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

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**Abstract**

In this paper we study how income shocks and aggregate conditions influence income expectations, their uncertainty, and expectation errors. We use a uniquely rich longitudinal Dutch survey collecting detailed information on the distribution of 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 expected income distribution, which is consistent with extrapolative behaviour. For the first time, we document that positive income shocks lead to an increase in income expectation uncertainty. Our results partly confirm an over-reaction to income shocks, particularly for negative income shocks and high-income individuals. The above overall findings vary depending on the position in the income distribution. This evidence can be explained by different income processes and 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

Households' expectations on future income and its uncertainty are key factors in economic decisions. Life cycle models of consumption behavior predict that higher expected income leads to increased consumption, while greater uncertainty encourages precautionary savings and reduces current consumption (Coibion et al., 2024; Jappelli and Pistaferri, 2017). This, in turn, influences economic behavior in other areas such as portfolio allocation (Fagereng et al., 2018), labor supply (Rossi and Trucchi, 2016) and human capital (Patnaik et al., 2022). Expectations and consumption dynamics also have relevant implications for the aggregate economy, affecting the effectiveness and consequences of fiscal and monetary policy interventions and influencing the business cycle (recent examples are Bordalo et al., 2022; D'Acunto and Weber, 2024).

Despite the crucial role of households' income expectations, empirical evidence on their determinants is rare, possibly due to the limited availability of surveys collecting precise information on expectations over extended periods. This paper provides new evidence on the process of expectation formation, focusing on how several aspects of income expectations – the expected value of household income, its dispersion and the expectation error – respond to macroeconomic conditions and household income *shocks*.

How are households' expectations affected by income shocks and macroeconomic conditions? The response of income expectations to shocks depends on the degree of persistence of income over time. Future income is not affected by transitory shocks, while it reflects permanent or persistent shocks. However, individuals may have distorted expectations about the persistence of their income. In this case income expectations may over-react to shocks, resulting in an expectation error (Massenot and Pettinicchi, 2019; Cocco et al., 2022; Rozsypal and Schlafmann, 2023). Individuals may overestimate their income and be excessively optimistic about the future after an improvement in their financial situation, indicating overextrapolative expectations about their recent experience. According to the model of *diagnostic expectations* (Gennaioli and Shleifer, 2010; Bordalo et al., 2018, 2019), expectations respond to news by overweighting future outcomes that become more likely in light of current news, leading individuals to overestimate the probability of a positive future state when the current news is favorable and vice versa in the case of negative news. Our study investigates the relevance of diagnostic expectations in the framework of household income expectations. The effect of macroeconomic conditions on income expectations reflects individual assessment of these conditions, the awareness of their impact on household financial conditions, and the correlation of household income with the macroeconomy and the business cycle, which may vary across the income distribution and is possibly mediated by private or public insurance mechanisms.

We exploit a uniquely rich dataset, the DNB Household Survey, collecting detailed information on the distribution of household income expectations and realizations for a longitudinal sample of Dutch individuals. First, this allows us to construct a precise measure for the magnitude of the experienced income shock, defined as the deviation of household income realizations from their expectations. This represents a contribution to the literature, which has primarily focused on the effect of income changes, whether anticipated or unexpected. We combine this dataset with aggregate data on unemployment rate and economic policy uncertainty to capture aggregate conditions. Second, a unique feature of our empirical analysis is the availability of precise measures detailing the distribution of income expectations. Differently from previous literature (Brown and Taylor, 2006; Massenot and Pettinicchi, 2019; Cocco et al., 2022), we are able to quantify the *magnitude* of revision of income expectations and not only the expected direction of the income change, (i.e., improvement or deterioration). Moreover, by analysing the lower and upper bounds of expected income, we can also detect potential changes in the distribution of income expectations. We investigate whether an increase (decrease) in the expected value of income is due to a parallel shift in the distribution of expectations, reflecting a similar increase (decrease) in both the upper and lower bounds, or if it is driven by a relatively larger increase (decrease) of the left or right tail of the distribution. We measure perceived income uncertainty using indicators of the dispersion of income expectation at the individual level. To the best of our knowledge, this is the first attempt to examine the determinants of individuals' perception of income uncertainty.[1] The longitudinal structure of the dataset also allows to compare *ex-post* income realization with their expectations to precisely measure the expectation error. This allows to gauge if the response of income expectations to macroeconomic conditions and income shocks reflects actual changes in individual circumstances or if it captures an over/under-reaction to these changes. Understanding whether expectations revision reflects an over-reaction to income shocks and aggregate conditions has relevant implications for individual welfare and macroeconomic outcomes. According to the life-cycle model, an income shock determines a revision in optimal consumption. If income shocks are accompanied by an over-reaction of income expectations, consumers may deviate from their optimal consumption path, consuming less (more) than optimal in case of negative (positive) shocks. This has a detrimental effect on the ability to smooth consumption and may amplify the contraction in aggregate consumption during recessions.

In the second part of the empirical analysis, we explore how the response of income

[1]The only notable attempt is Cocco et al. (2022), although their analysis is limited by data constraints, as it only captures the direction of expected income changes.

expectations varies across the income distribution. This allows us to highlight potential heterogeneity in our results, which may arise from differences in income processes or the role of insurance mechanisms, such as unemployment benefits. Additionally, we can identify who is most exposed to the welfare consequences of expectation errors.

Our findings indicate that household income shocks have a significant and relevant impact on expectations, while aggregate conditions play a minor and mostly insignificant role. On average, both positive and negative household income shocks, particularly relatively large ones, prompt a revision in income expectations. Individuals experiencing a positive income shock revise their expectations upward, while they revise income expectations downwards when hit by negative shocks. More then one third of the income shock is perceived as persistent: a 10% increase in the positive (negative) income shocks determine an upward (downward) revision in income by 3.5% (3.8%). We also detect heterogeneity across the income distribution, with positive income shocks being more relevant at the bottom of the distribution and negative ones playing a major role at the top. Perceived income uncertainty increases with positive income shocks, and it is concentrated among middle-income earners. In the top-income group, while perceived uncertainty remains unaffected by income shocks, it marginally increases with aggregate conditions. On the whole, 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. Comparing income expectations and their future realizations we find that revision in expectations is partly due to an over-reaction to income shocks, particularly relevant for negative income shocks and high-income respondents. Given that top-income individuals are characterized by a lower marginal propensity to consume and a larger buffer stocks, over-reaction to income shocks is mostly concentrated in the group where the consequences of sub-optimal consumption path are less severe.

This study contributes to the literature investigating the role of individual experience (Malmendier and Nagel, 2011, 2016; Massenot and Pettinicchi, 2019; Kuchler and Zafar, 2019; Cocco et al., 2022; Rozsypal and Schlafmann, 2023) and aggregate conditions (Bloom, 2009; Malmendier and Nagel, 2011; Coibion et al., 2021; Easaw and Grimme, 2024) in shaping individual behavior and expectations. Most of these studies either focus on individual behavior and attitudes or expectations about macroeconomic factors. We add to this literature by evaluating the response of *expectations* about *household income* and its uncertainty. Moreover, we simultaneously consider both household and aggregate experiences, facilitating a comparison.

The rest of the paper is organized 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. Theoretical framework and literature review

The general theoretical framework underpinning our analysis builds on the cognitive processes that drive expectation formations. Gennaioli and Shleifer (2010) and Bordalo et al. (2018, 2019) elaborate a model of diagnostic expectations, where expectations overweight future outcomes that become more likely in light of current news. Therefore, favorable news leads individuals to overestimate the probability of positive future outcomes, while negative events cause them to overestimate the likelihood of negative future outcomes. In our specific context, this implies there is a link between current income shocks and the revision of expectations and expectation error. 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 revision in income expectation following an income shock may be driven by truly persistent shocks. However, if income shocks are significantly correlated with expectation errors, this may indicate distorted expectations. Massenot and Pettinicchi (2019) illustrate this aspect building on the concepts of extrapolation and overextrapolation. If individuals consider shocks to be persistent and extrapolate their recent experience, the relationship between current and expected income growth is positive. On the contrary, if they expect transitory income shocks and mean-reversion, this relationship is negative. Individuals *overextrapolate* when they consider their income growth to be more persistent than it actually is, thus generating an expectation error. Individuals overestimate their future income following a positive shock, and they underestimate it following a negative one. Similarly, Rozsypal and Schlafmann (2023) illustrate an expectation formation rule based on the overpersistence bias, where individuals overestimate the persistence of their income process.[2] The main difference between Rozsypal and Schlafmann (2023) and the diagnostic expectations approach of Gennaioli and Shleifer (2010) and Bordalo et al. (2018, 2019) is that in the latter the expectation error depends on the latest news, whereas in Rozsypal and Schlafmann (2023) it depends on the history of individual income shocks. By studying the response of income expectations and expectation error to new information - aggregate conditions and income shocks - this paper contributes to this literature by empirically examining the relevance of diagnostic expectations and its

[2]Rozsypal and Schlafmann (2023) model expectation formation in the context of a standard income process with permanent and transitory income shocks, while Massenot and Pettinicchi (2019) do not explicitly model the income process but they assume an AR(1) process for income growth.

heterogeneity across the income distribution. A critical aspect of our analysis is the inclusion of a measure of income shocks rather than 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.

By analysing the effect of household income shocks and macroeconomic conditions on individual income expectations, this paper builds on the empirical literature studying 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 (Malmendier and Nagel, 2016; Kuchler and Zafar, 2019) or the role of *personal experience and individual events* (Bucciol and Zarri, 2015; Bucciol and Miniaci, 2018; 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 behavior. Risk attitudes, expectations and portfolio composition are influenced by experiences of stock market returns and economic depression (Malmendier and Nagel, 2011; Guiso et al., 2018; Angelini and Ferrari, 2021; Heiss et al., 2022) and high inflation (Malmendier and Nagel, 2016; Malmendier and Botsch, 2020; Malmendier and Wellsjo, 2024). 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 aggregate 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, behavior and expectations. For instance, personal experience with portfolio risks and returns (Kautsia and Knupfer, 2008; Bucciol and Miniaci, 2018), life-course negative events (Bucciol and Zarri, 2015), and a natural disaster (Hanaoka et al., 2018) influence financial risk propensity and risk-taking. Our approach is related to these studies inasmuch it relies on an individual-specific measure of income shocks, namely the gap between individual income expectations and its realization. Most of these studies examine outcomes related to individual behavior or attitudes. Notable exceptions are Brown and Taylor (2006), Massenot and Pettinicchi (2019), Cocco et al. (2022) and Rozsypal and Schlafmann (2023), who focus on income expectations. Cocco et al. (2022) and Massenot and Pettinicchi (2019) investigate how a change in households' financial conditions (improvement or deterioration) influences income expectations in, respectively, the U.K. and the Netherlands. They consistently find evidence of overextrapolation following a financial improvement. Cocco et al. (2022) is the only study focusing on the link between income changes and uncertainty. They show that financial condition deterioration leads

to increased dispersion in income expectations, with individuals assigning higher probabilities to both future deterioration and improvement. Massenot and Pettinicchi (2019) also examine the impact of expectation error on behavior, showing a significant impact on consumption. Brown and Taylor (2006) rely on the same U.K. dataset used by Cocco et al. (2022) to investigate the determinants of individual financial expectations. Their results suggest that financial expectations are influenced by both the life and business cycles. Compared to these 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 expectation revisions, including upper and lower boundaries, expectation errors, and income uncertainty. Rozsypal and Schlafmann (2023) focus on income expectation errors and document their correlation with income levels in the U.S.. This evidence is consistent with overpersistence bias in expectation formation, namely overestimation of the income process persistence.

Finally, our study relates to the growing literature using subjective probabilities to elicit individual expectations (see, for instance, Dominitz and Manski, 1997, 2004; Manski, 2004; Hurd et al., 2011; Attanasio and Augsburg, 2016; Attanasio et al., 2020). Empirical studies show a significant role of expectations in individual and household choices in several domains, such as consumption and savings (Brown and Taylor, 2006; Vellekoop and Wiederholt, 2019; Christelis et al., 2020; 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 three times, to construct the shock variables and 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.[3] The final dataset includes 3,767 observations from 1,064 respondents (on average, 3.54 observations per respondent). Below we report the definition of our key variables, that are described in more detail in Appendix A.

## 3.1. Income Measures

**Income Realizations.** The measure of household income that we use in the empirical analysis is gathered through the following question:

> "*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.*"

This question is particularly well-suited to our purpose, since it refers to the same income measure that is used to elicit income expectations, namely total net household income.

**Income Expectations.** Income expectations are collected through two sets of questions. Respondents start reporting the lower and upper bounds for expected income, 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. What do you expect to be the lowest (highest) total net yearly income your household may realize in the next 12 months?*"

The interval between the lower ($l$) and upper ($h$) bounds is divided into equal intervals:

$$l + (h - l)x, \quad with \quad x = \frac{2}{10}, \frac{4}{10}, \frac{6}{10}, \frac{8}{10}.$$

Respondents declare, then, the probability that future income will be lower than the threshold $l + (h - l)x$. More precisely, for each threshold, they are asked:

> "*What do you think is the probability (in percent) that the net yearly income of your household will be less than euro [threshold] in the next 12 months?*"

[3]Selection bias based on consistent answers to income realization probabilities is further discussed in Appendix A. 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.

Observed and expected income measures are comparable and refer to the total net income of the household. Kovacs et al. (2021) illustrate that labor income is the primary source of total household income in the DHS dataset.[4]

## 3.2. Dependent variables: 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. Our first outcome of interest is the mean expected household income for the upcoming year (variable *Exp. inc.*), calculated as a weighted average using the probabilities and the associated amounts.[5] Expected income variations may arise from adjustments in the 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.*). The latter variable is built from the probabilities and the associated amounts in questions described above. The standard deviation is set to zero if the lower and upper bound differ by less than 5 euros.

Finally, we investigate whether the revision in expectations results from updating new relevant information or is driven by an over-reaction 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

[4]We also exploit job related expectations collected by DHS to examine their link with income expectations. These findings, reported in Appendix B, support the primary role of labor income in shaping household income expectations.

[5]We otherwise take the simple average between the lower and upper bound when they differ by less than 5 euros. Income values below the lower bound and above the upper bound are given zero probability.

error indicates that 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 raise 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).

## 3.3. Key regressors: 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 2 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.)*).[6] One further variable we consider for personal experience is a dummy equal to one if the respondent is unemployed (variable *Unemployed*).

FIGURE 2 ABOUT HERE

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 labor market conditions (variable *Unempl. rate*); we use the average value

[6] 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.

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 3 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 labor market conditions, and the dynamics of the two indices can diverge.

FIGURE 3 ABOUT HERE

### 3.4. 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 home-ownership. 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 no children, and owns a home. On average, expected income is higher than the income realization. This leads to an average negative expectation error.

TABLE 1 ABOUT HERE

## 4. Analysis

We study the link between income expectations, expectation uncertainty and expectation errors 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, $\phi_i$ is the individual fixed effect and $\varepsilon_{it}$ 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. The vector of the key regressors $s_{it}$ includes positive and negative income shocks and a dummy for being unemployed. Aggregate conditions ($a_{it}$) include economic policy uncertainty and the unemployment rate in the Netherlands, which are

constant across the 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.

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 B for details.[7]

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 all the measures of income expectations we analyse. Looking at income expectations, results in Column 1 show a significant effect of both positive and negative income shocks, with positive shocks raising expected income and negative shocks reducing it, consistent with extrapolative behavior, as in Massenot and Pettinicchi (2019) and Cocco et al. (2022). The effects of these shocks are comparable: A 10% increase in the size of the income shock results in a 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 is 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.

[7]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.

Along with income expectations, income shocks affect the perception of income uncertainty. Positive shocks increase uncertainty, widening the spread between upper and lower bounds (Column 4) and raising the standard deviation of expectations (Column 5).[8] Negative shocks have a weaker or insignificant effect on uncertainty. This result is in contrast with evidence in Cocco et al. (2022), showing an increase in expectations dispersion only after a deterioration in financial conditions. This difference could be attributed to the explanatory variables used: we identify negative income shocks, while Cocco et al. (2022) focus on worsening financial conditions, which can be either unexpected or anticipated. Focusing on aggregate conditions, 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 examine expectation errors (Column 6) and their magnitude (Column 7) to assess if expectations reflect actual income realization or if they overreact to income shocks, in line with overextrapolation (Massenot and Pettinicchi, 2019; Cocco et al., 2022) and diagnostic expectations (Bordalo et al., 2018, 2019). Expectation errors, defined as the difference between ex-post income realization and its expected value in previous period ($Exp.\ err_t = y_{t+1} - E_t[y_{t+1}]$), 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 increase errors by 6%. The reduction in the expectation error following an increase in the positive shock (Column 6) may depend on either an increase in overforecasting, namely an increase in the size of the error when positive, or a reduction in underforecasting, namely a reduction in the error when negative. Similar reasoning apply to the effect of negative income shocks. To disentangle these two mechanisms, we examine the absolute value of the expectation error (Column 7). The negative and statistically significant impact of a positive shock indicates an average reduction in its size, suggesting that the predominant channel is the weakening of underforecasting. On average, negative shocks increases expectation errors (Column 6), but do not significantly affect the size of the expectation error (Column 7). This indicates that negative income shocks trigger both mechanisms, with some individuals decreasing overforecasting and others increasing underforecasting. These findings partly confirm the role of overextrapolation and diagnostic expectations in explaining the response of income expectations to *shocks*. On average, respondents tend to reduce the size of the expectation error following positive income shocks, denoting an improved accuracy and

[8] 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.

absence of overextrapolation. However, we find evidence of overextrapolation following negative shocks, this increasing underforecasting. The analysis on the heterogeneity across the income distribution illustrated in Section 4.2 will provide further insights into these results.

In Appendix A 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 B.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 expectation 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.[9] We augment the baseline regression in Equation (1) by adding one dummy variable for positive shocks,[10] 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 4, with the estimated coefficients reported in Appendix Table B.3. As a general result, our findings are driven by large income shocks.

FIGURE 2 ABOUT HERE

## 4.2. Heterogeneity by income group

In this section we investigate how baseline results are heterogeneous across income subgroups, identified using average household income during the observed period.[11] This may contribute to understand the drivers behind the results in Table 2 and gauge their

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

[10] The robustness of the baseline results to the inclusion of this variable are shown in Appendix Table B.2.

[11] 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.

implications. Income processes may vary across income groups, exhibiting different degrees of persistence and uncertainty, with income for top earners potentially being highly correlated with the business cycle. Also the availability and the relevance of public (unemployment) and private (within-family) insurance mechanisms against income fluctuations may vary across the income distribution.[12] Finally, due to the positive correlation between income and education, top-income individuals may be more aware about the current macroeconomic conditions and how they can affect household income. This analysis also allows us to examine the heterogeneity in the welfare consequences of expectation revisions, particularly expectation errors and income uncertainty, which may be more severe for lower-income groups due to limited financial buffers.

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 C. First, we detect heterogeneity in the effect of shocks on the expected value of income (Column 1), possibly reflecting different income processes for the three groups. Approximately 50% of positive shocks are considered as persistent for the bottom- and middle-income groups, while top-income individuals perceive them as transitory (insignificant coefficient in Panel C). Conversely, negative shocks are highly persistent for top-income earners, with a 10% increase in negative shocks resulting in a 9% rise in expected income.

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 transfers and unemployment benefits in mitigating income uncertainty. Positive income shocks are the primary factors influencing perceived income risk for middle-income respondents. They upwardly revise expectations about future income across the entire spectrum (Columns 2-3), 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 influenced by income shocks but rather responds to aggregate conditions, although the 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

[12]It is worth noting that income refers to net household income.

et al., 2022): Information selection, information acquisition and information processing. As shown in Appendix Table C.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.[13]

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.[14] 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 relevant especially for high-income respondents.

TABLE 3 ABOUT HERE

# 5. Conclusions

In this paper we study how income shocks and aggregate conditions affect income expectations, their uncertainty and expectation errors. First, our findings contribute to understand household expectations and, consequently, their behavior in response to income shocks and throughout the business cycle. This, in turn, informs the development of policy interventions, including fiscal and labor market policies. Moreover, our results have relevant implications on individuals' welfare. Individuals revise their income expectations downward after a negative income shock and upward following a positive shock, with more than one-third of shocks perceived as persistent. According to the permanent income hypothesis, this induces a change in consumption. If these shocks are accompanied by an over-reaction of income expectations, consumers make a sub-optimal consumption, which

[13]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.

[14]The mixed effect of negative income shocks on overextrapolation is evident in the reduced estimated effect from Column 6 to Column 7 in Panel A and the statistically insignificant coefficient in Column 7 in Panel B.

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 increases with income. The welfare consequences of suboptimal consumption plans due to expectation errors are less severe for the top income group, characterized by lower marginal utility of consumption and possibly 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. Prudent individuals also increase their precautionary savings when income uncertainty rises, thereby reducing current consumption. Consumption contraction following a negative income shock is more severe if it is accompanied by an upward revision in income uncertainty. However, we do not find evidence supporting this channel, as we do not estimate any significant effect of negative shocks on uncertainty. Conversely, positive income shocks are associated with an increase in income dispersion, which weakens the effect of positive shocks on consumption growth. Finally, 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 some 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.

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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 C.1.

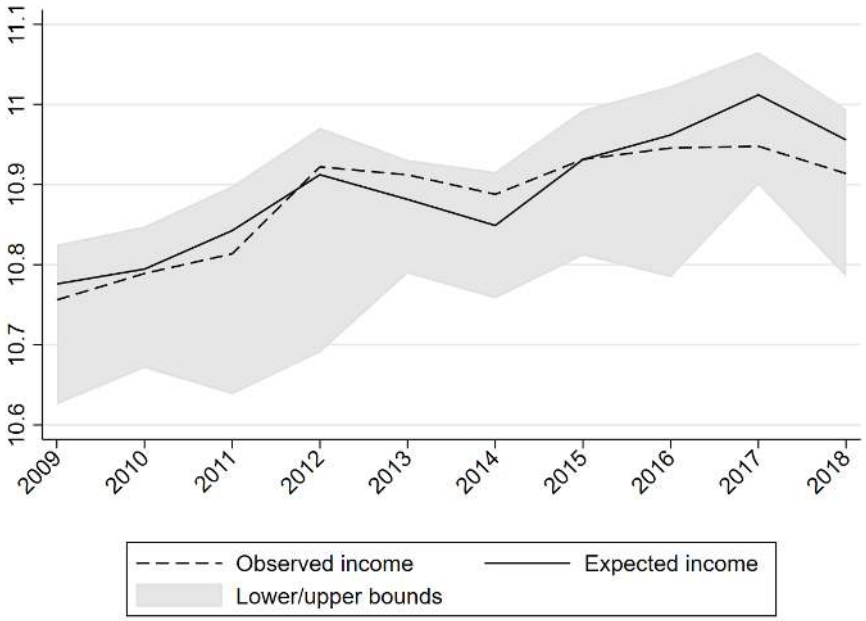


Figure 1: Time pattern of income observations and expectations (ihs, mean values)

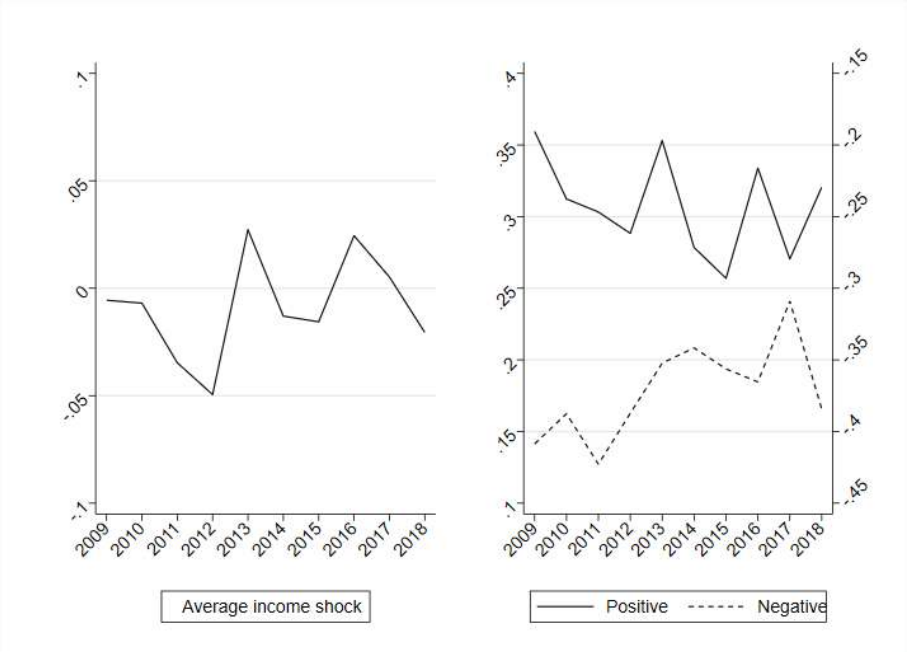


Figure 2: Time pattern of income shocks

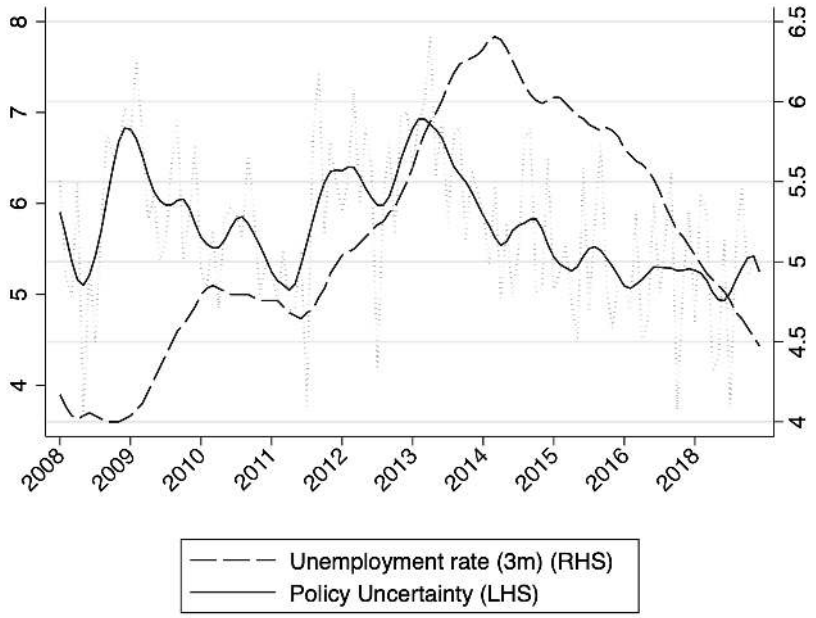


Figure 3: Time pattern of unemployment rate and macroeconomic uncertainty

**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).

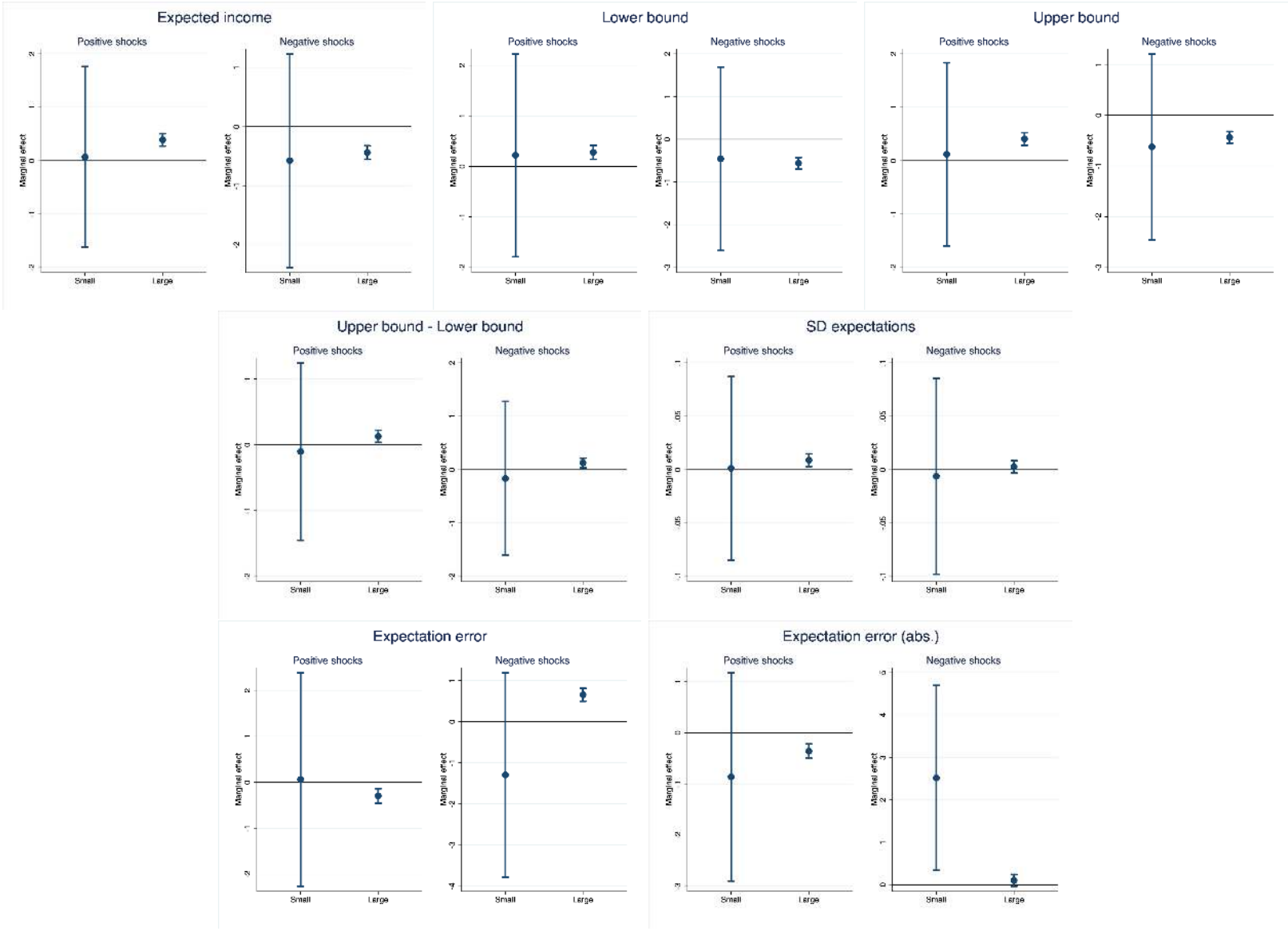


Figure 4: Marginal effects of small and large shocks

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

# A. Appendix: Variable definition

## A.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.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.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.

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 A.1. We only find a significant correlation with gender and age.

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 A.2 are consistent with the benchmark results.

Table A.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. $***p<0.01, **p<0.05, *p<0.1$.

Table A.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 A.3 reports estimate results for the sample that includes partners in addition to heads. Table A.4 also incorporates respondents reporting income bands for household income in addition to respondents reporting precise income values.[A.1] Our key results are confirmed in both alternative samples.

[A.1] In particular, we rely on the answer to question: *"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).

Table A.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 A.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. $***p<0.01, **p<0.05, *p<0.1$.

# B. Appendix: Sample Selection

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.[B.1] Estimate results are reported in Table B.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.[B.2] The bottom line in Table B.1 reports the degree of selection on unobservables relative to observables (the parameter $\delta$) that would be necessary to explain away the results. The absolute value of $\delta$ 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 B.2); ii) distinguish between large/small and positive/negative shocks, alone and interacted with the shock size (see Table B.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 summarized in Figure B.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 labor income in shaping total household income expectations.

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

[B.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 B.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 B.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 B.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 |

**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.

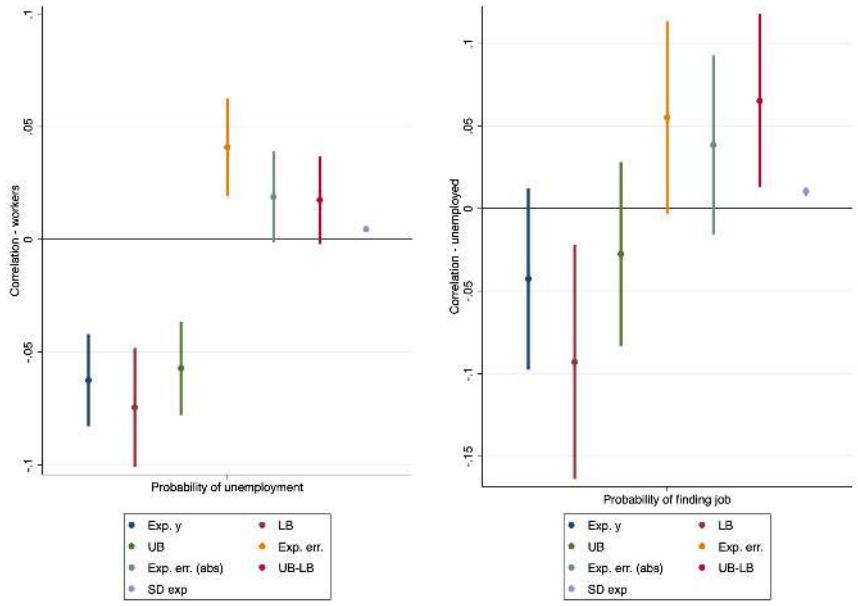


Figure B.1: Correlation between outcome variables and job-related expectations

**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.

# C. Appendix: Robustness checks

We report the characteristics of the bottom and top 33% income groups (see Table C.1) and the benchmark analysis split by sample group: Bottom 33% (see Table C.2), middle 33% (see Table C.3) and top 33% (see Table C.4).

Table C.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 C.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 C.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 C.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. $***p<0.01, **p<0.05, *p<0.1$.

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