

# Determinants of Households' Savings in Central, Eastern and Southeastern Europe

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*This paper uses data from the Euro Survey of the Oesterreichische Nationalbank (OeNB) for ten Central, Eastern and Southeastern European (CESEE) countries to analyze the saving behavior of CESEE households between 2010 and 2011. We investigate households' decisions to save and their subsequent portfolio choices based on the life-cycle hypothesis, i.e. by analyzing sociodemographic determinants of saving, most notably age. Understanding households' saving behavior is particularly relevant for CESEE countries to properly address public policy challenges related to promoting financial market development and financial stability. Our findings suggest that age as well as education and income drive the propensity to save and reveal that the hump-shaped relationship between age and savings as predicted by the life-cycle hypothesis holds for CESEE. Age also plays a role in households' portfolio choices, with younger persons having a higher propensity to own life insurance, while older persons are more likely to have savings deposits.*

*JEL classification: D14, D80, D84, G11*

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## 1 Introduction

Saving is a key macroeconomic variable, as it is a potential source of investment and thus economic growth. It also plays a role in the monetary transmission mechanism. Usually, the private sector,<sup>2</sup> including households, provides the bulk of savings in an economy. Households are heterogeneous in terms of size, economic activity, income, net wealth and cultural background. This means that investigating households' behavior at the aggregate level only by looking at the "average" household ignores many potentially important aspects. Therefore, in the recent years, several central banks have increasingly invested effort into exploring households' behavior and balance sheets at the individual, i.e. the micro level. The most recent venture in this vein is the Eurosystem's Household Finance and Consumption Survey (HFCN, 2013).<sup>3</sup>

The analysis of household savings at a more disaggregated level is important not only for understanding economic growth but also for assessing the stability of a country's financial system and its public finances. The financial systems of Central, Eastern and Southeastern European (CESEE) countries are mostly dominated by foreign-owned banks with relatively high loan-to-deposit ratios. During the 2008–2009 crisis, policymakers and banks started initiatives to bring these ratios closer to balance.<sup>4</sup> Such a policy should strengthen and stabilize the

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<sup>2</sup> In the countries under investigation, the average share of private saving in 2010 amounted to more than 90% of total saving in the economy, according to the IMF Article IV Reports.

<sup>3</sup> For an overview of how household survey data have been used to inform policy on household finance and consumption decisions in advanced economies, see HFCN (2009).

<sup>4</sup> E.g., the joint measures of the Austrian Financial Market Authority (FMA) and the OeNB seek to strengthen the business model sustainability of Austrian banks operating in the CESEE and include imposing a 110% limit for the loan-to-deposit ratio of new businesses (OeNB, 2011).

funding base of banks operating in CESEE, as it intends to diversify away banks' dependency on foreign financing. In addition, the ageing of society in many countries drives up costs in particular within the pension and healthcare systems and thus puts a great strain on public finances and more emphasis on individuals' future saving behavior.<sup>5</sup>

To affect the volume of household savings (e.g. by regulatory measures or policy incentives), policymakers first need to understand what households' saving motives are (i.e. those other than benefiting from the applicable interest rates) and how these motives differ across households. Moreover, by knowing more about the financial behavior of various types of households, policymakers gain insight into which groups might be vulnerable to certain types of shocks (e.g. income or interest rate shocks) and how well they are hedged against these shocks. Irrespective of which policy decision makers choose to apply, the chosen policy will always have to take into account households' saving behavior and portfolio choices and will, in turn, affect households at the same time.

Furthermore, the CESEE region has some specific features which themselves justify an analysis of household savings in these countries compared with other countries. For example, many CESEE countries are highly euroized, and remittances are an important source of income, especially in some countries of Southeastern Europe. In addition, local capital markets are often not as developed and alternative financial instruments (e.g. life insurance) are not as widely used as in other high-income countries (see chart 1). All these factors might have an impact on the saving and portfolio decisions of different types of individuals.

In this paper, we analyze how households' saving decisions (*whether* to save and *which financial instruments* to use) in the CESEE region differ across individuals, depending on their sociodemographic characteristics, which means we look beyond the aggregate "average household." We do so by testing the life-cycle hypothesis, which, put broadly, predicts that different types of individuals (classified in particular – but not solely – by age) differ in their saving behavior. Our findings suggest that age, in addition to other sociodemographic factors, specifically education and income, drives individuals' propensity to save. As predicted by the life-cycle hypothesis, younger and older respondents are less likely to save, but older persons in CESEE dissave less than predicted by the hypothesis. Age also plays a role in portfolio choice, with younger persons having a higher propensity to own life insurance, while older persons are the most likely to have savings deposits.

The paper is structured as follows: Section 2 highlights the relevant theoretical literature and empirical findings on households' saving behavior and portfolio choices in general and in the CESEE countries in particular. Section 3 presents the data and some stylized facts on the development of the financial markets in CESEE, while section 4 introduces the empirical strategy applied. Our main results on the determinants of saving and of choosing financial instruments follow in section 5, with robustness checks in section 6. Section 7 concludes with policy implications.

<sup>5</sup> For an analysis of the ageing problem in the EU Member States, including the CESEE EU countries, and of possible policy measures and measures already taken, see European Commission (2012).

## 2 Literature Review

### 2.1 The Life-Cycle Hypothesis

The life-cycle hypothesis (LCH; Modigliani and Brumberg, 1954; Modigliani, 1986) and the permanent income hypothesis (PIH; Friedman, 1957) have become the standard framework used to analyze consumption and saving decisions. An important implication of these theories is a hump-shaped wealth-age profile: Midlife households have higher wealth (accumulated savings) than households consisting of retired or young persons, which may even have negative wealth (debt exceeding assets). A related major prediction of LCH/PIH is a consumer's reaction to income shocks: Permanent income shocks should affect both consumption and savings, whereas income shocks that are only temporary should affect savings only.

Since the introduction of the LCH and PIH, the empirical literature testing them has primarily focused on the advanced economies due to the quality and availability of data (especially micro data); it has produced mixed results: Studies that found evidence of the LCH (e.g. Attanasio and Weber, 1995, for the U.S.A.; Kapteyn et al., 2005, for the Netherlands; Pistaferri, 2001, for Italy; HFCN, 2013, for the euro area) stress methodological caveats that have to be addressed properly.

Other papers have found that household consumption and saving decisions are driven by additional motives next to consumption-smoothing over the life cycle. For instance, if consumers face uncertainty and accumulate precautionary savings (Friedman, 1957; Carroll, 1994) and/or are subject to borrowing constraints (Zeldes, 1989), their consumption (and thus saving) is indeed sensitive to changes in current income. In addition to retired persons' increased awareness of higher life expectancy and/or potential health costs, the motive to leave bequests might help explain the "retirement saving puzzle," i.e. some authors' unexplained finding that retired persons consume and dissave less than predicted by the PIH (Alessie et al., 1999).

A small number of studies empirically investigate the LCH for one or more of the CESEE countries covered by our analysis. Denizer et al. (2002) study Bulgaria, Hungary and Poland based on survey data from 1993 to 1995 and find that the determinants of saving are generally similar for transition and market economies. However, they find a U-shaped relation between age and savings that runs counter to the LCH. In addition, they find that the educational status, which they interpret as an approximation of future income, increases savings whereas the impact of the employment status is insignificant. Hanousek and Tuma (2002) investigate the PIH for the Czech Republic using the example of voucher privatization from 1993 to 1996. They find that irrespective of the respondents' age profiles, only a small number of transferred assets were consumed, which corroborates the PIH. A recent study by Leszkiewicz-Kedzior and Welfe (2012) verifies the validity of the LCH for Polish households in the period from 1990 to 2008 and is motivated by the need to investigate the underlying assumption of macroeconomic models. They confirm that the LCH is legitimate for Poland but only applies to less than 10% of households in the long run, explaining this with the income constraints of the majority of Polish households in the early years of transition due to elevated macroeconomic instability.

## 2.2 Households' Portfolio Choices

Once a household decides *whether and how much* to save, a decision about *how* to save, i.e. a portfolio choice, will have to follow. Attempts to investigate whether the life cycle also plays a role in this process are much scarcer than those testing the general LCH, because authors assume that in a frictionless setting, optimal portfolio allocations are determined by the expected risks and returns of the respective assets, given the investor's risk aversion. Consequently, the demographic or life-cycle characteristics of the investor, or even of his wealth, do not play a direct role in his portfolio choice above and beyond their possible indirect effect on his risk aversion. However, authors who added "real-life" assumptions to the portfolio choice problem, e.g. risky labor income and borrowing constraints (e.g. Cocco et al., 2005) or the role housing (a highly illiquid and nondivisible asset) plays in households' portfolios (Flavin and Yamashita, 2002), found that the optimal asset allocations in households' portfolios do indeed change over households' life cycles. Market frictions might help explain some patterns found in the micro data, e.g. the "stock market participation puzzle"<sup>6</sup> or the "underdiversification"<sup>7</sup> problem.<sup>8</sup>

Both patterns, as well as the hump-shaped age profile of the probability (i.e. the participation rates) of owning particular financial asset classes, have been found in the euro area (HFCN, 2013). They are, however, valid for mutual funds, bonds, shares, voluntary private pensions and whole life insurance, and other financial assets, but not for deposits and money owed to households. When looking at amounts and the resulting portfolio shares rather than participation rates, the hump-shaped relationship turns into a linear one with household age for most asset classes, e.g. bonds, mutual funds and shares; the portfolio share of deposits is U-shaped. The hump-shaped age profile driven by ownership probability as opposed to values or shares of individual assets was found in U.S. data by Ameriks and Zeldes (2004).<sup>8</sup> While controlling not only for age but also for other life cycle factors (e.g. having children of various ages, marital status, employment status), Xiao (1996) found that the probability of ownership of several financial asset classes does vary with these variables.<sup>9</sup>

To our knowledge, Revoltella and Mucci (2004) is the only study that empirically investigates the portfolio choice of households in a sample of 11 CESEE countries. Their study is based on aggregate data for the period from 2000 to 2003 and focuses on the effects of the macroeconomic environment (e.g. inflation, GDP growth), the level of financial market development, the institutional framework (i.e. pension reforms, health insurance) and income distribution within a country on the demand for different financial instruments. They conclude that deposits are

<sup>6</sup> The stock market participation puzzle refers to the phenomenon that survey data (e.g. U.S. data in Mankiw and Zeldes, 1991) often find a considerably lower share of households holding stocks than standard portfolio theory would predict.

<sup>7</sup> Underdiversification means that a large share of households holds a portfolio which contains only a few financial assets (often only one). The risk and return properties are such that the resulting portfolio is not optimally diversified according to the standard portfolio theory (see Roche et al., 2013, for an overview of empirical findings and a possible life cycle-related theoretical explanation).

<sup>8</sup> However, they also stress that it is virtually impossible to disentangle and identify all three of the possible effects (age, cohort and time effects) at the same time.

<sup>9</sup> However, a clear, unifying pattern is hard to identify.

perceived as liquid instruments and are the preferred saving instrument of low-income groups, while preference for mutual funds increases as households' income goes up.

More recently, also based on survey evidence from the Euro Survey, Stix (2011) provides insights into determinants of savings in foreign currency, and Stix (2012) studies why people choose to hold cash (frequently foreign currency cash) rather than making use of financial intermediaries and investing in interest-bearing assets.

### 3 Composition of Households' Savings and Portfolios: Data and Descriptive Statistics

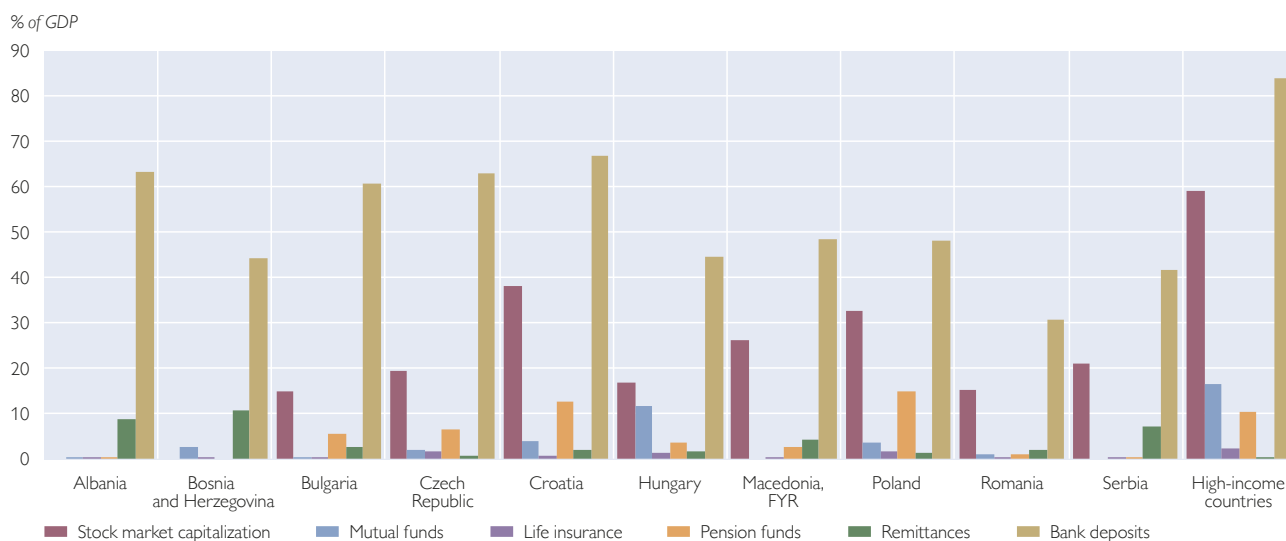
This section will first present some stylized evidence of financial development in CESEE, putting it into a historical and institutional perspective, and will then briefly introduce our dataset as well as descriptive statistics.

#### 3.1 Institutional Background of Households' Saving Decisions

Chart 1 presents selected financial indicators in CESEE and compares them with the respective indicators for high-income countries. It shows that in CESEE, bank deposits dominate among assets. The share of CESEE households' deposits in GDP increased steadily in the first decade of the millennium, especially after the 2008–2009 crisis. However, chart 1 also shows that there are significant differences across CESEE countries, with the share of deposits in GDP ranging between 67% in Croatia and 31% in Romania. Compared with an average 84% in the high-income countries aggregate, these figures are still rather low in CESEE. Stock market capitalization of 59% of GDP in high-income countries puts into perspective the corresponding figures for the CESEE countries with the highest stock

Chart 1

#### Selected Financial Indicators in CESEE and in High-Income Countries in 2011



Source: World Bank Global Financial Development Database.

Note: Data as of 2011 or 2010, if 2011 data are not available. High-income countries are those in which 2011 gross national income per capita was USD 12,476 or more. This aggregate covers 70 countries, including the Czech Republic, Croatia, Hungary and Poland. The values depicted for the high-income aggregate are medians.

market capitalization in Croatia at 38% of GDP and the lowest in Bulgaria and Romania at 15% of GDP.

Compared to high-income countries, where the share of pension fund assets in GDP is 11%, both Poland (15%) and Croatia (13%) have a higher share of pension fund assets in GDP. The level of mutual fund assets is still well below that in high-income countries (17% of GDP), but it grew rapidly after transition in some countries: Hungary has the most highly developed mutual fund industry (12% of GDP) among CESEE countries.

### 3.2 OeNB Euro Survey: Data and Descriptive Statistics

The data analyzed in this paper are taken from the OeNB Euro Survey, which has been carried out on commission of the OeNB on a semiannual basis since fall 2007 in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, the FYR Macedonia, Hungary, Poland, Romania and Serbia. Each survey wave polls a representative sample of 1,000 respondents aged 14 years and older in each country with the exception of Poland, where only the ten largest cities are sampled. For the purpose of this analysis, we exclude respondents who are younger than 18 years, as the majority of respondents aged 14 to 17 years will not take saving decisions.

The survey collects information on households' saving and loan decisions as well as their economic sentiments and expectations. The central variable of our analysis is based on the following question, which was put to all respondents in the surveys from spring 2010 to fall 2011, providing us with a total of around 40,000 observations:

Box 1

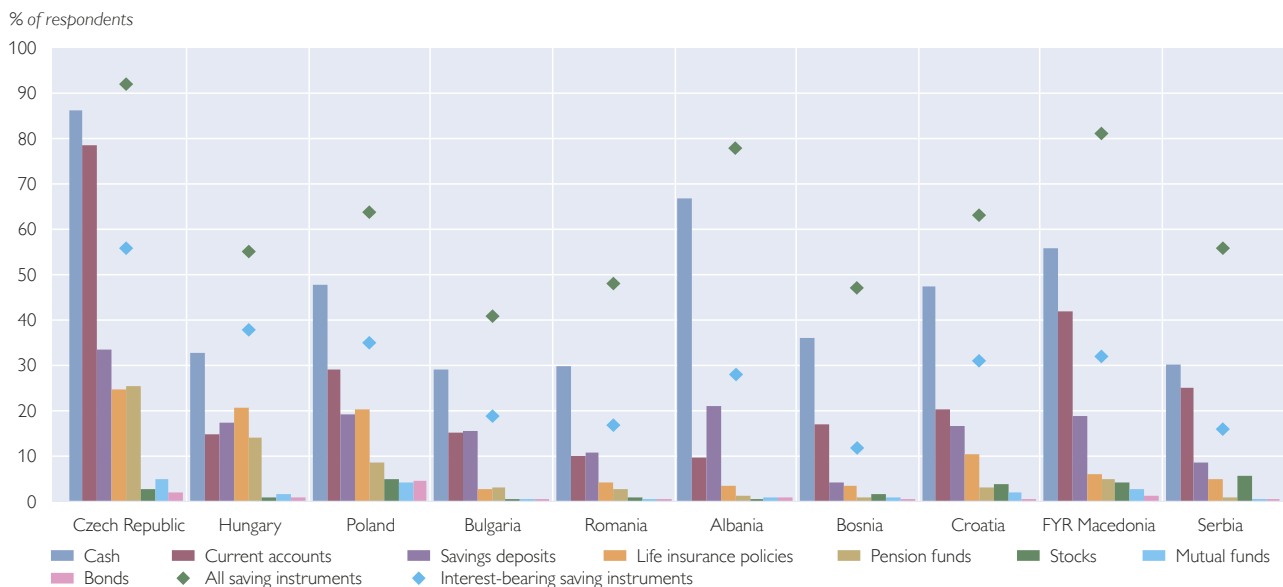
*“There are several ways in which you can hold savings. For example, one can hold cash, use bank accounts, have life insurances, hold mutual funds, etc. Please take a look at this card that lists various savings instruments – could you please select the ones you are using and rank them according to the amounts you have saved on the respective instrument. Please refer to savings you hold personally or together with your partner.”*

#### SHOW CARD

Cash	1
Savings deposits (in foreign currency or in [LOCAL CURRENCY])	2
Life insurance	3
Mutual funds	4
Stocks	5
Pension funds (voluntary contributions)	6
Bonds	7
Current account / transaction account / wage card	8
Other	9
I have no savings	77
Don't know	88
No answer	99

It is important to point out that the answers to the above question do not contain information on amounts saved and the shares of each saving instrument in individual portfolios that would be based on volumes saved.

## Saving Instruments



Source: OeNB Euro Survey, 2010–2011.

Note: Excluding respondents answering “Don’t know” and “No answer.”

Chart 2 shows the percentage of respondents that hold one or more of the above saving instruments.<sup>10</sup> If we aggregate across saving instruments and look at the percentage of respondents holding savings, which we will refer to as “*all savings*,” we see a large variation between countries, ranging from an average of 92% in the Czech Republic to 41% in Bulgaria. Chart 2 illustrates that cash is the most widespread saving instrument in all countries surveyed, followed by current accounts or savings deposits. There is a marked difference between Central and Eastern European countries and Southeastern European countries in the use of life insurance policies and pension funds. In all CESEE countries, however, less than 10% of respondents invest in stocks, bonds or mutual funds.

On average across countries, the two non-interest-bearing instruments are the dominant saving instruments, as they are used by 46% (cash) and 26% (current account) of respondents.<sup>11</sup> These instruments might have a high incidence because respondents might not differentiate between cash or current accounts held with the intention to save and cash or current accounts held for day-to-day transactions. However, cash does serve as an important saving instrument in CESEE (Stix, 2012).

Nevertheless, we exclude cash and current accounts from the subsequent presentation and discussion of results for several reasons:<sup>12</sup> (1) Regarding cash, Stix (2012) provides an in-depth analysis of the factors that drive households to save in cash. He shows that households’ decision to save in cash is influenced by a lack of trust in banks, memories of past banking crises, the size of the shadow economy

<sup>10</sup> Percentages do not add up to 100%, as respondents could choose to name more than one saving instrument.

<sup>11</sup> Averages across countries are not weighted by country size.

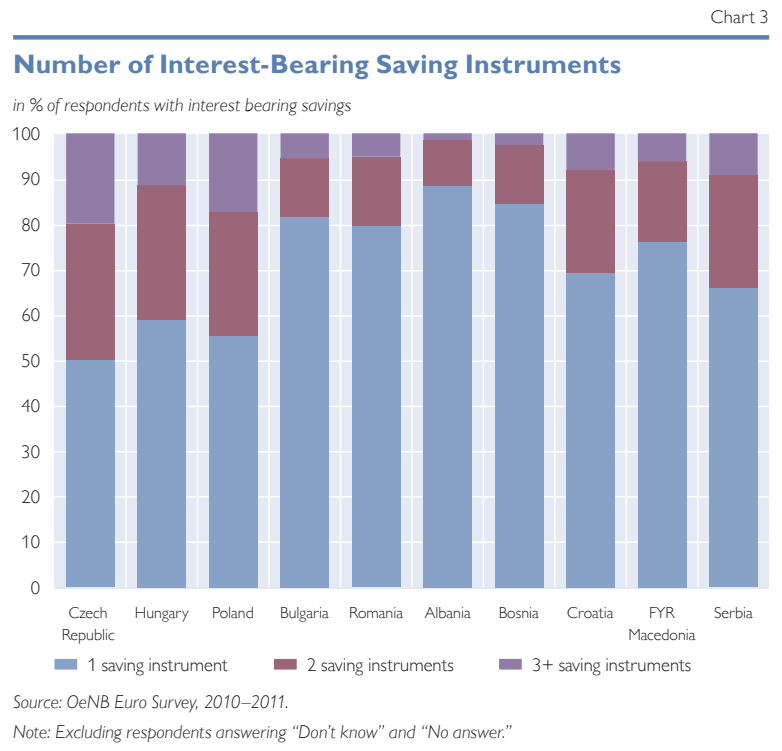
<sup>12</sup> Results including cash and current accounts as saving instruments are available from the authors on request.

and dollarization. Hence, saving in cash is driven by fundamentally different factors than those that drive the decision to save at a financial institution. Indeed, we find that as expected, the relationship between age and savings in cash is U-shaped, confirming that memories of previous economic crises are one important determinant. (2) Current accounts can be used as saving instruments but are often not. The word for “current account” can be synonymous with “wage card” in some countries, a concept which is clearly not related to savings as such. To prevent our measure of “savings” from including current accounts which are actually used for day-to-day transactions, we exclude current accounts. However, we re-ran regressions including current accounts. Results for overall savings do not change with regard to the LCH determinants, but LCH determinants are not significant for current accounts alone as the dependent variable. (3) Finally, in the LCH literature, cash and current accounts would normally not be regarded as saving instruments. Including these in our analysis would render our results more difficult to compare with previous research.<sup>13</sup>

If we aggregate savings excluding cash and current accounts (i.e. interest-bearing savings) – a group we will refer to as “*interest savings*” below – we also observe a strong variation between countries, ranging from an average of 56% of respondents holding interest savings in the Czech Republic to 12% in Bosnia and Herzegovina.

It is difficult to compare these results to aggregate data. First, our results do not refer to amounts but to the percentage of respondents that hold savings. Second, no data are available on households' saving rates on an aggregate level that would be comparable across all CESEE countries. Nevertheless, the question was asked in four consecutive survey waves and results did not change substantially from one wave to the next. This gives us confidence that results are robust and in fact provide very valuable evidence on the saving behavior of households.

The majority of *interest savings* portfolios are dominated by one-asset portfolios (chart 3). A similar “underdiversified” portfolio pattern has also been found recently for the euro area (HFCN, 2013). For CESEE, there is a substantial difference between Central and Eastern European countries and Southeastern European countries: On average, 45% of respondents with *interest savings* have more than one saving



<sup>13</sup> If we include cash and current accounts data, we see that the majority of all savings portfolios are also one-asset portfolios. “Underdiversification” can therefore not be explained by excluding these two saving instruments.



instrument in Central and Eastern European countries, while only 21% of *interest savers* have diversified portfolios in Southeastern European countries. The lowest degree of diversification is found in Albania, where only 11% of *interest savers* hold more than one saving instrument.

#### 4 Empirical Strategy

Our aim is to investigate the LCH with regard to saving in CESEE. We first estimate a probit model to analyze LCH determinants of interest savings denoted by  $S$ :

$$P(S=1)=\Phi_S(X_S\beta_S+u_S)$$

We extend this estimation by CESEE-specific factors affecting households' saving behavior. We then investigate the type of saving instruments households use. The intention to invest in a given financial instrument is observed only if a respondent has savings in the first place. Modeling the probability for holding an asset and neglecting the sample selectivity would result in biased estimators. Therefore, we follow the empirical approach proposed by Heckman (1979) and jointly estimate the probability of having savings (based on the equation above) and the probability of holding a specific saving instrument ( $F$ ):

$$P(F=1|S=1)=\Phi_F(X_F\beta_F+u_F)$$

where error terms are normally distributed,  $u_S \sim N(0,1)$ ,  $u_F \sim N(0,1)$  and correlated,  $\text{corr}(u_S, u_F) = \rho$ .

It is extremely difficult to come up with strong selection instruments, as respondents who are able to save are likely to put some effort into choosing the right saving instrument. Nevertheless, we propose four selection instruments, which should be correlated with the decision to save but not with the decision how to save. First, similar to Stix (2012), we include the perceived distance to the nearest bank (*bank perceived as far*<sup>14</sup>), assuming it increases the costs of using a bank and not the cost of investing in a specific saving instrument. Furthermore, we assume that plans to take out a loan (*plan a loan*) have an impact on savings but not on the choice of a certain financial asset. It could be argued that collateral requirements for loan contracts drive the choice of saving instruments. However, while we find that saving instruments, in particular life insurance, are correlated with existing loans, we do not find this correlation for planned loans. We also include *remittances* as a selection instrument, as recipients of remittances are unlikely to receive and consume them simultaneously, therefore increasing their propensity to save while not binding them to a particular saving instrument. Finally, positive expectations regarding the development of the economy (*expected economic situation better*) are likely to influence respondents' decision to save<sup>15</sup> but not their decision to invest in a particular financial asset.

<sup>14</sup> We will denote variable names in italics. A detailed explanation of the variables can be found in the online annex, table A.1. Descriptive statistics are in table A.2.

<sup>15</sup> From the perspective of precautionary savings, we would expect a negative sign. Alternatively, positive expectations may boost savings.

Following the standard estimation in the LCH literature, we analyze the relation between age and savings. We use age as a continuous variable and additionally include *age squared* to capture possible nonlinearities.

A further LCH determinant of saving is the presence of children in a household. Having dependent children shifts parents' consumption expenditure needs upward and thus should reduce saving. However, some researchers found that having children might increase parents' saving rate (Crossley and O'Dea, 2010),<sup>16</sup> which might be due to a stronger precautionary motive associated with having children. We include the number of children in the household in two categories: the number of children up to six years of age ( $N \text{ children} \leq 6\text{yrs}$ ) and the number of children between 7 and 15 years of age ( $N \text{ children} \leq 15\text{yrs}$ ).

We also control for household size, distinguishing between one- and two-person households (*one-person household / two-person household*) and larger households by using dummy variables. The expected effects associated with this variable reflect the economies of scale, i.e. the relatively higher savings of larger households. By contrast, having controlled for the presence of children for larger households, there is also a higher probability that some of the other household members are nonearners, and if this effect prevails, it should decrease the saving prevalence of larger households.

We further include information on whether the respondents are a *head of household* and whether they are employed or not. Both variables are assumed to have a positive effect on saving under the assumption that the (permanent) income of both the head of household and the employed person is relatively higher and their liquidity constraints are lower. We control for those who are *self-employed*, as self-employment may lead to higher precautionary savings and to the allocation of a lower fraction of the respective portfolio to risky assets such as stocks (Campbell, 2006). We also include a dummy variable for *female* respondents. This may affect saving behavior e.g. through higher life expectancy for women. Higher *education* is also often found to have a positive effect on saving, mainly because of the higher expected lifetime earnings of those with an above-average education. Finally, we control for *income*, which previous research documents show to be positively correlated with saving.

Saving in the CESEE region is likely to be affected by specific determinants related to the economic history of these countries, their institutions and the resulting individual sentiments. One effect of this transition experience is that households often save in foreign rather than local currency. We explicitly do not address the currency dimension of savings in this paper. Nevertheless, following previous research based on OeNB Euro Survey data,<sup>17</sup> we include variables capturing whether respondents remember past periods of high inflation (*remembers inflation*), whether they receive *remittances* or *income in euro*, their expectations of their country's

<sup>16</sup> Crossley and O'Dea (2010) found that the saving rate of U.K. couples with children was statistically insignificantly higher than that for couples without children if saving did not include durables and statistically significantly higher if saving included durables.

<sup>17</sup> Stix (2012), and Beckmann and Scheiber (2012).

Table 1

**Determinants of Savings**

Dependent variable	(1) Interest savings	(2) Interest savings
Age	0.060 *** (0.014)	0.057 *** (0.014)
Age squared	-0.005 *** (0.001)	-0.004 ** (0.001)
Female	0.006 (0.005)	0.006 (0.011)
One-person household	0.011 (0.015)	0.012 (0.019)
Two-person household	0.014 ** (0.006)	0.011 (0.01)
Children ≤6 years	0.01 (0.01)	0.012 (0.008)
Children ≤15 years	-0.001 (0.004)	0.004 (0.006)
Household head	0.003 (0.005)	0.003 (0.005)
High income	0.137 *** (0.018)	0.130 *** (0.021)
Medium income	0.060 *** (0.013)	0.059 *** (0.011)
Don't know /no answer income	0.036 * (0.022)	0.065 ** (0.032)
Medium education	0.072 *** (0.016)	0.075 *** (0.013)
High education	0.193 *** (0.026)	0.199 *** (0.022)
Employed	0.068 *** (0.009)	0.065 *** (0.015)
Self-employed	0.097 *** (0.02)	0.105 *** (0.019)
Remembers high inflation		0.038 *** (0.011)
Income in euro		0.245 *** (0.042)
Risk averse		0.042 ** (0.016)
Bank perceived as far		-0.013 *** (0.004)
Expected economic situation better		0.050 ** (0.022)
Plan a loan		0.055 *** (0.015)
Remittances		0.111 *** (0.026)
Log-L	-20,272.8	-9,856.6
N	38,519	18,497
P(dependent variable=1)	0.28	0.3

Source: Authors' calculations.

Note: Marginal effects from probit model, standard errors (adjusted for clustering at the country level) in parentheses. \*: significant at the 10% level, \*\*: significant at the 5% level, \*\*\*: significant at the 1% level. For a definition of the variables, see annex. All estimations include time-fixed and country-fixed effects. P(dependent variable=1) denotes the unconditional sample probability that a respondent has savings.

future economic situation and whether they perceive themselves as *risk averse*.<sup>18</sup> See the annex for a detailed description of all the variables used and descriptive statistics.

The countries covered by the OeNB Euro Survey have important structural and institutional differences. To account for these, we include country-fixed and time-fixed effects. A logical second step of the analysis, which is beyond the scope of this paper, would be to account explicitly for the country and regional-level factors affecting saving and to examine the cross-country differences and the regional as well as individual heterogeneities more closely.

## 5 Results

Table 1 presents marginal effects from a probit estimation where the dependent variable is *interest savings* and the controls include the basic LCH determinants (column 1). In line with saving propensity findings for the U.S.A. (Ameriks and Zeldes, 2004), our results indicate a hump-shaped relationship between age and saving: Older and younger respondents are less likely to save while middle-aged respondents are most likely to save. However, the hump shape is not particularly pronounced. It flattens with age, which is in line with the “bequest motive” literature. In chart 4, we visualize the hump shape based on the results in table 1 (column 2). A further important determinant of saving propensity is education. Respondents with university degrees or medium education are more likely to save. This is in line with previous research and could indicate both an income effect and the effect of higher financial literacy.

<sup>18</sup> We also experiment with measures of trust in the financial system. Trust in both local and foreign banks is found to be highly significant. However, this is very likely endogenous to interest savings. Therefore, we do not include it in the baseline specification. Furthermore, we do not include “memories of restricted access to deposits,” as this refers to the respondents who tend to save in cash (Stix, 2012) and is insignificant for interest savings.

Chart 4

Income itself has the expected positive and significant effect on savings. Households with high or medium income as well as those who refuse to declare their income are more likely to save than low-income households.

We also find that compared to non-working (i.e. retired and unemployed) respondents, the *employed* are more likely to save by 7 percentage points and the *self-employed* by 11 percentage points. The latter finding may be related to precautionary motives.

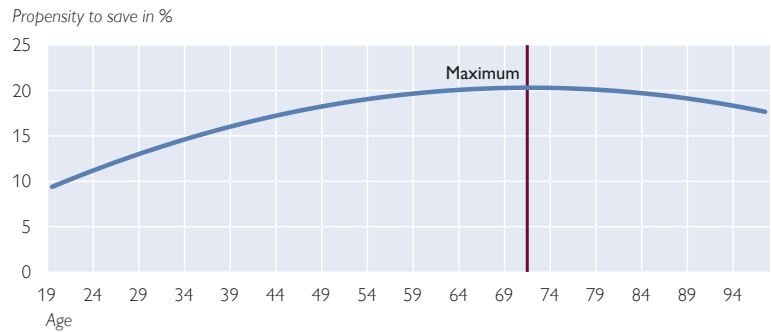
With regard to further LCH determinants that have been analyzed in the literature, we do not find a clear-cut pattern. The number of young children in a household has a positive but insignificant effect on savings, while the number of teenage children has a weakly negative but also insignificant effect. We find some indication that two-person households are more likely to save compared with single-person households and those with three or more members. This might be because two-person households more frequently consist of two adults, i.e. two potential income earners, than of one adult and one child.

In column 2 of table 1, we investigate further determinants of savings that are not derived from the LCH. First, we find that *risk averse* individuals are more likely to save. This could be interpreted in line with previous research on “precautionary savings.”

Stix (2012) shows that memories of past economic turbulence drive households to save in cash. Stix (2011) investigates the link between these memories and the currency choice for savings in detail. In column 3, we control for *memories of hyperinflation* and find that the likelihood of those who *remember high inflation* having savings is 5 percentage points higher than of those who do not. We posit that this could be one reason for the flattening-out hump-shaped pattern with regard to age. First, CESEE households “(re-)started” saving comparatively late because of the transition period. Second, those whose savings were depleted by hyperinflation might be driven to save by precautionary motives. Finally, respondents with a regular income in euro, which on average across countries applies to only 2% of respondents, are 25 percentage points more likely to save than respondents without a regular income in euro. We presume that this captures an income effect, i.e. salaries in euro are higher than in local currency.

To analyze the determinants of the choice of saving instruments, we have to account for the selection bias. As discussed in section 4, we employ *bank perceived as far*, *expected economic situation better*, *remittances*, and *plan a loan* as selection instruments. Table 1, column 2 presents the marginal effects of our probit estimation and shows that respondents who perceive the nearest bank to be far away are 1 percentage point less likely to save than those who consider their bank to be close. Those who are optimistic about the economic development of their country are 5 percentage points more likely to save than less optimistic respondents. Planning to take out a loan also raises the probability of saving by 6 percentage points.

### The Estimated Relationship Between Age and the Propensity to Save



Source: Authors' calculations.

Respondents who receive remittances are 11 percentage points more likely to save than those who do not.

We use this specification to estimate a Heckman selection model of the choice of saving instruments; table 2 presents the results. The correlation between the selection and outcome equations, as indicated by  $\rho$ , shows that our selection instruments are not perfect but valid for most specifications. The literature on portfolio choice uses the LCH determinants as controls rather than discussing their effect on the choice of investment in detail. As our data do not allow us to estimate a portfolio choice model as such, we focus on analyzing which socio-demographic groups are likely to diversify their portfolios. Columns 1 and 2 in table 2 show who diversifies their saving portfolios. In column 1, the dependent variable is a categorical variable ranging from 1 to 7, depending on the number of saving instruments respondents hold, given that they have *interest savings*. Column 2 presents an alternative specification of column 1; the dependent variable is a dummy that takes the value one if the respondent holds two or more interest-bearing saving instruments. In line with results for savings as such, we find that higher income, higher education and/or higher employment status cohorts are more likely to hold more interest-bearing saving instruments. We find that respondents who perceive themselves as *risk averse* do not diversify their portfolios. This is interesting, as it runs counter to concepts of risk diversification, but it might be explained by the assumption that *risk averse* respondents “stick” to one well-known saving instrument.

Interestingly, we find that the hump-shaped relation between age and savings also holds for age and the choice of a number of saving instruments, as also confirmed by the preliminary descriptive results for the euro area (HFCN, 2013). Younger and older respondents are not only less likely to save; they are also less likely to hold several saving instruments at the same time. This could be related to lower financial literacy. In a comparative analysis of financial literacy across the world, Lusardi and Mitchell (2011) find that financial literacy is particularly low among younger and older respondents.

In a further step, we analyze the determinants of individual saving instruments. Results should be viewed with the necessary degree of caution, as some of the saving instruments in question – in particular stocks, bonds and mutual funds – are hardly used in some countries. Therefore, results only give an indication and should not be regarded as robust. It is beyond the scope of this paper, however, to analyze the specific determinants of each individual saving instrument in detail. Instead, we use the specification from columns 1 and 2 of table 2 and shed some light on whether certain sociodemographic groups tend to invest in specific saving instruments. We find that many of the sociodemographic controls are insignificant, which is not surprising, as it is unlikely that sociodemographic factors alone determine portfolio choice.

Nevertheless, some results are fairly intuitive: Employed respondents are more likely to hold pension funds, which may be related to the pension schemes attached to their jobs. Risk averse respondents are less likely to invest in stocks, but also less likely to invest in pension funds. More importantly, however, the results with regard to the LCH determinants, in particular age, are also intuitive: We find a hump-shaped relation for age and most of the saving instruments in question. Savings deposits constitute an important exception, as we find a U-shaped relation,

Table 2

**Determinants of Saving Instruments**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	N instru- ments (1/7)	≥2 saving instruments	Deposits	Life insurance	Pension funds	Stocks	Mutual funds	Bonds
Age	0.133 *** (0.045)	0.100 *** (2.965)	-0.070 ** (2.026)	0.124 *** (3.376)	0.082 (1.462)	0.039 (0.976)	0.001 (0.042)	-0.019 * (1.902)
Age squared	-0.015 *** (0.005)	-0.012 *** (3.176)	0.010 ** (2.367)	-0.015 *** (3.530)	-0.01 (1.578)	-0.005 (1.106)	0 (0.329)	0.002 ** (2.001)
Female	-0.037 (0.035)	-0.005 (0.419)	-0.021 (1.551)	0.01 (0.77)	-0.002 (0.152)	-0.003 (0.199)	-0.005 (0.800)	-0.006 (0.905)
One-person household	-0.039 (0.086)	0 (0.001)	0.02 (0.674)	-0.012 (0.252)	-0.048 ** (1.967)	-0.044 * (1.861)	0.014 (1.14)	-0.002 (0.207)
Two-person household	-0.062 (0.052)	-0.019 (0.913)	-0.008 (0.731)	0.014 (1.015)	-0.023 (1.361)	-0.030 *** (2.602)	0.007 (0.63)	-0.025 *** (4.530)
Children ≤6 years	-0.034 * (0.020)	-0.017 * (1.768)	-0.030 *** (2.966)	0.015 (1.372)	0 (0.024)	-0.016 (1.402)	-0.002 (0.248)	0.002 (0.43)
Children ≤6 years	0.024 (0.018)	-0.002 (0.155)	-0.016 (1.041)	0.015 (1.485)	0.011 (1.007)	-0.009 (1.250)	0.004 *** (3.119)	-0.003 (0.779)
Household head	0.021 (0.025)	0.014 (1.558)	0.003 (0.273)	-0.012 (1.591)	0.002 (0.197)	0.018 (1.606)	0.006 (0.989)	0.005 (1.469)
High income	0.106 ** (0.052)	0.058 (1.555)	0.045 ** (2.023)	0.042 (0.759)	-0.029 (1.588)	0.017 (0.341)	0.012 (0.38)	0.006 (0.45)
Medium income	-0.012 (0.020)	0.002 (0.136)	0.024 (1.526)	0.012 (0.403)	-0.037 *** (2.970)	-0.018 (1.107)	0.001 (0.053)	-0.014 (1.025)
Don't know /no answer income	0.143 ** (0.058)	0.042 (1.608)	0.049 ** (2.106)	0.005 (0.112)	-0.006 (0.303)	0.041 (1.279)	0.018 * (1.746)	0.007 (0.457)
Medium education	0.074 * (0.045)	0.066 * (1.868)	0.008 (0.495)	0.032 (1.396)	0.021 (1.048)	0.019 (0.705)	-0.001 (0.027)	0.014 (0.883)
High education	0.196 *** (0.055)	0.115 * (1.827)	0.061 *** (4.198)	0.059 * (1.757)	0 (0.000)	0.038 (0.854)	0.01 (0.249)	0.02 (0.904)
Employed	0.014 (0.050)	0.028 (1.267)	-0.034 ** (2.193)	0.027 (1.115)	0.053 ** (2.404)	-0.016 (1.526)	0.001 (0.071)	-0.014 (0.989)
Self-employed	0.217 *** (0.076)	0.070 * (1.771)	0.011 (0.648)	0.080 *** (2.776)	-0.002 (0.080)	-0.009 (0.210)	0.015 (0.84)	0.033 ** (2.318)
Remembers high inflation	0.038 (0.037)	0.035 ** (2.363)	-0.021 (1.284)	0.026 * (1.8)	0.022 ** (2.507)	-0.003 (0.122)	0.006 (0.51)	-0.003 (0.276)
Income in euro	0.147 * (0.084)	0.045 (0.745)	0.064 (1.284)	0.076 * (1.724)	-0.037 (1.276)	-0.021 (0.339)	0.028 (0.651)	0.019 (0.988)
Risk averse	-0.101 * (0.057)	-0.034 *** (2.886)	-0.014 (0.761)	0.01 (0.772)	-0.012 (1.186)	-0.035 * (1.687)	-0.013 (0.782)	-0.01 (0.547)
Rho	-0.14 ***	-0.29	-0.43 ***	0.3	-0.13	-0.26	0.23	-0.1
Log-L	-17,058.84	-13,044.52	-13,214.16	-13,108.83	-12,453.1	-11,358.83	-11,150.37	-10,766.09
N(selection equation)	18,497	18,497	18,497	18,497	18,497	18,497	18,497	18,497
N(outcome equation)	5.531	5.531	5.531	5.531	5.531	5.531	5.531	5.531
P(dependent variable=1)		0.33	0.19	0.12	0.07	0.03	0.02	0.01

Source: Authors' calculations.

Note: In column 1, the dependent variable ranges from 1 to 7 and indicates the number of saving instruments the respondent has. In column 2, the dependent variable is a dummy variable that takes the value 1 if the respondent has 2 or more saving instruments. In columns 3 to 8, the dependent variable is a dummy variable that takes the value 1 if the respondent has a savings deposit (c.3), a life insurance (c.4), a pension fund (c.5), holds stocks (c.6), mutual funds (c.7) or bonds (c.8). P(dependent variable=1) denotes the sample probability of the respective dependent variable. Coefficients report the average marginal effects. The coefficients are based on a Heckman sample selection probit model (except in column 1, which is not a probit model), where the selection is whether the respondent has savings (see table 1, column 2). We employ distance to bank, exp econ sit better, plan a loan and remittances for identification. t-statistics are adjusted for clustering at the country level and are presented in parentheses below coefficients. Rho denotes the correlation between the selection and the outcome equation. \*: significant at the 10% level, \*\*: significant at the 5% level, \*\*\*: significant at the 1% level.

which is in line with results from the HFCN (2013). This shows that older respondents mainly save in the form of savings deposits (or cash). Saving instruments such as life insurance policies, where the hump shape is particularly pronounced, may in fact not be available for older respondents.

## 6 Robustness Checks

The results presented in the LCH literature often depend on how age is defined (HFCN, 2009) – authors using broader and fewer age categories more often find a linear rather than a hump-shaped relationship. We therefore experimented with different specifications of age brackets and confirm the sensitivity of results to the definition of age brackets. Using fewer age brackets indicates a linear relationship, whereas using ten age brackets results in a hump-shaped relationship.<sup>19</sup>

Second, we cannot control for marital status in the baseline specification, as this information is available for households in only six countries. In table 3, we first present, in column 2a, the baseline estimation for the sample of countries for which data on households' marital status is available and then include marital status information in column 2b. We find that being married is positively and significantly correlated with saving probability.

Third, a further concern in our estimation is that we do not control for wealth (nonfinancial assets). For robustness purposes, we use information on whether the respondent owns a house, a car or a secondary residence as proxies for wealth. These data are available only for one wave. Column 1a of table 3 therefore presents the results of fall 2011, while column 1b presents the results of fall 2011 including the three above-mentioned proxies for wealth. Our results show that owning a house, a car or a secondary residence is indeed positively and significantly correlated with savings. In this specification, age squared becomes insignificant. In column 1a, it is marginally significant at 10.01%. Furthermore, we find that age and ownership of a house or secondary residence are positively correlated while age and ownership of a car are negatively correlated. However, the proxies for wealth might be endogenous, especially as they do not refer to amounts and thus cannot capture accumulation over time. Lastly the number of observations is down to 7,000, as we have to exclude three survey waves.

Finally, given that our country sample is very heterogeneous, our results may be driven by one particular country, or country fixed effects may not fully control for the differences in structure and development of the financial system in these countries. While we acknowledge that these issues should be addressed in multi-level models, we pursue different strategies to check for the robustness of our results. First, we dropped one country at a time from our sample. This procedure did not change the quality of the results. Second, to account for the fact that some of the countries in our sample are highly euroized, we split the sample into respondents with a preference for foreign currency savings and those with a preference for local currency savings. The respective results do not change the overall picture with regard to the LCH. Finally, we include interaction terms for LCH determinants (age) and country dummy variables. Specifically, we repeat the baseline estimation in table 1, column 2 for each of the ten countries in our sample and include a country-specific interaction term for age and test whether this differs significantly from the noninteracted, i.e., cross-country average age coefficient. The significance of the F-test indicates in the respective country that the age-savings hump shape differs from the average hump shape displayed in chart 4. Where this is the case, the hump shape is more pronounced; moreover, these countries are countries with more developed financial systems, e.g., the Czech

<sup>19</sup> Results are available from the authors upon request.

Table 3

**Robustness Analysis**

	(1a)	(1b)	(2a)	(2b)
sample	fall 2011 only		AL, BA, MK, BG, HR, RO	
Dependent variable	<i>Interest savings</i>		<i>Interest savings</i>	
Own house		0.067 *** (0.019)		
Own second residence		0.148 *** (0.034)		
Own car		0.091 *** (0.016)		
Married				0.014 (0.014)
Age	0.070 *** (0.027)	0.053 * (0.027)	0.044 ** (0.018)	0.050 ** (0.025)
Age squared	-0.004 (0.003)	-0.003 (0.003)	-0.003 (0.002)	-0.004 (0.003)
Female	0.001 (0.012)	0.009 (0.01)	0.006 (0.017)	0.009 (0.016)
One-person household	0.025 (0.018)	0.061 *** (0.022)	0.028 (0.021)	0.036 (0.019)
Two-person household	0.023 (0.018)	0.034 ** (0.016)	0.017 (0.013)	0.016 (0.013)
Children ≤6 years	0.023 ** (0.01)	0.024 ** (0.011)	0.004 (0.009)	0 (0.014)
Children ≤15 years	0.030 *** (0.008)	0.031 *** (0.009)	-0.002 (0.008)	-0.013 (0.009)
Household head	0.002 (0.011)	0.006 (0.01)	0.002 (0.006)	0 (0.008)
High income	0.090 *** (0.032)	0.052 * (0.03)	0.131 *** (0.03)	0.152 *** (0.027)
Medium income	0.055 *** (0.019)	0.039 ** (0.016)	0.069 *** (0.014)	0.088 *** (0.01)
Don't know /no answer income	0.072 ** (0.036)	0.045 (0.035)	0.088 ** (0.036)	0.104 *** (0.033)
Medium education	0.082 *** (0.023)	0.074 *** (0.023)	0.074 *** (0.014)	0.068 *** (0.014)
High education	0.205 *** (0.033)	0.171 *** (0.03)	0.183 *** (0.018)	0.181 *** (0.028)
Employed	0.070 *** (0.013)	0.060 *** (0.012)	0.035 *** (0.008)	0.031 *** (0.01)
Self-employed	0.134 *** (0.03)	0.104 *** (0.031)	0.099 *** (0.023)	0.085 *** (0.012)
Bank perceived as far	-0.014 ** (0.006)	-0.013 ** (0.006)	-0.009 * (0.005)	
Expected economic situation better	0.068 ** (0.03)	0.059 ** (0.029)	0.015 (0.027)	
Plan a loan	0.043 * (0.024)	0.060 ** (0.027)	0.046 ** (0.02)	
Remittances	0.079 * (0.044)	0.049 (0.037)	0.093 *** (0.028)	0.106 *** (0.015)
Remembers inflation	0.007 (0.009)	0.011 (0.01)	0.025 *** (0.007)	0.034 *** (0.011)
Income in euro	0.321 *** (0.108)	0.311 *** (0.102)	0.249 *** (0.049)	0.233 *** (0.027)
Risk averse	0.060 *** (0.023)	0.054 ** (0.024)	0.036 *** (0.014)	0.033 *** (0.013)
Log-L	-3477.4	-3299.4	-5725.3	-5402.1
N	6633	6431	11421	10955
P(dependent variable=1)	0.3	0.3	0.24	0.23

Source: Authors' calculations.

Note: Marginal effects from probit model, standard errors (adjusted for clustering at the country level) in parentheses. \*: significant at the 10% level, \*\*: significant at the 5% level, \*\*\*: significant at the 1% level. See annex for a definition of the variables. All estimations include time-fixed and country-fixed effects. P(dependent variable=1) denotes the unconditional sample probability that a respondent has interest savings. All estimations are carried out for subsamples, which are indicated above the estimations.



Republic. For Bulgaria, results indicate a U-shape, which is in line with results from Denizer et al. (2002).

We also investigated further determinants which might influence households' decision to diversify their savings portfolios. However, we find that neither expectations regarding inflation and/or the exchange rate nor trust in institutions have a significant effect on households' saving decisions.<sup>20</sup>

## 7 Conclusions

Using data from the OeNB Euro Survey for ten CESEE countries in 2010 and 2011, we investigated CESEE household saving behavior and portfolio choices. More specifically, we analyzed whether the decision of a household to save and the subsequent decision which financial instruments to choose depended, in addition to other determinants, on the household's life cycle. Our findings suggest that the individual propensity to save has a flattening-out hump shape, i.e. young and old people are less likely to save than middle-aged people, but older respondents' propensity to dissave is smaller than the life-cycle hypothesis would predict. This is possibly due to a bequest motive or to memories of past economic turbulences. Age similarly plays a role in the diversification of households' portfolios and in the individual choice of financial instruments. In addition, education, income and employment status also shape the two stages of a saving decision.

Looking forward, these findings should be taken into account when formulating policies that are intended to affect savings. In practice, it is often assumed that pensioners and households with children belong to the most vulnerable groups in society, and policies are often set accordingly. Our results suggest that among those lacking insurance against income shocks due to a lack of (diversified) savings are the young people. By contrast, households with children seem to be able to build average buffers. In addition, older respondents up to a certain age are even broadly able to maintain their saving likelihood. However, our results also suggest that the flattening-out hump shape of households' propensity to save, i.e. the fact that for the old, only weak dissaving is recorded, might be due to memories of past economic turbulences related to transition. This pattern might change as generations without such an experience enter retirement age. Furthermore, population ageing itself will likely have an aggravating negative effect on savings.

Household savings should also be seen in the context of policies that target education. We find that higher education levels lead to a higher propensity to save and to more diversified savings; and this effect is not exclusively due to expectations of higher income. Policies that foster education will therefore not only affect growth via human capital formation but also by increasing the propensity to save, which in turn will affect gross fixed capital formation. In addition, previous research shows that education is correlated with financial literacy. Improving not only education levels in general but financial literacy in particular could therefore boost savings.

Policies targeted at financial literacy could furthermore affect not only savings as such but also households' portfolio diversification. We find that those who

<sup>20</sup> Previous research stressed the role of religion in making financial decisions (see e.g. Grosjean, 2011). We address this issue by repeating our estimations for a subsample of three countries (Macedonia, Romania, Serbia) for which information on religion is available.

perceive themselves as risk averse are more likely to underdiversify their portfolios, possibly because they stick to one familiar saving instrument they trust. At the moment, savings deposits seem to be the most popular saving instrument for the middle-aged and older people in CESEE, while pension funds are scarcely used. Life insurance is the most prevalent financial instrument among younger respondents, while pension funds are not so popular with this age group. One of the many possible explanations for this prevalence might be that taking out a life insurance policy is a requirement for taking out a loan. We suspect that it would be possible to find more diversified (optimal) portfolios for each of the respective life-cycle phases. By extension, our findings imply that improving the levels of education and financial literacy will lead not only to higher, but also to more diversified savings. Further research could also investigate whether the lack of diversified portfolios is driven by the demand or the supply of alternative financial products.

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## Annex

Table A.1

## Data and Variable Description – Dependent Variables

Label	Description
	All variables are derived from the question presented in section 3. For all variables, "Don't know" or "No answer" responses are coded as missing. The coding does not take the importance at which the respondent ranks the respective saving instrument into account.
All savings	Dummy variable that takes the value one for respondents who cite one of the possible saving instruments, zero for those answering "I have no savings."
Interest savings	Dummy variable that takes the value one for respondents who cite one of the possible saving instruments, zero for those answering "I have no savings" or for those who only name cash and or current accounts.
Cash	Dummy variable that takes the value one for respondents who cite cash as one of their saving instruments, zero for those who have savings but do not cite cash.
Current accounts	Dummy variable that takes the value one for respondents who cite current accounts as one of their saving instruments, zero for those who have savings but do not cite current accounts.
N instruments	Categorical variable ranging from 1 to 7 according to the number of saving instruments the respondent reports. This variable includes the category "other," but does not include cash or current accounts.
N instruments $\geq 2/\geq 2$ saving instruments	Dummy variable based on categorical variable above, coded as one if the respondent has two or more interest-bearing savings instruments.
Deposits	Dummy variable that takes the value one for respondents who cite savings deposits as one of their saving instruments, zero for those who have savings but do not cite savings deposits.
Life insurance	Dummy variable that takes the value one for respondents who cite life insurance policies as one of their saving instruments, zero for those who have savings but do not cite life insurance policies.
Pension funds	Dummy variable that takes the value one for respondents who cite pension funds as one of their saving instruments, zero for those who have savings but do not cite pension funds.
Stocks	Dummy variable that takes the value one for respondents who cite stocks as one of their saving instruments, zero for those who have savings but do not cite stocks.
Mutual funds	Dummy variable that takes the value one for respondents who cite mutual funds as one of their saving instruments, zero for those who have savings but do not cite mutual funds.
Bonds	Dummy variable that takes the value one for respondents who cite bonds as one of their saving instruments, zero for those who have savings but do not cite bonds.

Source: OeNB Euro Survey.

**Data and Variable Description – Explanatory Variables (in the order of the regression results)**

Label	Description
Age, age squared	Age of respondent divided by 10, age squared of respondent.
Female	Dummy variable that takes the value one if the respondent is female.
Size of household (one person, two persons)	Dummy variables that take the value one if the respondents live in a single household or in a household with two people. Omitted category: household with three or more people.
Children	Number of children aged 6 years and younger or 7 to 15 years.
Head of household	Dummy variable that takes the value one if the respondent is the head of the household (the main earner in the household).
Income (high, medium, don't know / no answer)	Dummy variables that take the value one for each net household income tercile (high, medium, low). Sample values are used to construct terciles. For those respondents who did not give an answer, an additional dummy variable is defined (dk / na income). Omitted category: income low.
Education	Dummy variables; degree of education (university level, medium level, and basic education). Omitted category: education low.
Employment	Dummy variable coded as one if respondent belongs to selected occupational category. Omitted category: not working (retired, unemployed, students).
Remembers high inflation	Dummy variable coded as one if the respondent agrees with the statement "I remember periods of high inflation during which the value of the local currency dropped sharply."
Income in euro	Dummy variable; one if the respondent regularly receives income in euro.
Remittances	Derived from answers to the question "Do you personally or your partner receive any money from abroad? E.g. from family members living or working abroad, pension payments, etc.?" Dummy variable coded as one if answer is "yes, regularly" or "yes, infrequently," zero otherwise.
Risk averse	Derived from answers to the statement that "in financial matters, I prefer safe investments over risky investments." Categorical variable ranging from 1 ("strongly disagree") to 6 ("strongly agree").
Bank perceived as far	Derived from answers to the statement "for me, it takes quite a long time to reach the nearest bank branch." Answers are "strongly agree" "agree" "somewhat agree" "somewhat disagree" "disagree" "strongly disagree." Categorical variable ranging from 1 ("strongly disagree") to 6 ("strongly agree").
Expected economic situation better	Dummy variable coded as one if the respondent agrees with the statement "Over the next five years, the economic situation in my country will improve."
Plan a loan	Dummy variable coded as one if the respondent replies "yes" to the question "Do you plan to take out a loan over the next year?"
Own house / car / second residence	Dummy variables that take the value one if the household owns the house or apartment they live in, owns a car or a second residence, zero otherwise.
Married	Dummy variable that takes the value one if the respondent is married, zero otherwise. Data available for Albania, Bosnia and Herzegovina, FYR Macedonia, Bulgaria, Croatia, and Romania only.

Source: OeNB Euro Survey.

Table A.3

## Descriptive Statistics

	Min/Max	CZ	HU	PL	BG	RO	AL	BA	HR	MK	RS	Total
All savings	0/1	0.92 (0.27)	0.55 (0.50)	0.64 (0.48)	0.41 (0.49)	0.48 (0.50)	0.78 (0.42)	0.47 (0.50)	0.63 (0.48)	0.81 (0.40)	0.56 (0.50)	0.62 (0.49)
Interest savings	0/1	0.56 (0.50)	0.38 (0.49)	0.35 (0.48)	0.19 (0.39)	0.17 (0.37)	0.28 (0.45)	0.12 (0.33)	0.31 (0.46)	0.32 (0.47)	0.16 (0.37)	0.28 (0.45)
N instruments	0/1	1.79 (1.00)	1.56 (0.78)	1.88 (1.45)	1.24 (0.57)	1.28 (0.63)	1.14 (0.39)	1.22 (0.62)	1.42 (0.69)	1.37 (0.85)	1.47 (0.77)	1.49 (0.91)
N instruments ≥2	0/1	0.50 (0.50)	0.41 (0.49)	0.44 (0.50)	0.18 (0.39)	0.21 (0.41)	0.12 (0.33)	0.16 (0.37)	0.32 (0.47)	0.25 (0.43)	0.34 (0.48)	0.32 (0.47)
Cash	0/1	0.86 (0.34)	0.33 (0.47)	0.48 (0.50)	0.29 (0.45)	0.30 (0.46)	0.69 (0.46)	0.37 (0.48)	0.51 (0.50)	0.56 (0.50)	0.31 (0.46)	0.46 (0.50)
Current accounts	0/1	0.79 (0.41)	0.16 (0.36)	0.29 (0.45)	0.15 (0.36)	0.10 (0.31)	0.12 (0.33)	0.19 (0.39)	0.22 (0.41)	0.44 (0.50)	0.26 (0.44)	0.26 (0.44)
Deposits	0/1	0.60 (0.49)	0.48 (0.50)	0.55 (0.50)	0.81 (0.39)	0.65 (0.48)	0.85 (0.36)	0.38 (0.49)	0.59 (0.49)	0.66 (0.47)	0.57 (0.50)	0.62 (0.49)
Life insurance policy	0/1	0.45 (0.50)	0.57 (0.50)	0.59 (0.49)	0.14 (0.35)	0.27 (0.44)	0.13 (0.34)	0.32 (0.47)	0.43 (0.50)	0.21 (0.40)	0.32 (0.47)	0.37 (0.48)
Pension funds	0/1	0.46 (0.50)	0.37 (0.48)	0.25 (0.43)	0.16 (0.37)	0.16 (0.36)	0.04 (0.20)	0.09 (0.29)	0.14 (0.34)	0.17 (0.38)	0.07 (0.25)	0.22 (0.42)
Stocks	0/1	0.05 (0.22)	0.02 (0.15)	0.14 (0.35)	0.02 (0.15)	0.07 (0.25)	0.03 (0.16)	0.14 (0.34)	0.15 (0.36)	0.14 (0.35)	0.37 (0.48)	0.10 (0.30)
Mutual funds	0/1	0.09 (0.28)	0.05 (0.22)	0.12 (0.32)	0.00 (0.06)	0.01 (0.11)	0.04 (0.21)	0.06 (0.24)	0.05 (0.22)	0.09 (0.28)	0.03 (0.16)	0.06 (0.24)
Bonds	0/1	0.04 (0.19)	0.03 (0.17)	0.13 (0.34)	0.01 (0.08)	0.02 (0.14)	0.03 (0.18)	0.05 (0.22)	0.01 (0.08)	0.04 (0.21)	0.04 (0.20)	0.04 (0.20)
Age /10	1.9/9.7	4.63 (1.72)	4.83 (1.69)	4.06 (1.32)	4.33 (1.44)	4.71 (1.60)	3.92 (1.46)	4.51 (1.63)	4.32 (1.58)	4.65 (1.66)	4.49 (1.49)	4.44 (1.58)
Age squared	4/94	24.38 (17.15)	26.17 (17.02)	18.21 (10.90)	20.8 (12.74)	24.72 (15.57)	17.51 (12.36)	23.01 (15.43)	21.2 (14.99)	24.43 (16.26)	22.41 (14.18)	22.26 (14.99)
Female	0/1	0.49 (0.50)	0.52 (0.50)	0.53 (0.50)	0.51 (0.50)	0.55 (0.50)	0.49 (0.50)	0.55 (0.50)	0.56 (0.50)	0.57 (0.50)	0.51 (0.50)	0.53 (0.50)
One-person household	0/1	0.11 (0.32)	0.24 (0.43)	0.1 (0.30)	0.11 (0.32)	0.19 (0.39)	0.02 (0.15)	0.11 (0.31)	0.13 (0.34)	0.06 (0.24)	0.07 (0.26)	0.12 (0.32)
Two-person household	0/1	0.35 (0.48)	0.32 (0.47)	0.31 (0.46)	0.3 (0.46)	0.37 (0.48)	0.12 (0.32)	0.24 (0.42)	0.25 (0.44)	0.16 (0.36)	0.18 (0.39)	0.26 (0.44)
Children ≤6 years	0/5	0.19 (0.47)	0.15 (0.47)	0.15 (0.40)	0.17 (0.45)	0.14 (0.41)	0.2 (0.48)	0.18 (0.47)	0.19 (0.49)	0.24 (0.56)	0.21 (0.49)	0.18 (0.47)
Children ≤15 years	0/6	0.35 (0.66)	0.24 (0.60)	0.28 (0.57)	0.28 (0.56)	0.22 (0.54)	0.36 (0.69)	0.3 (0.62)	0.27 (0.60)	0.45 (0.79)	0.39 (0.70)	0.31 (0.64)
Household head	0/1	0.59 (0.49)	0.65 (0.48)	0.52 (0.50)	0.59 (0.49)	0.64 (0.48)	0.48 (0.50)	0.58 (0.49)	0.51 (0.50)	0.54 (0.50)	0.51 (0.50)	0.56 (0.50)
High income	0/1	0.3 (0.46)	0.23 (0.42)	0.23 (0.42)	0.19 (0.39)	0.23 (0.42)	0.32 (0.47)	0.28 (0.45)	0.28 (0.45)	0.26 (0.44)	0.17 (0.38)	0.25 (0.43)
Medium income	0/1	0.32 (0.47)	0.23 (0.42)	0.29 (0.46)	0.26 (0.44)	0.23 (0.42)	0.31 (0.46)	0.28 (0.45)	0.26 (0.44)	0.26 (0.44)	0.22 (0.42)	0.27 (0.44)
Don't know / no answer income	0/1	0.02 (0.16)	0.18 (0.39)	0.07 (0.26)	0.28 (0.45)	0.29 (0.46)	0.1 (0.31)	0.19 (0.39)	0.22 (0.42)	0.08 (0.28)	0.25 (0.43)	0.17 (0.38)
Medium education	0/1	0.86 (0.35)	0.59 (0.49)	0.68 (0.47)	0.67 (0.47)	0.54 (0.50)	0.6 (0.49)	0.7 (0.46)	0.75 (0.43)	0.55 (0.50)	0.61 (0.49)	0.65 (0.48)
High education	0/1	0.11 (0.31)	0.17 (0.37)	0.23 (0.42)	0.24 (0.43)	0.23 (0.42)	0.21 (0.41)	0.11 (0.32)	0.13 (0.34)	0.17 (0.37)	0.19 (0.39)	0.18 (0.39)
Employed	0/1	0.77 (0.42)	0.49 (0.50)	0.74 (0.44)	0.63 (0.48)	0.47 (0.50)	0.61 (0.49)	0.43 (0.49)	0.56 (0.50)	0.38 (0.48)	0.5 (0.50)	0.55 (0.50)
Self-employed	0/1	0.1 (0.29)	0.03 (0.18)	0.07 (0.26)	0.04 (0.19)	0.03 (0.18)	0.12 (0.32)	0.04 (0.19)	0.06 (0.24)	0.06 (0.24)	0.05 (0.22)	0.06 (0.24)
Risk averse	0/1	0.55 (0.50)	0.59 (0.49)	0.52 (0.50)	0.73 (0.44)	0.59 (0.49)	0.6 (0.49)	0.48 (0.50)	0.66 (0.47)	0.83 (0.38)	0.69 (0.46)	0.63 (0.48)
Income in euro	0/1	0.01 (0.08)	0.01 (0.10)	0.01 (0.10)	0.02 (0.14)	0.01 (0.12)	0.05 (0.22)	0.03 (0.17)	0.02 (0.15)	0.05 (0.22)	0.03 (0.16)	0.02 (0.16)
Remittances	0/1	0.03 (0.17)	0.02 (0.14)	0.03 (0.18)	0.05 (0.22)	0.07 (0.25)	0.22 (0.41)	0.12 (0.32)	0.06 (0.24)	0.12 (0.32)	0.08 (0.27)	0.08 (0.28)
Bank perceived as far	1/6	3 (1.26)	2.19 (1.31)	2.52 (1.32)	2.49 (1.60)	3.05 (1.50)	2.95 (1.43)	3.19 (1.50)	2.71 (1.52)	3.16 (1.76)	2.82 (1.63)	2.8 (1.53)
Expected economic situation better	0/1	0.33 (0.47)	0.42 (0.49)	0.46 (0.50)	0.32 (0.47)	0.23 (0.42)	0.44 (0.50)	0.31 (0.46)	0.36 (0.48)	0.52 (0.50)	0.27 (0.44)	0.37 (0.48)
Plan a loan	0/1	0.14 (0.35)	0.04 (0.19)	0.13 (0.33)	0.06 (0.23)	0.04 (0.20)	0.1 (0.30)	0.1 (0.30)	0.07 (0.25)	0.12 (0.32)	0.12 (0.32)	0.09 (0.28)
Own house	0/1	0.67 (0.47)	0.86 (0.35)	0.59 (0.49)	0.89 (0.31)	0.76 (0.43)	0.93 (0.26)	0.95 (0.23)	0.79 (0.41)	0.94 (0.23)	0.87 (0.34)	0.79 (0.41)
Own car	0/1	0.75 (0.43)	0.49 (0.50)	0.7 (0.46)	0.66 (0.47)	0.36 (0.48)	0.41 (0.49)	0.58 (0.49)	0.86 (0.35)	0.61 (0.49)	0.59 (0.49)	0.55 (0.50)
Own second residence	0/1	0.17 (0.38)	0.07 (0.25)	0.07 (0.26)	0.16 (0.37)	0.06 (0.24)	0.08 (0.27)	0.09 (0.29)	0.14 (0.35)	0.12 (0.32)	0.13 (0.34)	0.11 (0.31)
Married	0/1				0.45 (0.50)	0.47 (0.50)	0.66 (0.47)	0.48 (0.50)	0.41 (0.49)	0.54 (0.50)		

Source: OeNB Euro Survey.

Note: Descriptive statistics are the average value for the surveys in spring 2010, fall 2010, spring 2011 and fall 2011, except for "Own house," "Own car" and "Own second residence," where the data are from fall 2011 only. "Total" is the average across countries that is not weighted by size.