to go up by around four percent of a standard deviation.[29] The coefficient is positive but insignificant for clothing (Column 4) and durables (Column 5). Again, exogenous variation in real-wealth changes does not causally affect planned spending on groceries (Column 1). The results indicate knowledge about the wealth effects of inflation transmits to spending through its effect on perceived and expected real net wealth.

Actual spending We now turn to the treatment effects on actual spending. In Table 7, we report effects on total spending, as well as separately on nondiscretionary and discretionary spending. Panel A presents reduced-form evidence of a significantly positive effect of the loan-erosion information on total and discretionary spending. Comparing the loan-treatment group with the control group in the 60 days following survey participation, relative to the 60

[29]The economic magnitude of the coefficient on real net wealth is substantially above the magnitudes shown in Panel A. The difference possibly in part reflects that in the absence of news, wealth estimates are sticky, and households are unlikely to make large adjustments to their short-term spending plans as a consequence. Once households receive news about real net wealth instead, for example due to our information intervention, the updating of perceptions and expectations can cause larger changes in spending plans.

days prior, the treatment group increases total spending by €187 and discretionary spending by €121. Economically, the effect on discretionary spending constitutes a 6% increase in spending over the average measured spending in the 60 days pre-treatment. The magnitudes are roughly similar over a 90-day window. Effects are weaker over a 30-day horizon, likely because it takes time to adjust spending.

Panel B reports results from an IV regression based on Equation 2. The Kleibergen-Paap F-statistic varies between 7.4 and 10.9, rejecting that the worst-case bias of two-stage least squares exceeds 15–20% of the worst-case error of OLS. We find a positive relation between instrumented posterior real-net-wealth perceptions and expectations and total and discretionary spending. Effects are strongest when considering spending over the 60 days post-treatment relative to pre-treatment: a one-percentage-point increase in real net wealth raises total spending by €92 and discretionary spending by €70. Again, the effect on nondiscretionary spending is close to zero and insignificant. The patterns are hence similar to the reduced-form evidence (Panel A), albeit statistical significance is more sparse.

To gauge the economic magnitudes, we translate the average treatment effects into MPCs using a back-of-the-envelope calculation. The loan-erosion treatment increases perceived and expected real net wealth by 2.5 percentage points on average (Table 4). Average net wealth of our respondents is €326,000, corresponding to an increase of €8,150. Hence, with an average treatment effect on total spending of €187 over 60 days (Panel A of Table 7), the estimates translate into an MPC of 2.3%. We calculate a comparable MPC of 2.8% based on the IV regression (Panel B of Table 7), as a one-percentage-point increase in real net wealth (€3,260) induces €92 more total spending. The magnitudes are consistent with estimates from the literature on the stock-market-wealth effect on consumption.[30]

[30] Chodorow-Reich, Nenov, and Simsek (2021) calculate an MPC of three percent in a quantitative model, a magnitude similar to the central scenario in the review by Poterba (2000). Di Maggio, Kermani, and

Appendix Table A7 illustrates the robustness of the treatment effects on actual spending. In Panel A, we estimate treatment effects using OLS instead of Huber-robust regressions. Economic magnitudes remain non-trivial but estimates become a bit noisier. Panel B shows estimates when fixing the baseline time window to 60 days before the survey intervention. Treatment effects are stronger. In Panel C, we add uncategorized spending to our measures of total and discretionary spending. We restrict transactions to uncategorized non-integer outflows of below €100, which according to the bank are more likely to constitute consumption (rather than, e.g., peer-to-peer transfers). Treatment effects are slightly larger on average. Results are also robust to additionally controlling for changes in regular income, such as salary, pension, and children's allowances (Panel D), which we do because inflation-induced wealth changes might alter the demand for leisure (Doepke and Schneider, 2006). Similarly, in Panel E, we add other post-treatment expectations to our standard set of controls. These additional controls include expectations about house prices, unemployment, own economic situation, and interest rates, and could in principle confound the loan-treatment effect on spending.[31] The loan-treatment coefficients are slightly larger with the added controls.

Real-net-wealth change as the underlying mechanism We interpret our results as reflecting how knowledge about the wealth effects of inflation, through own real-net-wealth changes, impacts spending. Our approach, based on Equation 2, yields a "total" estimate of how exogenous variation in these changes ultimately affects spending. However, the loan-erosion information provision could alter other perceptions and expectations, which in turn could shape spending choices. For example, households, realizing that debt erosion harms banks' profits, might expect increases in interest rates. Table 8 reports insignificant loan-

Majlesi (2020) report an MPC of below three percent for the top 10% of the wealth distribution.

[31] As the loan treatment might alter these expectations, we sacrifice econometric rigor by estimating such a model (Angrist and Pischke, 2009).

treatment effects on a set of other expectations: house prices, unemployment, own income, general optimism, and interest rates.[32] This result suggests knowledge about the wealth effects of inflation indeed affects spending through perceived and expected wealth.

Our results indicate households spend out of wealth gains, likely because of increased confidence about their household balance sheet. Indeed, respondents state that their hypothetical MPC out of such unrealized gains is smaller but close to their MPC out of realized gains (Appendix Figure A5). 51% of respondents have a positive MPC out of realized gains and 43% spend out of unrealized gains.[33] Households that receive the loan-erosion information report more positive beliefs about debt, both in the context of inflation and generally, than those in the control group (Table 3). Treated respondents also agree more with the statement that with their balance sheet they are well-positioned for high inflation (Appendix Table A4). Higher household spending might thus reflect greater perceived financial security and confidence about own wealth. This channel is consistent with Fisher (1933) who posits changes in real debt feed into economic activity through consumer confidence. More generally, this channel supports the view that fluctuations in consumer sentiment causally affect consumption (e.g., Angeletos and La'O, 2013).

Moreover, our respondents on average accumulate savings over time (Table 1), similar to other samples of German households (e.g., Bachmann et al., 2021). These authors also highlight based on representative data from the Deutsche Bundesbank that most Germans are financially unconstrained. Hence, our survey participants can likely increase spending when they feel wealthier in real terms by drawing down on their existing stock of savings.

[32]The point estimate on expected house prices is marginally significant but negative and therefore is unlikely to drive the positive effect of the loan-erosion treatment on consumption.

[33]10% of respondents would spend less, a fraction similar to Fuster, Kaplan, and Zafar (2020).

5.2 Effects on debt financing

Can more positive beliefs about nominal debt induced by the loan-erosion information provision affect debt choices? Table 9 documents effects of the loan-erosion treatment on choices in a hypothetical real-estate investment task. Respondents purchase real estate with up to €500,000 in equity and €500,000 in debt. We also elicit preferences on the mortgage type: adjustable (ARM) versus fixed rate (FRM) and, conditional on selection of a FRM, the length of the fixed-rate period.

Panel A reports reduced-form evidence that survey participants in the loan-treatment and control group are similar in their preferred home value on average. However, the two groups differ significantly in their preferred financing structure. Information about inflation-induced debt erosion increases the average mortgage size by nearly €18,000. This increase leads to a three-percentage-points higher debt/price ratio, relative to an average of 49%. Moreover, the treatment group prefers a FRM over an ARM.

In Panel B, we analyze the effect of the loan-erosion treatment through the perceived inflation protection of debt. We therefore instrument beliefs about the relative inflation protection provided by nominal debt using the loan-erosion-treatment dummy (Columns 3–4 of Table 3 report the first stage). The Kleibergen-Paap F-statistic for the first stage is between 15 and 20. Treatment-induced increases in the perceived inflation protection of nominal debt reduce the use of equity, increase the use of debt, and hence lead to a higher debt/price ratio of the transaction. A one-unit increase in the perceived inflation protection of debt (ranging from one to four) increases this ratio by 16 percentage points. These results indicate that knowledge about inflation-induced erosion of nominal liabilities affects hypothetical financing choices through its positive impact on beliefs about debt.

6 Implications for theory

Our findings have implications for the HANK literature that focuses on the transmission of economic policy, while at the same time being consistent with micro data on the wealth distribution and the composition of wealth (e.g., Bayer, Born, and Luetticke, 2024; Kaplan, Moll, and Violante, 2018). A key insight of this literature is that the impact of macroeconomic shocks on aggregate consumption depends on the covariance between individual MPCs and exposure to the shock (e.g., Bilbiie, 2008; Patterson, 2023). Consider expansionary monetary policy that increases inflation. In HANK models, redistribution caused by the Fisher channel amplifies the effect of monetary policy on aggregate consumption because the beneficiaries, households with a negative net nominal position, have higher MPCs than the losers (e.g., Auclert, 2019). This result hinges on the assumption that all households have full information and form expectations rationally; that is, they know of the Fisher channel, and adjust their consumption accordingly.

We argue that taking into account heterogeneity in knowledge of the effects of macroeconomic shocks is important to assess their aggregate consequences. One key finding of our paper is households with large nominal-debt positions, which typically have higher MPCs, are largely unaware of inflation-induced debt erosion. Based on our findings, it would be fruitful to extend the HANK framework to allow for information frictions and other deviations from FIRE. Possible avenues could be following the strategy of Auclert, Rognlie, and Straub (2020) who introduce information rigidity to jointly get large impact MPCs at the micro level and humped-shaped macro responses as well as Pfäuti, Seyrich, and Zinman (2024) who allow for heterogeneity in cognitive skills and overconfidence in HANK models.

We sketch in a highly stylized example how asymmetric awareness of the Fisher channel might alter its short-run effects. Suppose for example that nominal prices unexpectedly

rise by 10%. A nominal saver with $NNP = €100k$ experiences a real wealth effect of $-€10k$. Conversely, a nominal debtor with $NNP = -€100k$ gains the equivalent of $€10k$. Assume a one-year MPC of 0.3 for the nominal saver and of 0.5 for the nominal debtor.[34] Under FIRE, the saver then reduces consumption by $€3k$, whereas the debtor spends $€5k$ more. Aggregate consumption increases by $€2k$. Limited awareness of debt erosion alters the effects on aggregate demand. Assume only 50% of borrowers know about debt erosion, whereas everyone knows about savings erosion, roughly consistent with our evidence. This assumption cuts the increase in consumption of net debtors to $€2.5k$, leading to a fall in aggregate consumption by $€0.5k$. This simple example illustrates the possible importance of heterogeneity in knowledge for the effects of macroeconomic shocks and for the redistributive effects of surprise inflation on aggregate demand in particular.

Two additional points are noteworthy. First, as we show in Appendix Figure A5, MPCs out of balance-sheet revaluations akin to the Fisher channel may be lower than MPCs out of realized gains. If lower MPCs out of the wealth effects of inflation compress the MPC gap between debtors and savers, effects on consumption due to redistribution might be muted. Second, limited knowledge adds a temporal component to the consumption dynamics: even unaware debtors may raise consumption once they repay fixed nominal obligations with higher future nominal income. High impact MPCs, as in FIRE, hence frontload consumption that might occur later. One implication of frontloading is that inflation can feed on itself and trigger inflationary spirals, as in Pallotti (2024).

[34] Heterogeneous agent models often aim for high MPCs, consistent with empirical estimates (e.g., Kaplan and Violante, 2022). Our stylized MPCs are broadly similar to the estimates in Auclert (2019).

7 Conclusion

We causally study the wealth effects of inflation in an information-provision experiment on customers of a large German bank during a historic inflation episode. On average, households are well-informed about prevailing inflation and are highly concerned about the impact of inflation on their wealth. Yet, they know surprisingly little about the reduction in the real value of nominal debt due to surprise inflation. Once we inform respondents about the debt-erosion channel, they increase estimates of their real net wealth and causally increase their planned and actual consumption. Moreover, treated respondents differ in leverage choices in a hypothetical real-estate transaction. Our results document the redistributive nature of surprise inflation across households and provide causal estimates for how individuals adjust behavior following inflation-induced redistribution of wealth.

Our findings inform a recent class of HANK models. A core amplification mechanism in these models comes from a positive covariance between exposure to economic shocks and propensities to spend. Applied to the Fisher channel, amplification occurs because the beneficiaries of unexpected inflation, households with a negative net nominal position, have higher MPCs than the losers (Auclert, 2019). We show the beneficiaries are largely unaware of inflation-induced debt erosion, which suggests effects of redistribution might be limited in the short run. Based on our findings, it would be interesting to extend the HANK framework to consider how shock exposure varies with shock awareness.

On the policy side, understanding optimal monetary policy in general and the implications for the optimal inflation target in particular remain largely unexplored in a framework that deviates from FIRE (Coibion, Gorodnichenko, and Wieland, 2012; Dávila and Schaab, 2023). Moreover, our results suggest suboptimal household debt choices given a large fraction of our survey population was initially uninformed about inflation-induced debt erosion.

Wealthier, more educated survey participants, which are overrepresented in our sample relative to the German population, are better informed about inflation-induced nominal-position erosion, which might raise concerns about possible redistribution from parts of the population that are less well informed to those that are better informed (D'Acunto et al., 2023). In addition, an interesting avenue for future work concerns the welfare effects of the wealth redistribution surprise inflation causes, which includes questions on the role of the income response as well as the desirability of net debtors benefiting at the expense of net savers (Del Canto et al., 2023; Doepke and Schneider, 2006; Fagereng et al., 2023).

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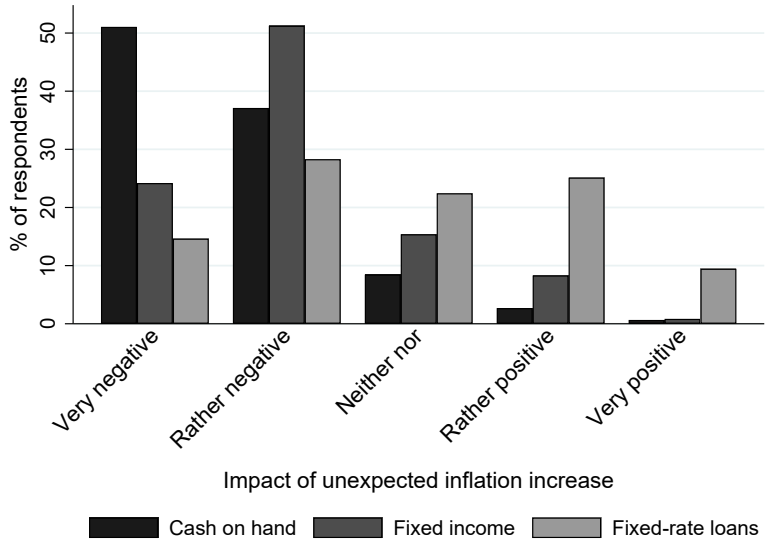
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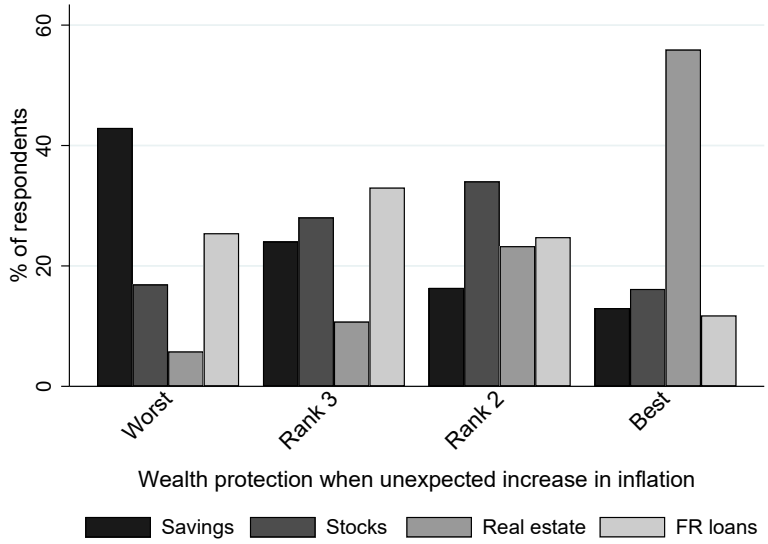
Figures and Tables

Figure 1: Prior knowledge about the wealth effects of inflation

Panel A. Impact of unexpected inflation on nominal positions

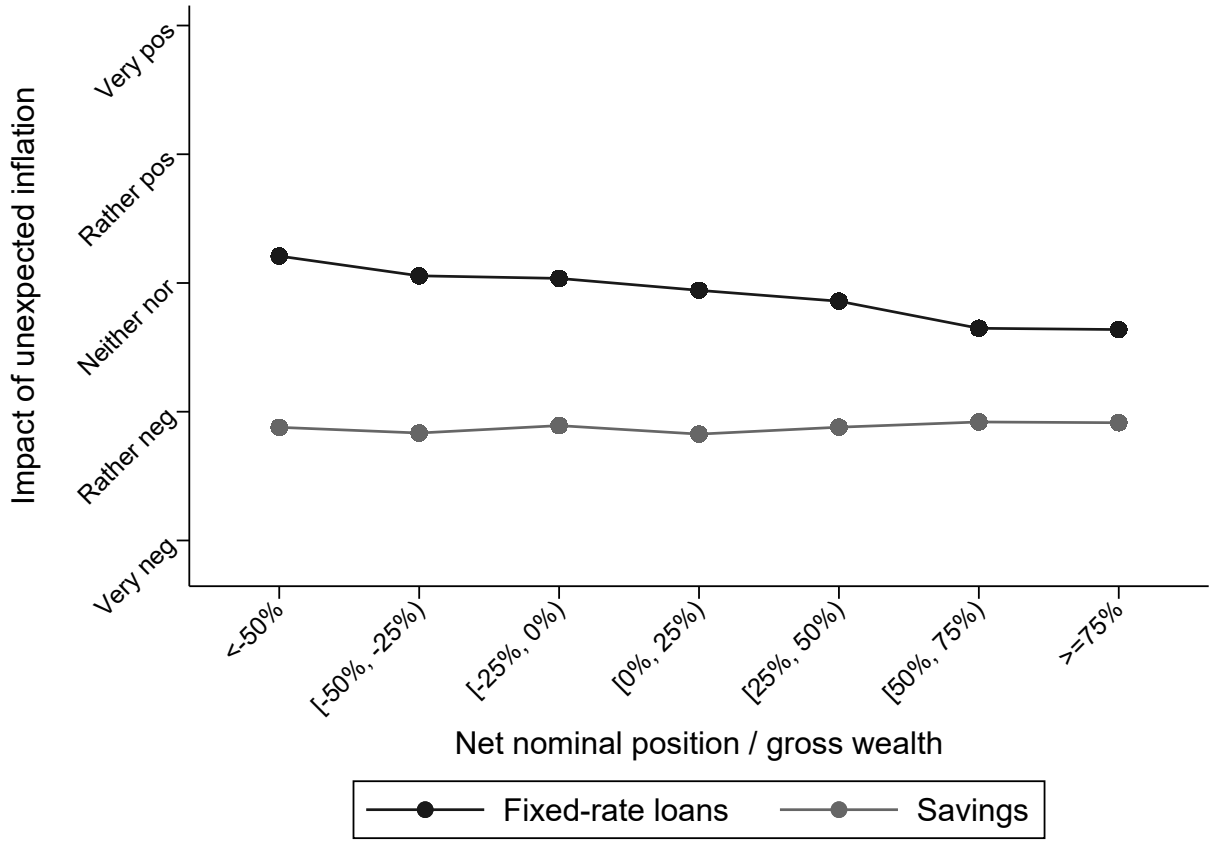


Panel B. Wealth protection by nominal positions during unexpected inflation



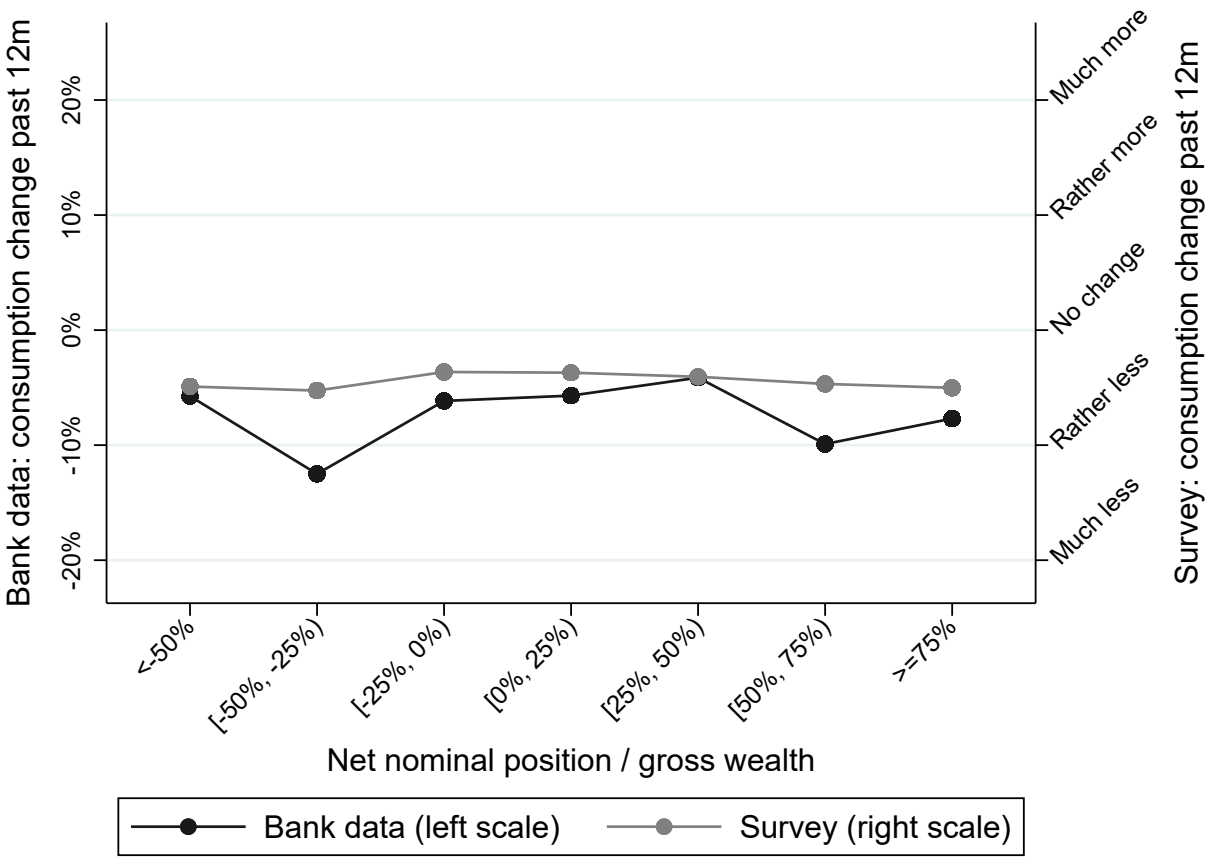
Notes: The figures show the distribution of beliefs about how financial instruments fare during an unexpected increase in inflation. The top panel shows the distribution of responses to "What do you think, is an unexpected increase in inflation positive or negative for owners of the following financial products?" For fixed income, we list savings accounts, bonds, and life insurances as examples. The bottom panel shows the distribution of responses to "With which of the following financial products would you expect the highest real-net-wealth return during unexpectedly high inflation? Please state "1" for the product with the best inflation protection, "2" for [...]" We plot responses of the control group only, as we pose this question post-treatment. We list examples of savings products.

Figure 2: Prior knowledge about the wealth effects of inflation by NNP



Notes: We plot average responses by respondents' net nominal position to the question "What do you think, is an unexpected increase in inflation positive or negative for owners of the following financial products?" Responses are for *fixed-rate loans* and *savings*, the latter being the average of cash on hand and fixed income (such as savings accounts, bonds, and life insurances).

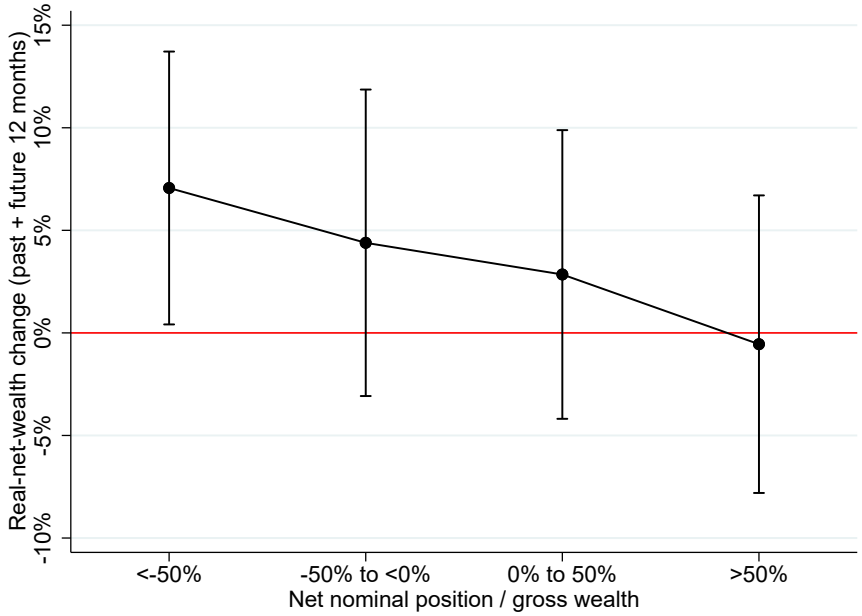
Figure 3: Spending change during 2021–22 inflation surge by NNP



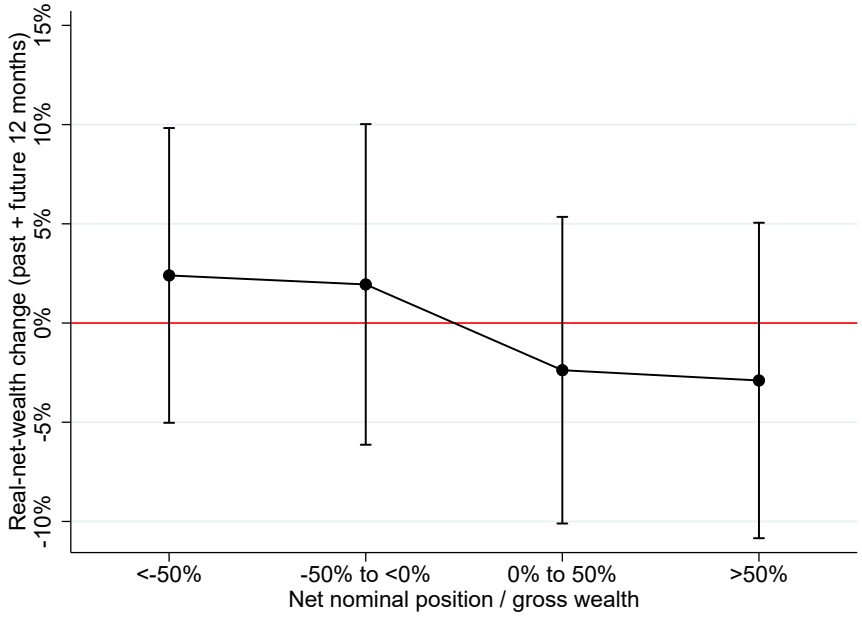
Notes: Referring to the left vertical axis, we plot the median spending change by respondents' net nominal position. Specifically, we contrast discretionary spending, defined in Section 2.2, between April–June of 2021 and April–June of 2022. Spending growth is adjusted by the rate of inflation during that period, of 8.3%. Referring to the right vertical axis, we plot average responses by respondents' net nominal position to the question "Have you consumed rather more or less as a consequence of changes in the following factors over the past 12 months, such as abstained from a purchase or purchased something extra?" One of the factors we ask about is the rate of inflation.

Figure 4: Treatment effect on changes in real net wealth by NNP

Panel A. Loan-erosion treatment



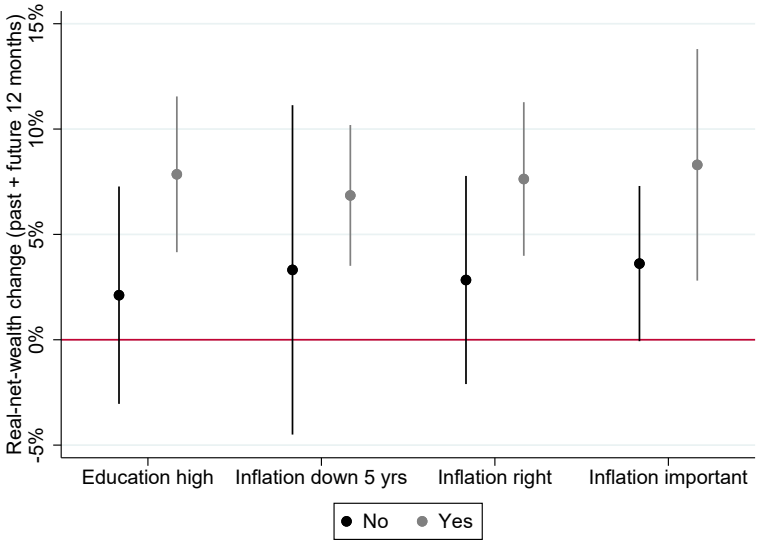
Panel B. Savings-erosion treatment



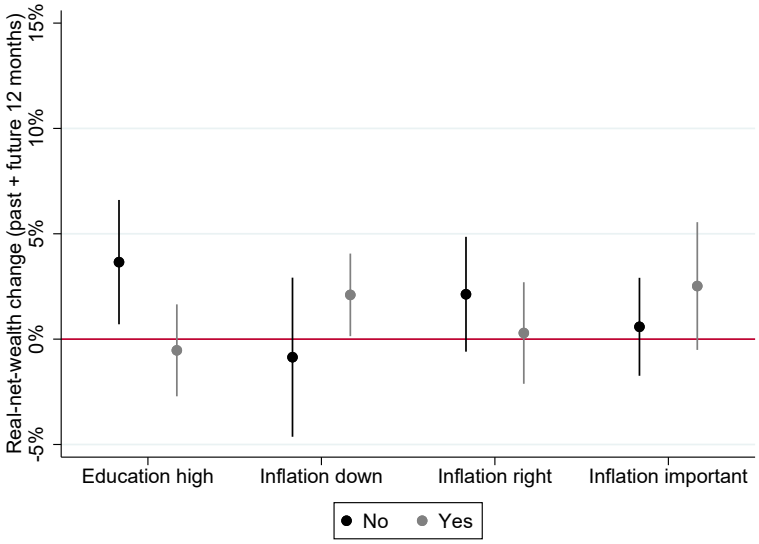
Notes: The figures report coefficients and 95% confidence bounds from regressions of respondents' post-treatment perceptions and expectations of changes in real net wealth over the sum of the past and next 12 months. We regress these wealth changes on a loan-treatment (Panel A) or savings-treatment indicator (Panel B), interacted with respondents' net nominal position as a fraction of their gross wealth. We describe the treatments in detail in Section 2.1. Regressions include the standard set of controls. Results are from Huber-robust regressions to control for outliers and influential observations. Standard errors are robust to heteroscedasticity.

Figure 5: Heterogeneity in loan-treatment effect on real net wealth

Panel A. Subsample of households with negative net nominal position



Panel B. Subsample of households with positive net nominal position



Notes: The figures report coefficients and 95% confidence bounds on the loan-treatment indicator from regressions of respondents' post-treatment estimates of changes in real net wealth over the past and next 12 months. We describe the treatment in detail in Section 2.1. In Panel A, regressions are limited to households with a negative NNP; in Panel B, regressions are limited to households with a positive NNP. Moreover, we split the sample by another respondent characteristic: *Education high*, which equals one for completed higher education and zero otherwise; *Inflation down 5 yrs*, which is one if the rate of inflation expected in five years is below currently perceived inflation; *Inflation right*, which is one if currently perceived inflation deviates by at most 0.5 pp from actual inflation; and *Inflation important*, which is one if respondents perceive inflation to be substantially more important for their own wealth than the average of GDP growth, stock prices, and interest rates. Regressions include the standard set of controls. Results are from Huber-robust regressions to control for outliers and influential observations. Standard errors are robust to heteroscedasticity.

Table 1: Descriptive statistics

Data sources:	PHF	Bank sample				
Statistics:	Mean	Mean	SD	P25	P50	P75
Demographic characteristics						
Female (0/1)	0.50	0.45	0.50	0.00	0.00	1.00
Age (years)	52.97	48.08	15.08	36.00	48.00	60.00
University completed (0/1)	0.29	0.48	0.50	0.00	0.00	1.00
Business at university (0/1)		0.10	0.30	0.00	0.00	0.00
Employed (0/1)	0.54	0.72	0.45	0.00	1.00	1.00
Gross wealth (€ k)	238.13	385.57	659.37	25.00	120.83	463.02
Nominal assets / gross wealth (%)	37.21	42.67	33.66	10.00	30.00	79.00
Nominal debt / gross wealth (%)	10.12	16.78	22.88	0.00	5.00	30.00
Homeowner (0/1)	0.44	0.59	0.49	0.00	1.00	1.00
Stockholdings (0/1)	0.20	0.54	0.50	0.00	1.00	1.00
Spending and income						
Total spending (avg./month)		1,844	1,202	1,001	1,604	2,385
Nondiscretionary spending (avg./month)		818	584	397	702	1,106
Discretionary spending (avg./month)		978	763	432	785	1,329
Regular income (avg./month)	2,274	2,862	2,002	1,457	2,381	3,826
Perceptions and expectations						
Inflation rate today (%)		8.78	6.24	7.00	7.90	8.00
Inflation rate in 12 months (%)		10.39	9.80	6.00	8.50	10.00
Inflation rate in five years (%)		10.67	15.07	3.00	5.00	10.50
Real-net-wealth change past 12 months (%)		-7.45	14.91	-14.00	-6.00	0.00
Inflation important for own wealth (0–4)		2.37	1.02	2.00	2.00	3.00
GDP growth important for own wealth (0–4)		1.73	1.06	1.00	2.00	2.00
Interest rates important for own wealth (0–4)		1.34	1.14	0.00	1.00	2.00

Notes: This table reports summary statistics for respondents' characteristics (survey and bank data), spending and income (bank data), and perceptions and expectations (survey data). We present the variables' mean, standard deviation (SD), 25th percentile (P25), median (P50), and 75th percentile (P75). We compare our respondents to a representative German sample from the 2017 wave of the Bundesbank's Panel on Household Finances. In our sample, we winsorize the one-percent tails of gross wealth. Spending and income are monthly averages over the six months preceding the survey, winsorized at the 97.5th percentile. The belief variables reported in the table refer to priors elicited before the treatment. Priors on inflation and own real net wealth are point estimates, with the one-percent tails trimmed. The baseline number of observations is 3,190.

Table 2: Correlates of beliefs about balance-sheet effects of unexpected inflation

Dependent variable:	Unexpected inflation increase positive or negative for...				
	cash	fixed income	stocks	real estate	FR loans
	(1)	(2)	(3)	(4)	(5)
Female (0/1)	−0.043	0.003	−0.123***	−0.038	−0.111***
	(0.035)	(0.036)	(0.036)	(0.036)	(0.034)
Age group					
>35 to 45 years	0.004	−0.058	−0.148***	−0.207***	−0.021
	(0.057)	(0.057)	(0.056)	(0.057)	(0.052)
>45 to 55 years	0.004	−0.125**	−0.132**	−0.131**	−0.048
	(0.058)	(0.058)	(0.058)	(0.058)	(0.055)
>55 to 65 years	−0.017	−0.253***	−0.215***	−0.107*	−0.080
	(0.060)	(0.059)	(0.061)	(0.060)	(0.057)
>65 years	0.090	−0.276***	−0.092	−0.059	−0.062
	(0.064)	(0.061)	(0.063)	(0.062)	(0.061)
University completed (0/1)	−0.144***	0.046	0.086**	−0.014	0.051
	(0.040)	(0.040)	(0.040)	(0.039)	(0.039)
Business at university (0/1)	−0.133**	−0.040	−0.017	0.053	0.202***
	(0.052)	(0.066)	(0.060)	(0.060)	(0.062)
Log gross wealth	−0.086***	−0.037***	0.015	0.079***	0.098***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Stockholdings (0/1)	−0.114***	−0.021	−0.029	−0.007	0.135***
	(0.040)	(0.041)	(0.042)	(0.041)	(0.039)
Homeowner (0/1)	0.130***	0.097**	−0.003	0.070	−0.062
	(0.045)	(0.045)	(0.046)	(0.045)	(0.042)
Inflation relatively important (0/1)	−0.147***	−0.052	0.007	0.109***	0.079**
	(0.037)	(0.038)	(0.038)	(0.038)	(0.037)
Accurate inflation perception (0/1)	−0.144***	−0.061	0.043	0.085*	0.030
	(0.046)	(0.043)	(0.043)	(0.044)	(0.040)
Inflation lower in five years (0/1)	−0.137***	0.062	0.131***	0.100**	0.245***
	(0.042)	(0.040)	(0.042)	(0.041)	(0.039)
Averse to debt (0/1)	−0.133***	−0.048	−0.045	−0.007	−0.125***
	(0.036)	(0.037)	(0.037)	(0.036)	(0.036)
Observations	3,134	3,134	3,134	3,134	3,134
R-squared	0.07	0.02	0.02	0.04	0.10

Notes: This table reports estimates of regressions of beliefs about the impact of an unexpected inflation increase on various balance-sheet items, measured on an ordinal scale from 0 ("very negative") to 4 ("very positive"). We standardize the outcome variables using the mean and standard deviation of our sample. For *fixed income*, we list savings accounts, bonds, and life insurances as examples. *FR loans* refers to fixed-rate loans. *Inflation relatively important* measures respondents' beliefs about the importance of inflation for own wealth relative to the average importance of GDP growth, interest rates, and stock prices. *Accurate inflation perception* is a dummy equal to one if respondents' estimate of current inflation is at most 1.5 pp off actual inflation. *Inflation lower in five years* indicates the expectation that inflation will be lower in five years than it is perceived today. *Averse to debt* is a dummy equal to one if respondents rather or fully agree with the statement they are uncomfortable with taking on debt (60% of respondents). Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Treatment effects on beliefs about nominal positions

Dependent variable:	Inflation-protection ranking					
	Nominal assets		Nominal debt		Debt aversion	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat: savings erosion	−0.124***	−0.126***	0.051	0.056	0.037	0.046
	(0.045)	(0.043)	(0.044)	(0.044)	(0.043)	(0.041)
Treat: loan erosion	−0.080*	−0.080*	0.200***	0.190***	−0.119***	−0.123***
	(0.045)	(0.044)	(0.045)	(0.046)	(0.044)	(0.042)
Controls	N	Y	N	Y	N	Y
Observations	2,977	2,928	2,977	2,928	3,190	3,134
R-squared	0.00	0.11	0.01	0.04	0.00	0.11

Notes: This table reports regression estimates of beliefs about nominal positions in each treatment group relative to the control group. To elicit the beliefs about inflation protection (Columns 1–4), we ask: "With which of the following financial products would you expect the highest real-net-wealth return during unexpectedly high inflation?" Respondents rank *nominal assets*, stocks, real estate, and *nominal debt* relative to each other, with higher numbers indicating better performance. For *nominal assets*, we list cash on hand, savings accounts, bonds, and life insurances as examples. In Columns 5–6, the dependent variable measures agreement with the statement "I am uncomfortable with taking on debt." Five possible responses range from "completely disagree" to "completely agree." We standardize the outcome variables using the mean and standard deviation of the sample. A detailed description of the treatments is in Section 2.1. The list of controls is in Section 4. *Observations* are lower in Columns 1–4 because respondents may skip this question and lower in odd-numbered columns because we trim the one-percent tails of inflation beliefs that serve as controls. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Treatment effect on changes in real net wealth

DV:	Change in real net wealth						
	Last 12 months		Next 12 months		Last + next 12 months		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treat: savings	−0.932	−0.807	−0.835	−0.981	−1.767	−1.788	−1.606**
	(0.648)	(0.646)	(0.769)	(0.773)	(1.217)	(1.222)	(0.781)
Treat: loan	1.490**	1.743***	1.260	1.204	2.749**	2.947**	2.495***
	(0.676)	(0.666)	(0.769)	(0.761)	(1.222)	(1.207)	(0.787)
Controls prior	Y	Y	Y	Y	Y	Y	Y
Controls demo	N	Y	N	Y	N	Y	Y
Robust reg	N	N	N	N	N	N	Y
Avg. Y CG	-2.51	-2.55	-3.11	-3.01	-5.62	-5.56	-6.33
Observations	3,190	3,134	3,190	3,134	3,190	3,134	3,099
R-squared	0.17	0.19	0.10	0.13	0.18	0.20	0.40

Notes: This table reports the perception and expectation of changes in the real net wealth in each treatment group relative to the control group. Columns 1 and 2 consider real-net-wealth changes estimated over the past 12 months, Columns 3 and 4 refer to changes estimated over the next 12 months, and Columns 5–7 show estimates of changes over the last plus next 12 months. We describe the treatments in detail in Section 2.1. The list of controls is in Section 4. *Robust reg* indicates whether the estimates are from ordinary least squares or Huber-robust regressions to control for outliers and influential observations. *Observations* are lower in specifications with demographic controls because we trim the one-percent tails of inflation beliefs that serve as controls. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Treatment effect on changes in real net wealth by NNP

Dependent variable:	Change in real net wealth					
	Last 12 months		Next 12 months		Last + Next 12 months	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat: savings	0.283	0.559	−0.092	0.517	0.711	1.632
	(0.748)	(0.730)	(0.956)	(0.953)	(1.523)	(1.508)
Treat: loan	1.155	1.658**	2.254**	2.895***	3.859**	5.017***
	(0.769)	(0.752)	(1.001)	(0.984)	(1.559)	(1.528)
NNP≥0	0.971	1.208**	0.502	0.999	1.388	2.280*
	(0.606)	(0.603)	(0.804)	(0.820)	(1.222)	(1.241)
Treat: savings × NNP≥0	−2.278***	−2.529***	−0.764	−1.673	−3.204*	−4.447**
	(0.879)	(0.859)	(1.126)	(1.125)	(1.773)	(1.762)
Treat: loan × NNP≥0	−0.942	−1.513*	−1.500	−1.880	−2.606	−3.546**
	(0.900)	(0.880)	(1.167)	(1.154)	(1.808)	(1.784)
Controls for prior estimate	Y	Y	Y	Y	Y	Y
Controls for demographics	N	Y	N	Y	N	Y
Avg. Y omitted group	-2.52	-2.74	-3.15	-3.22	-5.56	-5.82
Observations	3,127	3,059	3,165	3,112	3,158	3,101
R-squared	0.46	0.48	0.24	0.26	0.38	0.39

Notes: This table reports the perception and expectation of changes in the real net wealth in each treatment group relative to the control group. Columns 1 and 2 consider changes over the past 12 months, Columns 3 and 4 refer to changes over the next 12 months, and Columns 5 and 6 show estimates of changes over the past plus next 12 months. We describe the treatments in detail in Section 2.1. *NNP≥0* equals one if the respondent has a non-negative net nominal position and is zero otherwise. *Controls for prior estimate* include a directional and a point estimate of past-12-month changes in real net wealth. *Controls for demographics* include a quadratic polynomial in the respondent's age, risk tolerance, the log of gross wealth, and dummy variables for the respondent's gender, marital status, educational level, business-related university degree, employment status, beliefs about inflation (trimmed at one-percent tails), voucher instead of lottery survey-participation incentive, and whether participation follows a reminder email sent to encourage survey participation. Results are from Huber-robust regressions to control for outliers and influential observations. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Changes in real net wealth and planned spending

Dependent variable:	Planned spending				
	Groceries	Restaurants	Leisure	Clothing	Durables
	(1)	(2)	(3)	(4)	(5)
Panel A. Endogenous regression					
RNW change	0.001	0.004***	0.004***	0.004***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Controls for prior RNW	N	N	N	N	N
Observations	3,134	3,134	3,134	3,134	3,134
R-squared	0.04	0.16	0.13	0.10	0.08
Panel B. Reduced form					
Treat: loan erosion	−0.007	0.110***	0.108**	0.042	0.069
	(0.043)	(0.041)	(0.042)	(0.042)	(0.043)
Controls for prior RNW	Y	Y	Y	Y	Y
Observations	2,088	2,088	2,088	2,088	2,088
R-squared	0.04	0.16	0.12	0.10	0.09
Panel C. Instrumental variable					
RNW change	−0.010	0.037*	0.041**	0.015	0.027
	(0.017)	(0.019)	(0.020)	(0.017)	(0.019)
Controls for prior RNW	Y	Y	Y	Y	Y
Observations	2,065	2,065	2,065	2,065	2,065
1^{st} stage F-stat	10.31	10.31	10.31	10.31	10.31
Controls for demographics	Y	Y	Y	Y	Y

Notes: This table reports estimates from regressions of planned spending. In Columns 1–4, we measure changes in planned spending on various nondurables over the next four weeks relative to the last four weeks on a five-point scale, ranging from "much less" to "much more." In Column 5, the dependent variable is the number of durable items expected to purchase over the next 12 months. We standardize the outcome variables. *RNW change* is the post-treatment point estimate of last- and next-12-month changes in own real net wealth. In Panels B and C, we omit the savings-erosion treatment group. In Panel C, we instrument *RNW change* using the loan-erosion treatment. The list of controls is in Section 4. Results are from OLS regressions (Huber robust in first stage in Panel C). Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Changes in real net wealth and actual spending

DV:	Total			Nondiscretionary			Discretionary		
Window:	30	60	90	30	60	90	30	60	90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Reduced form									
T: loan	65.6*	186.5***	166.9**	−4.8	21.7	38.2	40.8*	121.0***	132.8**
	(36.4)	(59.6)	(78.4)	(15.8)	(24.3)	(33.1)	(24.7)	(40.8)	(55.8)
N	1,465	1,513	1,477	1,431	1,414	1,405	1,451	1,488	1,497
R2	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.04	0.03
Panel B. Instrumental variable									
RNW	29.8	92.4**	42.6	0.9	7.8	18.0	33.2*	70.3**	55.8
	(24.1)	(44.5)	(46.2)	(8.7)	(13.8)	(20.3)	(19.4)	(34.2)	(38.7)
N	1,460	1,469	1,452	1,451	1,441	1,429	1,447	1,465	1,458
F-stat	8.49	8.83	8.12	10.92	10.51	9.01	8.00	8.18	7.35
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Avg. Y	-267.0	-308.4	-22.8	-92.6	-46.6	58.7	-147.2	-222.9	-240.3

Notes: This table reports estimates from regressions of actual spending. We study total (Columns 1–3), nondiscretionary (Columns 4–6), and discretionary (Columns 7–9) spending, as described in Section 2.2. We compare individual-level aggregate spending in the 30, 60, and 90 days following survey participation relative to the same time window pre-participation respectively. *RNW* is the post-treatment point estimate of the sum of last- and next-12-month changes in own real net wealth. We instrument this estimate using the loan-erosion information treatment. We omit the savings-erosion treatment group from the estimations. Section 2.1 entails detailed descriptions of the treatments. All regressions include the standard set of controls, described in Section 4. Results in Panel A are from Huber-robust regressions to control for outliers and influential observations. In Panel B, we use Huber regressions in the first stage and a jackknife procedure in the second stage. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Treatment effects on other expectations

Dependent variable:	12-month expectation				Change in interest rates	
	House prices	Unemployment	Own income	Optimism	One year	Five years
	(1)	(2)	(3)	(4)	(5)	(6)
Treat: loan erosion	−0.078*	−0.063	−0.040	−0.005	−0.036	−0.274
	(0.043)	(0.044)	(0.042)	(0.042)	(0.101)	(0.183)
Controls	Y	Y	Y	Y	Y	Y
Avg. Y CG	0.00	0.00	0.00	0.00	1.47	2.48
Observations	2,088	2,088	2,088	2,088	2,067	2,065
R-squared	0.09	0.04	0.11	0.11	0.04	0.11

Notes: This table reports expectations of the loan-erosion treatment group relative to the control group. In Columns 1–3, we study 12-month-ahead expectations using a five-point scale, ranging from "much lower" to "much higher." The dependent variable in Column 4 measures agreement, on a five-point scale ranging from "completely disagree" to "completely agree," to the statement "I am optimistic about the future." We standardize the outcome variables in Columns 1–4. In Columns 5–6, we compare point estimates of expected interest rates relative to the perceived current interest rate (we trim the one-percent tails of the outcome variable). Section 2.1 entails detailed descriptions of the treatments. The list of controls is in Section 4. Results are from OLS regressions. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Perceived inflation protection of debt and real-estate investment

Dependent variable:	Price (€k)	Equity (€k)	Debt (€k)	Debt/price	FRM
	(1)	(2)	(3)	(4)	(5)
Panel A. Reduced form					
Treat: loan erosion	5.474	−9.829	17.770***	0.031***	0.073*
	(7.574)	(6.254)	(6.202)	(0.009)	(0.039)
Observations	2,082	2,088	2,088	2,082	2,088
R-squared	0.19	0.11	0.12	0.06	0.06
Panel B. Instrumental variable					
Debt as inflation hedge	0.067	−67.138*	83.528**	0.160**	0.321
	(44.590)	(36.228)	(40.753)	(0.065)	(0.268)
Observations	1,914	1,940	1,933	1,913	1,910
1st stage F-stat	17.70	20.29	16.89	18.46	15.12
Controls	Y	Y	Y	Y	Y
Avg. Y control group	542.79	280.25	260.48	0.48	2.22

Notes: This table reports estimates from regressions of features of a hypothetical real-estate transaction. Column 1 is on the preferred hypothetical purchase price, capped at €1,000,000; Column 2 considers the equity stake, capped at €500,000; Column 3 refers to the size of the mortgage, also capped at €500,000; Column 4 features the debt-to-price ratio; and Column 5 is on an ordinal-scale variable that takes on 0 if respondents choose an adjustable-rate mortgage, 1 in case of a mortgage with a five-year fixed-rate period, 2 for a 10-year fixed-rate period, 3 for a 20-year fixed-rate period, and 4 for a 30-year fixed-rate period. Section 2.1 entails detailed descriptions of the treatments. To elicit beliefs about *Debt as inflation hedge*, we ask: "With which of the following financial products would you expect the highest real-net-wealth return during unexpectedly high inflation?" Respondents rank nominal assets, stocks, real estate, and nominal debt relative to each other, with higher numbers indicating higher relative returns. We instrument the perceived inflation protection of nominal debt using the loan-erosion information treatment. The list of controls is in Section 4. In Panel A, results are from Huber-robust regressions to control for outliers and influential observations. In Panel B, we use OLS in the first stage and a jackknife procedure in the second stage. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix:

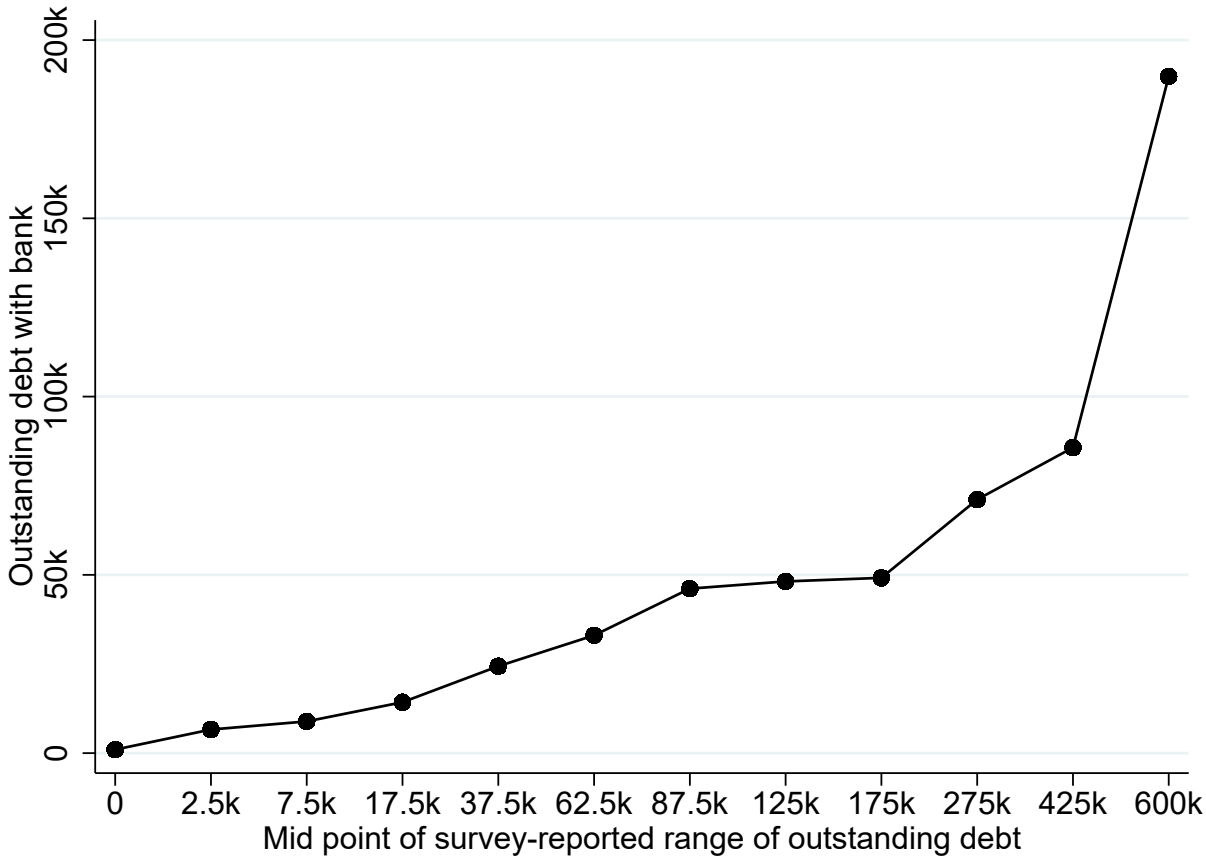
Households' Response to the Wealth Effects of Inflation

Philip Schnorpfeil, Michael Weber, and Andreas Hackethal

Not for Publication

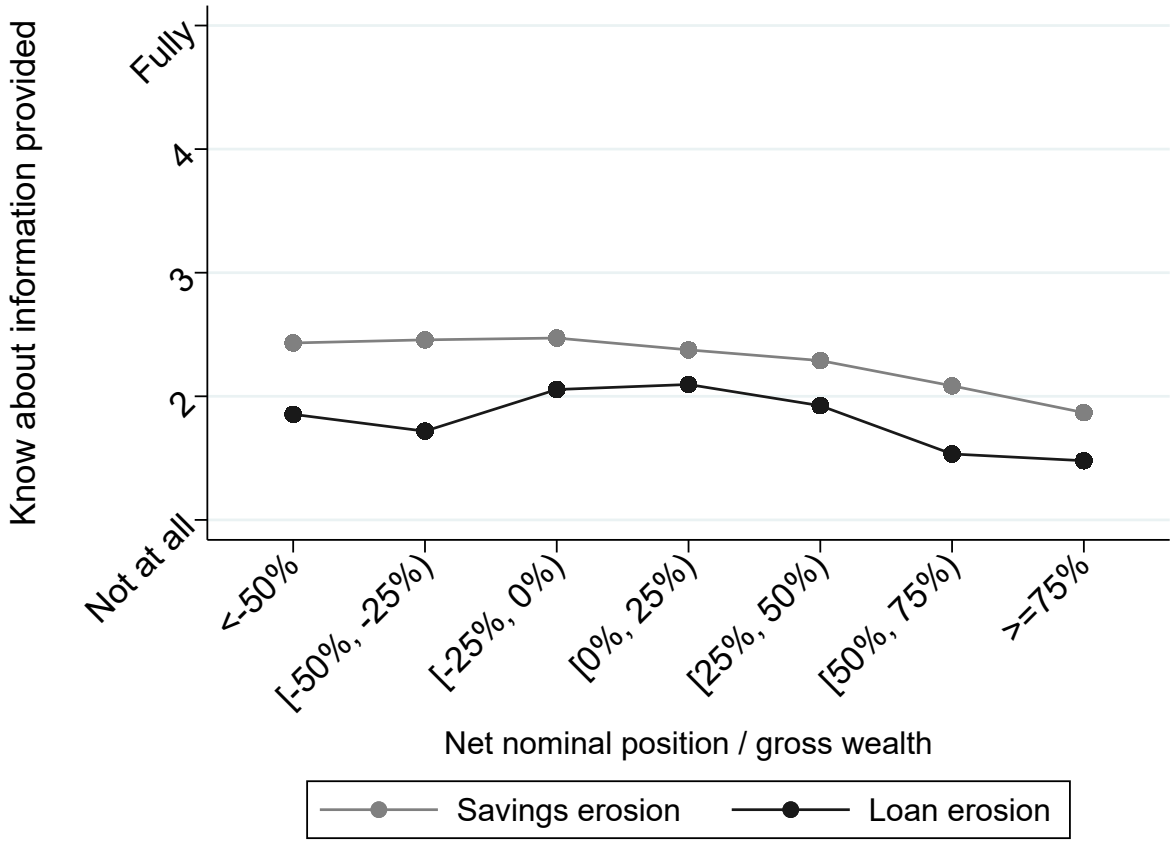
A Appendix figures and tables

Figure A1: Association between debt reported in survey and data from bank



Notes: This figure documents respondents' average debt balance with our bank partner in the month of survey participation for each mid point of outstanding-debt bandwidth reported by respondents in the survey. The debt balance at the bank includes consumer and mortgage debt. In the survey, households select the value of their outstanding debt, if any, from various ranges we provide. We take the respective mid point of the ranges we ask about.

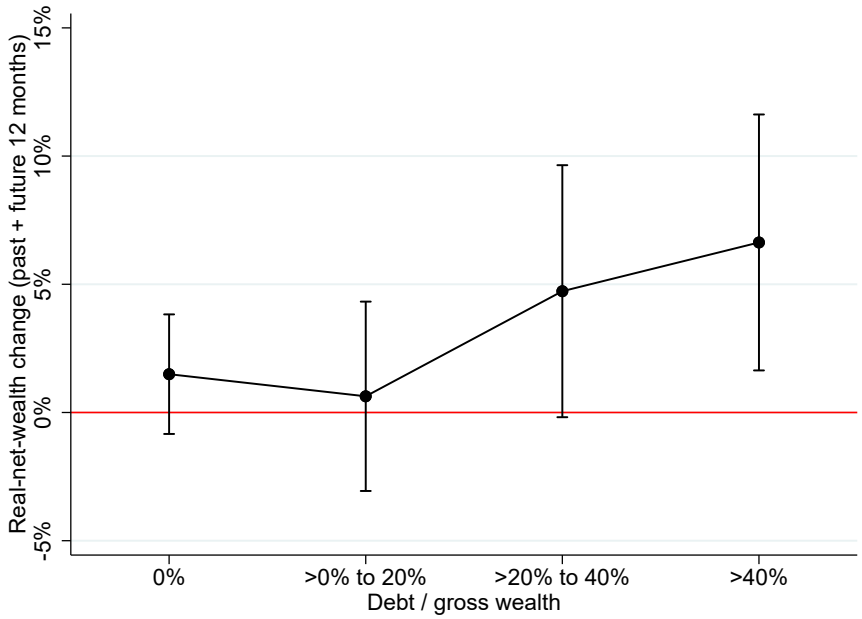
Figure A2: Knowledge about information provided by treatment and NNP



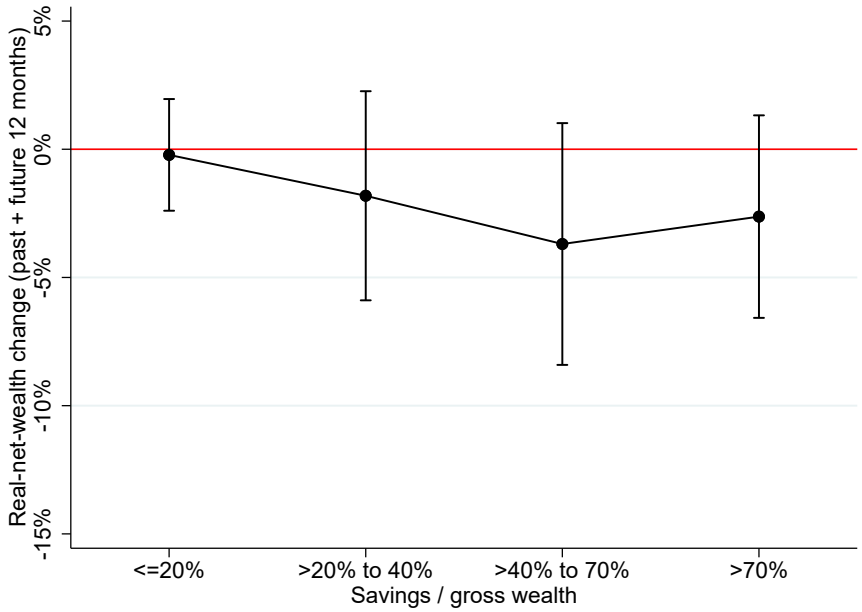
Notes: The figure shows respondents' stated knowledge about the treatment information. We plot averages by treatment (savings erosion vs. debt erosion) and net nominal position as a fraction of gross wealth. Naturally, the control group does not receive this question.

Figure A3: Treatment effect on changes in real net wealth by nominal position

Panel A. Loan-erosion treatment



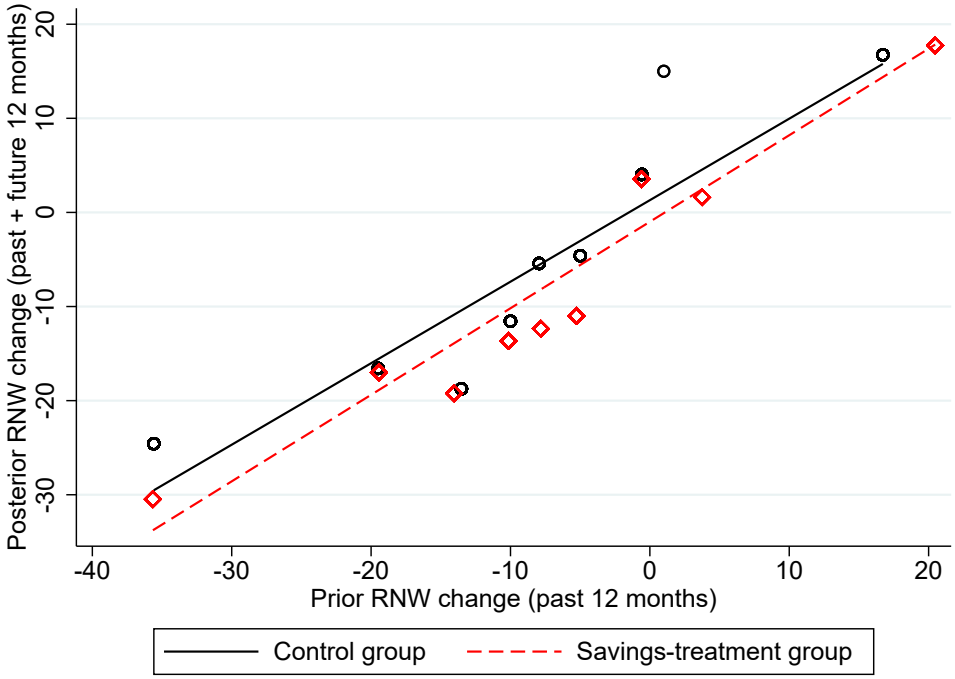
Panel B. Savings-erosion treatment



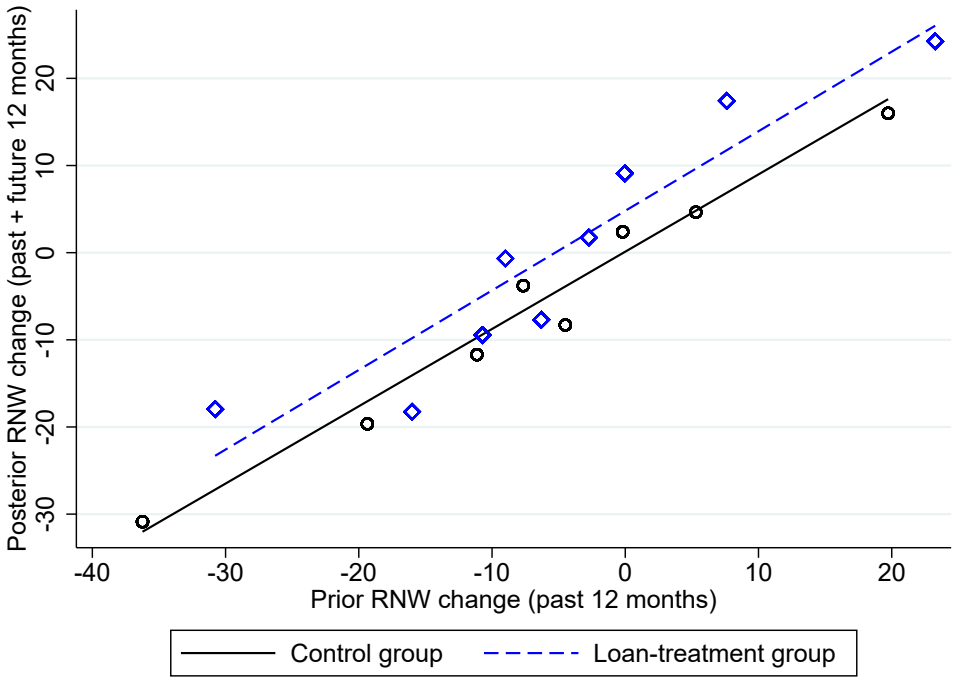
Notes: The figures report coefficients and 95% confidence bounds from regressions of respondents' post-treatment estimates of the change in their real net wealth over the past and next 12 months. In Panel A, we regress the wealth changes on the loan-treatment indicator, interacted with respondents' debt as a fraction of gross wealth. In Panel B, we regress real-net-wealth changes on the interaction of the savings-treatment indicator and respondents' nominal savings as a fraction of gross wealth. We describe the treatments in detail in Section 2.1. Regressions include the standard set of controls. Results are from Huber-robust regressions to control for outliers and influential observations. Standard errors are robust to heteroscedasticity.

Figure A4: Treatment effects on beliefs about RNW changes by prior and NNP

Panel A: Effect of savings-erosion treatment on positive-NNP subjects

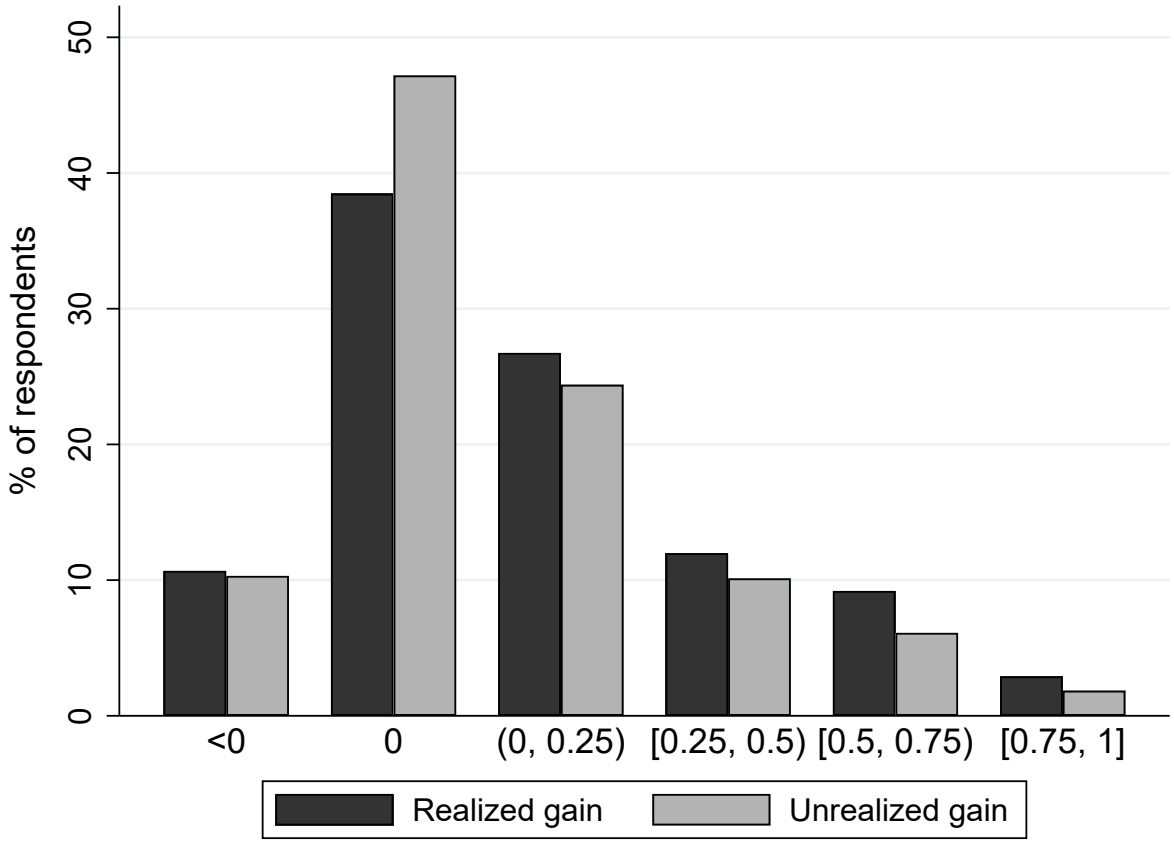


Panel B: Effect of loan-erosion treatment on negative-NNP subjects



Notes: This figure reports binscatter plots of respondents' post-treatment beliefs about changes in their real net wealth over the last 12 months plus next 12 months, conditional on pre-treatment estimates of past-12-month RNW changes. In Panel A, the sample comprises respondents with a positive net nominal position. In Panel B, the sample contains respondents with a negative NNP.

Figure A5: Marginal propensity to consume out of realized vs. unrealized gain



Notes: This figure shows a histogram of MPCs for two gain scenarios. On realized gains, we pose the following question: "Please consider a hypothetical situation where you unexpectedly receive a one-time payment of €10,000 today. How would you change your spending behavior over the next three months as a consequence of that?" On the unrealized-gain scenario, we ask: "Please consider that today you carefully calculate your total wealth, from which you subtract the value of outstanding loans. You are surprised to realize that you own €10,000 more than previously believed. How would you change your spending behavior over the next three months as a consequence of that?" Respondents use a slider to indicate a spending response between €-10,000 and €10,000.

Table A1: Consumption categories

	Total spending	Discretionary spending	Nondiscretionary spending
	(1)	(2)	(3)
Living			
Groceries	Yes		Yes
Clothing	Yes	Yes	
Multimedia	Yes		Yes
Hairdresser/wellness	Yes	Yes	
Drugstore	Yes		Yes
Pets	Yes		Yes
Cafeteria	Yes		Yes
Gifts	Yes	Yes	
Other living expenses	Yes	Yes	
Housing			
Rent	Yes		Yes
Energy and water	Yes		Yes
Furniture / home accessories	Yes	Yes	
Housing fees	Yes		Yes
Domestic help	Yes		Yes
Property taxes	Yes		Yes
Renovations	Yes	Yes	
Other housing expenses	Yes		Yes
Leisure			
Restaurants/cafes/bars	Yes	Yes	
Events/tickets	Yes	Yes	
Sports/fitness	Yes	Yes	
Hobbies/clubs/associations	Yes	Yes	
Vacation / travel expenses	Yes	Yes	
Books/music/movies/apps	Yes	Yes	
Electronics/computers/games	Yes	Yes	
Subscriptions	Yes		Yes
Other leisure expenses	Yes	Yes	
Transportation	Yes		Yes

continued

Table A1 continued

	Total spending	Discretionary spending	Nondiscretionary spending
	(1)	(2)	(3)
Health			
Pharmacy	Yes		Yes
Physician	Yes		Yes
Glasses / contact lenses	Yes		Yes
Hospital	Yes		Yes
Other health expenses	Yes		Yes
Children			
Activities and toys	Yes	Yes	
Children's clothing	Yes	Yes	
Childcare	Yes		Yes
School fees	Yes		Yes
Other expenses on children	Yes	Yes	
Career			
Office supplies / teaching material	Yes		Yes
Business travel	Yes		Yes
Tuition	Yes		Yes
Continuing education	Yes		Yes
Other career-related expenses	Yes		Yes
Other outflows			
Donations	Yes	Yes	
Cash withdrawals	Yes	Yes	
Credit card	Yes	Yes	
Online purchases	Yes	Yes	

Notes: This table reports spending categories coming from the partner bank's PFM tool, and how we assign them to the three spending measures. Details on these measures are in Section 2.2.

Table A2: Balancedness across treatment arms

	Control group (1)	Treat: savings (2)	p-value (1)=(2) (3)	Treat: loan (4)	p-value (1)=(4) (5)	p-value (2)=(4) (6)
Demographic characteristics						
Female (0/1)	0.48	0.45	0.20	0.42	0.01***	0.14
Age (years)	48.34	47.82	0.43	48.06	0.66	0.71
University completed (0/1)	0.51	0.47	0.07*	0.47	0.10*	0.88
Business at university (0/1)	0.10	0.10	0.90	0.11	0.57	0.65
Employed (0/1)	0.71	0.71	0.96	0.73	0.32	0.34
Gross wealth (€k)	407.25	401.13	0.84	348.09	0.03**	0.06*
Nominal assets / gross wealth (%)	43.09	41.55	0.29	43.37	0.85	0.21
Nominal debt / gross wealth (%)	17.06	15.94	0.25	17.35	0.77	0.16
Homeowner (0/1)	0.60	0.60	0.99	0.57	0.25	0.25
Stockholdings (0/1)	0.54	0.55	0.41	0.53	0.91	0.35
Spending and income						
Total spending (avg./month)	1,870	1,840	0.63	1,808	0.32	0.60
Nondiscretionary spending (avg./month)	837	799	0.21	813	0.42	0.64
Discretionary spending (avg./month)	985	994	0.81	949	0.36	0.25
Regular income (avg./month)	2,847	2,899	0.62	2,813	0.74	0.40
Perceptions and expectations						
Inflation rate today (%)	8.62	8.87	0.34	8.85	0.40	0.93
Inflation rate in 12 months (%)	10.22	10.55	0.44	10.41	0.65	0.76
Inflation rate in five years (%)	10.50	10.77	0.67	10.73	0.72	0.95
Real-net-wealth change past 12 months (%)	-7.61	-7.12	0.44	-7.63	0.97	0.43
Inflation important for own wealth (0–4)	2.39	2.31	0.09*	2.42	0.52	0.02**
GDP growth important for own wealth (0–4)	1.76	1.73	0.41	1.69	0.11	0.42
Interest rates important for own wealth (0–4)	1.40	1.29	0.03**	1.33	0.19	0.41

Notes: This table shows means for different observable characteristics of respondents in each treatment arm (Columns 1, 2, and 4). We provide a check of balance of means across arms in Columns 3, 5, and 6. We winsorize the one-percent tails of gross-wealth estimates. Spending and income measures are monthly averages spanning the six months preceding the survey, and are winsorized at the 97.5th percentile. The belief variables reported in the table refer to priors elicited before the information treatment. Priors on inflation and own real net wealth are point forecasts, with the one-percent tails trimmed. The baseline number of observations is 3,190.

Table A3: Full set of correlates of beliefs about balance-sheet effects of inflation

Dependent variable:	Unexpected inflation increase positive or negative for...				
	cash	fixed income	stocks	real estate	FR loans
	(1)	(2)	(3)	(4)	(5)
Female (0/1)	−0.019	0.015	−0.120***	−0.046	−0.139***
	(0.038)	(0.039)	(0.039)	(0.039)	(0.037)
Age group					
>35 to 45 years	−0.007	−0.056	−0.103*	−0.138**	0.040
	(0.061)	(0.063)	(0.062)	(0.062)	(0.057)
>45 to 55 years	−0.011	−0.115*	−0.090	−0.045	0.032
	(0.063)	(0.064)	(0.064)	(0.065)	(0.061)
>55 to 65 years	−0.050	−0.228***	−0.174***	−0.025	0.020
	(0.066)	(0.066)	(0.067)	(0.067)	(0.063)
>65 years	0.062	−0.233***	−0.093	0.017	0.005
	(0.092)	(0.088)	(0.091)	(0.086)	(0.088)
East Germany (0/1)	0.017	−0.006	0.000	0.021	−0.036
	(0.045)	(0.046)	(0.047)	(0.044)	(0.044)
University completed (0/1)	−0.128***	0.049	0.074*	−0.024	0.049
	(0.042)	(0.042)	(0.041)	(0.040)	(0.040)
Business at university (0/1)	−0.132**	−0.048	−0.035	0.052	0.190***
	(0.053)	(0.067)	(0.061)	(0.061)	(0.062)
Married (0/1)	−0.012	0.037	−0.001	0.040	−0.008
	(0.038)	(0.040)	(0.040)	(0.039)	(0.038)
Retired (0/1)	0.014	−0.012	0.027	−0.045	−0.036
	(0.082)	(0.080)	(0.085)	(0.077)	(0.081)
Student (0/1)	−0.048	0.008	0.035	0.191**	0.085
	(0.096)	(0.088)	(0.091)	(0.092)	(0.085)
Employee (0/1)	0.016	0.015	0.003	−0.031	−0.112***
	(0.042)	(0.046)	(0.045)	(0.045)	(0.043)
Craftsman (0/1)	0.195**	−0.094	−0.181**	−0.221**	−0.193**
	(0.086)	(0.084)	(0.088)	(0.088)	(0.076)
Risk tolerance	−0.005	0.028	0.056***	0.020	0.046**
	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)
Money illusion (0/1)	0.045	0.004	−0.038	0.032	−0.159***
	(0.040)	(0.041)	(0.040)	(0.039)	(0.040)
Inflation relatively important (0/1)	−0.146***	−0.054	0.012	0.097**	0.079**
	(0.038)	(0.039)	(0.039)	(0.038)	(0.037)
Accurate inflation perception (0/1)	−0.143***	−0.068	0.038	0.087**	0.024
	(0.046)	(0.044)	(0.043)	(0.044)	(0.041)
Inflation lower in five years (0/1)	−0.111***	0.062	0.123***	0.083**	0.215***

continued

Table A3 continued

Dependent variable:	Unexpected inflation increase positive or negative for...				
	cash	fixed income	stocks	real estate	FR loans
	(1)	(2)	(3)	(4)	(5)
	(0.043)	(0.041)	(0.042)	(0.042)	(0.039)
Averse to debt (0/1)	−0.135***	−0.031	−0.036	0.002	−0.107***
	(0.037)	(0.037)	(0.038)	(0.037)	(0.036)
Log gross wealth	−0.083***	−0.047***	0.014	0.081***	0.095***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Stockholdings (0/1)	−0.129***	−0.044	−0.065	−0.019	0.120***
	(0.042)	(0.043)	(0.044)	(0.043)	(0.041)
Homeowner (0/1)	0.154***	0.038	0.034	0.071	−0.087*
	(0.054)	(0.055)	(0.056)	(0.054)	(0.049)
Net nominal position / gross wealth					
-50% to <-25%	0.013	−0.082	−0.078	−0.020	−0.125
	(0.096)	(0.115)	(0.107)	(0.108)	(0.105)
-25% to <0%	0.092	0.026	0.003	−0.203**	−0.153
	(0.087)	(0.102)	(0.094)	(0.096)	(0.094)
0% to <25%	0.138*	−0.106	0.066	−0.066	−0.244***
	(0.082)	(0.097)	(0.091)	(0.092)	(0.090)
25% to <50%	0.155*	−0.080	0.011	−0.087	−0.234**
	(0.090)	(0.105)	(0.098)	(0.099)	(0.096)
50% to <75%	0.224**	−0.149	0.003	−0.184*	−0.248**
	(0.098)	(0.109)	(0.105)	(0.106)	(0.101)
≥75%	0.084	−0.171	0.104	−0.015	−0.152
	(0.100)	(0.112)	(0.107)	(0.108)	(0.102)
Observations	3,091	3,091	3,091	3,091	3,091
R-squared	0.07	0.02	0.03	0.05	0.11

Notes: This table reports regression estimates of beliefs about the impact of unexpected inflation on various balance-sheet items, measured on an ordinal scale from 0 ("very negative") to 4 ("very positive"). We standardize the outcome variables. For *fixed income*, we list savings accounts, bonds, and life insurances as examples. *FR loans* refers to fixed-rate loans. *Inflation relatively important* measures respondents' beliefs about the importance of inflation for own wealth relative to the average importance of GDP growth, interest rates, and stock prices. *Accurate inflation perception* is a dummy equal to one if respondents' estimate of current inflation is at most 1.5 pp off actual inflation. *Inflation lower in five years* indicates the expectation that inflation will be lower in five years than it is perceived today. *Averse to debt* is a dummy equal to one if respondents rather or fully agree with the statement they are uncomfortable with taking on debt (60% of respondents). Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Treatment effects on beliefs about own wealth

Dependent variable:	Inflation positive effect on RNW			Strong balance sheet when inflation		
	(1)	(2)	(3)	(4)	(5)	(6)
Treat: savings erosion	−0.012	−0.019	−0.025	0.042	0.026	0.116
	(0.043)	(0.043)	(0.088)	(0.044)	(0.041)	(0.077)
Treat: loan erosion	0.129***	0.142***	0.232**	0.071	0.093**	0.141*
	(0.044)	(0.044)	(0.096)	(0.043)	(0.040)	(0.075)
NNP≥0			−0.028			−0.031
			(0.071)			(0.068)
Treat: savings erosion × NNP≥0			0.008			−0.112
			(0.101)			(0.091)
Treat: loan erosion × NNP≥0			−0.118			−0.064
			(0.108)			(0.089)
Controls	N	Y	Y	N	Y	Y
Observations	3,190	3,134	3,134	3,190	3,134	3,134
R-squared	0.00	0.03	0.03	0.00	0.18	0.17

Notes: This table reports beliefs about own wealth in the context of inflation of respondents in each treatment group relative to those in the control group. Columns 1–3 consider beliefs about the impact of inflation on real net wealth. The question reads: "What has been the impact of the following factors on the change of your real net wealth over the past 12 months?" Five response options range from "very negative" to "very positive." From the response to inflation we subtract the average response to the other factors we ask about (Ukraine conflict, COVID-19, climate change, economic growth). Columns 4–6 refer to agreement to the statement that the respondent's balance sheet is well-suited for high inflation. Five response options range from "completely disagree" to "completely agree." We standardize all outcome variables. Section 2.1 entails detailed descriptions of the treatments. *NNP≥0* is a dummy equal to one if the respondent has a non-negative net nominal position and zero otherwise. The list of controls is in Section 4. Results are from OLS regressions. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5: Heterogeneity in loan-treatment effect on change in RNW

Dependent variable:	Real-net-wealth change over last + next 12 months			
Characteristic:	Education high	Inflation down in 5	Inflation accurate	Inflation important
	(1)	(2)	(3)	(4)
Panel A. Subset with negative NNP and characteristic satisfied				
Treat: loan erosion	7.852***	6.850***	7.630***	8.302***
	(1.877)	(1.699)	(1.851)	(2.785)
Observations	270	353	270	199
R-squared	0.45	0.42	0.57	0.46
Panel B. Subset with negative NNP and characteristic not satisfied				
Treat: loan erosion	2.115	3.317	2.836	3.615*
	(2.619)	(3.956)	(2.507)	(1.872)
Observations	255	166	249	327
R-squared	0.45	0.35	0.36	0.40
Panel C. Subset with positive NNP and characteristic satisfied				
Treat: loan erosion	−0.532	2.101**	0.290	2.520
	(1.111)	(0.999)	(1.227)	(1.544)
Observations	751	927	735	667
R-squared	0.47	0.43	0.46	0.39
Panel D. Subset with positive NNP and characteristic not satisfied				
Treat: loan erosion	3.655**	−0.858	2.130	0.586
	(1.503)	(1.923)	(1.388)	(1.185)
Observations	831	621	819	914
R-squared	0.30	0.31	0.34	0.32
Controls	Y	Y	Y	Y
Avg. Y control group	-5.62	-5.62	-5.62	-5.62

Notes: This table reports estimates of regressions of RNW changes on various subsamples based on respondent characteristics: *Education high*, which equals one for completed higher education and zero otherwise; *Inflation down in 5*, which is one if the rate of inflation expected in five years is below currently perceived inflation; *Inflation accurate*, which is one if currently perceived inflation deviates by at most 0.5 pp from actual inflation; and *Inflation important*, which is one if respondents perceive inflation to be substantially more important for their own wealth than the average of GDP growth, stock prices, and interest rates. In Panels A and C, we run regressions on the subsample of respondents who satisfy a characteristic, respectively. In Panels B and D, we consider the subsamples of respondents not satisfying a characteristic. Moreover, we split the sample based on respondents' net nominal position (negative in Panels A and B, non-negative in Panels C and D). Section 2.1 entails detailed descriptions of the treatment. The list of controls is in Section 4. Results are from Huber-robust regressions to control for outliers and influential observations. Standard errors are robust to heteroscedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Correlation between planned and actual changes in spending

Dep. var.:	Total			Nondiscretionary			Discretionary		
Window:	30	60	90	30	60	90	30	60	90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Planned nondurables spending									
Nondurables	44.6**	62.4**	111.9***	18.2**	18.2	9.4	17.6	36.9*	97.6***
	(18.2)	(30.6)	(41.2)	(8.4)	(12.6)	(17.1)	(12.4)	(20.5)	(30.1)
N	1,466	1,514	1,472	1,432	1,413	1,407	1,455	1,489	1,493
R2	0.03	0.03	0.02	0.04	0.02	0.03	0.03	0.04	0.04
Panel B. Planned durables spending									
Durables	17.9	76.7**	54.7	6.4	5.0	−5.7	4.8	58.8***	88.3***
	(18.6)	(30.0)	(40.9)	(8.0)	(12.3)	(16.2)	(12.5)	(21.3)	(29.2)
N	1,465	1,514	1,476	1,431	1,414	1,405	1,453	1,490	1,494
R2	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.04	0.04
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Avg. Y	-217.2	-174.5	91.8	-91.8	-37.2	84.1	-130.2	-124.4	-153.5

Notes: This table reports estimates from regressions of actual spending on planned spending. We study total (Columns 1–3), nondiscretionary (Columns 4–6), and discretionary (Columns 7–9) spending, as described in Section 2.2. We compare individual-level aggregate spending in the 30, 60, and 90 days following survey participation relative to the same time window pre-participation, respectively. In Panel A, *Nondurables* is the average planned change in spending across nondurables categories (groceries, restaurants, leisure, clothing) over the next four weeks relative to the past four weeks. Five response options range from "much less" to "much more." In Panel B, *Durables* is the sum across indicators of planned purchases of large/durable items (real estate, vehicles, large household items, large vacations, luxury goods, others) over the next 12 months. We standardize the two measures of planned spending. The list of controls is in Section 4. Results are from Huber-robust regressions to control for outliers and influential observations. Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Robustness of treatment effects on actual spending

Dep. var.:	Total			Nondiscretionary			Discretionary		
Window:	30	60	90	30	60	90	30	60	90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. OLS instead of Huber-robust regressions									
T: loan	117.9*	264.1**	136.2	44.3	85.9*	48.8	56.2	177.6**	116.1
	(68.2)	(102.5)	(136.8)	(31.2)	(51.6)	(72.0)	(51.7)	(74.6)	(96.3)
N	1,514	1,514	1,514	1,514	1,514	1,514	1,514	1,514	1,514
R2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Panel B. Fixed pre-treatment baseline of 60 days									
T: loan	180.2***	186.5***	132.5*	34.3	21.7	39.5	72.0*	121.0***	185.8***
	(68.2)	(59.6)	(79.1)	(31.7)	(24.3)	(38.4)	(42.5)	(40.8)	(54.3)
N	1,469	1,513	1,482	1,464	1,414	1,456	1,460	1,488	1,473
R2	0.07	0.03	0.04	0.07	0.02	0.04	0.05	0.04	0.05
Panel C. Adding uncategorized spending to total and discretionary spending									
T: loan	66.1*	190.6***	177.8**	−4.8	21.7	38.2	39.3	130.9***	141.1**
	(37.0)	(60.6)	(79.7)	(15.8)	(24.3)	(33.1)	(25.6)	(41.6)	(56.4)
N	1,466	1,513	1,483	1,431	1,414	1,405	1,455	1,489	1,493
R2	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.04	0.03
Panel D. Adding change in income as control									
T: loan	69.6*	171.8***	162.3**	−4.0	21.1	34.4	42.0*	117.9***	129.3**
	(37.0)	(59.9)	(76.6)	(15.8)	(24.0)	(32.9)	(25.1)	(41.1)	(55.5)
N	1,466	1,512	1,480	1,435	1,411	1,404	1,455	1,491	1,498
R2	0.03	0.04	0.03	0.04	0.03	0.03	0.03	0.04	0.04
Panel E. Adding controls for other expectations									
T: loan	73.4**	198.8***	166.0**	−1.5	22.8	42.4	44.4*	130.5***	131.8**
	(36.8)	(60.2)	(79.5)	(16.0)	(24.7)	(33.7)	(25.5)	(41.3)	(55.8)
N	1,448	1,494	1,459	1,414	1,402	1,390	1,437	1,467	1,471
R2	0.04	0.03	0.02	0.04	0.03	0.03	0.03	0.04	0.04
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Avg. Y	-267.0	-308.4	-22.8	-92.6	-46.6	58.7	-147.2	-222.9	-240.3

Notes: This table shows estimates from regressions of actual spending. We study total (Columns 1–3), nondiscretionary (Columns 4–6), and discretionary (Columns 7–9) spending, as described in Section 2.2. We compare total individual-level spending in the 30, 60, and 90 days following survey participation relative to the same time window pre-participation respectively. In Panel A, we use OLS rather than Huber-robust regressions. In Panel B, we vary the post-treatment time window but hold fixed the pre-participation window at 60 days. In Panel C, we add uncategorized non-integer outflows worth less than €100 to total and discretionary spending. In Panel D, we add regular income (such as salary, pension, children's allowances) to the list of controls. In Panel E, we add to the list of controls general optimism and the 12-months-ahead expectation about house prices, unemployment, own income, and interest rates. Section 2.1 entails detailed descriptions of the treatment. The list of controls is in Section 4. Results are from Huber-robust regressions (other than in Panel A). Robust standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

B Experimental instructions

This appendix provides the survey instructions translated from German into English. We use green text in parentheses to highlight aspects of the survey design. We show non-numerical response options to the questions using a), b), c), and so forth.

B.1 Welcome screen

Welcome to this survey by Goethe University Frankfurt!

The survey will take **about 10 minutes**. Your responses will be aggregated and only be used for scientific research. If you feel you are unfamiliar with some of the survey topics, that is fine. We just ask you for your best guess. Since we are interested in your unfiltered opinion, please refrain from using external sources (e.g., Google).

In return for your completed participation, you will receive an **Amazon voucher worth €10** [if voucher version] / get the **chance to win one of 50 Amazon vouchers worth €50** [if lottery version]. To receive the voucher [if voucher version] / To receive the voucher in case of a win [IF lottery version], you can enter your e-mail address at the end of the survey. Your email address will only be used to send you the voucher.

Please do not use the "Back" button in your browser, as this may require restarting the survey.

Do you have questions? Please contact us at **umfrage@finance.uni-frankfurt.de**.

B.2 Pre-treatment section

Q1: What is your highest level of educational attainment?

a) Currently pursuing apprenticeship or studies (no degree yet)

b) Finished apprenticeship at training college or company

c) Finished apprenticeship at technical school or university of cooperative education

d) Obtained Bachelor, graduated from university of applied sciences or technical college

e) Diploma or Master, finished teacher training

f) Finished doctorate studies

g) Other professional degree

h) No degree (and not currently pursuing apprenticeship or studies)

[Ask if Q1=d), e), or f)]

Q1.1: In what field of study did you obtain your highest educational attainment?

a) Economics and Business Administration

b) Computer Science

c) Law

d) Medicine or Psychology

e) Engineering

f) Other field of study

[Randomized order of Q2 and Q3]

[Randomized assignment to either gain frame, or loss frame in Q2 and Q3]

Q2: Please imagine that you unexpectedly receive [if gain frame] / have to make [if loss frame] a **one-time payment of €10,000** today. How would this change your spending **over the next three months**?

Please click and drag the sliders below. [Range is from €-10,000 to €10,000, in €100 increments]

How much more/less would you save?

How much more/less would you spend?

How much higher/lower would your outstanding loans be?

Q3: Please imagine that today you carefully calculate the total value of your assets and subtract from it the value of possible outstanding loans. You realize to your own surprise that you have **€10,000 more** [if gain frame] / less [if loss frame] than previously assumed. How would this change your spending **over the next 3 months**?

Please click and drag the sliders below. [Range is from €-10,000 to €10,000, in €100 increments]

How much more/less would you save?

How much more/less would you spend?

How much higher/lower would your outstanding loans be?

Q4: To what extent does your wealth situation depend on the following factors?

Response options: Not at all – Very little – Somewhat – Strongly – Very strongly

[Factors presented in randomized order]

Inflation rate

Economic growth

Stock prices

Interest rates

Q5: Have you consumed rather more or less as a consequence of changes in the following factors **over the past 12 months**, such as abstained from a purchase or purchased something extra?

Response options: Much less – Rather less – No change – Rather more – Much more

[Factors presented in randomized order]

Inflation rate

Economic growth

Stock prices

Interest rates

Q6: What do you think is the current rate of inflation in Germany, and what will it be in the future?

Note: the rate of inflation is the percentage change in overall prices in the economy in the last 12 months, most commonly measured by the Consumer Price Index. A falling price level is commonly known as "deflation".

If you think there was deflation, please enter a negative value. You may enter up to one decimal point.

Current rate of inflation: ____%

Expected rate of inflation in one year: ____%

Expected rate of inflation in five years: ____%

Q6.1: How certain are you about your responses?

Response options: 1 ("Not at all certain") – 2 – 3 – 4 – 5 ("Very certain")

Current rate of inflation

Expected rate of inflation in one year

Expected rate of inflation in five years

Q7: What is the composition of your household's **gross wealth**? Gross wealth includes all assets, without deducting outstanding loans. For example, if you bought property financed by a loan, only the current value of the property is part of gross wealth, without deducting the outstanding loan amount.

Example: a household has €20 of cash, €80 of real estate, and €40 of loans. Gross wealth is therefore €100. Cash constitutes 20% and real estate 80% of gross wealth.

Please enter "0" if a category does not apply to you. The sum of your entries should equal 100%.

Cash and fixed-rate savings (e.g., saving accounts, bonds, life insurances): ____%

Stocks: ____%

Real estate (owner-occupied or investment): ____%

Other (e.g. vehicles, gold): ____%

Total (the sum should equal 100): [Sum of values above] %

[If the total of the asset entries does not equal 100%, the following message is displayed: "Please make sure that the sum of your entries equals 100%."]

How large are outstanding loans as a share of your gross wealth? Example: a household has €100 of gross wealth and €40 of loans. Loans have a 40% share of gross wealth.

Enter a "0" if you do not have any outstanding debt.

Mortgages: ____%

Consumer loans: ____%

[As soon as the respondent makes a loan entry, the following text is displayed.]

Your outstanding loans make up [sum of share of mortgages and consumer loans]% of your gross wealth. Thus, your net wealth is [1 - (sum of share of mortgages and consumer loans)]% of your gross wealth.

Q8: For some of the following questions, we kindly ask you to provide information about **real-value changes**. These changes take inflation into account. For example, an investor who earns a 5% annual return would achieve a real return of -2% with 7% inflation. Thus, despite having a positive nominal return, this investor experiences a loss in purchasing power.

Now, please think about the **net wealth** of your household. This is your gross wealth minus your outstanding loans. How has the real value of your net wealth changed **in the past twelve months**?

Real value gain: Net worth has increased by more than inflation.

Net wealth has increased similar to inflation.

Real value loss: Inflation has increased by more than net wealth.

[If a) or c) in Q8, ask the following question]

Q8.1: Please estimate **how positively** [if a)] / **negatively** [if c)] your net wealth has changed in real terms.

Please click and drag the slider below.

Positive real change in % [if a)] / Negative real change in % [if c)]. [Slider ranging from 1% to 60%]

Q9: What do you think, is an **unexpected increase in inflation** rather positive or negative for owners of the following financial instruments?

Response options: Very negative – Rather negative – Neither nor – Rather positive – Very positive

Cash on hand

Fixed-rate products (e.g., time deposits, bonds, life insurances)

Stocks

Real estate

Fixed-rate loans

Q9.1: How certain are you about your responses?

Response options: 1 ("Not at all certain") – 2 – 3 – 4 – 5 ("Very certain")

B.3 Treatment section

[Control group]

The current inflation rate in Germany is **8.7%**. This is the highest rate in more than 70 years. That is, goods and services priced at € 100 one year ago now cost € 108.70 on average.

[Savings-erosion treatment group]

The **current inflation rate in Germany is 8.7%**, the highest rate in more than 70 years. That is, goods and services priced at €100 one year ago now cost €108.7 on average. This price increase has a relatively **negative effect on savers**: the savings amount (e.g., checking account, bond, life insurance) is unchanged nominally or lower, but worth less in real terms as a consequence of money depreciation.

As an example, consider a €50,000 savings product with a three-year maturity that you took out one year ago. The real value of the savings product has already fallen sharply, and will depreciate further if inflation remains high: **€50,000 savings value one year ago ⇓ €38,800 real value today**

The **inflation-induced savings depreciation** thus has a negative effect on the real net wealth of savers.

Note: the numbers come from current calculations by the Universities of Chicago and Frankfurt (**calculation details**).

[Loan-erosion treatment group]

The **current inflation rate in Germany is 8.7%**, the highest rate in more than 70 years. That is, goods and services priced at €100 one year ago now cost €108.7 on average. This price increase has a relatively **positive effect on borrowers**: the loan amount is unchanged nominally, but worth less in real terms as a consequence of money depreciation.

As an example, consider a €50,000 loan with a three-year maturity that you took out one year ago. The real value of the loan has already fallen sharply, and will depreciate further if inflation remains high: **€50,000 loan value one year ago ⇓ €38,800 real value today**

The **inflation-induced loan depreciation** thus has a positive effect on the real net wealth of borrowers.

Note: the numbers come from current calculations by the Universities of Chicago and Frankfurt (**calculation details**).

[Text presented to respondents who click on "calculation details" button]

Calculation details: "To determine the present value of a fixed-rate savings product [if savings treatment] / loan [if loan treatment], we calculate the present value of future interest payments and

principal repayments (discounted cash flow). The present value calculation involves discounting each payment using a discount rate. This step allows to make comparable payments that occur at different points in time. The discount rate takes into account the inflation expectation prevailing at the respective time periods.

In our calculation, the discount rate is set at 3% one year ago (1% + 2% inflation expectation) and then increases linearly to 9.7% today (1% + 8.7% inflation expectation). This increase in the discount rate significantly reduces the present value of future payments. The inflation data used is based on the Harmonized Consumer Price Index from the German Federal Statistical Office. [If savings treatment] Additionally, the calculation assumes that the savings product every month pays interest at an annualized rate of 0.3%. [If loan treatment] Additionally, the calculation assumes a nominal interest rate of 3%, an annual repayment rate of 3%, and monthly payments."

[Treatment groups only]

Q10: Have you known about the information on the impact of inflation on loans [if loan treatment] / savings [if savings treatment]?

Response options: 1 ("Completely unknown") – 2 – 3 – 4 – 5 ("Completely known")

B.4 Post-treatment section

Q11: What do you expect the following economic factors to be **in twelve months**?

Response options: Much lower – Rather lower – No change – Rather higher – Much higher

Stock prices

Real-estate prices

Unemployment rate

Own net income

Q12: What do you estimate to be the **interest rate** for a newly contracted loan with a five-year maturity and fixed interest rate currently? And what interest rate do you expect for the future?

Please enter up to one decimal place.

Current annual interest rate: ____%

Annual interest rate in one year: ____%

Annual interest rate in five years: ____%

Q13: Compared to the past four weeks, do you plan to spend more or less **in the next four weeks** on the following:

Response options: Much less – Somewhat less – Similar amount – Somewhat more – Much more

Groceries

Eating out at restaurants

Leisure activities (e.g., movies/theater, vacations, hobbies)

Clothing, shoes

Q14: Do you plan to purchase any of the following products or take a major vacation **within the next twelve months**?

Multiple choices are possible.

a) House or apartment

b) Car or other vehicle

c) Household item or electronic device (e.g., refrigerator, sofa, mobile phone)

d) Major vacation

e) Luxury item (e.g., watch, jewelry)

f) Other

g) None of the above

[If Q14 is not answered with g), ask Q14.1 in the next screen.]

Q14.1: How much do you plan to spend on the house or apartment [if a)], the car or other vehicle [if b)], the household item or electronic device [if c)], the major vacation [if d)], the luxury item [if e)], other major products [if f)]?

a) €____%

b) I do not know or prefer not to answer

Q15: We would like to ask you again about the **net wealth** of your household. There is no right or wrong answer here. Please estimate the **real-value change** of your net wealth **in the past twelve months**, as well as the expected change **in the next twelve months**.

Please click and drag the sliders below. [Sliders ranging from -60% to 60%]

Real change of net wealth in the past twelve months

Expected real change of net wealth in the next twelve months

Q15.1: How certain are you about your estimates?

Response options: 1 ("Not at all certain") – 2 – 3 – 4 – 5 ("Very certain")

Real change of net wealth in the past twelve months

Expected real change of net wealth in the next twelve months

Q16: In your opinion, what impact did the following factors have on the **real** value of your **net wealth in the past twelve months**?

Response options: Very negative – Rather negative – None – Rather positive – Very positive

[Randomized order]

Inflation

Ukraine conflict

COVID-19

Climate change and policies

Economic development

Q17: With which of the following financial products would you expect the **highest real-net-wealth return during unexpectedly high inflation**?

Please assign a "1" to the financial product with the best inflation protection, a "2" to the second-best protection, a "3" to the third-best, and a "4" to the fourth-best inflation protection.

Savings products (e.g., cash, savings account, bonds, life insurance)

Stocks

Real estate

Fixed-rate loans

Q18: Imagine you want to **buy property**. You can use up to €500,000 in borrowed capital (bank loan) and €500,000 in equity (savings) for the purchase. How much money would you use to buy the property, and how would you finance it?

Please click and drag the sliders below.

Purchase price [Slider ranging from €0 to €1,000,000]

Equity used [Slider ranging from €0 to €500,000]

You would finance the property using €[purchase price - equity used] of borrowed capital.

Fixed-rate period [Response options: "None" – "5 years" – "10 years" – "20 years" – "30 years"]

Note: the mortgage term describes the period for which the agreed interest rate in the loan contract is fixed.

Q19: To what extent do you agree with the statements below?

Response options: "Strongly disagree" – "Somewhat disagree" – "Neither agree nor disagree" – "Somewhat agree" – "Strongly agree"

[Randomized order]

a) One should use savings to buy something for themselves.

b) Taking on loans makes me uncomfortable.

c) I am concerned about high inflation.

d) With my balance sheet, I am well-equipped for times of high inflation.

e) I am optimistic about the future.

f) I expect to work more in the coming months than in the previous months.

g) Unexpected high inflation leads to a redistribution of wealth from savers to borrowers.

Q20: You are now nearing the end of the survey. We just have a few more questions about you.

When making personal savings or investment decisions, how would you generally describe your **risk tolerance**?

Response options: 1 ("Not at all willing to take risks") – 2 – 3 – 4 – 5 ("Very risk tolerant")

Q21: Imagine that your income and expenses are about 10% higher than they were a year ago. At that time, you were planning to sell a high-quality watch but did not get around to it due to lack of time. The price of this watch has since increased from €10,000 to €11,000. Would you now be more inclined to sell your watch compared to a year ago?

a) Yes, more inclined to sell

b) No, more inclined to keep

c) Unchanged

Q22: How would you estimate the combined value of the cash holdings and interest-bearing assets (such as savings accounts, bonds, life insurance) of your household?

[Dropdown menu]

a) 0 to under €2,500

b) €2,500 to under €5,000

c) €5,000 to under €10,000

d) €10,000 to under €25,000

e) €25,000 to under €50,000

f) €50,000 to under €75,000

g) €75,000 to under €100,000

h) €100,000 to under €150,000

i) €150,000 and above

Q23: How would you estimate the outstanding value of all the loans of your household?

[Dropdown menu]

a) €0 (no loans)

b) €1 to under €5,000

c) €5,000 to under €10,000

d) €10,000 to under €25,000

e) €25,000 to under €50,000

f) €50,000 to under €75,000

g) €75,000 to under €100,000

h) €100,000 to under €150,000

i) €150,000 to under €200,000

j) €200,000 to under €350,000

k) €350,000 to under €500,000

l) €500,000 and above

Q24: How interesting did you find this survey?

Response options: 1 ("Not at all interesting") – 2 – 3 – 4 – 5 ("Very interesting")

Q25: Do you have any suggestions or feedback regarding our survey? Please share them here (**optional**).

[Text field]

Q26: Thank you for participating in our survey!

As a token of appreciation for your participation, you will receive an Amazon voucher worth €10 [if voucher] or a chance to win one of 50 Amazon vouchers worth €50 [if lottery]. To receive the voucher, simply confirm that you would like to be contacted by us for the purpose of voucher delivery and provide your email address in the next step.

a) Yes, I would like to receive the voucher [if voucher] / participate in the voucher lottery [if lottery]

b) No, I do not want to receive the voucher [if voucher] / do not want to participate in the voucher lottery [if lottery]

[If Q26 is answered with a), present Q26.1 in the same screen]

Q26.1: Please provide your email address for voucher delivery:

Enter email address:

Confirm email address:

[Closing text below]

Thank you once again for your participation! Your answers have been saved. You may now close this window in your browser.