Household savings in CESEE: expectations, experiences and common predictors

Melanie Koch, Thomas Scheiber[1]

This study analyzes the link between household savings and adverse financial experiences as well as financial expectations. Using data from the 2019 OeNB Euro Survey, we focus our analysis on Central, Eastern and Southeastern European (CESEE) economies. Managing perceptions of the past and expectations about the future may be particularly crucial in countries where people have repeatedly experienced macroeconomic crises. Besides controlling for a rich set of individual characteristics in a standard regression framework, we also use a double LASSO regression analysis to test if detected effects are confounded by omitted variables. While people's expectations about the economic situation in their country are positively related to the extensive margin of having savings and saving regularly, inflation expectations are negatively related to the amount people save regularly. Crisis experiences matter less but having experienced restricted access to one's bank account discourages savings in general. Crisis experiences become more relevant if we restrict our analysis to older respondents and to savings during the COVID-19 pandemic in 2020, for which we have some data. The LASSO approach mostly supports our findings but also shows that neither crisis experiences nor expectations about economic or inflation developments are relevant predictors of the propensity to save regularly. It reveals, however, that trust in the national central bank is, among other things, a relevant predictor of savings behavior.

Household savings are a key macroeconomic variable. They serve as a significant source of domestic funding for investments, ultimately promoting economic growth through financial markets and, more commonly, through banks. Apart from this, households accumulate savings as a means of precaution, allowing them to absorb adverse economic shocks. This, in turn, helps smooth the business cycle and maintain financial stability. The demand for precautionary savings is linked to the extent of uncertainty, which depends on the quality of a country's social security net, its pension system and educational system. Because of this uncertainty, household expectations might be a key macroeconomic variable as well. For example, households' inflation expectations are assumed to influence their real interest rate perceptions, which then affect their savings and consumption decisions and, with this, macroeconomic outcomes (Woodford, 2003).

Empirically, households are heterogeneous in terms of size, economic activity, income, net wealth and cultural background as well as their expectations and experiences. This calls for microeconomic evidence to analyze savings behavior. Malmendier and Nagel (2016) show that differences in experiences strongly predict differences in expectations, linking individuals' expectations to their financial decisions. The dispersion of inflation expectations, for instance, is particularly

pronounced following periods of highly volatile inflation. The underlying learning-from-experience mechanism rests on psychological evidence (Tversky and Kahnemann, 1973) and the notion that the dispersion of beliefs arises naturally due to differences in experiences. Leombroni et al. (2020) complement these findings by showing that varying inflation expectations across age cohorts during the Great Inflation in the US in the 1970s matter for the propensity to save, the size of tax effects, the volume of nominal credit and the price of housing as collateral. Goldfayn-Frank and Wohlfart (2020) show that severe crisis experiences can permanently impede people's ability to form expectations. East Germans, who experienced an inflation shock after reunification, still expect higher inflation than West Germans, even decades after reunification. East Germans' higher inflation expectations are reflected in higher consumer debt and lower bond holdings.

In a similar vein, recent literature emphasizes the role of economic sentiments (i.e., households' growth expectations) as a predictor of consumption expenditures and, hence, savings in the US and the euro area (Dees and Brinca, 2013; Christiansen et al., 2014). Again, the link between economic sentiments and the business cycle is time-varying and strengthened, for instance, after the global financial crisis (Lozza et al., 2015, for Italy; Soric, 2018, for Central, Eastern and Southeastern Europe (CESEE)). Furthermore, macroeconomic conditions and economic senti-ments influence each other (Van Aarle and Kappler, 2012, for the euro area). Finally, tail events can trigger larger belief revisions that may scar beliefs for a long time (Van Giesen and Pietres, 2019; Kozlowski et al., 2020). Thus, the complex interaction between experiences and expectations establishes a time-varying influence – sometimes clustered at a specific age cohort – on individual savings decisions that reaches beyond the life-cycle hypothesis and the permanent income hypothesis.

Still, microeconometric evidence on the determinants of savings for house-holds in CESEE is scarce, although this region is considered a prime example for studying the interaction between household experiences, expectations and financial decisions. The CESEE region exhibits some special features when it comes to savings. First, people in CESEE have experienced several negative events in the last 30 years which have eroded the value of their savings, leaving a deep scar on people's trust in banks and local currencies (Beckmann and Scheiber, 2012).[2] These events include national currency crises, banking crises, hyperinflation periods during the transition to market economies and the Yugoslav wars; or, more recently, the global financial crisis in 2008/2009 and the ongoing COVID-19 pandemic. Consequently, CESEE households resorted to keeping savings in foreign currency cash and foreign currency deposits, if at all. Brown and Stix (2015) show that crisis experiences, economic expectations and weak trust in institutions are the main determinants of monetary expectations in CESEE, which, together with network externalities, explain the region's demand for foreign currency deposits. Another stylized fact for CESEE is that a substantial share of people prefers to save in cash. While the importance of saving in cash and/or in foreign currency declined strongly in Hungary and Poland, it remained quite substantial for households in

---

[2] *While trust in local currencies has recovered gradually over the last decade, the lead of trust in the euro vis-à-vis the respective local currency has narrowed only in three out of seven countries (i.e., in Albania, Hungary and Serbia), staying the same or increasing otherwise.*

Southeastern Europe (SEE).[3] Stix (2013) shows that weak trust in banks, gray economies and experiences of restricted access to one's bank account are the main drivers of CESEE individuals' preference for saving in cash. Finally, the share of individuals who report that they do not have any savings is relatively high. Average shares of savers ranged from only 19% in Bosnia and Herzegovina to 71% in Czechia in 2012 and have increased only moderately over the last decade (see the left-hand panel of chart 1).

Up to date, to the best of our knowledge, the only study analyzing potential determinants of savings across different CESEE countries has been conducted by Beckmann et al. (2013). Using OeNB Euro Survey data from 2010–2011, the authors find age, income and education to be the strongest socioeconomic predictors of the propensity to save. Due to lack of data, they can only analyze whether people have savings or not and they do not explicitly focus on people's experiences and expectations. Kłopocka (2017) looks at the latter at the aggregate level for Poland and finds that the gross household savings rate is positively related to changes in an aggregate index of future consumer confidence. This significant relationship is mostly driven by unemployment expectations.

In this paper, we analyze the relationship between household savings and future economic prospects as well as negative financial experiences of individuals in CESEE prior to the COVID-19 pandemic. Drawing on data from the OeNB Euro Survey from 2019, we focus on financial events that themselves cannot be influenced by the individual and the perceptions of which are malleable, e.g., perceptions of a country's economic situation, economic crises and inflation events. We consider two distinct dimensions of savings: the savings stock, i.e., *having savings at all,* and the savings flow, i.e., *saving on a regular basis.* The latter information was surveyed for the first time in 2019. Therefore, we can look at both the propensity to save regularly and the amount that is saved regularly (extensive and intensive margin). A caveat of our study is that we pool the data over all ten countries in our sample. This is because the sample within each country becomes too small, especially since two of our three dependent variables are dummy variables. Thus, we cannot estimate how expectations and experiences interact with country effects. The country effects capture, for instance, relevant differences in national pension systems. By pooling the data, we can control for several individual and household characteristics that we would otherwise not have been able to include. Besides employing standard regression techniques with predetermined covariates, we also use a more data-driven approach. This allows us to include more control variables than previous studies. Thus, with the help of the so-called double LASSO approach, we search for potential covariates that are important to uncover the "non-confounded" relationship between our independent variables of interest and savings. Eventually, we also sneak a peek at the savings stock and its covariates in 2020, the year when the COVID-19 pandemic hit CESEE, where memories of past crisis periods used to trigger a rather swift and strong reaction amid a renewed economic crisis (Prean and Stix, 2011; Brown and Stix, 2015).

---

[3] *Czechia is the only country in the OeNB Euro Survey where both euroization of deposits and preference for saving in cash have never been elevated since 2007. For indicators on cash preference, trust in currencies and banks as well as euroization, see the OeNB's website at https://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey/Main-Results.html.*

Our results show that having savings and saving regularly are significantly positively related to expectations about a country's future economic situation, while inflation expectations show no significant or large connection to these extensive margins. However, inflation expectations show a significant negative relation to the amount that individuals save regularly, i.e., respondents who expect high inflation with a larger probability save less. In contrast, expectations about a country's economic situation are not significantly related to the amount saved. For individuals' experiences, we do not find as strong effects but having experienced restricted access to one's bank account seems to discourage savings in general. However, if we restrict our sample to older respondents, i.e., to those who are more likely to have experienced (more) adverse events, memories and experiences become more relevant. Beyond socioeconomic factors like income (shocks), education, age and employment, we find a strong relationship between financial literacy as well as self-control and savings. Besides expectation management, these factors could be adequately addressed by policymakers and central banks through programs and trainings.

The double LASSO approach shows that most of our findings hold even when considering a larger set of covariates. This means that our results are not likely to be driven by omitted variable bias. However, the relationship between expectations about the economic situation in a country and the savings flow is not robust to this approach. Hence, none of the considered expectation and experience variables can predict the extensive margin of savings flows. Further control variables that turn out to be relevant predictors of savings are wealth, social status and trust in the national central bank. In contrast to 2019, we find that respondents' experiences with high inflation become highly significant for having savings in 2020. As in every correlational study, causal interpretation of our results should be made with caution. In our case, this holds especially true for the inference of control variables using the double LASSO framework. Still, we shed light on potential determinants of savings behavior in CESEE.

Our study is related to the scarce empirical literature that analyzes the effects of individual expectations on consumption and/or savings at the disaggregated level. Vellekoop and Wiederholt (2019) find that inflation expectations are negatively related to households' net worth and positively related to their consumption of durables in a panel sample of Dutch households. Using an Italian panel sample, Rondinelli and Zizza (2020) show that the nexus between inflation expectations and durable consumption can depend on the inflation regime (high or low). In general, our results are in line with both studies, showing that also in CESEE, individuals who expect prices to rise save less on a regular basis.

Understanding households' savings decisions at a more disaggregated level is important not only for understanding economic growth and the monetary transmission mechanism but also for assessing the stability of a country's financial system and public finances. Microfounded evidence is important for policymakers to encourage or discourage savings. Optimal policies can accommodate economic growth and business cycle needs and, at the same time, ensure household (financial) well-being. Small adjustments at the household level can cause substantial changes at the aggregate level (Bhamra and Uppal, 2019). Individuals' financial experiences from the past and perceptions of the future might play a crucial role when it comes to savings behavior. Essentially, experiences and perceptions are not only affected

through direct channels (e.g., Lachowska and Myck, 2018; d'Addio et al., 2020) but also through communication efforts of authorities (Blinder et al., 2008).

This paper is structured as follows: Section 1 introduces the data and describes the variables. In section 2, we outline the empirical approach. Section 3 presents the main results including those obtained with the double LASSO procedure, while section 4 presents initial evidence on savings in 2020. Finally, section 5 concludes.

1 Data and variables

We use data from the OeNB Euro Survey, an annual, cross-sectional household survey, conducted to gain insights into euroization and the financial behavior of individuals in non-euro area CESEE countries.[4] In each country, a multistage stratified random sampling procedure is applied that targets residents aged 18 years or older and generates a representative sample of 1,000 individual interviews per country. The interviews are carried out face-to-face in the respondent's home. Data weighting is used to ensure a nationally representative sample for each country; sampling weights use census population statistics on gender, age, region and, where available, education as well as ethnicity (separately for each country). Our analysis is based on data from the 2019 wave of the OeNB Euro Survey which included a special module on savings. The survey was administered in the fall of 2019, about four months before the first COVID-19 cases were officially registered in the sampled countries.[5]

1.1 Savings variables of interest

We concentrate our analysis on three different outcome variables, which measure various dimensions of savings behavior. The first variable is a simple assessment of the propensity to have savings. Survey respondents are asked the following question:

> **Savings stock**
>
> *"There are several ways in which one can hold savings. For example, one can hold cash, use bank accounts, have life insurances, hold mutual funds, pension funds, etc. Do you currently have any savings? Please refer to savings you hold personally or together with your partner."*
>   *1. Yes   2. No   3. Don't know   4. No answer*

Based on this question, we construct a dummy variable for the *savings stock* that captures the extensive margin of having savings, excluding those respondents who were not willing or not able to respond. Since this variable is collected in all survey waves, we can also use it to analyze savings in 2020, the first year of the COVID-19 pandemic. The definition of savings is broad, ranging from cash to deposits and financial market securities. A novelty in the 2019 wave is that respondents are also asked whether, and if so, how much they save regularly:

---

[4] *Six countries are EU member states (Bulgaria, Croatia, Czechia, Hungary, Poland and Romania), while the other four countries (Albania, Bosnia and Herzegovina, North Macedonia and Serbia) are potential candidates for EU membership. For more information and technical details on the OeNB Euro Survey, see https://www.oenb.at/en/ Monetary-Policy/Surveys/OeNB-Euro-Survey.html.*

[5] *Out of the ten OeNB Euro Survey countries, Croatia was the first to report a case on February 25, 2020 (see https://ourworldindata.org/covid-cases).*

> **Savings flow**
>
> "At the end of the month, do you usually have some money left that you can save, for example, to finance major future purchases, provide for emergencies or accumulate wealth? If so, how big an amount can you save?"

Based on this question, we build two variables. First, a dummy variable for the *savings flow* that indicates whether respondents can save regularly or not; second, a variable for the *savings flow amount* that measures the amount of savings per month in euro adjusted for purchasing power parity (PPP). Respondents who state that they usually do not have any money left to save at the end of the month get a zero. As in question one, we exclude those respondents who did not provide a valid answer.[6]

Note the difference between the two survey questions we rely on: The first question refers to the state of having savings (the stock), while the second refers to the act of saving (the flow). Because of its higher granularity, the savings flow amount can be directly linked to people's current experiences and expectations, which might be more difficult to identify based on the binary assessment of the savings stock. Furthermore, the second question emphasizes the ability not the willingness to save. Thus, it can be seen as an indicator for financial resilience. If already in ordinary times individuals do not have the ability to build up or increase their savings stock, they might be hit hard when they experience a sudden income shock. Alternatively, with reference to the life-cycle and permanent income hypotheses, individuals might no longer be in a state where they have to accumulate savings; rather, they dissave. Therefore, both dimensions of savings, the stock and the flow, are important to assess the financial resilience of individuals.

1.2 Expectations and experiences

Our main explanatory variables of interest are expectations about *future* financial prospects and past experiences with adverse events related to financial matters. In detail, we consider the following items:

> **Expectations**
>
> 1. Over the next five years, the economic situation of [MY COUNTRY] will improve.
> 2. Over the next year, prices will strongly increase in [MY COUNTRY].
> 3. Over the next 12 months, I expect the financial situation of my household to get better.

Expectation items are elicited with a rating scale from 1 ("strongly disagree") to 6 ("strongly agree").[7] Given that the scale does not have a midpoint, respondents who are not sure whether they agree or not can only answer "don't know" to these

---

[6] *Still, with the help of a third question about savings, we can distill some further information about respondents who answered "don't know" to the second question. We recover whether they can save regularly or not and adjust our second dummy variable accordingly. Results are very similar without this adjustment, but it would leave us with a smaller sample size.*

[7] *Developments across countries and over time for survey items 1 and 3 can be tracked under https://www.oenb.at/ en/Monetary-Policy/Surveys/OeNB-Euro-Survey/Main-Results/individual-trust-and-expectations.html.*

items. We recode this kind of non-response as a midpoint of the scale and thereby extend the scale from 1 to 7.[8]

We include item 3 with two grains of salt. First, there is particularly high concern about reverse causality between savings and item 3: Having savings or being able to save might well affect individuals' perceptions about the future financial situation of their household. Second, our analysis focuses on individual respondents, their personal characteristics and their perceptions rather than on the whole household they are living in. In general, we are more interested in how individuals' perceptions of exogenous events are related to their savings behavior. Nevertheless, we think it is important to control for personal prospects and try to disentangle the latter from perceptions of external circumstances. This is especially important when examining expectations about the economic situation in a country. One of the main reasons why expectations about domestic economic developments are supposed to influence savings behavior is their link to individual income expectations. However, we are interested in a potential relationship between economic expectations and savings beyond this link, which is why we control for (a proxy of) expected income. Regarding people's experiences, we look at the following three survey items:

> **Experiences**
>
> *1. I remember periods of high inflation during which the value of the [LOCAL CURRENCY] dropped sharply.*
> *2. I remember periods during which access to savings deposits was restricted in [MY COUNTRY].*
> *3. If you think back in time to periods of economic turbulences that happened prior to 2008, e.g. very high inflation, banking crisis or restricted access to savings deposits. At that time, did you personally incur a financial loss due to such events?*
>   *a) No, I had no savings then*
>   *b) No, I did not incur a financial loss*
>   *c) Yes*

Again, items 1 and 2 are originally measured on a rating scale ranging from 1 ("strongly disagree") to 6 ("strongly agree"), which we extend by including "don't know" answers as midpoint answers. For item 3, we create dummy variables for each answer option, also for non-responses. Option b ("No, I did not incur a financial loss") will serve as the omitted category. Generally, item 3 should be treated with caution. It refers to the period before 2008, when around 20% of our respondents had been under 18 years old. This issue could also apply to items 1 and 2, for which no time frame is set, and which focus on perceptions of the past rather than on financial loss. Older respondents are more likely to have experienced at least one period of economic turbulence and are more likely to experience several instances of such events. Therefore, we run additional estimations to better take into account that such experiences come with age.

In sum, we mainly consider two different kinds of expectations about and two different types of experiences with external financial circumstances (survey items 1 and 2, respectively), and include a third more personal expectation and

---

[8] *Our results are robust to excluding "don't know" answers completely.*

experience.[9] For the double LASSO approach that we employ, we only consider the four types mentioned earlier as fixed independent variables.
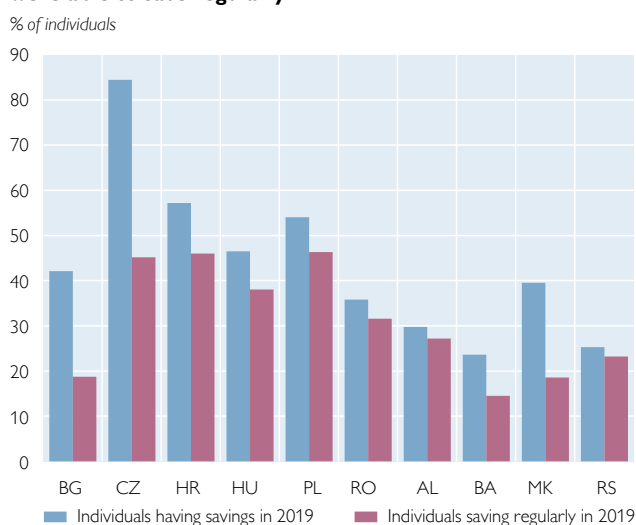
1.3 Descriptive statistics

The left panel of chart 1 shows the share of individuals who reported to have savings (stock) and who were able to save on a regular basis (flow) in fall 2019. The right panel exhibits the reported amounts saved regularly in euro adjusted for PPP.[10] Results confirm what Corti and Scheiber (2014) described as stylized facts in their study: Most persons in CESEE neither have savings nor can they save (much) on a regular basis. In some countries, not even every fifth person can save regularly.[11] Table 1 in the online supplement indicates the (weighted) descriptive statistics for the explanatory variables of interest. In general, standard deviations for the expectation and experience variables show considerable heterogeneity in the

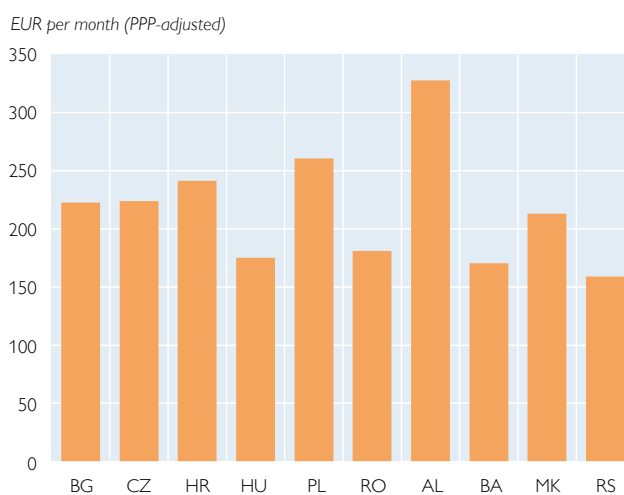Chart 1

Savings stock and savings flows

Share of individuals who had savings and were able to save regularly

% of individuals

Individuals having savings in 2019 | Individuals saving regularly in 2019

Average amount set aside by individuals who saved regularly

EUR per month (PPP-adjusted)

Source: OeNB Euro Survey 2019.

Note: Weighted averages excluding respondents who answered "don't know" or refused to answer. Weights are calibrated on census population statistics for age, gender, region and, where available, on education and ethnicity (separately for each country). Reported savings amounts suffer from a rather high incidence of item non-response (18% on average), which might imply an underestimation of amounts for EU member states in particular.

[9] Naturally, these independent variables are correlated to each other. However, none of the correlations is so strong that we need to worry about multicollinearity. Table 2 in the online supplement shows correlations between all six expectation and experience variables. Furthermore, chart 1 in the online supplement shows histograms for each variable.

[10] Note that the item non-response for the savings stock averages 3.2%, with the highest incidence being reported in Poland (7.8%) and Bulgaria (11%). For the savings flows, item non-response averages 18%, ranging from 5% in Albania to about 25% in Czechia and Hungary and 33% in Poland. A simple ordinary least squares (OLS) regression for the EU member states shows that item non-response is correlated with higher educational attainment and being male, which makes an underestimation of savings amounts in those countries particularly likely.

[11] Another stylized fact is the relative high importance of holding cash for savings reasons. For further details, see chart 2 in the online supplement.

answers of respondents.[12] Overall, expectations are rather pessimistic, with the average respondent not agreeing that the economic situation of their country or household will improve but agreeing that prices will increase. On average, respondents neither agree nor disagree with having experienced hyperinflation and restricted access to their bank accounts. A tenth of the sample incurred financial loss during crisis periods that occurred prior to the global financial crisis.

2 Empirical approach

To analyze the relationship between savings and expectations as well as experiences, we use two different approaches. We start with a standard regression analysis, in which we regress our explanatory variables of interest and a fixed set of covariates on the three savings variables. This means that we predetermine the set of control variables used in the regression analysis. Our choice of variables is based on economic theory and empirical evidence from previous literature. In contrast, our second approach is a more data-driven, machine learning approach, in which covariates are eventually selected using a least absolute shrinkage and selection operator (LASSO) regression analysis. We explain the procedures employed in more detail in the following subsections.

2.1 Common predictors

The previous literature identified a comprehensive set of determinants of savings, which we try to include in our standard regression analysis, while, at the same time, keeping the model tractable and especially avoiding overfitting. A complete list and description of all control variables used can be found in table A1 in the annex, and descriptive statistics in table 1 in the online supplement. Across all dimensions of savings, *income* seems to be an important determinant of savings. This partially explains the cross-country differences depicted in chart 1, revealing, e.g., that the share of savers in Czechia (the richest country) is much higher than in other countries. In our main specifications, we include respondents' personal income. We consider *age* to be another important factor, given the empirical evidence but also the theoretical considerations related to the life-cycle hypothesis. Following this hypothesis, the relationship between age and savings should be inversely U-shaped – above all for savings flows. Therefore, we also control for *age squared*. In the standard regressions, we additionally control for sex, education, having employment, being self-employed, the number of household members, the number of children under 6 and 15 years of age, financial literacy (index), risk aversion (index), self-control and whether or not households experienced an income shock in the previous year.

2.2 Regression analysis with fixed covariates

In general, we estimate regression equations of the following form:

$$Y_i = \alpha_0 + \beta_1 X_i + \beta_2 C_i + \varepsilon_i \tag{1}$$

---

[12] *For times series of the expectation variables by country, see https://www.oenb.at/en/Monetary-Policy/Surveys/ OeNB-Euro-Survey/Main-Results/individual-trust-and-expectations.html.*

where X_i is the vector of our four explanatory variables of interest (experience and expectation items 1 and 2) and C_i is the vector of additional control variables for each individual i. Depending on the nature of the savings variable, we either estimate the model using OLS or logit regressions. This means that Y_i is either the

$$\textit{savings flow amount} \quad \text{or} \quad \ln \frac{\textbf{P(Savings Flow or Stock=1|X)}}{\textbf{P(Savings Flow or Stock=0|X)}}$$

of individual i. We pool our regression analysis over all individuals and over all countries. There is valid concern that country-specific characteristics like pension schemes might affect how experiences and expectations are related to savings. This cannot be adequately addressed with country fixed effects. However, given the binary nature of two of the three dependent variables and the high share of (non-)savers in some countries, the sample size would be too small to estimate the regressions separately for each country, while retaining the large set of covariates we have. We clearly see a trade-off between estimating country and individual characteristics and opt for the latter. Still, we will briefly report some country-specific results if they strongly deviate from the average effect in our online supplement. Country-specific results should be treated with caution, however. For our logit regressions, we report average marginal effects. For both specifications, we again use sampling weights and cluster standard errors on the primary sampling unit. To retain as many observations as possible and to take non-response into account, we use income categories instead of PPP-adjusted income (as reported in table A1 in the annex) in the regressions. For each country, we create income quartile categories and another category for non-response. The lowest income quartile serves as base category. Finally, we estimate regressions with and without country fixed effects.

2.3 Double LASSO estimation

The choice of which covariates to include in regression estimation is a common source of sorrow. Not only can this choice lead to biased coefficients of the main explanatory variables but also, when taking a more holistic approach, to one over-looking important factors, which might affect the outcome variable. However, throwing in all potential covariates available is not sensible either. It might result in overfitting, i.e., it might explain the sample at hand very well but perform poorly in out-of-sample predictions, thus reducing the generalizability of results. Therefore, we also pursue a more data-driven selection of control variables for our analysis. We follow Belloni et al. (2014) and Urminsky et al. (2016) in establishing a double LASSO procedure to retrieve an optimal set of covariates. For this exercise, we consider a much larger set of potential control variables. Since the OeNB Euro Survey focuses on the financial behavior of individuals, we have a large bulk of variables that can be considered for this procedure.[13] Specifically, besides the covariates used in the main regressions, we include further variables for wealth (proxied by dwelling conditions and asset ownership), social status, trust in institutions, financial inclusion (bank/ATM availability, account ownership), perceptions of financial stability, migration intentions, remittances, indicators for being (over-)

---

[13] *Since the preselection of potential control variables is still made by us researchers, we are far from being able to claim that this approach is fully data driven.*

indebted, regional fixed effects and further sociodemographic characteristics. A list of these additional variables can be found in table A2 in the annex.

In general, LASSO estimation is a linear regression and prediction method to avoid the problem of overfitting *(regularization)* and, at the same time, to select right-hand-side variables *(selection)*. It is especially useful in high-dimensional settings, where many potential covariates are available and a preselection of covariates by the researcher can be biased or incomplete (Urminsky et al., 2016). The regression equation is the same as in the OLS framework, what changes is the optimization problem. To select and regulate, the sum of squared errors is minimized subject to a penalty term:

$$\min\{\sum_i (Y_i - \alpha_0 - \beta_1 X_i - \beta_2 C_i)^2 + \lambda \sum_k |\beta_k|\} \qquad (2)$$

The additional term penalizes the use of too many and too large coefficients: Regression coefficients of the variables are shrinked.[14] Depending on the size of the Lagrange multiplier λ, some coefficients will turn zero and, thereby, variables are effectively excluded from the estimation problem.

In the case of the double LASSO, two different kinds of LASSO regressions are performed. First, we estimate a regression of the dependent variable – in our case savings – on all control variables (excluding the main explanatory variables):

$$Y_i = \delta_0 + \delta_1 C_i + \varepsilon_i \qquad (3)$$

In a second step, we regress each main explanatory variable individually on all control variables:

$$X_{ij} = \theta_0 + \theta_1 C_i + \varepsilon_{ij} \qquad (4)$$

This second step is important in all cases, in which the researcher cannot guarantee that the main explanatory variables are perfectly randomly distributed over the control variables. In our analysis, this is extremely likely. Expectations and experiences are also affected by individuals' financial situation and sociodemographic characteristics. LASSOs have the general problem of regularization bias. They tend to underestimate effects and drop variables with moderate effects. Excluding such a variable after step one can lead to serious omitted variable bias if the dropped variable is correlated with the explanatory variable (Belloni et al., 2014). Eventually, we estimate an OLS regression including all control variables that were selected (element of union A) by equation (3) or (4), where selected means coefficients are non-zero:

$$Y_i = \alpha_0 + \beta_1 X_i + \sum_{k \in A} \beta_k C_{ik} + \varepsilon_i \qquad (5)$$

This last step gives us consistent, unbiased estimates of the coefficients for X_i, the four expectation and experience variables. However, this is not true for the coefficients of the control variables. Since these will be in general biased, we do not report coefficients and p-values later but still describe which covariates are selected

---

[14] *All variables are standardized before the optimization problem is performed.*

and might be of special relevance. As before, we cluster standard errors at the primary sampling unit and use weights in all steps of the procedure. We estimate linear probability models instead of logits for our binary dependent variables because the literature on LASSO logits is still evolving. We use STATA to estimate our regressions and prewritten user routines to perform LASSO regressions, which do not have all features needed for our logit models (e.g., clustering and weighting).

3 Econometric analysis of the relationship between savings and expectations as well as experiences

3.1 Main results

Table 1, columns (1) to (4), show the logit regression results for the propensity to have savings and to be able to save regularly. While inflation expectations are not significantly related to savings, having an optimistic outlook on the economic situation in a country is significantly positively related to both savings dimensions. Those respondents who strongly agree that the economic situation of their country will improve are, on average, about 8 to 9 percentage points more likely to have savings and 5 to 7 percentage points more likely to save regularly than those who strongly disagree. This positive effect does not seem to be solely driven by the fact that respondents who draw a bright future for their country also have higher hopes for their own household. When separately controlling for being optimistic about the future financial situation of one's household (at least for the upcoming year), the effect of which is highly significant itself, we find that the effect of expectations about the country's economic prospects remains significant and positive. We neither find an effect for inflation expectations nor experiences. However, having experienced restricted access to one's bank account is significantly negatively related to having savings at all but only if we do not control for country fixed effects. This could be caused by too strong a correlation between restricted access and respondents' country of residence (and age). Moreover, in contrast to the effect resulting from expectations about the economic situation of one's household or country, the effect of inflation experiences is not linear but mostly driven by people who strongly agree to having experienced such restrictions. We do not find a link between individuals' current state of savings and their experiences of having incurred financial loss during crisis periods before the global financial crisis. However, we find a remarkable persistence of the state of savings itself. Controlling for income, those who say that they did not have savings in crisis events before 2008 are also less likely to have savings and save on a regular basis today.[15] This persistency turns out to be related to being younger, less affluent, less (financially) educated and to having less self-control. As confirmed in previous studies on savings in and outside of CESEE, income and education have a large positive effect on the savings stock and flow. In line with Beckmann et al. (2013), we do not find evidence for a large gender gap in these broad measures of savings. If at all, men are less likely to have savings than women. The results for the age variables are

---

[15] In a similar vein, the results of the generalized ordered logit regression in table 6 of the online supplement show that respondents who lost their savings in a crisis event prior to 2008 were more likely to belong to the group of regular savers above the median amount in 2019.

somewhat surprising. We basically estimate a precise null for the savings stock and a U-shaped relationship for the savings flow, which contradicts the life-cycle hypothesis and the bivariate relationship shown in chart 2 in the online supplement. We also estimate a regression using age categories instead of respondents' exact age in years. With age categories, we clearly find no hump-shaped but a significant linear relationship between age and savings. There could be two broad reasons for this finding. First, there could be reasons why older (younger) people save more (less) than hypothesized.[16] Thus, the life-cycle hypothesis truly does not hold. Second, people who are older right now have a different savings trajectory – throughout their lifetime – than people who are younger. In the second case, our data cannot show a hump because we can neither observe older respondents' savings behavior when they were younger nor infer younger respondents' savings patterns when they will be older. Having a job and being self-employed are both significantly positively related to both the savings stock and savings flow. Conversely, having experienced an income shock is negatively related to accumulating savings regularly but not to having savings at all. The number of small children in a household is especially positively related to having savings, whereas the number of children aged between 6 and 15 years does not reveal a consistent effect. Household size is negatively related to savings but only if we do not control for country fixed effects. Looking at more behavioral factors, respondents' higher financial literacy and higher self-control are linked to a larger propensity to have savings and to save regularly.

Table 1

Main regressions results: savings stock, savings flow (logit) and savings flow amount (OLS)

Dependent variable	Savings stock		Savings flow		Savings flow amount	
	(1)	(2)	(3)	(4)	(5)	(6)
Expect better economic situation of country	0.015***	0.014***	0.011***	0.008**	0.776	−0.605
	(0.004)	(0.004)	(0.003)	(0.003)	(1.514)	(1.582)
Expect high inflation	0.003	0.002	−0.002	−0.004	−5.302***	−5.551***
	(0.004)	(0.004)	(0.004)	(0.004)	(1.797)	(1.946)
Expect better financial situation of household	0.033***	0.037***	0.043***	0.044***	10.948***	11.154***
	(0.004)	(0.004)	(0.003)	(0.003)	(1.321)	(1.324)
Experienced high inflation	−0.003	0.002	−0.001	−0.002	0.780	1.225
	(0.004)	(0.003)	(0.003)	(0.003)	(1.754)	(1.623)
Experienced restricted access to savings account	−0.009**	0.002	−0.002	0.003	−2.670*	−1.996
	(0.004)	(0.003)	(0.003)	(0.003)	(1.575)	(1.452)

Source: OeNB Euro Survey 2019.

*Notes: Dependent variables: savings stock = dummy for having savings; savings flow = dummy for being able to save; savings flow amount = amount saved regularly in euro (PPP-adjusted). Average marginal effects from logit estimations (1–4) and coefficients from OLS estimations (5–6) with/without country fixed effects, using sampling weights; robust standard errors are adjusted for clustering at the primary sampling unit level and reported in parentheses. ***, **, * denote that the effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of variables, see annex table A1. Base categories are: financial loss prior to 2008: no; 1st income quartile; Czech resident in specifications (2), (4) and (6). The sample comprises all ten OeNB Euro Survey countries.*

---

[16] *Pension systems, for instance, have a strong impact on savings behavior (e.g., d'Addio et al., 2020). Similarly, increasing (expected) longevity leads to higher savings in old age than predicted by the standard model (e.g., De Nardi et al., 2010; Gan et al., 2015).*

Main regressions results: savings stock, savings flow (logit) and savings flow amount (OLS)

Dependent variable	Savings stock		Savings flow		Savings flow amount	
	(1)	(2)	(3)	(4)	(5)	(6)
Financial loss prior to 2008: no savings	−0.095***	−0.062***	−0.078***	−0.068***	−22.275***	−19.078***
	(0.014)	(0.013)	(0.013)	(0.012)	(5.333)	(5.291)
Financial loss prior to 2008: yes	0.001	0.006	0.007	0.002	3.774	4.786
	(0.021)	(0.018)	(0.020)	(0.019)	(8.233)	(8.294)
Financial loss prior to 2008: don't know	0.025	0.014	−0.012	−0.015	−9.624	−10.277
	(0.027)	(0.024)	(0.024)	(0.022)	(8.523)	(8.683)
2nd income quartile	0.042**	0.064***	0.045**	0.056***	4.905	7.464*
	(0.019)	(0.017)	(0.019)	(0.018)	(3.953)	(3.970)
3rd income quartile	0.085***	0.107***	0.102***	0.119***	15.571***	20.551***
	(0.020)	(0.019)	(0.019)	(0.019)	(4.925)	(5.069)
4th income quartile	0.139***	0.163***	0.216***	0.232***	124.956***	130.842***
	(0.023)	(0.020)	(0.023)	(0.022)	(10.289)	(10.209)
Income: don't know/no answer	−0.027	0.035*	−0.062***	−0.026	−6.404	3.723
	(0.021)	(0.019)	(0.020)	(0.019)	(4.343)	(4.729)
Male	−0.018*	−0.013	0.006	0.011	2.735	3.599
	(0.010)	(0.010)	(0.010)	(0.010)	(4.357)	(4.310)
Age in years	0.001	0.002	−0.005**	−0.005**	−0.544	−0.603
	(0.002)	(0.002)	(0.002)	(0.002)	(0.782)	(0.761)
Age squared	0.000	0.000	0.000***	0.000***	0.013*	0.013*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.008)
Educational attainment (categories)	0.037***	0.043***	0.029***	0.035***	12.337***	12.410***
	(0.005)	(0.005)	(0.004)	(0.004)	(2.403)	(2.272)
Employed (dummy)	0.078***	0.027*	0.108***	0.076***	16.288***	8.187*
	(0.018)	(0.016)	(0.016)	(0.016)	(4.837)	(4.906)
Self-employed (dummy)	0.093***	0.100***	0.071***	0.087***	78.458***	76.202***
	(0.021)	(0.019)	(0.019)	(0.020)	(17.942)	(16.962)
Household members	−0.022***	0.001	−0.013**	0.004	0.429	2.387
	(0.006)	(0.006)	(0.005)	(0.005)	(2.857)	(2.966)
Children aged under 6 years	0.049***	0.029**	0.028**	0.014	3.052	−0.648
	(0.013)	(0.012)	(0.012)	(0.012)	(4.711)	(4.697)
Children aged 6 to 15 years	0.020**	0.007	−0.001	−0.013	5.378	4.148
	(0.010)	(0.010)	(0.010)	(0.009)	(6.389)	(6.485)
Financial literacy index	0.061***	0.035***	0.041***	0.021***	14.338***	11.060***
	(0.005)	(0.005)	(0.005)	(0.005)	(1.862)	(2.127)
Risk/uncertainty aversion index	0.010	0.014*	0.004	0.010	−3.438	−2.116
	(0.009)	(0.008)	(0.008)	(0.008)	(2.300)	(2.243)
Self-control index	0.052***	0.043***	0.028***	0.025***	6.667**	7.364**
	(0.008)	(0.008)	(0.007)	(0.007)	(3.251)	(3.079)
Income shock (dummy)	0.000	−0.015	−0.071***	−0.073***	−16.504***	−19.653***
	(0.017)	(0.016)	(0.016)	(0.015)	(4.736)	(5.019)
Country fixed effetcs	No	Yes	No	Yes	No	Yes
Log-likelihood	−5,397.30	−4,907.36	−4,329.00	−4,114.22	–	–
Pseudo R-squared (McFadden) / Adjusted R-squared	0.11	0.19	0.15	0.19	0.15	0.16
Probability > Chi squared / F-statistic (df_m)	667.7(25)	965.8(34)	818.9(25)	974.9(34)	22.1(25)	18.3(34)
Number of observations	8,843	8,843	8,214	8,214	7,709	7,709
Baseline predicted probability / amount	0.45	0.45	0.32	0.33	66	66

Source: OeNB Euro Survey 2019.

*Notes: Dependent variables: savings stock = dummy for having savings; savings flow = dummy for being able to save; savings flow amount = amount saved regularly in euro (PPP-adjusted). Average marginal effects from logit estimations (1–4) and coefficients from OLS estimations (5–6) with/without country fixed effects, using sampling weights; robust standard errors are adjusted for clustering at the primary sampling unit level and reported in parentheses. ***, **, * denote that the effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of variables, see annex table A1. Base categories are: financial loss prior to 2008: no; 1st income quartile; Czech resident in specifications (2), (4) and (6). The sample comprises all ten OeNB Euro Survey countries.*

We look at the amount respondents set aside on a regular basis including amounts equaling zero[17] in columns (5) and (6) of table 1. Given the considerable share of non-response for this question, the results should be treated with caution with respect to their representativeness. Here, we cannot confirm that respondents' expectations about their country's economic situation matter for how much they save. However, we do find a significant correlation between respondents' inflation expectations and the amount respondents save regularly. The more respondents think that prices will increase in the future, the less they save. This effect is mostly linear and sizable: For every one-point increase on the rating scale, the amount saved decreases by more than EUR 5. Expectations about the financial situation of one's household are again positively related to savings. We find a marginally significant (this time basically linear) link between having experienced restricted access to one's bank account and the amount set aside if we do not control for country fixed effects. The significance and direction of the effects of the control variables are comparable to the results for respondents' propensity to save regularly as indicated in columns (3) and (4).

In the online supplement, we provide several robustness checks for our main results presented in table 1.

3.2 Double LASSO results suggest that wealth, social status and trust in the central bank might be relevant predictors of the extensive margin to save

Table 2 summarizes the OLS results for the explanatory variables of interest from the double LASSO approach. While respondents' expectations about their country's economic prospects are still a significant predictor of the savings stock, their relationship to the savings flow is not as robust. The coefficient is shrinked tremendously and is no longer significant. Moreover, none of the experience variables turn out to be a significant predictor of respondents' savings behavior. In contrast, the relationship between inflation expectations and the amount people save regularly is almost as strong as before. Having no savings in past crises is a strong (negative) predictor for all dependent variables. None of the LASSO regressions ever selects age squared (or age to the power of three) as a predictor but only age in years, underlining that there is no hump-shaped link between age and savings in our data. Newly added covariates that seem to be strong predictors of savings behavior, even though their coefficients cannot be consistently estimated within the LASSO framework, are the variables that proxy wealth and social status. For the extensive margin of the savings stock and flow, trust in the national central bank also seems to be a relevant predictor. Moreover, the reason why the coefficients for respondents' expectations about the economic situation in their country are smaller and mostly non-significant seems to be due to the fact that these expectations are mediated by individuals' expectations about the financial situation of their household and their trust in institutions. Country expectations are significant for all three outcome variables if we run simple regressions only including such expectations, income and country fixed effects. However, coefficients become smaller and less often significant if we add expectations about household finances,

---

[17] *In the online supplement, we also use other model specifications like a two-part model or ordered logit (see tables 5 and 6 in the online supplement).*

Table 2

Double LASSO approach: selected OLS results

Dependent variable	Savings stock		Savings flow		Savings flow amount	
	(1)	(2)	(3)	(4)	(5)	(6)
Expect better economic situation of country	0.011***	0.011***	0.005	0,003	−1.634	−2.040
	(0.004)	(0.004)	(0.004)	(0.004)	(1.876)	(1.9)
Expect high inflation	0.007	0.003	0.002	0.000	−4.138**	−4.837**
	(0.004)	(0.004)	(0.004)	(0.004)	(2.04)	(2.278)
Experienced high Inflation	0.001	0.005	−0.003	−0.004	1.235	1.604
	(0.004)	(0.004)	(0.004)	(0.004)	(2.034)	(1.869)
Experienced restricted access to savings account	−0.005	0.003	0.000	0.002	−2.685	−2.978*
	(0.004)	(0.004)	(0.003)	(0.003)	(1.712)	(1.648)
Observations	6,942	6,942	6,477	6,477	6,182	6,182
Baseline controls plus additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	Yes	No	Yes	No	Yes

Source: OeNB Euro Survey 2019.

Notes: Dependent variables: savings stock = dummy for having savings; savings flow = dummy for being able to save; savings flow amount = amount saved regularly in euro (PPP-adjusted). Effects from post double LASSO OLS estimations with/without country fixed effects (partialed out), using sampling weights; robust standard errors are adjusted for clustering at the primary sampling unit level and reported in parentheses. ***, **, * denote that the effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For the list of control variables used, see annex tables A1 and A2. The sample comprises all ten OeNB Euro Survey countries.

diminishing even further if we include trust variables. In sum, we find that certain expectations are significant predictors of the savings stock and the intensive margin of savings flows, while none of the main expectations and experiences of interest predict the extensive margin of savings flows.

3.3 Extensions of baseline regressions

As mentioned earlier, people's perceptions of past negative events might depend on how old they were when the event happened (Malmendier and Nagel, 2016). One of our questions on people's past experiences explicitly asks about events that happened before 2008. The likelihood of having experienced any adverse event at all crucially depends on age (Ehrmann and Tzamourani, 2012), especially in the region we are looking at. To take this into account, we estimate our standard regressions only for older adults in our sample population, to whom we refer to as the "crisis cohort." More specifically, we only include those respondents who were 18 years or older at the end of the transition crisis or the Yugoslav wars, i.e., individuals who potentially incurred financial loss during these times. We indeed find that past experiences matter more for older respondents (see table 3 in the online supplement).[18] For the savings stock, the negative coefficient of having experienced limited access to one's savings account becomes larger and more significant if we do not control for country fixed effects. In contrast, for younger people the coefficient is very small and not significant. Furthermore, if we control for country fixed effects, we find that having experienced high inflation has a

---

[18] Simple t-tests show that the crisis cohort agrees significantly more strongly, on average, with the statements on past inflation experiences or restricted access to one's saving account than younger cohorts.

marginally significant, positive effect for the crisis cohort.[19] We again observe that having had no savings during crisis periods prior to 2008 has a negative effect on respondents' savings stock and flows. The latter is also slightly significantly related to having experienced high inflation. As was to be expected, this relationship is negative for the extensive margin of savings flows. However, it is positive for the intensive margin: The subsample of respondents who more strongly agree to having experienced high inflation is less likely to save regularly but sets aside higher amounts if they save regularly.

With respect to expectations, we find the subsample results to be broadly in line with the full sample results (see table 3 in the online supplement). Interestingly, respondents' expectations about their country's economic situation become significant for the amount saved regularly in the subsample. When considering an alternative specification using an interaction term between age categories and economic expectations, we observe that older cohorts with positive expectations tend to save moderately more, while younger cohorts with positive expectations save substantially less. This is in line with the prediction of the life-cycle hypothesis, stating that expectations matter more for younger people (see table 4 in the online supplement).

4 Savings in 2020

The focus of our study is deliberately on the year 2019 instead of 2020 for two reasons: First, we do not have data on savings flows in 2020. Second, we are interested in the relationship between savings and expectations particularly in ordinary times. When thinking about potential impacts of a crisis, it is extremely useful to look at how people entered the crisis. The COVID-19 pandemic that hit the world in 2020 had an immediate impact on people's savings behavior, as many saw their income decrease and possibilities to consume were restricted. However, people's level of savings prior to the pandemic was crucial for how well they could weather the pandemic, determining, e.g., their general capability of buffering income shocks. Whether the pandemic itself will have a potentially long-lasting effect by, e.g., changing people's preferences remains an open question for future research.[20] Nevertheless, comparing our results for 2019 with those for 2020 could offer first insights into how authorities could manage individuals' perceptions of the pandemic and their economic prospects. Based on the savings stock – the only savings variable for which we have data in 2020 –, we first look at whether the share of respondents with savings has changed. As indicated in the left panel of chart 2, we clearly have to reject this. The share of respondents with savings in 2020 across all countries considered is not even 1 percentage point smaller than in 2019 and by no means do the shares within each country differ significantly from each other.

---

[19] *For evidence on the intergenerational transmission of adverse inflation experiences, see Farvaque and Mihailov (2009). As an alternative to splitting the sample, we interacted the dummy variable for the cohort that experienced past crisis events with all survey items on respondents' experiences. In the case of restricted access to one's bank account (excluding country fixed effects), the crisis cohort dummy and the interaction term exhibit significant negative effects on predicting the extensive margin. The other results are inconclusive.*

[20] *Concerning euro cash hoardings, OeNB Euro Survey data show that individuals who have been strongly affected by the pandemic in economic terms tend to have lower trust in the stability of the local currency and demonstrate an increased demand for cash (see box 3 in European Central Bank, 2021).*
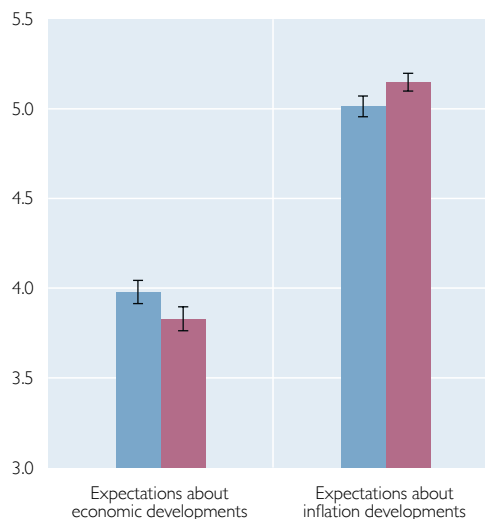
Chart 2

Comparison between 2019 and 2020 results

Savings stock

Weighted share of respondents with valid answers in %
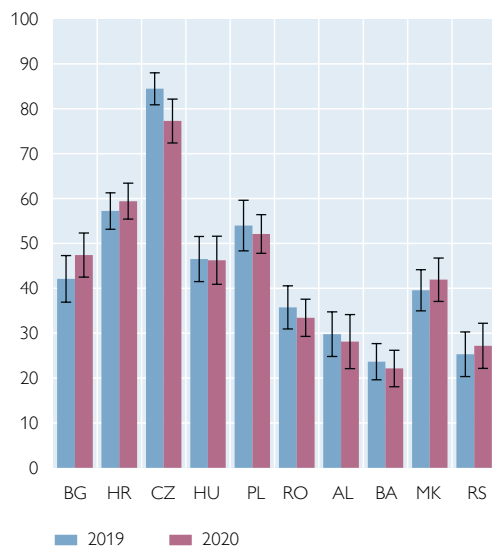
Expectations

Weighted average value on a Likert scale from 1 to 7

■ 2019   ■ 2020

Source: OeNB Euro Survey 2019 and 2020.

Note: Weighted averages excluding respondents who answered "don't know" or refused to answer for the left panel and excluding respondents who refused to answer for the right panel. Weights are calibrated on census populations statistics for age, gender, region and, where available, on education and ethnicity (separately for each country). 95% confidence intervals.

Preliminary evidence from a survey question that explicitly deals with how individuals were affected by the COVID-19 pandemic suggests that while some people had to cut savings, some others could set money aside even though they had not been able to do so before. These observations might cancel each other out. We moreover look at whether people's expectations changed between 2019 and 2020. The right panel of chart 2 depicts slight changes in the two explanatory expectation variables, with the average respondent being significantly less optimistic about the future economic situation of their country and significantly more convinced that prices will increase in 2021. As expected, respondents' experiences are very persistent and do not significantly deviate from their historical means.

Eventually, we want to know whether the multivariate relationship between savings and experiences as well as expectations in 2020 is different from that in 2019. Thus, we rerun regressions (1) and (2) from table 1 for 2020. Unfortunately, not all control variables used in the previous specifications are available. For 2020, there is no data on whether respondents incurred financial loss during crisis periods before the global financial crisis and no measure for respondents' self-control. For the financial literacy and risk/uncertainty aversion indices, one item is missing for each index but we can still construct the variables using the remaining items. Thus, we first rerun regressions for 2019 with the smaller/different set of covariates to check whether this makes a big difference. In general, results stay very similar (size and significance), especially with respect to the four main explanatory variables. The most remarkable change is that respondents' risk/uncertainty aversion is now significantly positively related to the savings stock. When repeating these two

regressions (with and without country fixed effects) for 2020, we find some striking differences for the main explanatory variables.[21] Individuals' expectations about the economic situation in their country are only significant if we do not control for country fixed effects. In contrast, having experienced limited access to one's bank account stays significant in both specifications. Most importantly, having experienced high inflation in the past, which was neither economically nor statistically significant in 2019, is significantly positively related to having savings in 2020.[22] This raises the question of whether CESEE residents who experienced past economic crises learned their lesson by preferring higher precautionary savings in times of heightened uncertainty.[23] Moreover, given the significant effect for the full sample, it might be the case that older generations pass on the lessons they have learned to the next generation.

Generally, memories of past periods of high inflation could affect savings directly by influencing the demand for precautionary savings (Caroll, 1992). Moreover, experiences of adverse economic events may introduce a lifelong bias in forming inflation expectations (i.e., hysteresis) and hence indirectly influence savings behavior (Brown and Stix, 2015; Goldfayn-Frank and Wohlfart, 2020). As discussed in footnote 24, both effects might be state dependent, i.e., their influence could differ between ordinary times and crisis times. Soric (2018) unveiled a similar time-varying impact of consumer confidence on GDP growth for eleven CESEE economies during the global financial crisis. Kozlowski et al. (2020) argue that the COVID-19 pandemic has the potential to trigger large belief revisions (similar to the transition crisis in CESEE) that could scar people's beliefs persistently, casting shadows on future economic outcomes. We find suggestive evidence that the precautionary motive might indeed matter, as the positive coefficient of inflation experiences on savings is slightly larger for older persons. Furthermore, the coefficient for risk aversion increases in size in 2020 compared to 2019. There is also a negative interaction between inflation experiences and risk aversion, meaning that those who experienced high inflation and are more willing to take risks are more likely to save. Regarding the indirect influence, a simple analysis of the factors associated with inflation expectations reveals a complex interaction between respondents' age, experiences of past periods of high inflation and financial literacy, which seems to exhibit a state-dependent pattern.[24] Regression tables are available from the authors upon request.

---

[21] For the regression results, see table A3 in the annex.

[22] It should be noted that the relationships between savings and the other covariates do not differ substantially from the ones in table 1. The only exception is that having experienced an income shock is significantly negatively related to savings in 2020.

[23] By analogy: Past crisis experiences triggered dynamics already observed during the global financial crisis in 2008/2009, when SEE residents reacted to the loss of trust in banks and increased depreciation expectations by swiftly shifting their portfolios toward euro cash and euro deposits (Dvorsky et al., 2009; Stix, 2010).

[24] In 2019, i.e., in ordinary times, inflation expectations were moderately lower for older respondents (crisis cohort) and higher among respondents who reported memories of past high inflation; particularly among those who also belonged to the crisis cohort (significant interaction term). Moreover, financial literacy had a small dampening effect on inflation expectations. In 2020, i.e., in crisis times, inflation expectations were dominated by a strong positive and significant effect resulting from memories of high inflation, irrespective of whether respondents belonged to the crisis cohort or not (insignificant interaction term). The dampening effect for older persons became insignificant, yet financial literacy increased the probability of reporting high inflation expectations — contrary to ordinary times.

5 Conclusion

Policymakers are interested in influencing households' savings behavior according to the needs of economic growth and financial stability. In contrast, households rather think about their individual well-being than that of the whole economy or of financial stability when making savings decisions. To understand which instruments could be useful in steering savings behavior, we need to have a sound understanding of what exactly determines household savings.

In this paper, we try to shed light on whether, and if so, in what ways people's expectations about and experiences with financial events that are beyond their control could affect their savings behavior. In particular, such expectations and experiences are assumed to influence macroeconomic outcomes through precautionary savings and perceived real interest rates. Moreover, the fact that individuals' expectations about and perceptions of exogenous financial events may be shaped by decision makers is of particular interest to central banks. After all, central bank communication was regarded as a promising policy tool already more than a decade ago (e.g., Blinder et al., 2008) and might play an important role in managing economic expectations and perceptions. Our study focuses on economies in CESEE, where individuals have experienced several adverse economic events over the past three decades (and more) and tend to face more economic uncertainty.

Using data from the OeNB Euro Survey from 2019, we find that both the extensive margin of the savings stock and the intensive margin of regular monthly savings (flows) are significantly positively related to individuals' expectations about their country's future economic situation. Moreover, higher inflation expectations are negatively linked to the monthly amount people save regularly. Effects resulting from people's experiences are in general smaller but having experienced restricted access to one's bank account does matter for some savings dimensions and subsamples. For older respondents who were more likely to have been affected by negative events in the past, we find significant relationships between having savings and remembering such events, especially periods of high inflation. When looking beyond socioeconomic factors like income (shocks), education, age and employment, we find a strong link between respondents' financial literacy as well as self-control and savings. As recently shown in a meta-analysis by Kaiser et al. (2020), financial literacy is not only correlated to savings but causally affects it. The authors also underline that financial education and behavior trainings can be a useful (and cost-effective) tool to improve individuals' financial health. So far, financial literacy in CESEE has been relatively low (Beckmann and Reiter, 2020) across all income groups.

Our main findings are mostly confirmed when using a more data-driven approach to covariate selection, namely a double LASSO regression analysis. Still, this analysis reveals that none of the expectations and experiences considered predict whether people save regularly or not. What seems to be an important factor for saving on a regular basis and having savings at all is, among other things, trust in the national central bank. Thus, central banks should not only keep an eye on avoiding adverse macroeconomic events in the first place but also on rebuilding trust with those who have lived through such experiences.

The COVID-19 pandemic again drew attention to the state of household savings. Amid constrained consumption opportunities and increased uncertainty,

households' (aggregate) savings rate and deposits grew very strongly in 2020. When examining the savings stock in that year, we find that respondents' experiences with high inflation become an important factor. Our analysis highlights that memories of past crises can reemerge in times of renewed heightened uncertainty, resuming a link with individual savings decisions by, e.g., raising the demand for precautionary savings. However, it remains to be seen whether this pandemic will have a long-lasting effect on household savings behavior. This particularly depends on individuals' expectations about the future and on how this pandemic will be remembered. This, in turn, might hinge on how policymakers including central banks communicate with the general public. Further research is needed on the overall effect of expectation management. Expectations are related to financial behaviors that might counteract or reinforce each other. Therefore, policies in this respect should not only consider one single aspect of financial behavior such as savings in isolation.

References

Beckmann, E., M. Hake and J. Urvova. 2013. Determinants of Households' Savings in Central, Eastern and Southeastern Europe. In: Focus on European Economic Integration Q3/13. OeNB. 8–29.

Beckmann, E. and T. Scheiber. 2012. The Impact of Memories of High Inflation on Households' Trust in Currencies. In: Focus on European Economic Integration Q4/12. OeNB. 80–93.

Beckmann, E. and S. Reiter. 2020. How financially literate is CESEE? Insights from the OeNB Euro Survey. In: Focus on European Economic Integration Q3/20. OeNB. 36–59.

Belloni, A., V. Chernozhukov and C. Hansen. 2014. Inference on Treatment Effects after Selection among High-Dimensional Controls. In: The Review of Economic Studies 81(2). 608–650.

Bhamra, H. S. and R. Uppal. 2019. Does Household Finance Matter? Small Financial Errors with Large Social Costs. In: American Economic Review 109(3). 1116–1154.

Blinder, A. S., M. Ehrmann, M. Fratzscher, J. de Haan and D.-J. Jansen. 2008. Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence. In: Journal of Economic Literature 46(4). 910–945.

Brown, M. and H. Stix. 2015. The Euroization of Bank Deposits in Eastern Europe. In: Economic Policy 30(81). 95–139.

Caroll, C. D. 1992. The buffer stock theory of saving: some macroeconomic evidence. Brook Pap Econ Act 2. 61–155.

Christiansen, C., J. N. Eriksen and S. V. Moller. 2014. Forecasting US recessions: The role of sentiment. In: Journal of Banking and Finance 49. 459–468.

Cieslak, A. and A. Schrimpf. 2019. Non-Monetary News in Central Bank Communication. In: Journal of International Economics 118. 293–315.

Corti, M. and T. Scheiber. 2014. How Did CESEE Households Weather the Crisis? Evidence from the OeNB Euro Survey. In: Focus on European Economic Integration Q2/14. OeNB. 76–87.

d'Addio, A., M. Roger and F. Savignac. 2020. Pensions and Household Savings: Cross-Country Heterogeneity in Europe. In: ECB Working Paper Series. No. 2372/February.

Dees, S. and P. S. Brinca. 2013. Consumer confidence as a predictor of consumption spending: Evidence for the United States and the euro area. In: International Economics 134. 1–14.

De Nardi, M., E. French and J. B. Jones. 2010. Why Do the Elderly Save? The Role of Medical Expenses. In: Journal of Political Economy 118(1). 39–75.

Dvorsky, S., T. Scheiber and H. Stix. 2009. CESEE Households Amid the Financial Crisis: Euro Survey Shows Darkened Economic Sentiment and Changes in Savings Behavior. In: Focus on Eastern European Integration Q4/09. OeNB. 71–83.

Ehrmann, M. and P. Tzamourani. 2012. Memories of High Inflation. In: European Journal of Political Economy 28. 174–191.

European Central Bank. 2021. The International Role of the Euro. 20th Annual Review. Frankfurt am Main.

Farvaque, E. and A. Mihailov. 2009. Intergenerational Transmission of Inflation Aversion: Theory and Evidence. In: IRIIS Working Paper Series 2009-11. CEPS/INSTEAD.

Gan, L., G. Gong, M. Hurd and D. McFadden. 2015. Subjective Mortality Risk and Bequests. In: Journal of Econometrics 188(2). 514–525.

Goldfayn-Frank, O. and J. Wohlfahrt. 2020. Expectation Formation in a New Environment: Evidence from the German Reunification. In: Journal of Monetary Economics 115. 301–320.

Hansen, S., M. McMahon and M. Tong. 2019. The Long-Run Information Effect of Central Bank Communication. In: Journal of Monetary Economics 108. 185–202.

Kaiser, T., A. Lusardi, L. Menkhoff and C. Urban. 2020. Financial Education Affects Financial Knowledge and Downstream Behaviors. In: NBER Working Paper No. 27057/April.

Kłopocka, A. M. 2017. Does Consumer Confidence Forecast Household Saving and Borrowing Behavior? Evidence for Poland. In: Social Indicator Research 133. 693–717.

Kozlowski, J., Veldkamp, L. and V. Venkateswaran. 2020. Scarring body and mind: the long-term belief-scarring effects of COVID-19. NBER Working Paper 27439.

Lachowska, M. and M. Myck. 2018. The Effect of Public Pension Wealth on Saving and Expenditure. In: American Economic Journal: Economic Policy 10(3). 284–308.

Leombroni, M., M. Piazzesi, R., Ciaran and M. Schneider. 2020. Inflation and the price of real assets. CEPR Discussion Papers 14390.

Lozza, E., A. Bonanomi, C. Castiglioni and A. C. Bosio. 2015. Consumer sentiment after the global financial crisis. In: International Journal of Market Research 58(5). 671–686.

Malmendier, U. and S. Nagel. 2011. Depression Babies: Do Macroeconomic Experiences Affect Risk Taking? In: Quarterly Journal of Economics 126(1). 373–416.

Malmendier, U. and S. Nagel. 2016. Learning from Inflation Experiences. In: Quarterly Journal of Economics 131(1). 53–87.

Prean, N. and H. Stix. 2011. The Effect of Raising Deposit Insurance Coverage in Times of Financial Crisis – Evidence from Croatian Microdata. In: Economic Systems 35. 496–511.

Rondinelli, C. and R. Zizza. 2020. Spend Today or Spend Tomorrow? The Role of Inflation Expectations in Consumer Behaviour. In: Temi di discussione (Working Paper Series). No. 1276/April.

Soric, P. 2018. Consumer confidence as a GDP determinant in New EU Member States: a view from a time-varying perspective. In: Empirica 45. 261–282.

Stix, H. 2010. The Euro as a Safe Haven Asset in Central, Eastern and South-Eastern Europe. In: Nowotny, E., P. Mooslechner, and D. Ritzberger-Grünwald. 2010. The Euro and Economic Stability. Cheltenham, UK: Edward Elgar. 109–128.

Stix, H. 2013. Why Do People Save in Cash? Distrust, Memories of Banking Crises, Weak Institutions and Dollarization. In: Journal of Banking & Finance 37(11). 4087–4106.

Tversky, A. and D. Kahneman. 1973. Availability: A Heuristic for Judging Frequency and Probability. In: Cognitive Psychology. 207–232.

Urminsky, O., C. Hansen and V. Chernozhukov. 2016. Using Double-Lasso Regression for Principled Variable Selection. Mimeo.

Van Aarle, B., and M. Kappler. 2012. Economic sentiment shocks and fluctuation in economic activity in the Euro Area and the USA. In: Intereconomics 47. 44–51.

Van Giesen, R. and R. Pietres. 2019. Climbing out of an economic crisis: A cycle of consumer sentiment and personal stress. In: Journal of Economic Psychology 70. 109–124.

Vellekoop, A. and M. Wiederholt. 2019. Inflation Expectations and Choices of Households. In: SAFE Working Paper Series. No. 250/April.

Williams, R. 2006. Generalized ordered logit/partial proportional odds models for ordinal dependent variables. In: The Stata Journal 6(1). 58–82.

Williams, R. 2016. Understanding and interpreting generalized ordered logit models. In: Journal of Mathematical Sociology 40(1). 7–20.

Woodford, M. 2003. Interest and Prices: Foundations of a Theory of Monetary Policy. Princeton, New Jersey: Princeton University Press.

Annex

Control variables used in the regression analysis

Label	Description
Income quartile	Personal income per month (after taxes) divided into four percentiles per country. Non-response to income is coded as fifth category.
Male	Dummy variable that equals 1 if the respondent is male and zero if the respondent is female.
Age in years	Age of the respondent in years.
Age squared	Age of the respondent squared.
Age groups	Ordinal variable for the age of the respondent: ten age brackets with a span of 5 years, starting from 19 years to 69 years, and an open age bracket for 70 years or older.
Crisis cohort	Dummy variable that equals 1 if the repsondent is 18 years or older at the end of the transition crisis or the Yugoslav wars. For Czechia, Hungary and Poland, the last crisis year was 1991, for Bosnia and Herzegovina, Croatia, North Macedonia and Romania 1993, for Serbia 1994, and for Albania and Bulgaria 1997.
Educational attainment	Ordinal variable for the education of the respondent: 1 "primary," 2 "lower secondary," 3 "(upper) secondary," 4 "post-secondary (non-tertiary) education," 5 "first stage of tertiary education," 6 "second stage of tertiary education."
Employed	Dummy variable that equals 1 if the respondent is employed (including self-employed) and zero otherwise (retired, unemployed, students).
Self-employed	Dummy variable that equals 1 if the respondent is self-employed and zero otherwise (including non-working).
Household members	Number of household members in the respondent's household.
Children aged under 6 years	Number of children in the respondent's household below the age of 6.
Children aged 6 to 15 years	Number of children in the respondent's household aged 6 to 15 years.
Financial literacy index	Index counting the correct answers to the following questions: 1. Suppose you had 100 [LOCAL CURRENCY] in a savings account and the interest rate was 2% per year. Disregarding any bank fees, how much do you think you would have in the account after 5 years if you left the money to grow: more than 102, exactly 102, less than 102 [LOCAL CURRENCY]? 2. Suppose that the interest rate on your savings account was 4% per year and inflation was 5% per year. Again, disregarding any bank fees – after 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account? 3. Suppose that you have taken a loan in EURO. Then the exchange rate of the [LOCAL CURRENCY] depreciates against the EURO. How does this change the amount of local currency you need to make your loan installments? Does the amount of local currency increase, stay exactly the same, or decrease? 4. When an investor spreads his money among different assets, does the risk of losing money increase, decrease, or stay the same?
Risk/uncertainty aversion index	Standardized index of the answers to the following questions: 1. In managing your financial investments, would you say you have a preference for investments that offer: a) VERY HIGH returns, but with a HIGH risk of losing part of the invested capital. b) A GOOD return, but also a FAIR degree of protection for the invested capital. c) A FAIR return, with a GOOD degree of protection for the invested capital. d) LOW returns, WITH NO RISK of losing the invested capital. 2. In financial matters, I prefer safe investments over risky investments. On a scale from 1 ("strongly agree") to 6 ("strongly disagree") (reverse coded for the index).
Self-control index	Standardized index of the answers to the following questions: 1. I tend to live for today and let tomorrow take care of itself. 2. I am impulsive and tend to buy things even when I cannot really afford them. Both on a scale from 1 ("strongly agree") to 6 ("strongly disagree").
Income shock	Dummy variable that equals 1 if the respondent's household experienced "[…] an unexpected significant reduction of its income over the past 12 months."

Source: OeNB Euro Survey 2019 and 2020.

Additional control variables used in the double LASSO regression analysis

Label	Description
Age³	Age of the respondent to the power of three.
Condition of dwelling	Assessment of the interviewer about the condition of the respondent's dwelling: 1 "excellent and well-maintained," 2 "good, needs some minor repairs," 3 "poor, needs major work," or 4 "very poor, some walls or ceilings need replacement."
Relative wealth	Assessment of the interviewer about how the condition of the respondent's dwelling compares to those in the neighborhood: 1 "in a better condition," 2 "in more or less the same condition," 3 "in a poorer condition," or 4 "there are no neighboring dwellings."
Household assets	Eight dummy variables if the respondent's household owns any of the following: 1 "car," 2 "main residence," 3 "secondary residence," 4 "other real estate," 5 "mobile phone," 6 "computer," 7 "internet access," or 8 "land."
Trust in institutions	Six dummy variables if the respondent trusts in the following: 1 "government/cabinet of ministers," 2 "police," 3 "domestically owned banks," 4 "foreign owned banks," 5 "the European Union," or 6 "national central bank." On a scale from 1 ("I trust completely") to 5 ("I do not trust at all").
Bank availability	Assessment of the respondent of the following statement: "For me, it takes quite a long time to reach the nearest bank branch." On a scale from 1 ("strongly disagree") to 6 ("strongly agree").
Bank stability	Assessment of the respondent of the following statement: "Currently, banks and the financial system are stable in my country." On a scale from 1 ("strongly disagree") to 6 ("strongly agree").
Owns bank account	Dummy variable that equals 1 if the respondent owns a bank account and zero otherwise.
Bank in town/village	Dummy variable that equals 1 if there is a bank in the town or village the respondent lives in and zero otherwise.
ATM in town/village	Dummy variable that equals 1 if there is an ATM in the town or village the respondent lives in and zero otherwise.
Size of village/city	Number of inhabitants of the town/village/city the respondent lives in.
Indebted	Dummy variable that equals 1 if the respondent has a loan and zero otherwise.
Expenses > Income	Assessment of the respondent if their household expenseses in the last 12 months were 1 "higher than household income," 2 "roughly equal to household income," or 3 "lower than household income."
Migration intention	Dummy variable that equals 1 if the respondent intends to move abroad in the next 12 months and zero otherwise.
Remittances	Indicator if the respondent or the partner receives money from abroad: 1 "no," 2 "yes infrequently," or 3 "yes regularly."
Family abroad	Dummy variable that equals 1 if the respondent has family abroad and zero otherwise.
Religion	Categorical variable for the respondent's religion: 1 "Atheist/Agnostic," 2 "Muslim," 3 "Orthodox Christian," 4 "Catholic Christian," 5 "other Christian, including Protestant," 6 "other (for example Jew, Buddhist, etc.)," or 7 "no answer."
Marital status	Categorical variable for the respondent's marital status: 1 "single," 2 "separated/divorced," 3 "widowed," 4 "married/with partner living in same household," 5 "married/with partner living in different household," or 6 "no answer."
Social status	Proxy for the socioeconomic status the respondent grew up with, measured by the amount of books the household owned when the respondent was ten years old (ordinal variable).

Source: OeNB Euro Survey 2019.

Logit regression on savings stock: 2019 and 2020

	2019		2020	
	(1)	(2)	(3)	(4)
Expect better economic situation of country	0.013***	0.013***	0.001	0.007*
	(0.004)	(0.004)	(0.004)	(0.004)
Expect high inflation	−0.001	−0.001	−0.002	0.002
	(0.005)	(0.004)	(0.005)	(0.004)
Expect better financial situation of household	0.030***	0.035***	0.015***	0.025***
	(0.004)	(0.004)	(0.004)	(0.004)
Experienced high inflation	−0.003	0.003	0.011***	0.017***
	(0.004)	(0.004)	(0.004)	(0.004)
Experienced restricted access to savings account	−0.010***	0.002	−0.018***	−0.008**
	(0.004)	(0.003)	(0.004)	(0.004)
2nd income quartile	0.047**	0.066***	0.025	0.034*
	(0.019)	(0.017)	(0.019)	(0.018)
3rd income quartile	0.095***	0.113***	0.085***	0.106***
	(0.021)	(0.019)	(0.021)	(0.020)
4th income quartile	0.147***	0.166***	0.138***	0.145***
	(0.024)	(0.021)	(0.024)	(0.022)
Income: don't know/no answer	−0.014	0.045**	0.018	0.078***
	(0.022)	(0.019)	(0.023)	(0.021)
Male	−0.015	−0.012	−0.013	−0.012
	(0.011)	(0.010)	(0.010)	(0.010)
Age in years	0.003	0.003	0.002	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Age squared	0.000	0.000	0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Educational attainment (categories)	0.042***	0.047***	0.043***	0.047***
	(0.005)	(0.005)	(0.005)	(0.005)
Employed (dummy)	0.069***	0.019	0.084***	0.043***
	(0.018)	(0.016)	(0.017)	(0.016)
Self-employed (dummy)	0.108***	0.114***	0.137***	0.129***
	(0.021)	(0.019)	(0.022)	(0.021)
Household members	−0.022***	0.002	−0.009	0.007
	(0.006)	(0.006)	(0.006)	(0.005)
Children aged under 6 years	0.052***	0.028**	0.025*	0.011
	(0.013)	(0.012)	(0.013)	(0.012)
Children aged 6 to 15 years	0.024**	0.008	0.005	−0.020*
	(0.010)	(0.010)	(0.012)	(0.011)
Financial literacy index	0.064***	0.037***	0.064***	0.036***
	(0.007)	(0.006)	(0.007)	(0.006)
Risk/uncertainty aversion index	0.025***	0.027***	0.035***	0.032***
	(0.006)	(0.005)	(0.006)	(0.006)
Income shock (dummy)	−0.011	−0.023	−0.067***	−0.065***
	(0.017)	(0.016)	(0.015)	(0.014)
Country fixed effetcs	No	Yes	No	Yes
Log-likelihood	−5622.88	−5080.30	−5717.41	−5276.93
Pseudo R-squared (McFadden)	0.09	0.18	0.08	0.15
Probability > Chi squared (df_m)	576.0 (21)	891.0 (30)	589.0 (21)	836.2 (30)
Number of observations	9,038	9,038	9,108	9,108
Baseline predicted probability	0.45	0.45	0.45	0.45

Source: OeNB Euro Survey 2019 and 2020.

Notes: Dependent variables: savings stock = dummy for having savings. Average marginal effects from logit estimations with/without country fixed effects, using sampling weights; robust standard errors are adjusted for clustering at the primary sampling unit level and reported in parentheses. ***, **, * denote that the average marginal effect is statistically different from zero at the 1%, 5% and 10% level, respectively. For a definition of variables, see annex table A1. Base categories are: 1st income quartile; Czech resident in specifications (2) and (4). The sample comprises all ten OeNB Euro Survey countries.