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Household Income Expectations: The Role of Shocks and Aggregate Conditions *

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Abstract

We conduct an empirical investigation to examine how income shocks and aggregate conditions influence income expectations, expectation uncertainty and expectation errors. We use data from a large longitudinal Dutch survey collecting detailed information on household income expectations. Our results show that income shocks, much more than aggregate conditions, induce a revision in income expectations across the entire spectrum of the income distribution. This expectation revision is consistent with an extrapolative behavior. We also observe that positive income shocks lead to an increase of expectation uncertainty. Our results partly confirm overreaction of respondents to income shocks, particularly for negative income shocks and high-income respondents. The above overall findings vary conditional on the position in the income distribution. This evidence may depend on different income processes and different degrees of awareness regarding the impact of income shocks and aggregate conditions.

Keywords: Income expectations; Expectation uncertainty; Expectation error; Income shocks; Aggregate conditions.
JEL Classification: D84, G50.

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1. Introduction

Income expectations and perceived income uncertainty are key factors in economic decisions, such as consumption, saving, financial behaviour and labour supply. Moreover, individual expectations and consumer confidence have relevant consequences on the aggregate economy, determining the effectiveness of fiscal and monetary policy interventions and influencing the business cycle. How do individuals form income expectations and how accurate are they? What affects perceived income uncertainty? This paper sheds light on this complex cognitive process by examining the role of income shocks and aggregate conditions.

Specifically, we examine how income shocks - defined as the deviation of income realization from their expected value - and aggregate conditions - notably macroeconomic uncertainty and labour market conditions - influence income expectations, expectation uncertainty and expectation errors. First, we gauge whether household income shocks and aggregate conditions drive an update in the *level* of expected value and the overall spectrum of perceived possible income realizations. Second, we investigate *perceived income risk*. Specifically, we investigate the evolution of the dispersion of possible income realization - measured by the difference between the upper and lower boundaries in expected income realization - and the standard deviation of income expectations, based on self-assessed probabilities of several potential income realization within those boundaries. To the best of our knowledge, with the notable exception of Cocco et al. (2022), we are the first to look at the variability around income expectations. However, differently from Cocco et al. (2022), we benefit from more detailed data on the underlying distribution of income expectations. By analysing the income *expectation error*, we also assess whether the expectation revision reflects a change in future income realizations or if it denotes an overreaction to change in the circumstances. Finally, we present some evidence on how savings reflect income shocks and expectations through a mediation analysis.

Recent literature pointed out the importance of individual experience in shaping individual behaviour and expectations (Cocco et al., 2022; Kuchler and Zafar, 2019; Malmendier and Nagel, 2016, 2011; Rozsypal and Schlafmann, 2023). Moreover, aggregate conditions have been found to play a role in determining individual expectations of economic outcomes (Bloom, 2009; Coibion et al., 2021; Easaw and Grimme, 2024; Malmendier and Nagel, 2011). We contribute to the broad literature on experiences and economic outcomes and assess how different dimensions of income expectations respond to income shocks and macroeconomic conditions. Our contribution to the literature is threefold and consists in i) analysing income expectations, expectation uncertainty and error in the same dataset, which allows to investigate the relationship among these dimensions;

ii) simultaneously considering both household and aggregate experiences, facilitating a comparison between these two types of experiences.; iii) exploring potential variations in behavior across the income distribution. For this purpose we utilise a uniquely rich dataset, the DNB Household Survey, collecting detailed information on the distribution of household income expectations for a longitudinal sample of Dutch individuals.

Our findings indicate that household income shocks play a more relevant role in shaping expectations compared to aggregate conditions. We find that both positive and negative household income shocks, particularly relatively large ones, prompt a revision in income expectations. This reassessment is consistent with an extrapolative behaviour: Individuals experiencing a positive income shock revise their expectations upward, while they revise income expectations downwards when hit by negative shocks. The impact of revision in expected income may be amplified or weakened by the perception of income uncertainty. Our results illustrate a significant impact of experienced income shocks, particularly positive shocks, to raise perceived income risk. Comparing income expectations and their future realizations we find that, on average, respondents reduce the size of the expectation error following positive income shocks, suggesting the appropriateness of the extrapolative behaviour. Conversely, negative shocks prompt both an enhancement in accuracy and an increase in underforecasting.

On a further exercise, we detect heterogeneity across the income distribution, positive income shocks being more relevant at the bottom of the distribution and negative shocks playing a major role at the top. At the bottom, perceived uncertainty is significantly affected by neither income shocks nor aggregate conditions, potentially due to the role of welfare benefits. In the middle of the distribution, positive income shocks significantly raise perceived income risk, potentially mitigating the consumption response to such positive shocks. In the top-income group, perceived uncertainty remains unaffected by income shocks, but marginally increases with aggregate conditions. The expectations revision triggers both an improvement in accuracy, especially for positive income shocks and at the bottom of the income distribution, and an increase in the size of the expectation error, particularly for negative shocks and top-income respondents This suggests that the diagnostic expectation mechanism proposed by Bordalo et al. (2018, 2019) is particularly relevant for negative income shocks and high-income respondents. On the whole, this heterogeneity may stem from different income process across the distribution or different degrees of awareness regarding the impact on household conditions of income shocks and aggregate conditions.

Finally, we offer preliminary insights into how savings reflect income shocks and expectation revision. Despite data limitations, our mediation analysis is in line with theoretical predictions from saving models. We find an overall increase in savings attributed to the di-

rect effect of positive income shocks, weakened by the indirect negative impact of upward revisions in expectations.

The rest of the paper is organised as follows. Section 2 reviews the related literature. Section 3 illustrates the data. Empirical methods and results are discussed in Section 4 and Section 5 concludes. Finally, a separate appendix reports additional details.

2. Literature review

By analysing the effect of household income shocks and macroeconomic conditions on individual income expectations, this paper contributes to the literature focusing on the effect of experiences on economic outcomes. These studies consider either the role of *macroeconomic conditions* experienced during the life-cycle and in the recent past (Kuchler and Zafar, 2019; Malmendier and Nagel, 2016) or the role of *personal experience and individual events* (Bucciol and Miniaci, 2018; Bucciol and Zarri, 2015; Cocco et al., 2022; Rozsypal and Schlafmann, 2023).

The first group of studies examine whether people living through different macroeconomic histories differ in their expectations, attitudes and behaviour. Risk attitudes, expectations and portfolio composition are influenced by experiences of low stock market returns and economic depression (Angelini and Ferrari, 2021; Guiso et al., 2018; Malmendier and Nagel, 2011) and high inflation (Malmendier and Nagel, 2016; Malmendier and Wellsjo, 2023; Malmendier and Botsch, 2020). These studies provide evidence that aggregate experience affects economic expectations, with a primary focus on expectations of macroeconomic variables, such as inflation or stock market trends. We add to this recent literature by linking individual experience with expectations of individual outcomes, namely future household income. In doing this, we also hinge on Roth and Wohlfart (2020), who show how individuals' macroeconomic expectations affect their personal economic prospects.

Personal events have also been shown to have a relevant impact on individual attitudes, behaviour and expectations. For instance, personal experience with portfolio risks and returns (Bucciol and Miniaci, 2018; Kautsia and Knupfer, 2008), life-course negative events (Bucciol and Zarri, 2015), and a natural disaster (Hanaoka et al., 2018) influence financial risk propensity and risk-taking. Similarly, the measure of income shocks used in our analysis is individual-specific, as it depends on the gap between individual income expectations and its realization.

Most of these studies examine outcomes related to individual behaviour or attitudes. Notable exceptions are Brown and Taylor (2006), Cocco et al. (2022) and Rozsypal and

Schlafmann (2023), who focus on expectations. Cocco et al. (2022) investigate how a change in households' financial conditions (improvement or deterioration) influences income expectations in the U.K.. Individuals tend to revise their expectations in response to changed financial conditions, consistently with both extrapolative expectations and mean-reversion. Both mean-reversion and extrapolation are excessive relative to future income realizations. Cocco et al. (2022) are the first to delve into how income shocks impact perceived uncertainty. A negative income shock triggers higher dispersion in expectations, driven by increased polarization, encompassing both extrapolative behaviour and mean reversion. Brown and Taylor (2006) rely on the same U.K. dataset to investigate the determinants of individual financial expectations. Their results suggests that financial expectations are influenced by both life-cycle and the business cycle. Compared to these two studies, our paper has the advantage of estimating the effect of shocks, measured as the deviation of income realizations from their expectations, rather than focusing on changes in financial conditions, either unexpected or predicted. Moreover, instead of categorically assessing whether respondents expect an improvement or a deterioration in their financial conditions, our study precisely measures expectations revisions, including upper and lower boundaries, expectation errors, and income uncertainty. Rozsypal and Schlafmann (2023) examine errors in income expectations. They show that the observed patterns in expectation errors are consistent with forward-looking expectations when individuals overestimate the persistence of the income process. This *overpersistence bias* lets people overreact to income shocks and is consistent with the positive correlation between expectation error and income that they document for the U.S..

The theoretical framework underpinning this analysis builds on the cognitive processes that drive expectation formations. Bordalo et al. (2018, 2019) and Gennaioli and Shleifer (2010) elaborate a model of *diagnostic expectations*, where expectations overweight future outcomes that become more likely in light of current news. This suggests that individuals tend to overestimate the probability of a positive future state when the current news is favourable and vice versa in the case of negative news. In our specific context, this implies a link between current income shocks and the revision of expectations and expectation error.[1] Diagnostic expectations embed extrapolation. However, unlike mechanical extrapolation based on adaptive expectations, diagnostic expectations are forward-looking. Distortions arise when news provides informative insights into future events. A critical aspect of our analysis is the inclusion of a measure of income shocks, not just income changes. This is crucial as shocks represent an update to an individual's information set, providing a more nuanced understanding of the cognitive processes involved.

[1]Similarly, the overpersistence bias illustrated by Rozsypal and Schlafmann (2023) predict a correlation between the forecast error and the income quantile, reflecting the history of past income shocks.

Finally, one may worry about the accuracy of expectations elicited through survey questions. Starting from the seminal paper by Manski (2004), a growing literature rely on subjective probabilities to elicit individual expectations (see, for instance, Dominitz and Manski, 2004; Hurd et al., 2011). Moreover, empirical studies show a significant role of expectations in individual and household choices in several domains, such as consumption (Brown and Taylor, 2006; Kovacs et al., 2021), mortgage choices (Brown et al., 2008), investment decisions (Armona et al., 2019), human capital investments (Patnaik et al., 2022) and firm's profits (Massenot and Pettinicchi, 2018).

3. Data

We use data from the DNB Household Survey (DHS), a longitudinal annual survey representing the Dutch-speaking population. The survey collects, among others, information on income, income expectations, and socio-economic characteristics. We focus on the 2008-2018 period (11 waves) as this ensures consistency in the wording of questions related to income expectations. In particular we exclude successive waves, where changes in the probabilities elicitation method limit information on income expectations.

Our sample is restricted to household heads aged 26-80, observed at least twice, to exploit the panel dimension of the dataset. In the baseline sample, respondents without a precise household income value or providing inconsistent answers on income realization probabilities are excluded.[2] The final dataset includes 3,767 observations from 1,064 respondents (on average, 3.54 observations per respondent).

3.1. Income expectations, expectation uncertainty and errors

The outcomes of the analysis relate to distinct aspects of income expectations, encompassing expected income level, expectation uncertainty, and expectation error. Both observed and expected incomes refer to the total net annual income of the household. Details on the derivation of the dependent variables are available in Appendix A. To enhance comparability, we transform each income measure (whether observed or expected) using an inverse hyperbolic sine function.

Our first outcome of interest is the mean expected household income for the upcoming year (variable *Exp. inc.*). Expected income variations may arise from adjustments in the

[2]Selection bias based on consistent answers to income realization probabilities is further discussed in Appendix B. In the same appendix, we assess robustness in two alternative samples: i) including partners alongside heads of households and ii) incorporating respondents reporting income bands for household income in addition to respondents reporting precise income values.

income distribution's top and/or bottom spectrum. To assess these channels' significance, we also explore the lower and upper expectation boundaries, respectively denoted as variables *LB* and *UB*. Figure 1 illustrates the average values of observed and expected incomes over the years, and the area between lower and upper expectation boundaries. Observed and expected incomes generally exhibit parallel movements, with expected income falling slightly behind observed income from 2012 to 2015. The average gap between lower and upper expectation boundaries fluctuates across the sample period, peaking during the Sovereign Debt Crisis (2012-13).

FIGURE 1 ABOUT HERE

To examine expectation uncertainty, we use two outcome variables: the difference between upper and lower boundaries of expectations (variable *UB-LB*) and the standard deviation of income expectations (variable *SD exp.*).

Finally, we investigate whether the revision in expectations results from updating new relevant information or is driven by an overreaction to income shocks and macroeconomic conditions. To explore this, we consider the expectation error (variable *Exp. err.*) and its absolute value (variable *Exp. err. (abs)*). Expectation error at time t is defined as the difference between income observed at time $t+1$ and the income expectation made at time t: $Exp.\ err_t = y_{t+1} - E_t[y_{t+1}]$, where y is household income. A positive expectation error characterizes a situation where the respondent underforecasts their income (i.e., observed income is higher than its expectation in the previous period). Conversely, a negative expectation error indicates overforecasting (i.e., observed income is lower than income expectation). A positive marginal effect on the expectation error denotes an increase in the difference between future income realization and its expected value. This effect can be driven by either an increase in underforecasting (i.e., a rise in the size of the expectation error when positive) or a decrease in overforecasting (i.e., a fall in the size of the expectation error when negative). Examining the absolute value of the expectation error provides information on its size. Therefore, a positive marginal effect on the absolute value of the expectation error indicates an increase in the distance between income expectations and its realization (no matter the direction).

Observed and expected income measures are comparable and refer to the total net income of the household. Kovacs et al. (2021) illustrate that labour income is the primary source of total household income in the DHS dataset. We exploit job related expectations collected by DHS to examine their link with income expectations. These findings, reported in Appendix C, support the primary role of labour income in shaping household income expectations.

3.2. Income shocks and aggregate conditions

Turning to the income shock variables, we define a shock as the difference between income realization and its expectation from the previous year ($shock_t = y_t - E_{t-1}[y_t]$). These shocks are categorized into positive and negative errors based on whether the difference between observed and expected income is greater or smaller than zero. Figure A.1 illustrates the dynamics of shocks over the analysis period. On average, shocks are negative during the Sovereign Debt Crisis (2012-13) and fluctuate around zero in subsequent years. The negative average is primarily driven by relatively large negative shocks until 2012. To ease interpretation, we use the absolute value of (inverse hyperbolic sine of) negative shocks as a regressor (variable *Negative shock (abs.)*).[3] One further variable we consider for personal experience is a dummy equal to one if the respondent is unemployed (variable *Unemployed*).

Aggregate conditions are measured along two dimensions. Economic policy uncertainty (EPU) is proxied by the index for the Netherlands developed by Kroese and Parlevliet (2015). It measures domestic policy uncertainty based on frequency counts of articles in leading Dutch newspapers. To ease the interpretation of the results, and consistently with the income measures, we use the inverse hyperbolic sine transformation of the monthly value of the EPU index (variable *Uncertainty in NL*). We employ the percentage Dutch unemployment rate from the Federal Reserve Economic Data (FRED) to measure labour market conditions (variable *Unempl. rate*); we use the average value over the 3 months before the interview. To enhance precision, each DHS observation is associated with a specific value based on the month and year of the interview. Therefore, not only do the variables change over the years, but they also vary within the same year, depending on the interview date. Figure A.2 depicts the dynamics of the EPU index and the unemployment rate over the sample period. Notably, the trend shows that policy uncertainty does not necessarily reflect labour market conditions, and the dynamics of the two indices can diverge.

3.3. Further variables and summary statistics

Control variables include information on age, living arrangement (with or without a partner and children), employment status (working, retired, or unemployed), and homeownership. Further time-invariant control variables (e.g., gender, education) are absorbed in the fixed effects of the regression models. Descriptive statistics of the sample are reported in Table 1. The average respondent is 60 years old, resides with a partner but

[3] In the regressions, the variable *Positive shock* (*Negative shock (abs.)*) reports the size of the shock when it is positive (negative) and is otherwise set to zero.

no children, and owns a home. On average, expected income is higher than the income realization. This gives rise to an average negative expectation error.

TABLE 1 ABOUT HERE

4. Analysis

We study the link between income expectations, expectation uncertainty and expectation error with income shocks and aggregate conditions. For this purpose, we estimate Equation (1) for individual i in year t,

$$y_{it} = \beta_0 + \beta_1 s_{it} + \beta_2 a_{it} + \beta_3 c_{it} + \phi_i + \varepsilon_{it} \tag{1}$$

where $(\beta_0, \beta_1, \beta_2, \beta_3)$ are the parameters to estimate, ϕ_i is the individual fixed effect and ε_{it} the idiosyncratic error term. The dependent variables y_{it} are seven and include, alternatively, different dimensions of income expectations: expected income level, expectation uncertainty and error. Income shocks s_{it} include positive and negative income shocks together with a dummy for being unemployed, while aggregate conditions a_{it} include economic policy uncertainty and the unemployment rate in the Netherlands. These variables are constant across individuals interviewed in the same month and year. Finally, we include a set of time-varying control variables c_{it}. The dependent and explanatory variables in the specification are illustrated in Section 3.

The key explanatory variables are already determined at the time of the interview (income shocks) or they are outside of individual control (aggregate conditions). This makes us believe there should be no endogeneity problems due to reverse causality with the specification. Moreover, we exploit the longitudinal dimension of the dataset and estimate the model with fixed-effect regressions. This method, which makes use of the within-individual variability to identify coefficients, is robust to the omission from the specification of time-invariant variables that in principle could affect interpretation of questions or income expectations (e.g., pessimistic or optimistic attitudes). However, we are aware that time-varying omitted variables could still be present (e.g., mood at the time of the interview) and have an impact on the answers, this way generating inconsistent estimates of the coefficients. A test developed by Oster (2019) suggests that omitted variables should not alter our main findings; see Appendix C.

For each dependent variable, standard statistical tests find the fixed-effect model to describe the data better than the pooled model (without individual fixed effects) and

random-effect model (where individual effects are absorbed in the error term); results are available upon request. In what follows, we adopt the convention to comment on coefficients significant at least at the 5% level.

4.1. Benchmark results

Table 2 outlines the results of the benchmark analysis. In general, household income shocks play a more relevant role compared to aggregate conditions, which only marginally affects income expectations. Column 1 shows that both positive and negative income shocks affect income expectations, with positive shocks raising them and negative shocks reducing them, consistent with extrapolative behavior, as in Cocco et al. (2022). The effects of these shocks are comparable: A 10% increase in the size of the income shock results in a by 3.5-3.8% revision in expected income, showing that more than one third of income shocks are perceived to be persistent.

These revisions impact the entire distribution of expectations, as shown in columns 2 and 3. Positive shocks increase both the minimum and maximum expected income, and negative shocks decrease both bounds. However, there's a notable difference in the effects of positive and negative shocks on the upper and lower bounds of expectations, with positive shocks having a greater impact on the upper bound and negative shocks on the lower bound.

Along with income expectations, income shocks affect the perception of income uncertainty, crucial for saving and consumption decisions. Positive shocks increase uncertainty, widening the spread between upper and lower bounds (Column 4) and raising the standard deviation of expectations (Column 5).[4] Negative shocks have a weaker or insignificant effect on uncertainty. Focusing on aggregate conditions, the unemployment significantly increases uncertainty, but its effect is small, consistent with firms uncertainty measures (Easaw and Grimme, 2024). Hence, an increase of 1 percentage point in the unemployment rate results in an increase in the standard deviation by 0.2%.

We assess if expectation revisions correspond to actual income realization or if respondents overreact to income shocks by examining expectation errors (Column 6) and their magnitude (Column 7). Expectation errors are unbiased, as indicated by the non-significant constant in Column 6. Income shocks significantly alter expectation errors, with negative shocks having nearly double the impact. Specifically, a 10% increase in positive shocks reduces errors by 3.1%, while the same increase in negative shocks increases errors by 6%. The reduction in the expectation error following an increase in the

[4]Columns 2 and 3 show that the upper bound of income expectations increases by more than the lower bound, leading to an overall growth in dispersion.

positive shock (Column 6) indicates either an increase in overforecasting or a reduction in underforecasting. In Column 7, the negative and statistically significant impact of a positive shock on the absolute value of the expectation error indicates an average reduction in its size. Therefore, the weakening of underforecast is the predominant channel. On average, negative shocks increases expectation errors (Column 6), but do not significantly affect the size of the expectation error (Column 7), likely due to their triggering both mechanisms: decreasing overforecasting and increasing underforecasting. These findings partly confirm "diagnostic expectations" in Bordalo et al. (2019, 2018) and the "overpersistence bias" in Rozsypal and Schlafmann (2023). While, on average, respondents tend to reduce the size of the expectation error following positive income shocks, a relevant number of respondents overreact to negative shocks and increase underforecasting.

From a broader perspective, the findings in Table 2 suggest that expectations and their errors are related mainly to income shocks and only marginally to aggregate conditions. Both positive and negative shocks alter expectation levels following an extrapolative behaviour, with more than one third of both shocks being perceived as persistent. However, positive shocks are followed by an increased accuracy in expectations, shown by an average reduction in the magnitude of the expectation error. On the contrary, negative income shocks drive both a decrease in overforecasting and an increase in underforecasting. Finally, only positive shocks correlate with income risk. Specifically, positive shocks are associated not only to higher expectations but also to higher expectation uncertainty. The analysis on the heterogeneity across the income distribution illustrated in Section Section 4.2 will provide further insights into these results.

In Appendix B we report results from robustness checks on alternative samples. In particular, we enlarge the sample and include partners and respondents reporting income bands for household income. Our results are also robust to omitted variables according to the Oster (2019) test; see Appendix Table C.1.

TABLE 2 ABOUT HERE

The response of income expectations to income shocks may depend on the shock size. A relatively small deviation of income realizations from their expected value might not be salient and prompt individuals to revise their future expectations. Conversely, individuals might overreact only to relatively large deviations from their expectations. The magnitude of income shocks may make them more representative about future income and, thus, trigger a response in terms of expectations revisions. To investigate heterogeneity based on the size of income shocks, we identify "large" shocks, separately for positive and negative shocks, defined as shocks larger than the median.[5] We augment the baseline

[5]Similar findings are obtained using alternative thresholds, available upon request.

regression in Equation (1) by adding one dummy variable for positive shocks[6], alone and together with two dummy variables for large negative and positive shocks and their interaction with the shock. This way, the marginal effect of shocks can differ for large/small and positive/negative shocks. A graphical representation of the marginal effect of the four types of shocks on the outcome variables is plotted in Figure 2, with the estimated coefficients reported in Appendix Table C.3. As a general result, individuals significantly revise their expectations across all dimensions considered in response to large shocks only. The marginal effects of shocks smaller than the median are, instead, never statistically significant.

FIGURE 2 ABOUT HERE

4.2. Results by income group

Income expectations' responses to income shocks and the aggregate conditions may vary across the income distribution, due to factors like different income processes and the role of public (unemployment) insurance. Moreover, the welfare consequences of expectations revision, particularly expectation error and income uncertainty, may be more severe when income is lower, possibly due to limited financial buffers. Analysing heterogeneity across the income distribution may help to understand the drivers of results in Table 2 and to gauge their consequences. We explore these potential differences by examining how baseline results vary across income subgroups using average household income during the observed period.[7]

The three panels in Table 3 outline the key estimate results of the bottom-, middle- and top-income groups, respectively, with the full set of estimated coefficients shown in Appendix D. We detect significant heterogeneity. The effect of positive income shocks on income expectations (Columns 1-3) and expectation errors (Columns 6-7) is mainly driven by the bottom 66% of the income distribution (Panels A and B), with a significant marginal effect of positive income shocks only for these two groups. Conversely, in the top income group (Panel C), revisions in the expected income, lower bound and upper bound are primarily driven by negative shocks, with a magnitude more than double with respect to the bottom and middle income groups.

The determinants of perceived uncertainty (Columns 4-5) also exhibit heterogeneity across the income distribution. At the bottom, perceived uncertainty is not significantly affected by either income shocks or aggregate conditions, possibly due to the role of public

[6]The robustness of the baseline results to the inclusion of this variable are shown in Table C.2.

[7]This measure ensures constant groups and avoids allocating families differently in exceptional years with large income shocks. The average income in the 3 groups is 18,000, 32,000 and 53,000 euros.

transfers and unemployment benefits in reducing uncertainty of low-income respondents. Positive income shocks is the primary factor influencing perceived income risk for middle-income respondents. They upwardly revise expectations about future income across the entire spectrum, but the increase in the upper bound surpasses the lower bound, leading to increased dispersion and potentially mitigating consumption response to positive shocks.

Expectations' dispersion in the top-income group is not significantly driven by income shocks but rather respond to aggregate conditions, although their impact is relatively small. Top-income respondents, often in managerial positions and more exposed to the stock market, are more affected by business cycles and macroeconomic dynamics. This aligns with findings in Roth and Wohlfart (2020), suggesting that those highly exposed to aggregate risk are more likely to update personal expectations in response to aggregate conditions. Heterogeneity across income groups may also stem from differences in inattentiveness and to the assessment of the aggregate conditions which, in turn, affect expectations. This may emerge at three different stages of expectation formation (Fuster et al., 2022): information selection, information acquisition and information processing. As shown in Appendix Table D.1, income is positively associated with education, financial literacy and the propensity to consult sources for financial decisions, which may reduce the cost of information acquisition and processing.[8]

Shocks exert different effects on expectation errors within the three subgroups. For the bottom and middle income groups, the reduction in expectation error determined by positive shocks (Column 6) is mainly driven by weakening of underforecast, as shown by the negative coefficient in Column 7. Negative shocks, instead, trigger both a decreasing overforecasting and an increasing underforecasting. In contrast, the top-income group experiences a significant increase in the size of the expectation error following a negative income shock, indicating an average increase in underforecasting of income in this group. Overall, our results suggest that after a positive income shock respondents tend either not to revise their expectations or to improve their accuracy. However, a significant number of respondents overreact to negative income shocks, excessively revising downward their expectations, particularly at the top of the income distribution. This suggests that the diagnostic expectation mechanism proposed by Bordalo et al. (2018, 2019) is particularly relevant for high-income respondents.

TABLE 3 ABOUT HERE

[8]This parallels with Easaw and Grimme (2024), where top executives are aware of aggregate uncertainty's impact on firms, likely extending to household income matters.

4.3. Expectations and saving

We analyse the link between income shocks and household savings using data on whether respondents save and the amount of savings, collected in brackets in DHS dataset (details on these variables in Appendix D). However, due to the bracketed format, caution is needed in interpreting these results. We conduct a mediation analysis to differentiate between the direct and the indirect effects of income shocks on savings, mediated by the revision in expectations and income uncertainty. Results, reported in Table D.5, are in line with predictions from the consumption and savings models. Positive shocks significantly affect savings.[9] Positive income shocks increase both the extensive and intensive margins of savings, mainly through a direct effect. This is consistent with the consumption smoothing over the life-cycle, where only a portion of the income shock is consumed, resulting in an overall increase in household savings. The indirect effect, mediated by revision in income expectations and uncertainty, is instead negative, showing that the revision in expectations is the dominant channel.[10]

5. Conclusions

In this paper we study how income shocks and aggregate conditions affect income expectations, their uncertainty and the expectation errors. Our analysis is based on a large Dutch longitudinal dataset collecting detailed information on the distribution of household income expectations. We find that income shocks, particularly large ones, are relevant to shape income expectations, their uncertainty and accuracy. Aggregate economic conditions play, instead, only a marginal role. Positive shocks increase income expectations and negative shocks reduce them, with more than one third of the shocks perceived as persistent. This expectation revision is in line with an extrapolative behaviour and affects the entire expectations distribution, including lower and upper bounds. Positive shocks only impact low and middle income respondents, while negative shocks have a larger effect at the top. Positive shocks also rise expectation uncertainty, particularly for middle income respondents. The expectations revision triggers both an improvement in accuracy, especially for positive income shocks and at the bottom of the income distribution, and an increase in the size of the expectation error, particularly for negative shocks and top-income respondents. We also provide some evidence confirming that the impact of income shocks and expectations is in line with the literature on savings.

[9] The insignificant effect of negative shocks may reflect the noisy measure for savings in the dataset.

[10] Given that positive income shocks are associated with increased income uncertainty (Table 2), we would expect the precautionary saving motive to increase savings.

Understanding the expectation formation process sheds light on the implications of individual and macroeconomic events and helps evaluate the impact of policy interventions. Our results have relevant implications on individuals' welfare. They indicate that respondents revise downward (upward) their optimal income expectations when hit by a negative (positive) income shock. According to the baseline predictions from the permanent income hypothesis, this determines a change in consumption. If the shocks are accompanied by an over-reaction of income expectations, consumers make a sub-optimal consumption, which is lower (higher) than its optimum after negative (positive) shocks. Our results show that over-reaction to positive income shocks is limited and that the relevance of underforecasts following a negative income shocks is increasing with income groups. Welfare consequences of suboptimal consumption plans due to expectation errors is less severe for the top income group, characterised by lower marginal utility of consumption and possibly endowed with larger buffer stocks. Thus, the ex-ante consumption pattern is closer to the optimal one in the group where consequences of sub-optimality are most pronounced.

From a broader perspective, the evidence on extrapolative behaviour and the degree of overreaction of expectations to income shocks contributes to understand the impact of policy interventions, such as fiscal or labour market policies, and their distributional effects. Additionally, they aid in comprehending household choices over the business cycle. Moreover, the evidence of limited responsiveness of household income expectations to aggregate conditions, beyond their individual circumstances, raises concerns regarding the accurate assessment of future scenarios related to the business cycle. Failure to adequately consider these factors may have detrimental consequences for consumers, particularly in recession periods.

Our empirical study has certain limitations, that also present opportunities for future research. We attribute the heterogeneity across the income distribution mainly to differences in the earning process, notably income uncertainty. However, income, education, financial knowledge and portfolio composition are intertwined. Consequently, isolating the specific role of each factor warrants further investigation. Moreover, although we observe the correlation between shocks and expectations, we do not explore the specific channels through which this connection operates. For example, psychological characteristics such as personality traits, or past experiences such as encountering recessions during one's life cycle, could influence how individuals perceive shocks. The analysis of underlying mechanisms is left for future research.

References

Angelini, V. and I. Ferrari (2021). The long-term effects of experienced macroeconomic shocks on wealth. Working Papers 2021:23, Department of Economics, University of Venice "Ca' Foscari".

Armona, L., A. Fuster, and B. Zafar (2019). Home price expectations and behaviour: Evidence from a randomized information experiment. *The Review of Economic Studies 86*(4 (309)), pp. 1371–1410.

Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica 77*(3), 623–685.

Bordalo, P., N. Gennaioli, R. La Porta, and A. Shleifer (2019). Diagnostic expectations and stock returns. *The Journal of Finance 74*(6), 2839–2874.

Bordalo, P., N. Gennaioli, and A. Shleifer (2018). Diagnostic expectations and credit cycles. *Journal of Finance 73*(1), 199–227.

Brown, S., G. Garino, and K. Taylor (2008). Mortgages and financial expectations: A household-level analysis. *Southern Economic Journal 74*(3), 857–878.

Brown, S. and K. Taylor (2006). Financial expectations, consumption and saving: A microeconomic analysis. *Fiscal Studies 27*(3), 313–338.

Bucciol, A. and R. Miniaci (2018). Financial risk propensity, business cycles and perceived risk exposure. *Oxford Bulletin of Economics and Statistics 80*(1), 160–183.

Bucciol, A. and L. Zarri (2015). The shadow of the past: Financial risk taking and negative life events. *Journal of Economic Psychology 48*, 1–16.

Cocco, J., F. Gomes, and P. Lopes-Cocco (2022). Evidence on expectations of household finances. CEPR discussion paper 17447, Center for Economic Policy Research.

Coibion, O., Y. Gorodnichenko, and M. Weber (2021). Fiscal policy and households' inflation expectations: Evidence from a randomized control trial. NBER working paper 28485, National Bureau of Economic Research.

Dominitz, J. and C. F. Manski (2004). How should we measure consumer confidence? *Journal of Economic Perspectives 18*(2), 51–66.

Easaw, J. and C. Grimme (2024). The relationship between aggregate uncertainty and firm-level uncertainty. *Oxford Economic Papers*.

Fuster, A., R. Perez-Truglia, M. Wiederholt, and B. Zafar (2022). Expectations with endogenous information acquisition: An experimental investigation. *The Review of Economics and Statistics 104*(5), 1059–1078.

Gennaioli, N. and A. Shleifer (2010). What comes to mind. *The Quarterly Journal of Economics 125*(4), 1399–1433.

Guiso, L., P. Sapienza, and L. Zingales (2018). Time varying risk aversion. *Journal of Financial Economics 128*(3), 403–421.

Hanaoka, C., H. Shigeoka, and Y. Watanabe (2018, April). Do risk preferences change? evidence from the Great East Japan Earthquake. *American Economic Journal: Applied Economics 10*(2), 298–330.

Hurd, M., M. Van Rooij, and J. Winter (2011). Stock market expectations of Dutch households. *Journal of Applied Econometrics 26*(3), 416–436.

Kautsia, M. and S. Knupfer (2008). Do investors overweight personal experience? evidence from ipo subscriptions. *The Journal of Finance 63*(6), 2679–2702.

Kovacs, A., C. Rondinelli, and S. Trucchi (2021). Permanent versus transitory income shocks over the business cycle. *European Economic Review 139*(103873), 1–19.

Kroese, L., S. K. and J. Parlevliet (2015). Beleidsonzekerheid in Nederland". No. 4715, Economisch Statistische Berichten.

Kuchler, T. and B. Zafar (2019). Personal experiences and expectations about aggregate outcomes. *The Journal of Finance 74*(5), 2491–2542.

Malmendier, U. and S. Nagel (2011). Depression babies: Do macroeconomic experiences affect risk taking? *Quarterly Journal of Economics 126*(1), 373–416.

Malmendier, U. and S. Nagel (2016). Learning from inflation experiences. *Quarterly Journal of Economics 131*(1), 53–87.

Malmendier, U. and S. Wellsjo (2023). Rent or buy? inflation experiences and homeownership within and across countries. *Journal of Finance forthcoming*.

Malmendier, U. M. and M. J. Botsch (2020). The long shadows of the great inflation: Evidence from residential mortgages. CEPR Discussion Papers 14934, C.E.P.R. Discussion Papers.

Manski, C. F. (2004). Measuring expectations. *Econometrica 72*(5), 1329–1376.

Massenot, B. and Y. Pettinicchi (2018). Can firms see into the future? survey evidence from germany. *Journal of Economic Behavior & Organization 145*, 66–79.

Oster, E. (2019). Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics 37*(2), 187–204.

Patnaik, A., J. Venator, M. Wiswall, and B. Zafar (2022). The role of heterogeneous risk preferences, discount rates, and earnings expectations in college major choice. *Journal of Econometrics 231*(1), 98–122.

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

Rozsypal, F. and K. Schlafmann (2023). Overpersistence bias in individual income expectations and its aggregate implications. *American Economic Journal: Macroeconomics 15*(4), 331–71.

Table 1: Summary statistics

Variable	Mean	Std. Dev.
Income variables		
Expected income	10.896	1.159
Lower bound exp. inc. (LB)	10.749	1.367
Upper bound exp. inc. (UB)	10.95	1.169
Upper - Lower bound (UB-LB)	.201	.831
SD expected income	.031	.056
Expectation error	-.039	1.291
Expectation error (abs.)	.503	1.19
Key explanatory variables		
Positive shock	.165	.4
Negative shock (abs.)	.173	.428
Unemployed	.025	.158
Uncertainty in NL	4.99	.612
Unempl. rate	5.604	1.267
Control variables		
Age	59.93	12.17
Partner in the hh	.684	.465
Children in the hh	.208	.406
Working	.455	.498
Retired	.421	.494
Homeowner	.779	.415
Observations	3,767	

Table 2: Benchmark analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	0.351***	0.277***	0.362***	0.085**	0.008***	-0.308***	-0.256***
	(0.048)	(0.057)	(0.049)	(0.038)	(0.002)	(0.066)	(0.058)
Negative shock (abs.)	-0.382***	-0.444***	-0.379***	0.065*	0.003	0.598***	0.009
	(0.044)	(0.053)	(0.045)	(0.035)	(0.002)	(0.061)	(0.053)
Unemployed	-0.144	-0.006	-0.154	-0.148	-0.001	0.367	-0.091
	(0.183)	(0.218)	(0.186)	(0.146)	(0.009)	(0.252)	(0.221)
Uncertainty in NL	0.037	0.054	0.031	-0.022	0.001	-0.075	-0.064
	(0.057)	(0.068)	(0.058)	(0.046)	(0.003)	(0.079)	(0.069)
Unempl. rate	-0.024	-0.006	-0.017	-0.011	0.002**	0.031	0.011
	(0.015)	(0.018)	(0.015)	(0.012)	(0.001)	(0.021)	(0.018)
Age	0.027**	0.026*	0.024*	-0.003	-0.001	-0.023	-0.017
	(0.013)	(0.015)	(0.013)	(0.010)	(0.001)	(0.018)	(0.015)
Partner in the hh	0.094	0.129	0.088	-0.041	-0.008	0.198	-0.017
	(0.161)	(0.192)	(0.163)	(0.129)	(0.008)	(0.222)	(0.195)
Children in the hh	-0.019	0.176	-0.044	-0.220**	-0.017***	-0.024	0.229
	(0.115)	(0.137)	(0.117)	(0.092)	(0.006)	(0.159)	(0.139)
Working	0.154	0.252	0.137	-0.115	-0.003	0.254	-0.243
	(0.146)	(0.174)	(0.149)	(0.117)	(0.007)	(0.202)	(0.177)
Retired	-0.067	0.055	-0.089	-0.144	-0.009	0.306	-0.057
	(0.142)	(0.169)	(0.144)	(0.114)	(0.007)	(0.196)	(0.172)
Homeowner	0.259	0.220	0.261	0.040	-0.001	-0.284	-0.135
	(0.195)	(0.232)	(0.197)	(0.155)	(0.010)	(0.268)	(0.235)
Constant	8.945***	8.527***	9.190***	0.663	0.076	1.320	2.030*
	(0.999)	(1.189)	(1.013)	(0.798)	(0.051)	(1.375)	(1.207)
R-squared	0.065	0.047	0.063	0.006	0.013	0.055	0.011
Individuals	1,064	1,064	1,064	1,064	1,064	1,064	1,064
Observations	3,767	3,767	3,767	3,767	3,767	3,767	3,767

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

Table 3: Heterogeneity by income

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
			Panel A - Bottom				
Positive shock	0.563***	0.532***	0.576***	0.044	0.005	-0.429***	-0.335***
	(0.092)	(0.106)	(0.093)	(0.071)	(0.005)	(0.129)	(0.109)
Negative shock (abs.)	-0.211***	-0.311***	-0.210***	0.101*	0.002	0.460***	-0.209**
	(0.075)	(0.088)	(0.077)	(0.058)	(0.004)	(0.106)	(0.089)
Unemployed	-0.175	0.044	-0.260	-0.304	-0.033*	0.527	-0.216
	(0.342)	(0.397)	(0.348)	(0.265)	(0.017)	(0.481)	(0.405)
Uncertainty in NL	-0.023	0.034	-0.035	-0.069	-0.003	-0.170	-0.074
	(0.134)	(0.155)	(0.136)	(0.104)	(0.007)	(0.188)	(0.159)
Unempl. rate	-0.046	-0.028	-0.041	-0.012	0.000	0.047	0.010
	(0.035)	(0.041)	(0.036)	(0.027)	(0.002)	(0.049)	(0.042)
Constant	8.003***	6.867**	8.609***	1.742	0.204*	1.852	5.191*
	(2.383)	(2.765)	(2.425)	(1.844)	(0.121)	(3.350)	(2.824)
R-squared	0.092	0.077	0.091	0.010	0.029	0.058	0.031
Individuals	390	390	390	390	390	390	390
Observations	1,197	1,197	1,197	1,197	1,197	1,197	1,197
			Panel B - Middle				
Positive shock	0.445***	0.234**	0.457***	0.223***	0.015***	-0.510***	-0.388***
	(0.072)	(0.092)	(0.074)	(0.071)	(0.005)	(0.107)	(0.096)
Negative shock (abs.)	-0.311***	-0.344***	-0.303***	0.040	0.006	0.504***	0.087
	(0.069)	(0.087)	(0.070)	(0.068)	(0.004)	(0.101)	(0.091)
Unemployed	-0.043	0.052	0.022	-0.029	0.029*	-0.157	0.130
	(0.237)	(0.303)	(0.243)	(0.234)	(0.015)	(0.350)	(0.314)
Uncertainty in NL	0.074	0.061	0.058	-0.003	-0.007	-0.050	-0.071
	(0.077)	(0.099)	(0.079)	(0.076)	(0.005)	(0.114)	(0.102)
Unempl. rate	-0.033	-0.005	-0.026	-0.022	0.002	0.027	0.041
	(0.021)	(0.026)	(0.021)	(0.020)	(0.001)	(0.031)	(0.027)
Constant	8.801***	8.305***	9.029***	0.724	0.173**	1.689	1.005
	(1.345)	(1.715)	(1.379)	(1.326)	(0.084)	(1.981)	(1.780)
R-squared	0.085	0.042	0.081	0.019	0.027	0.068	0.027
Individuals	343	343	343	343	343	343	343
Observations	1,266	1,266	1,266	1,266	1,266	1,266	1,266
			Panel C - Top				
Positive shock	-0.095	-0.098	-0.085	0.013	0.005	0.096	0.030
	(0.083)	(0.099)	(0.083)	(0.059)	(0.003)	(0.106)	(0.098)
Negative shock (abs.)	-0.896***	-0.866***	-0.893***	-0.027	0.002	1.116***	0.438***
	(0.092)	(0.110)	(0.092)	(0.066)	(0.004)	(0.118)	(0.109)
Unemployed	-0.533	-0.512	-0.535	-0.022	0.003	1.255**	-0.116
	(0.458)	(0.546)	(0.459)	(0.327)	(0.019)	(0.589)	(0.542)
Uncertainty in NL	0.023	0.035	0.030	-0.005	0.009***	-0.000	-0.027
	(0.086)	(0.103)	(0.086)	(0.061)	(0.004)	(0.110)	(0.102)
Unempl. rate	-0.000	0.005	0.007	0.002	0.002**	0.020	-0.010
	(0.023)	(0.027)	(0.023)	(0.016)	(0.001)	(0.030)	(0.027)
Constant	10.745***	11.228***	10.770***	-0.457	-0.115*	-0.563	0.326
	(1.522)	(1.817)	(1.527)	(1.088)	(0.063)	(1.957)	(1.803)
R-squared	0.094	0.064	0.094	0.006	0.048	0.094	0.021
Individuals	331	331	331	331	331	331	331
Observations	1,304	1,304	1,304	1,304	1,304	1,304	1,304

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$. The three panels refer to, respectively, respondents with average income in the bottom, middle and top 33% of the distribution. Descriptive statistics for the bottom- and top-income samples are reported in Appendix Table D.1.

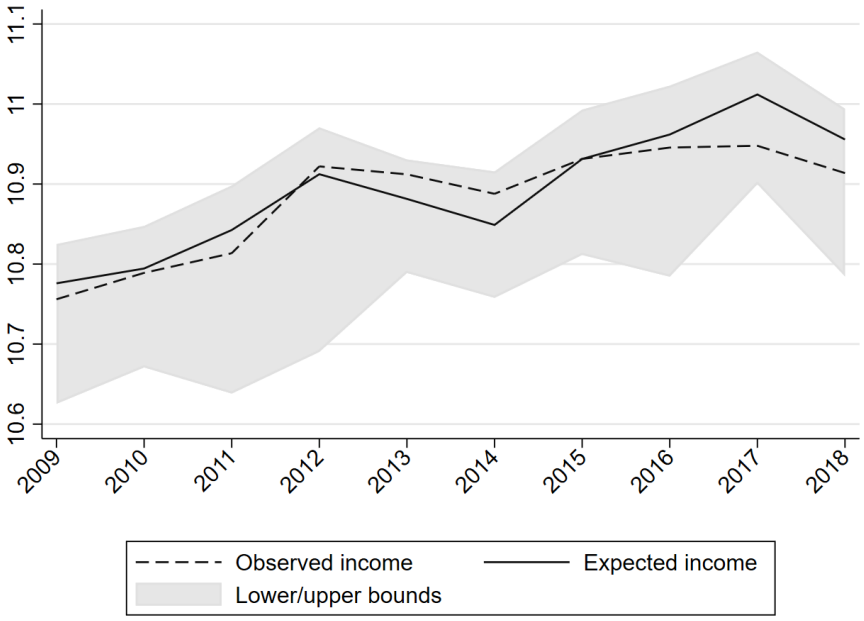

Figure 1: Time pattern of income observations and expectations (ihs, mean values)

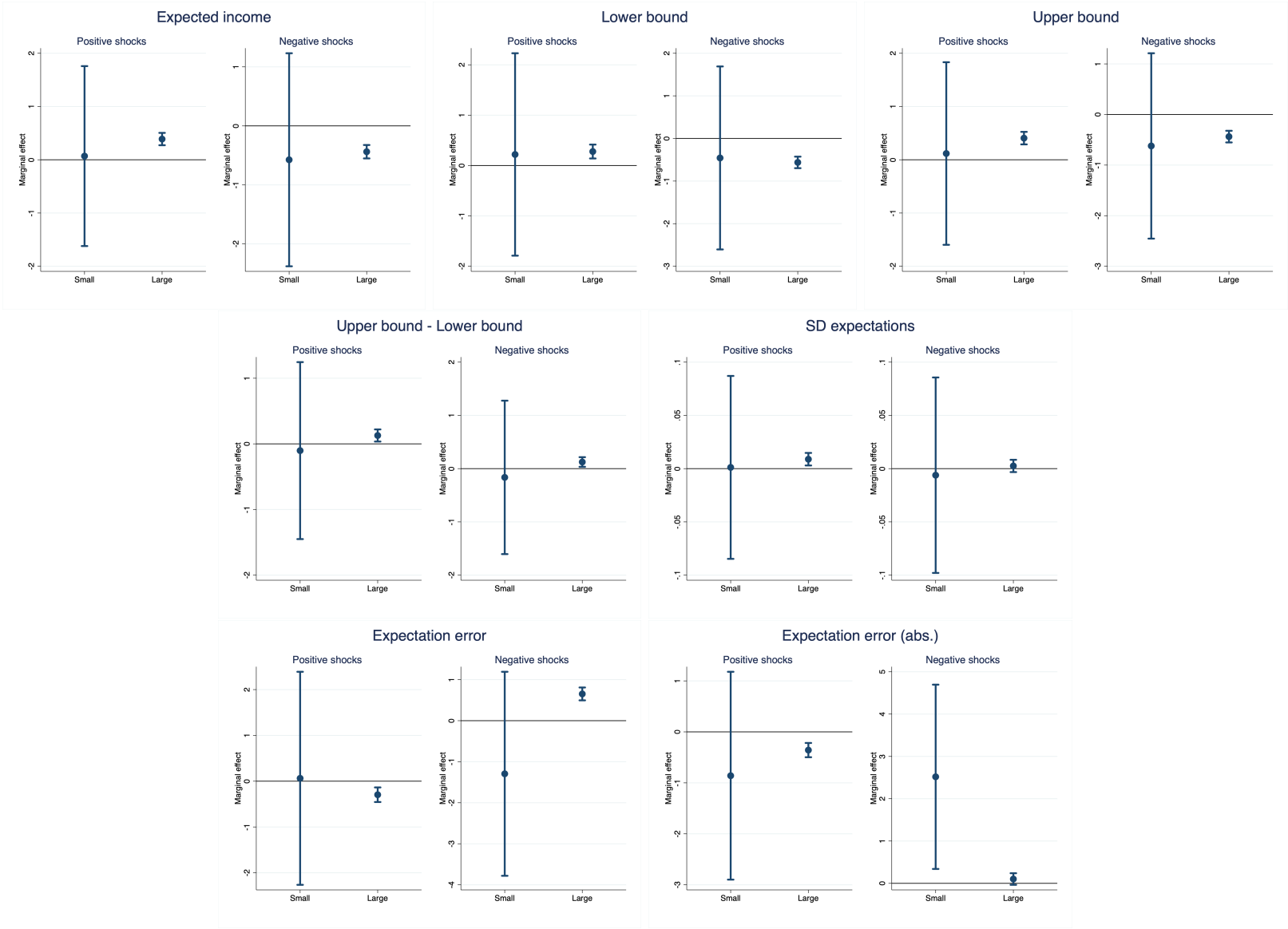

Figure 2: Marginal effects of small and large shocks

Notes: Estimated coefficients and 95% standard errors. Complete estimate results are reported in Table C.3.

A. Appendix: Variable definition

A.1. Dependent variables

Our dependent variables are derived from a set of raw measures available in the DHS questionnaire. Specifically, the building blocks are observed income, minimum and maximum expected income, and probabilities that future income falls below a given level. All the income-related variables are converted using the inverse hyperbolic sine transformation. Observed income is the answer to the question *IN49A*:

"[IN49A] What is the total net income for your household in [year]? The total net income for your household is the net income of all household members combined. Net income means the income after deduction of taxes and social security benefits."

The respondent has to provide an amount in euros. In case the amount is missing, we use information on income brackets in a robustness check reported in Appendix B.[A.1]

Minimum and maximum expected income are retrieved as answers to questions *LAAG* and *HOOG*, respectively:

"We would like to know a little bit more about what you expect will happen to the net income of your household in the next 12 months.
[LAAG] What do you expect to be the lowest total net yearly income your household may realize in the next 12 months?
[HOOG] What do you expect to be the highest total net yearly income your household may realize in the next 12 months?"

The respondent has to provide two amounts for the lowest and highest expected incomes. The lowest and highest expectations are then used to compute the amounts in

[A.1] In particular, we rely on the answer to question *IN50*: *"Please indicate about how much the total net income of your household was over the period 1 January [year] through 31 December [year]."* In this case, possible answers are a set of thresholds ranging from 1 (less than 8,000 euros) to 11 (more than 75,000 euros). For instance, threshold 5 indicates incomes between 13,000 and 16,000 euros. If the answer to IN49A is missing, we use for observed income the intermediate threshold value indicated in IN50. Extreme thresholds are set at their boundaries (i.e. 8,000 euros for threshold 1 and 75,000 euros for threshold 11).

question *PRO1*, *PRO2*, *PRO3* and *PRO4*:

"Below, we will show you a number of amounts that could theoretically be the total net income of your household. Please indicate with each amount what you think is the probability (in percentages (or how many cases out of 100)) that the total net yearly income of your household will be less than this amount in the next 12 months.
*[PRO1] What do you think is the probability (in percent) that the net yearly income of your household will be less than euro [LAAG+((HOOG-LAAG)*2)/10] in the next 12 months?*
*[PRO2] What do you think is the probability (in percent) that the net yearly income of your household will be less than euro [LAAG+((HOOG-LAAG)*4)/10] in the next 12 months?*
*[PRO3] What do you think is the probability (in percent) that the net yearly income of your household will be less than euro [LAAG+((HOOG-LAAG)*6)/10] in the next 12 months?*
*[PRO4] What do you think is the probability (in percent) that the net yearly income of your household will be less than euro [LAAG+((HOOG-LAAG)*8)/10] in the next 12 months?"*

The respondent has to provide four percentages, one for each question. Since the 2019 wave, only *PRO2* is asked. We use the answer to questions *PRO1*, *PRO2*, *PRO3* and *PRO4* together with their associated income amounts to generate percentiles of the expected income distribution.

A.1.1. Income expectations

We derive income expectation (variable *Exp. inc.* in the analysis) as a weighted average using the probabilities *PRO1*, *PRO2*, *PRO3* and *PRO4* and the associated amounts. We otherwise take the simple average between *LAAG* and *HOOG* in case *LAAG* and *HOOG* differ by less than 5 euros. We also focus on the lower and upper bounds of income expectation as an outcome of the analysis. They are, respectively, variables *LB* and *UB* in the analysis.

A.1.2. Expectation uncertainty

We consider two main measures for income uncertainty. The first is the difference between the upper and lower bounds of income expectations (variable *UB-LB* in the analysis). We also create a measure of standard deviation by exploiting the nature of the data. The standard deviation of expected income (variable *SD exp.* in the analysis) is derived from the probabilities and the associated amounts in questions *PRO1-PRO4*. The standard deviation is otherwise set to zero if *LAAG* and *HOOG* differ by less than 5 euros.

A.1.3. Expectation error

We define the expectation error (variable *Exp. err.* in the analysis) as the difference between the income realization reported in year $t+1$ and the income expectation for year $t+1$ reported in year t. We also consider its absolute value (variable *Exp. err. (abs)*) to focus on the magnitude of the expectation error.

A.2. Key regressors: income shocks and aggregate conditions

The key variables of interest in our study are income shocks and indices for aggregate conditions, namely unemployment rate and policy uncertainty. Details on their construction are illustrated in Section 3. Figure Figure A.1 and Figure A.2 plot, respectively, the dynamics of income shocks and aggregate conditions during the sample period of the analysis.

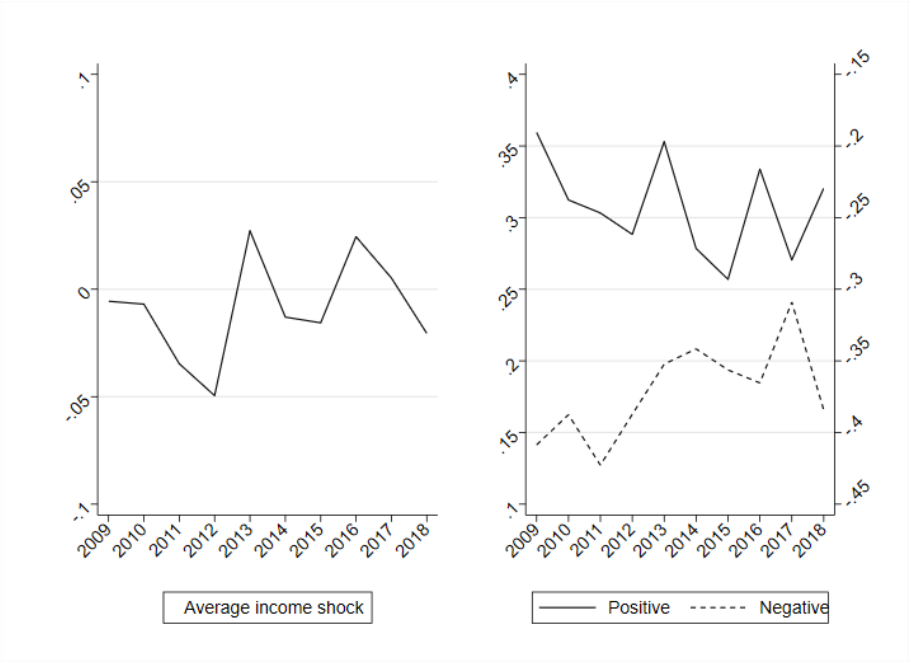

Figure A.1: Time pattern of income shocks

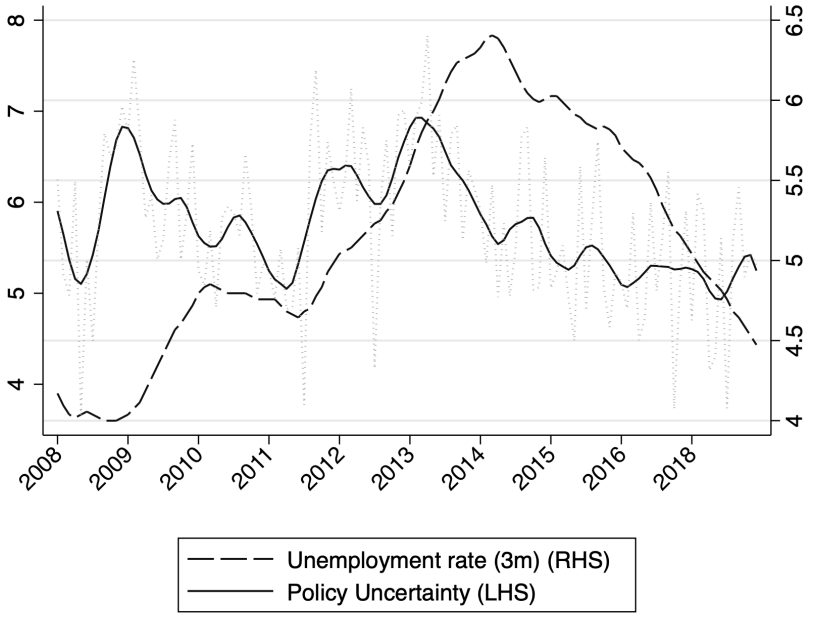

Figure A.2: Time pattern of unemployment rate and macroeconomic uncertainty

Notes: The graph shows the (3-months average) unemployment rate and the Policy Uncertainty Index (monthly values, ihs). For the latter, it plots both the original data points (dotted line) and those obtained by applying a smoothness filter (local OLS regression implemented through the lowess command in Stata; solid line).

B. Appendix: Sample Selection

The baseline sample includes respondents who give "consistent" answers on the probability distribution of expected income, namely those who are either i) certain about their future income (the difference between upper and lower bounds is smaller than 5 euros) or ii) reporting increasing probabilities with expected income thresholds. Hence, 83.18% of respondents give consistent probabilities (or are certain about future income). Even if less than 17% of respondents report inconsistent probabilities, this may raise concerns about the sample selection. To address this issue, we first examine the factors associated with the probability of giving a consistent probability distribution. OLS regression results are reported in Table B.1. We only find a significant correlation with gender and age.

Table B.1: Sample selection: Probability of giving a consistent probability distribution or being certain about future income.

Dep. var.	Consistent answer
Age	0.002**
	(0.001)
Partner in the hh	-0.006
	(0.015)
Children in the hh	0.011
	(0.016)
Working	0.006
	(0.020)
Retired	0.012
	(0.020)
Homeowner	0.010
	(0.014)
Female	0.053***
	(0.016)
Primary	-0.008
	(0.036)
High school	0.026
	(0.035)
Vocational training	0.016
	(0.037)
University	0.032
	(0.037)
Income realization	-0.006
	(0.006)
Financial assets	-0.000
	(0.000)
Year FE	YES
R-squared	0.021
Individuals	1,190
Observations	4,620

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

Second, we select the outcome variables which are not affected by reported probabilities (lower bound, upper bound and their difference), and we run the same regressions shown

in Table 2. Results reported in Table B.2 are consistent with baseline estimate results in Table 2.

Table B.2: Sample also including respondents with inconsistent probabilities - regressions on comparable outcomes.

	(1)	(2)	(3)
Dep. var.	LB	UB	UB-LB
Positive shock	0.260***	0.336***	0.076**
	(0.048)	(0.040)	(0.032)
Negative shock (abs.)	-0.431***	-0.363***	0.068**
	(0.045)	(0.037)	(0.030)
Unemployed	0.057	-0.150	-0.208*
	(0.185)	(0.154)	(0.126)
Uncertainty in NL	0.062	0.044	-0.018
	(0.058)	(0.048)	(0.039)
Unempl. rate	-0.014	-0.018	-0.004
	(0.016)	(0.013)	(0.011)
Age	0.030**	0.026**	-0.004
	(0.013)	(0.011)	(0.009)
Partner in the hh	0.140	0.101	-0.039
	(0.157)	(0.131)	(0.107)
Children in the hh	0.127	-0.032	-0.158**
	(0.118)	(0.099)	(0.080)
Working	0.271*	0.091	-0.180*
	(0.151)	(0.126)	(0.103)
Retired	0.122	-0.061	-0.183*
	(0.144)	(0.120)	(0.098)
Homeowner	0.180	0.223	0.043
	(0.202)	(0.168)	(0.137)
Constant	8.344***	9.054***	0.710
	(1.000)	(0.834)	(0.680)
R-squared	0.048	0.065	0.005
Individuals	1,190	1,190	1,190
Observations	4,620	4,620	4,620

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

Finally, we assess robustness of results in Table 2 in two alternative samples. Table B.3 reports estimate results for the sample that includes partners in addition to heads, while Table B.4 also incorporates respondents reporting income bands for household income in addition to respondents reporting precise income values. Our key results are confirmed in these samples.

Table B.3: Extended sample to include partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	0.320***	0.291***	0.327***	0.036	0.006***	-0.242***	-0.298***
	(0.040)	(0.049)	(0.041)	(0.034)	(0.002)	(0.059)	(0.052)
Negative shock (abs.)	-0.369***	-0.415***	-0.363***	0.052*	0.005**	0.599***	-0.051
	(0.036)	(0.044)	(0.036)	(0.030)	(0.002)	(0.052)	(0.046)
Unemployed	-0.077	0.161	-0.099	-0.259**	-0.011	0.251	-0.057
	(0.151)	(0.187)	(0.154)	(0.128)	(0.009)	(0.221)	(0.195)
Uncertainty in NL	0.020	0.028	0.013	-0.015	0.002	-0.078	-0.036
	(0.046)	(0.057)	(0.047)	(0.039)	(0.003)	(0.068)	(0.060)
Unempl. rate	-0.028**	-0.020	-0.020	-0.001	0.003***	0.028	0.020
	(0.013)	(0.015)	(0.013)	(0.011)	(0.001)	(0.018)	(0.016)
Age	0.022**	0.021	0.019*	-0.002	-0.000	-0.015	-0.018
	(0.011)	(0.013)	(0.011)	(0.009)	(0.001)	(0.015)	(0.014)
Partner in the hh	0.193	0.442***	0.183	-0.259**	-0.011	0.151	-0.056
	(0.139)	(0.171)	(0.141)	(0.118)	(0.008)	(0.203)	(0.179)
Children in the hh	0.079	0.145	0.063	-0.082	-0.009*	-0.004	0.158
	(0.096)	(0.118)	(0.097)	(0.081)	(0.005)	(0.140)	(0.123)
Working	0.149	0.080	0.144	0.064	0.005	0.283*	-0.202
	(0.113)	(0.139)	(0.115)	(0.096)	(0.006)	(0.165)	(0.146)
Retired	-0.048	-0.053	-0.063	-0.009	-0.005	0.342**	-0.084
	(0.111)	(0.136)	(0.112)	(0.094)	(0.006)	(0.162)	(0.142)
Homeowner	0.394**	0.362*	0.384**	0.023	-0.007	-0.421*	-0.137
	(0.154)	(0.189)	(0.156)	(0.130)	(0.009)	(0.224)	(0.198)
Constant	9.204***	8.851***	9.427***	0.576	0.046	0.916	1.963*
	(0.813)	(1.002)	(0.826)	(0.690)	(0.046)	(1.189)	(1.047)
R-squared	0.067	0.049	0.064	0.005	0.016	0.053	0.012
Individuals	1,447	1,447	1,447	1,447	1,447	1,447	1,447
Observations	4,917	4,917	4,917	4,917	4,917	4,917	4,917

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

Table B.4: Extended sample to include income in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	0.281***	0.265***	0.281***	0.016	-0.001	-0.209***	-0.264***
	(0.040)	(0.046)	(0.041)	(0.029)	(0.003)	(0.051)	(0.044)
Negative shock (abs.)	-0.348***	-0.360***	-0.351***	0.009	-0.002	0.549***	-0.007
	(0.046)	(0.053)	(0.047)	(0.033)	(0.004)	(0.057)	(0.049)
Unemployed	0.165	0.067	0.200	0.133	0.037**	0.459*	0.032
	(0.205)	(0.234)	(0.208)	(0.148)	(0.016)	(0.251)	(0.218)
Uncertainty in NL	-0.041	-0.024	-0.044	-0.020	0.002	0.000	-0.065
	(0.058)	(0.066)	(0.058)	(0.041)	(0.005)	(0.072)	(0.062)
Unempl. rate	-0.042***	-0.028	-0.038**	-0.010	0.000	0.044**	0.010
	(0.016)	(0.018)	(0.016)	(0.012)	(0.001)	(0.020)	(0.017)
Age	0.007	0.012	0.004	-0.008	-0.001	0.002	-0.009
	(0.013)	(0.015)	(0.013)	(0.009)	(0.001)	(0.016)	(0.014)
Partner in the hh	0.039	0.017	0.021	0.005	0.002	0.143	-0.077
	(0.159)	(0.182)	(0.162)	(0.115)	(0.012)	(0.197)	(0.171)
Children in the hh	0.140	0.353***	0.107	-0.246***	-0.044***	0.010	0.164
	(0.118)	(0.135)	(0.120)	(0.085)	(0.009)	(0.146)	(0.127)
Working	0.291*	0.345*	0.279*	-0.066	-0.004	0.274	-0.251
	(0.165)	(0.188)	(0.167)	(0.119)	(0.013)	(0.199)	(0.173)
Retired	0.143	0.189	0.132	-0.057	-0.005	0.237	-0.263
	(0.161)	(0.184)	(0.163)	(0.116)	(0.013)	(0.193)	(0.168)
Homeowner	-0.311*	0.283	-0.362*	-0.645***	-0.095***	0.076	0.282
	(0.182)	(0.208)	(0.185)	(0.132)	(0.014)	(0.229)	(0.199)
Constant	10.588***	9.385***	10.866***	1.481**	0.156**	-0.575	1.553
	(0.974)	(1.112)	(0.988)	(0.702)	(0.076)	(1.228)	(1.066)
R-squared	0.028	0.022	0.027	0.007	0.016	0.030	0.010
Individuals	2,114	2,114	2,114	1,779	1,779	2,114	2,114
Observations	7,637	7,637	7,637	6,527	6,527	7,637	7,637

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

C. Appendix: Robustness checks

We use the method developed by Oster (2019) to evaluate the possible degree of omitted variable bias under the assumption that the selection on the observed controls is correlated to the selection on observables. The method in Oster (2019) allows us to address selection bias for one critical variable only. For this reason, we do not distinguish between positive and negative shocks, but we include one single regressor for the inverse hyperbolic sine of the shock.[C.1] Estimate results are reported in Table C.1. Following the parametrization suggested by Oster (2019), we assume that the degree of variation which both observed and unobserved variables can account for is proportional to the variance explained by the covariates.[C.2] The bottom line in Table C.1 reports the degree of selection on unobservables relative to observables (the parameter δ) that would be necessary to explain away the results. The absolute value of δ always exceeds the rule of thumb cut-off of 1 indicated by Oster (2019). These findings strongly support the robustness of our findings to omitted variable bias.

In two further robustness checks we enrich the benchmark model specification and i) add a dummy variable making a distinction between positive and negative shocks (see Table C.2); ii) distinguish between large/small and positive/negative shocks, alone and interacted with the shock size (see Table C.3).

To further explore the relationship between income expectations and job-related expectations, we use additional information collected by the DHS. Respondents, categorized based on their employment status, are queried about the probability of losing or finding a job in the next 12 months. We estimate conditional correlations through OLS regressions of income on the probability of job loss or job finding while controlling for working status and a set of covariates. Results for working and unemployed respondents are graphically summarised in Figure C.1. The perceived probability of job loss significantly correlates with most outcome variables, displaying the expected sign. The results for the unemployed subgroup are less precise, partly due to the smaller sample size. However, the upper bound of expected income and income uncertainty significantly correlate with the likelihood of finding a job. These findings support the primary role of labour income in shaping total household income expectations.

[C.1] We also include, alternatively, the positive and negative shocks. The main findings are confirmed.

[C.2] More precisely, we assume that $R_{max} = 1.3\tilde{R}$, where R_{max} is the R^2 obtained in the hypothetical regression of the dependent variable on both observed and unobserved regressors; $\tilde{R}$ is the R^2 of the regression of the dependent variable on observables.

Table C.1: Oster test on omitted variable bias

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Shock	0.367***	0.366***	0.371***	0.005	0.002	-0.462***	-0.124***
	(0.028)	(0.034)	(0.029)	(0.023)	(0.001)	(0.039)	(0.034)
Uncertainty in NL	0.036	0.053	0.031	-0.022	0.001	-0.073	-0.066
	(0.057)	(0.068)	(0.058)	(0.046)	(0.003)	(0.079)	(0.069)
Unempl. rate	-0.024	-0.006	-0.018	-0.012	0.002**	0.031	0.011
	(0.015)	(0.018)	(0.015)	(0.012)	(0.001)	(0.021)	(0.018)
Age	0.027**	0.027*	0.024*	-0.003	-0.001	-0.025	-0.016
	(0.013)	(0.015)	(0.013)	(0.010)	(0.001)	(0.018)	(0.015)
Partner in the hh	0.095	0.114	0.091	-0.024	-0.007	0.214	-0.037
	(0.161)	(0.191)	(0.163)	(0.129)	(0.008)	(0.222)	(0.195)
Children in the hh	-0.016	0.183	-0.042	-0.225**	-0.017***	-0.040	0.240*
	(0.115)	(0.137)	(0.117)	(0.092)	(0.006)	(0.159)	(0.140)
Working	0.227**	0.252*	0.215*	-0.036	-0.002	0.074	-0.203
	(0.112)	(0.134)	(0.114)	(0.090)	(0.006)	(0.155)	(0.136)
Retired	-0.009	0.038	-0.025	-0.064	-0.008	0.183	-0.047
	(0.118)	(0.141)	(0.120)	(0.095)	(0.006)	(0.163)	(0.143)
Homeowner	0.256	0.211	0.258	0.047	-0.001	-0.264	-0.149
	(0.194)	(0.232)	(0.197)	(0.156)	(0.010)	(0.268)	(0.235)
Constant	8.857***	8.489***	9.099***	0.610	0.077	1.586	1.928
	(0.993)	(1.183)	(1.008)	(0.795)	(0.051)	(1.370)	(1.202)
Oster delta	662.607	-41.008	123.641	10.594	31.490	-14.813	32.507
R-squared	0.065	0.046	0.063	0.003	0.010	0.051	0.008
Individuals	1,064	1,064	1,064	1,064	1,064	1,064	1,064
Observations	3,767	3,767	3,767	3,767	3,767	3,767	3,767

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.

Table C.2: Specification change: Shock intercepts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
If pos. shock	-0.057	-0.021	-0.066	-0.045	-0.004*	0.034	0.121**
	(0.040)	(0.048)	(0.041)	(0.032)	(0.002)	(0.056)	(0.049)
Positive shock	0.377***	0.287***	0.393***	0.106**	0.009***	-0.324***	-0.312***
	(0.052)	(0.061)	(0.052)	(0.041)	(0.003)	(0.071)	(0.062)
Negative shock (abs.)	-0.408***	-0.453***	-0.408***	0.045	0.001	0.613***	0.063
	(0.048)	(0.057)	(0.048)	(0.038)	(0.002)	(0.066)	(0.058)
Unemployed	-0.154	-0.010	-0.165	-0.155	-0.002	0.373	-0.071
	(0.183)	(0.218)	(0.186)	(0.146)	(0.009)	(0.252)	(0.221)
Uncertainty in NL	0.035	0.053	0.029	-0.024	0.001	-0.074	-0.061
	(0.057)	(0.068)	(0.058)	(0.046)	(0.003)	(0.079)	(0.069)
Unempl. rate	-0.024	-0.006	-0.017	-0.011	0.002**	0.031	0.011
	(0.015)	(0.018)	(0.015)	(0.012)	(0.001)	(0.021)	(0.018)
Age	0.027**	0.026*	0.024*	-0.003	-0.001	-0.023	-0.016
	(0.013)	(0.015)	(0.013)	(0.010)	(0.001)	(0.018)	(0.015)
Partner in the hh	0.093	0.129	0.088	-0.041	-0.008	0.198	-0.016
	(0.161)	(0.192)	(0.163)	(0.129)	(0.008)	(0.222)	(0.194)
Children in the hh	-0.015	0.177	-0.040	-0.217**	-0.017***	-0.027	0.221
	(0.115)	(0.137)	(0.117)	(0.092)	(0.006)	(0.159)	(0.139)
Working	0.144	0.249	0.125	-0.124	-0.004	0.260	-0.222
	(0.146)	(0.174)	(0.149)	(0.117)	(0.007)	(0.202)	(0.177)
Retired	-0.075	0.052	-0.098	-0.150	-0.010	0.311	-0.041
	(0.142)	(0.169)	(0.144)	(0.114)	(0.007)	(0.196)	(0.172)
Homeowner	0.255	0.219	0.256	0.037	-0.002	-0.281	-0.127
	(0.195)	(0.232)	(0.197)	(0.155)	(0.010)	(0.268)	(0.235)
Constant	9.010***	8.550***	9.264***	0.714	0.080	1.281	1.893
	(0.999)	(1.190)	(1.014)	(0.799)	(0.051)	(1.377)	(1.208)
R-squared	0.066	0.047	0.064	0.007	0.014	0.055	0.013
Individuals	1,064	1,064	1,064	1,064	1,064	1,064	1,064
Observations	3,767	3,767	3,767	3,767	3,767	3,767	3,767

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$. "If pos. shock" is a dummy variable equal to one if the shock is positive and equal to zero if the shock is negative.

Table C.3: Heterogeneity: Shock size

Dep. var.	(1) Exp. inc.	(2) LB	(3) UB	(4) UB-LB	(5) SD exp.	(6) Exp. err.	(7) Exp. err. (abs)
If pos. shock	-0.023	0.042	-0.035	-0.077	-0.005	-0.088	0.222**
	(0.084)	(0.099)	(0.085)	(0.067)	(0.004)	(0.115)	(0.101)
If large pos. shock	-0.039	0.017	-0.040	-0.057	0.000	-0.036	0.059
	(0.076)	(0.091)	(0.077)	(0.061)	(0.004)	(0.105)	(0.092)
If large neg. shock	0.051	0.216**	0.046	-0.169**	-0.003	-0.172	0.044
	(0.082)	(0.098)	(0.084)	(0.066)	(0.004)	(0.113)	(0.099)
Positive shock	0.069	0.220	0.118	-0.103	0.001	0.063	-0.860
	(0.862)	(1.025)	(0.875)	(0.688)	(0.044)	(1.187)	(1.040)
Negative shock (abs.)	-0.574	-0.457	-0.621	-0.164	-0.006	-1.294	2.518**
	(0.921)	(1.096)	(0.935)	(0.735)	(0.047)	(1.268)	(1.111)
Positive shock*If large pos. shock	0.320	0.058	0.289	0.231	0.008	-0.359	0.502
	(0.864)	(1.028)	(0.877)	(0.690)	(0.044)	(1.190)	(1.043)
Negative shock*If large neg. shock	0.137	-0.105	0.184	0.289	0.009	1.946	-2.416**
	(0.923)	(1.098)	(0.937)	(0.736)	(0.047)	(1.271)	(1.113)
Unemployed	-0.146	0.019	-0.158	-0.177	-0.002	0.359	-0.074
	(0.184)	(0.218)	(0.186)	(0.147)	(0.009)	(0.253)	(0.222)
Uncertainty in NL	0.034	0.051	0.029	-0.022	0.001	-0.073	-0.060
	(0.057)	(0.068)	(0.058)	(0.046)	(0.003)	(0.079)	(0.069)
Unempl. rate	-0.024	-0.007	-0.017	-0.010	0.002**	0.031	0.011
	(0.015)	(0.018)	(0.015)	(0.012)	(0.001)	(0.021)	(0.018)
Age	0.026**	0.026*	0.023*	-0.003	-0.001	-0.022	-0.017
	(0.013)	(0.015)	(0.013)	(0.010)	(0.001)	(0.018)	(0.015)
Partner in the hh	0.102	0.154	0.097	-0.057	-0.008	0.204	-0.044
	(0.161)	(0.192)	(0.164)	(0.129)	(0.008)	(0.222)	(0.195)
Children in the hh	-0.016	0.175	-0.041	-0.216**	-0.017***	-0.030	0.227
	(0.115)	(0.137)	(0.117)	(0.092)	(0.006)	(0.159)	(0.139)
Working	0.148	0.267	0.129	-0.139	-0.004	0.245	-0.216
	(0.147)	(0.175)	(0.149)	(0.117)	(0.007)	(0.202)	(0.177)
Retired	-0.068	0.069	-0.091	-0.160	-0.010	0.304	-0.046
	(0.142)	(0.169)	(0.144)	(0.114)	(0.007)	(0.196)	(0.172)
Homeowner	0.254	0.213	0.255	0.041	-0.002	-0.285	-0.119
	(0.195)	(0.232)	(0.198)	(0.155)	(0.010)	(0.268)	(0.235)
Constant	9.006***	8.498***	9.264***	0.766	0.080	1.378	1.806
	(1.001)	(1.190)	(1.016)	(0.799)	(0.051)	(1.378)	(1.207)
Observations	3,767	3,767	3,767	3,767	3,767	3,767	3,767
R-squared	0.066	0.050	0.065	0.010	0.015	0.056	0.016
Number of pid	1,064	1,064	1,064	1,064	1,064	1,064	1,064

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$. Large positive and negative shocks are defined as shocks larger than their respective median.

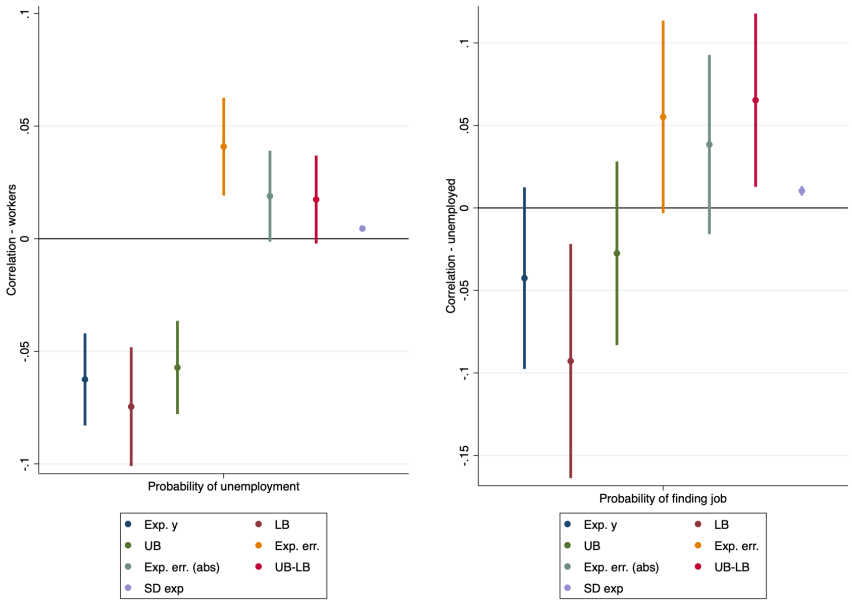

Figure C.1: Correlation between outcome variables and job-related expectations

Notes: Conditional correlation between outcome variables and job-related expectations. The graph plots OLS estimated coefficients and 90% level confidence intervals. The dependent variables are the same as in Table 2, and the key independent variable is the probability of losing/finding a job for workers or unemployed, respectively. Control variables are the same as in Table 2.

D. Appendix: Additional results

We report the characteristics of the bottom and top 33% income groups (see Table D.1) and the benchmark analysis split by sample group: Bottom 33% (see Table D.2), middle 33% (see Table D.3) and top 33% (see Table D.4). Finally, we run a mediation analysis where household saving decisions (yes/no) and saving amounts (transformed in inverse hyperbolic sine) are seen as a function of shocks, income expectations and expectation uncertainty (see Table D.5). In these models, shocks are mediated by revisions in income expectations and expectation uncertainty. The saving variables are defined as follows.

Decision to save

"Did your household put any money aside in the past 12 months?"

Possible answers are "yes" and "no". We construct an indicator which takes value one if the answer is"yes".

The average (standard deviation) in our sample is 0.695 (0.460).

Amount saved

"About how much money has your household put aside in the past 12 months?"

The respondent can choose among alternative value brackets:"less than 1500 euros"; 1500-5000 euros"; 5000-12,500 euros"; 12,500-20,000 euros"; 20,000-37,500 euros"; 37,500-75,000 euros"; more than 75,000 euros". We impute the central value for each bracket and the boundary for the extreme brackets.

The average (standard deviation) in our sample is 6.363 (4.283).

Table D.1: Characteristics in the bottom and top 33% income groups

Variable	Bottom	Top	t-test
Income variables			
Expected income	10.301	11.364	-22.098***
Lower bound exp. inc. (LB)	10.139	11.222	-19.365 ***
Upper bound exp. inc. (UB)	10.355	11.420	-21.910***
Upper - Lower bound (UB-LB)	0.216	0.198	0.524
SD expected income	0.028	0.034	-2.826***
Expectation error	-0.130	0.045	-3.163***
Expectation error (abs.)	0.716	0.360	7.018***
Key explanatory variables			
Positive shock	0.178	0.169	0.571
Negative shock (abs.)	0.283	0.103	9.854***
Unemployed	0.039	0.005	5.864***
Uncertainty in NL	5.002	4.973	1.200
Unempl. rate	5.570	5.639	-1.347
Control variables			
Age	61.545	58.073	7.136***
Partner in the hh	0.449	0.885	-26.315***
Children in the hh	0.149	0.275	-7.792***
Working	0.298	0.576	-14.537***
Retired	0.434	0.396	1.922*
Homeowner	0.567	0.931	-23.376***
Further variables			
Female	0.360	0.116	15.078***
College educ.	0.052	0.301	-17.030***
Vocational training educ.	0.219	0.097	8.491***
High School educ.	0.323	0.470	-7.568***
Low educ.	0.364	0.112	15.620***
No educ.	0.035	0.013	3.638***
Financial literate	0.287	0.527	-12.456***
Media financial source	0.423	0.589	-8.336***
Income (thousands)	18.273	52.181	-43.111***
Financial assets (thousands)	38.236	93.518	-10.605***
Observations	1,197	1,304	

Notes: The last column reports the value of a t-test comparing the mean of the bottom and top 33% of the income distribution. $***p<0.01, **p<0.05, *p<0.1$.

Table D.2: Subsample of bottom 33% income earners: Full output

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	0.563***	0.532***	0.576***	0.044	0.005	-0.429***	-0.335***
	(0.092)	(0.106)	(0.093)	(0.071)	(0.005)	(0.129)	(0.109)
Negative shock (abs.)	-0.211***	-0.311***	-0.210***	0.101*	0.002	0.460***	-0.209**
	(0.075)	(0.088)	(0.077)	(0.058)	(0.004)	(0.106)	(0.089)
Unemployed	-0.175	0.044	-0.260	-0.304	-0.033*	0.527	-0.216
	(0.342)	(0.397)	(0.348)	(0.265)	(0.017)	(0.481)	(0.405)
Uncertainty in NL	-0.023	0.034	-0.035	-0.069	-0.003	-0.170	-0.074
	(0.134)	(0.155)	(0.136)	(0.104)	(0.007)	(0.188)	(0.159)
Unempl. rate	-0.046	-0.028	-0.041	-0.012	0.000	0.047	0.010
	(0.035)	(0.041)	(0.036)	(0.027)	(0.002)	(0.049)	(0.042)
Age	0.041	0.049	0.033	-0.015	-0.002	-0.024	-0.062*
	(0.030)	(0.035)	(0.031)	(0.023)	(0.002)	(0.042)	(0.036)
Partner in the hh	-0.397	-0.244	-0.436	-0.193	-0.051**	0.746	-0.343
	(0.391)	(0.454)	(0.398)	(0.303)	(0.020)	(0.550)	(0.464)
Children in the hh	-0.232	-0.038	-0.305	-0.267	-0.051***	0.130	0.436
	(0.312)	(0.362)	(0.317)	(0.241)	(0.016)	(0.438)	(0.370)
Working	0.576**	0.848***	0.524*	-0.324	-0.018	-0.192	-0.758**
	(0.283)	(0.328)	(0.288)	(0.219)	(0.014)	(0.397)	(0.335)
Retired	-0.133	0.060	-0.144	-0.204	-0.011	0.303	0.043
	(0.262)	(0.304)	(0.267)	(0.203)	(0.013)	(0.369)	(0.311)
Homeowner	0.384	0.167	0.377	0.210	0.004	-0.765	0.106
	(0.603)	(0.699)	(0.613)	(0.466)	(0.031)	(0.847)	(0.714)
Constant	8.003***	6.867**	8.609***	1.742	0.204*	1.852	5.191*
	(2.383)	(2.765)	(2.425)	(1.844)	(0.121)	(3.350)	(2.824)
R-squared	0.092	0.077	0.091	0.010	0.029	0.058	0.031
Individuals	390	390	390	390	390	390	390
Observations	1,197	1,197	1,197	1,197	1,197	1,197	1,197

Notes: Standard errors in parentheses. The sample includes respondents with average income in the bottom 33% of the distribution. $***p<0.01, **p<0.05, *p<0.1$.

Table D.3: Subsample of middle 33% income earners: Full output

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	0.445***	0.234**	0.457***	0.223***	0.015***	-0.510***	-0.388***
	(0.072)	(0.092)	(0.074)	(0.071)	(0.005)	(0.107)	(0.096)
Negative shock (abs.)	-0.311***	-0.344***	-0.303***	0.040	0.006	0.504***	0.087
	(0.069)	(0.087)	(0.070)	(0.068)	(0.004)	(0.101)	(0.091)
Unemployed	-0.043	0.052	0.022	-0.029	0.029*	-0.157	0.130
	(0.237)	(0.303)	(0.243)	(0.234)	(0.015)	(0.350)	(0.314)
Uncertainty in NL	0.074	0.061	0.058	-0.003	-0.007	-0.050	-0.071
	(0.077)	(0.099)	(0.079)	(0.076)	(0.005)	(0.114)	(0.102)
Unempl. rate	-0.033	-0.005	-0.026	-0.022	0.002	0.027	0.041
	(0.021)	(0.026)	(0.021)	(0.020)	(0.001)	(0.031)	(0.027)
Age	0.028	0.031	0.026	-0.005	-0.002*	-0.027	-0.010
	(0.017)	(0.022)	(0.017)	(0.017)	(0.001)	(0.025)	(0.023)
Partner in the hh	0.273	0.270	0.262	-0.009	0.003	-0.101	0.042
	(0.193)	(0.246)	(0.198)	(0.190)	(0.012)	(0.284)	(0.255)
Children in the hh	0.054	0.426**	0.046	-0.380**	-0.009	-0.058	0.253
	(0.160)	(0.204)	(0.164)	(0.157)	(0.010)	(0.235)	(0.211)
Working	-0.068	-0.092	-0.035	0.057	0.008	0.077	0.304
	(0.200)	(0.255)	(0.205)	(0.197)	(0.013)	(0.295)	(0.265)
Retired	-0.143	-0.122	-0.139	-0.017	0.003	0.099	0.327
	(0.198)	(0.252)	(0.203)	(0.195)	(0.012)	(0.291)	(0.262)
Homeowner	0.222	0.270	0.206	-0.064	-0.021	0.004	-0.196
	(0.214)	(0.272)	(0.219)	(0.210)	(0.013)	(0.315)	(0.283)
Constant	8.801***	8.305***	9.029***	0.724	0.173**	1.689	1.005
	(1.345)	(1.715)	(1.379)	(1.326)	(0.084)	(1.981)	(1.780)
R-squared	0.085	0.042	0.081	0.019	0.027	0.068	0.027
Individuals	343	343	343	343	343	343	343
Observations	1,266	1,266	1,266	1,266	1,266	1,266	1,266

Notes: Standard errors in parentheses. The sample includes respondents with average income in the middle 33% of the distribution. $***p<0.01, **p<0.05, *p<0.1$.

Table D.4: Subsample of top 33% income earners: Full output

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. var.	Exp. inc.	LB	UB	UB-LB	SD exp.	Exp. err.	Exp. err. (abs)
Positive shock	-0.095	-0.098	-0.085	0.013	0.005	0.096	0.030
	(0.083)	(0.099)	(0.083)	(0.059)	(0.003)	(0.106)	(0.098)
Negative shock (abs.)	-0.896***	-0.866***	-0.893***	-0.027	0.002	1.116***	0.438***
	(0.092)	(0.110)	(0.092)	(0.066)	(0.004)	(0.118)	(0.109)
Unemployed	-0.533	-0.512	-0.535	-0.022	0.003	1.255**	-0.116
	(0.458)	(0.546)	(0.459)	(0.327)	(0.019)	(0.589)	(0.542)
Uncertainty in NL	0.023	0.035	0.030	-0.005	0.009***	-0.000	-0.027
	(0.086)	(0.103)	(0.086)	(0.061)	(0.004)	(0.110)	(0.102)
Unempl. rate	-0.000	0.005	0.007	0.002	0.002**	0.020	-0.010
	(0.023)	(0.027)	(0.023)	(0.016)	(0.001)	(0.030)	(0.027)
Age	0.012	-0.000	0.011	0.011	0.001	-0.013	0.008
	(0.019)	(0.023)	(0.020)	(0.014)	(0.001)	(0.025)	(0.023)
Partner in the hh	0.339	0.267	0.369	0.102	0.025**	0.097	0.070
	(0.282)	(0.336)	(0.283)	(0.201)	(0.012)	(0.362)	(0.334)
Children in the hh	0.023	0.127	0.005	-0.122	-0.008	-0.108	0.152
	(0.157)	(0.188)	(0.158)	(0.112)	(0.007)	(0.202)	(0.186)
Working	-0.393	-0.379	-0.440	-0.061	-0.000	1.370***	-0.213
	(0.330)	(0.394)	(0.332)	(0.236)	(0.014)	(0.425)	(0.391)
Retired	-0.410	-0.321	-0.462	-0.140	-0.011	1.151***	-0.222
	(0.325)	(0.388)	(0.326)	(0.232)	(0.013)	(0.418)	(0.385)
Homeowner	0.014	0.001	0.047	0.047	0.023*	-0.191	-0.206
	(0.328)	(0.392)	(0.329)	(0.234)	(0.014)	(0.422)	(0.389)
Constant	10.745***	11.228***	10.770***	-0.457	-0.115*	-0.563	0.326
	(1.522)	(1.817)	(1.527)	(1.088)	(0.063)	(1.957)	(1.803)
R-squared	0.094	0.064	0.094	0.006	0.048	0.094	0.021
Individuals	331	331	331	331	331	331	331
Observations	1,304	1,304	1,304	1,304	1,304	1,304	1,304

Notes: Standard errors in parentheses. The sample includes respondents with average income in the top 33% of the distribution. $***p<0.01, **p<0.05, *p<0.1$.

Table D.5: Expectations and saving

	Positive shocks		Negative shocks	
	Decision	Amount	Decision	Amount
Total (reduced)	0.052**	0.535**	0.023	0.177
	(0.023)	(0.210)	(0.020)	(0.184)
Direct (full)	0.118***	1.221***	0.023	0.165
	(0.037)	(0.333)	(0.020)	(0.184)
Indirect	-0.065**	-0.686**	0.001	0.012
	(0.030)	(0.277)	(0.002)	(0.021)
Observations	2636	2619	2636	2619

Notes: Estimated coefficients; standard errors in parentheses. $***p<0.01, **p<0.05, *p<0.1$.