

# The use of euro cash in CESEE and the role of euro adoption expectations

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*This short study presents data on the use of euro cash as a safe haven asset or as a means of payment over the last decade. We contrast these selected key indicators using OeNB Euro Survey data with the main literature findings on the determinants of currency substitution in Central, Eastern and Southeastern Europe (CESEE). According to these key indicators, euro cash holdings are currently widespread in Albania, Croatia, the Czech Republic, North Macedonia and Serbia. Due to overall declining euro cash amounts in the region, the extent of currency substitution continues its long-term downward trend in all CESEE countries. However, we still see a medium to high level of currency substitution in Croatia, North Macedonia and Serbia. Apparently, the determinants of euroization that have been identified in former research are still at work; this finding rests on the new data points of the key indicators presented here with respect to euroization and CESEE respondents' preferences for saving in cash or for saving in foreign currency as well as their habit of making certain payments in euro. Finally, we address the question whether EU integration prospects have an impact on people's propensity to hold euro cash. The simple empirical analysis presented here finds a positive and significant influence of expected euro adoption on the likelihood that individuals hold euro cash. However, such expectations do not seem to affect the amounts of euro cash held.*

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Over the last decade, several publications have used OeNB Euro Survey data to examine the determinants of currency substitution, defined in this study as the use of foreign currency cash as a safe haven asset or as a means of payment, as well as deposit substitution in Central, Eastern and Southeastern Europe (CESEE). This descriptive study builds on this strand of literature and presents updated time series of the main indicators on the use of euro cash in CESEE. How did these indicators perform over the last decade and do recent developments contrast with the main findings? We see that euro cash holdings are still widespread in some CESEE countries, but the importance of euro cash as a safe haven asset has been declining. This decline has been gradual, despite the pronounced – yet temporary – decrease in trust in the euro compared with the local currencies during the euro area sovereign debt crisis.<sup>2</sup> This corroborates the well-established conclusion in the literature that euroization (dollarization) is prone to persistence. And even once macroeconomic stabilization has been achieved, de-euroization does not necessarily take place, at least not fully, (see e.g. Feige and Dean, 2004). The cause of this persistence in the use of foreign currency cash for savings and transactions is essentially rooted in a fairly persistent loss of trust.

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<sup>2</sup> Currency preferences are closely correlated with trust in the domestic currency compared with the euro, the safe haven currency. A selected set of key indicators on euroization and trust can be found on the OeNB website at <https://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey.html>.

What distinguishes euroization in CESEE from, e.g., dollarization in Latin America is the process of institutional and economic integration in the EU. Also, the use of euro cash in CESEE may additionally have been driven by the development of European value chains, labor migration from CESEE to core industrial countries in the EU and related flows of remittances back to CESEE as well as tourist flows in both directions.<sup>3</sup> The question arises whether EU integration prospects have an impact on people's propensity to hold euro cash. The simple empirical analysis presented here finds a positive and significant influence of expected euro adoption on the likelihood that individuals hold euro cash. However, these expectations do not seem to affect the amounts of euro cash held.

This short study is structured as follows: Section 1 presents descriptive evidence on the prevalence of euro cash holdings, median amounts and the extent of currency substitution based on OeNB Euro Survey data and contrasts euro cash holdings with foreign currency savings and the overall euroization of household assets. Section 2 summarizes research results that explain (1) why Southeastern European (SEE) households prefer saving in cash rather than at banks and (2) why households prefer to use the euro for payments. The new data points on respondents' saving preferences and payment behavior complement this discussion. Section 3 presents results of two simple regressions in order to shed some light on the role of euro adoption prospects. In particular, we investigate which socioeconomic characteristics correlate with the reported euro cash holdings and whether expectations about euro adoption prospects are related to (1) people's propensity to hold euro cash and (2) the amount of euro cash holdings. Section 4 summarizes and discusses briefly some policy implications for the SEE countries.

## 1 Euro cash holdings still widespread in SEE countries

In a number of countries in CESEE, we have seen a significant prevalence of euro cash holdings. The results of the OeNB Euro Survey waves conducted from 2007 to 2018 show that euro cash holdings are widespread in Albania, Croatia, the Czech Republic, North Macedonia and Serbia (chart 1, left-hand panel). In those five countries, an average share of 36% of respondents reported to hold euro cash in the period 2017–18. The corresponding average for the other five countries (Bosnia and Herzegovina, Bulgaria, Hungary, Poland and Romania) was 13% of respondents.

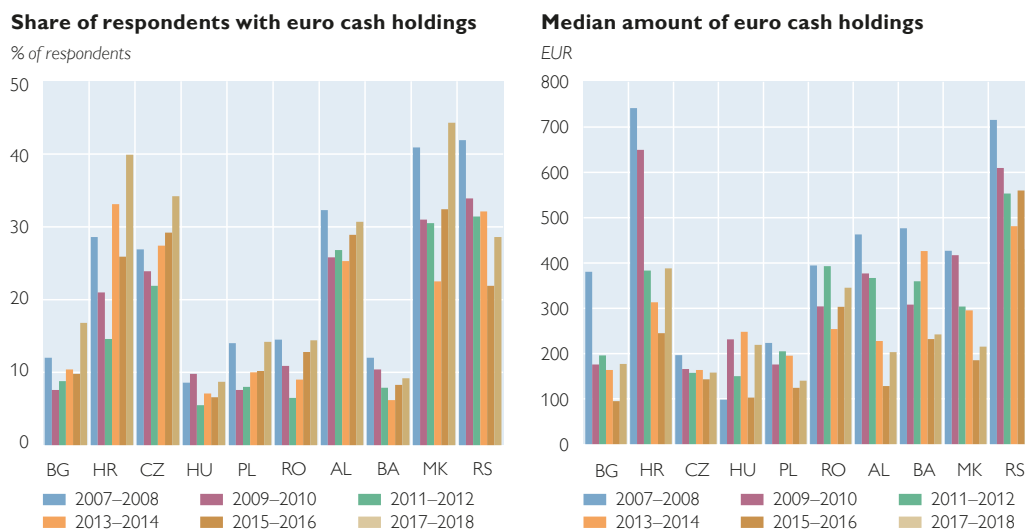
In the aftermath of the global financial crisis, euro cash holdings became less common, partly because households were forced to use their savings to compensate for a loss of income during the crisis period (Corti and Scheiber, 2014). The recent rebound of euro cash holdings in several CESEE countries shown in chart 1 (left-hand panel) may have been driven by rising incomes or a higher prevalence of remittances.<sup>4</sup>

The median amounts – based on self-reported euro cash amounts – show a rather pronounced trend of decreasing euro cash circulation in those countries that exhibited relatively high median amounts in 2007–08 (chart 1, right-hand panel).

<sup>3</sup> *Of course, these factors also play a role in Latin America, but the intensity of integration and the size of bi-directional flows is relatively more advanced in CESEE and in particular in the CESEE EU Member States than in Latin America. Furthermore, CESEE EU Member States have the option to become full-fledged members of Economic and Monetary Union (EMU), which implies the adoption of the euro as sole legal tender.*

<sup>4</sup> *The decline in euro cash holdings in Serbia in recent years, in turn, may reflect the country's dinarization strategy.*

## Euro cash holdings in Central, Eastern and Southeastern Europe



Source: OeNB Euro Survey.

Note: Weighted percentages are based on pooled data from survey waves of two consecutive years as indicated in the legend; respondents who answered “Don’t know” or who refused to answer have been excluded.

In recent years, the median amount in the Czech Republic, Poland, Bosnia and Herzegovina and North Macedonia has remained roughly the same, whereas the median in Bulgaria, Croatia, Hungary and Albania rebounded substantially. Only the Serbian median amount decreased further in the period 2017–18, yet at EUR 430, it still turns out to be the highest in the region, followed by Croatia (roughly EUR 390).

To highlight the macroeconomic significance of euro cash in CESEE, we relate survey figures to currency in circulation and households’ savings deposits. First, the currency substitution index (CSI, chart 2, left-hand panel) relates projected per capita euro cash amounts, as derived from the OeNB Euro Survey, to per capita local currency in circulation outside the banking sector.

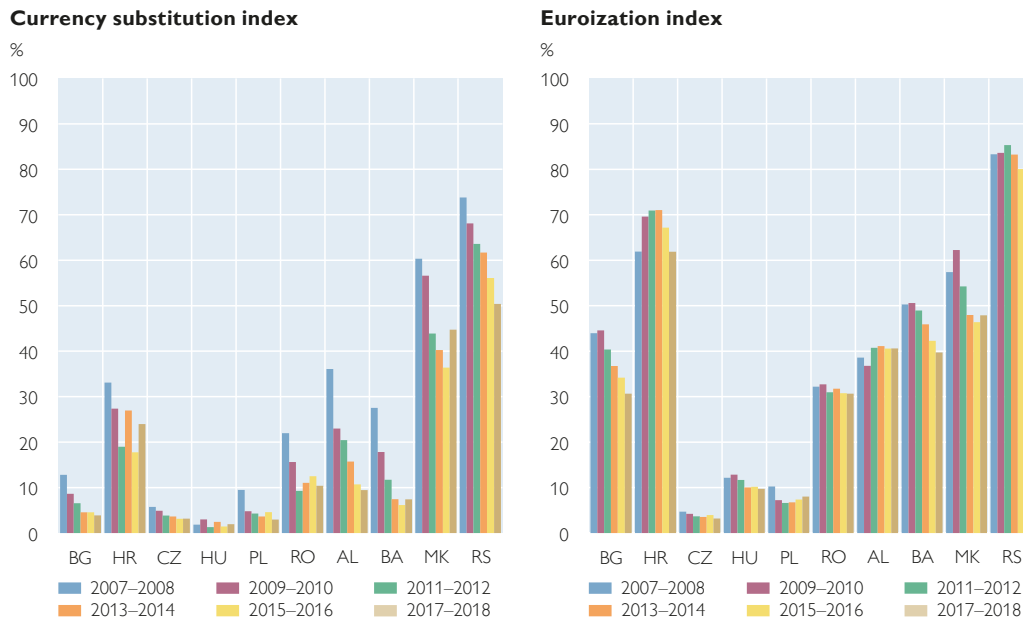
According to this measure, currency substitution had been macroeconomically insignificant in the Czech Republic, Hungary and Poland already in 2007–08 and has declined further since then. Correspondingly, a majority of respondents in these countries reported that they hold euro cash mainly for payments abroad or travelling (Scheiber and Stern, 2016).

Currency substitution has also trended downward in all SEE countries since 2007–08. Bulgaria and Bosnia and Herzegovina were the first SEE countries in which the CSI declined below 10%, which is regarded as the threshold for low euroization in the literature. In Albania and Romania, the CSI declined to 10% in 2017–18. Medium levels of currency substitution prevail in Croatia and North Macedonia, which both experienced a substantial increase of the CSI, to 24% and 45%, respectively, in 2017–18.<sup>5</sup> Meanwhile, the Serbian CSI declined further

<sup>5</sup> The sharp increase of the CSI in North Macedonia is driven by the results of the 2018 survey wave, which revealed that fairly small-amount euro cash holdings had become more common.

Chart 2

### Euro cash in circulation has decreased, share of euro deposits more stable



Source: OeNB Euro Survey, national central banks.

Note: The currency substitution index in the left-hand panel is calculated as the ratio of euro cash to euro cash plus national currency in circulation. The euroization index in the right-hand panel is calculated as euro cash plus foreign currency deposits divided by the sum of total cash and total deposits. For details, see Scheiber and Stix (2009).

while remaining above 50%.<sup>6</sup> Asked directly about their motives for holding euro cash, respondents cited the store of value function as the main reason (Scheiber and Stern, 2016).

Second, the euroization index combines per capita euro cash holdings and per capita euro deposits of the household sector over total currency in circulation outside the banking sector and total household deposits (chart 2, right-hand panel). Interestingly, the overall extent of households' asset euroization in SEE remained at a medium to high level over the last decade. The decreases of the euroization index visible in chart 2 can be mainly attributed to the downward trend of reported euro cash amounts; the underlying euroization of deposits turns out to be persistent.

## 2 Explaining household preferences for using euro cash

Money serves as a store of value and as a medium of exchange. Hence, currency substitution also impacts saving decisions. Engineer (2000) analyzed the role of transaction costs in an economy that uses competing fiat currencies. His model predicts that the low-transaction-cost currency (domestic currency) is used for everyday purchases, whereas the stable foreign currency serves the precautionary demand for money and has a lower velocity of circulation, i.e. foreign currency is

<sup>6</sup> A caveat relates to the fact that surveyed euro cash amounts are likely to suffer from underreporting because some respondents may be reluctant to reveal the true amounts; hence, in all CESEE countries, the true level of currency substitution may be higher than suggested by the reported CSI.

held as a store of value and used to make occasional large payments. OeNB Euro Survey data show considerable evidence for both uses in the SEE region. In order to be able to derive policy conclusions, a clear understanding of the underlying determinants is helpful. In the following, we summarize selected research results. The new data points on respondents' saving preferences and payment behavior complement this discussion.

## 2.1 Preference for saving in cash

First, Beckmann et al. (2013) looked at the structure of CESEE households' portfolios and found that in 2010–11, cash holdings were, on average, the most important saving instrument even for banked households.

Second, in an analysis of why CESEE households hold sizeable shares of their assets in cash at home rather than at banks, Stix (2013) finds that a lack of trust in banks, memories of past banking crises and weak tax enforcement are important factors in explaining respondents' preference for saving in cash. Moreover, the preference for cash is stronger in euroized SEE economies where a "safe" foreign currency serves as a store of value.

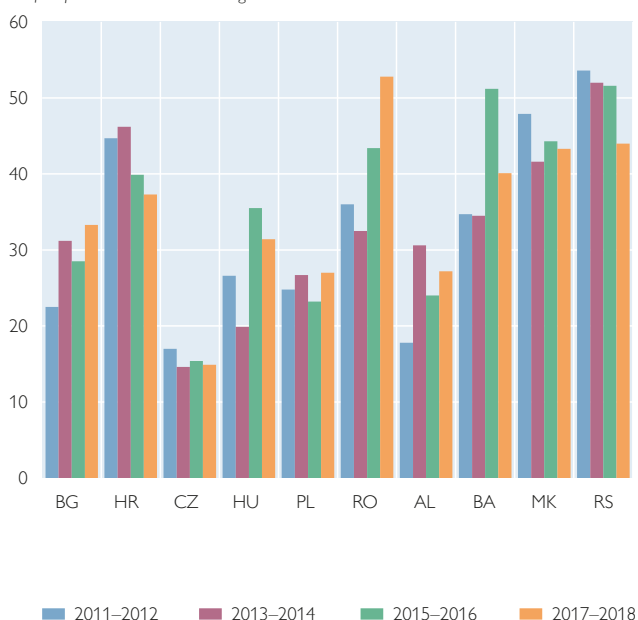
The left-hand panel of chart 3 presents data on CESEE households' preferences for saving in cash.<sup>7</sup> The share of respondents with savings who state that they prefer

Chart 3

### Preference for saving in cash or foreign currency

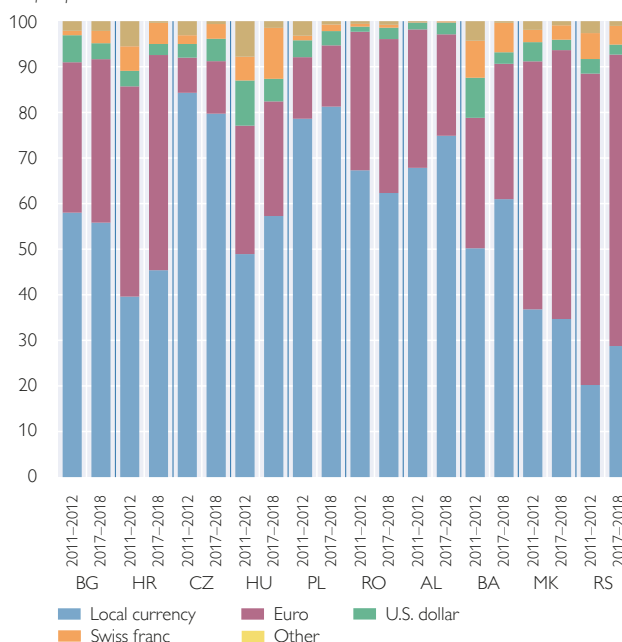
#### Preference for saving in cash

% of respondents who have savings



#### Preference for saving in foreign currency

% of respondents



Source: OeNB Euro Survey.

Note: Weighted percentages excluding respondents who answered "Don't know" or who refused to answer. The left-hand panel shows the share of respondents who have a strong cash preference, derived from the statement: "I prefer to hold cash rather than a savings account." The answers of the right-hand panel refer to the question: "Suppose you had two average monthly salaries to deposit in a savings account. Would you choose to deposit this amount in local currency, EUR, USD, CHF or other currency?"

<sup>7</sup> Note that the question on the preference for saving in cash has been included in all survey waves since fall 2007, yet, the necessary break variable, which controls for savings, has only been available since 2011.

to save in cash varies between 15% in the Czech Republic and 53% in Romania for the period 2017–18. Results from the literature indicate that the high incidence of cash savings is mainly attributable to trust issues (a phenomenon that is partly related to memories of past banking crises) and not so much a matter of an insufficient supply of bank services. Stix (2013) stresses that the combination of weak institutions and network effects in the use of foreign currency cash renders people’s tendency to save in cash rather persistent.

The right-hand panel of chart 3 presents updated evidence on CESEE households’ preference for saving in foreign currency, and particularly for saving in euro.<sup>8</sup> Brown and Stix (2015) used this variable from the 2011 and 2012 survey waves as a dependent variable in their paper. In comparison with 2017–18, the preferences for saving in foreign currency remained quite stable. The share of respondents who prefer to save in euro remained close to 50% in Croatia and at around 60% in North Macedonia and Serbia. This direct measure of currency preferences as well as the euroization index above indicate that deposit substitution turns out to be persistent in SEE.

Brown and Stix (2015) show that the preferences of CESEE households for euro deposits are partly driven by their distrust in the stability of their domestic currency, which, in turn, is related to their assessment of current policies and institutions. Furthermore, the authors confirm that the observed persistence of deposit euroization across the region is strongly influenced by households’ experiences of banking and currency crises during the 1990s.

## 2.2 Preference for payments in euro

Chart 4 (right-hand panel) shows the extent to which the euro is used as a means of payment in CESEE.<sup>9</sup> In general, the frequency of payments in euro over the last six months has declined in all CESEE countries since 2008, except for Croatia, Hungary and the Czech Republic. The decline was most pronounced in Bosnia and Herzegovina, North Macedonia and Serbia. At the same time, we see a rebound in euro payments for some countries between 2014 and 2017, notably in Croatia and Albania.

The left-hand panel of chart 4 reports a subjective measure of network externalities, i.e. the share of respondents per country who have savings and who agree with the statement “In [my country] it is very common to make payments in euro” (six-point Likert scale). Since 2008, the perceived measure of network effects has declined substantially in all SEE countries except Albania, where it has remained mostly unchanged.

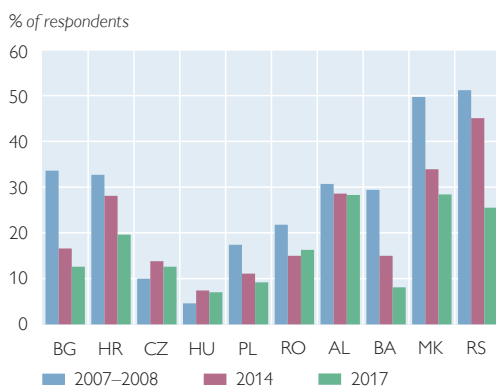
Scheiber and Stern (2016) examine the determinants of currency substitution in SEE. They find that perceived network externalities and monetary expectations (in particular exchange rate expectations) are still significantly associated with the formation of households’ preferences for receiving certain payments in euro. Relative trust in the euro versus the local currency – which is mainly related to

<sup>8</sup> Note that the survey question on the currency preference of deposits has been available since fall 2011. For reasons of readability, the results for 2013, 2015 and 2016 are not included. Data are available from the author upon request.

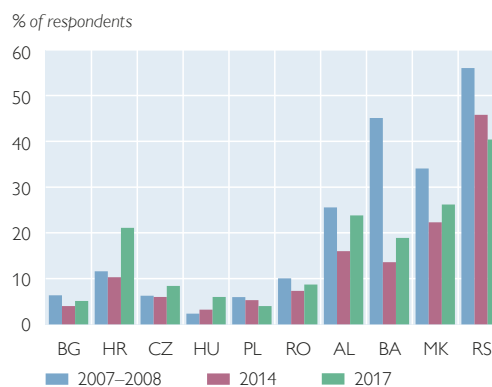
<sup>9</sup> Note that the respective survey question was only asked in the fall 2007, spring 2008, fall 2014 and fall 2017 waves. For reasons of comparability, the left-hand panel of chart 4 is confined to these points in time as well, although data are also available for the years 2010 to 2013.

### Perceived network effects and actual payments in euro over the last six months

#### Perceived network effects of paying in euro



#### Actual payments in euro during the last six months



Source: OeNB Euro Survey.

Note: The left-hand panel is based on agreement with the statement: "In my country it is very common to make certain payments in euro." The right-hand panel refers to the statement: "Did you make any payments in euro in your country during the last six months?"

past financial crises – turns out to be even more important than depreciation expectations. Overall, the results corroborate prior findings that the prevailing currency substitution is largely demand driven and not so much a consequence of constrained access to banking or payment services available in the local currency.<sup>10</sup>

### 3 Which characteristics correlate with observed euro cash holdings and the role of euro adoption expectations

Against the background of EU integration, the question arises whether individual expectations with respect to future euro adoption have a significant influence on euro cash holdings. In the following empirical exercise, we distinguish between the six CESEE EU Member States, for which euro adoption is a possible and relevant policy option, and the four EU candidate and potential candidate countries (CPCCs) in the sample. For the latter group of countries – Albania, Bosnia and Herzegovina, North Macedonia and Serbia – EU accession needs to precede the process toward joining the euro area, as in all earlier cases.

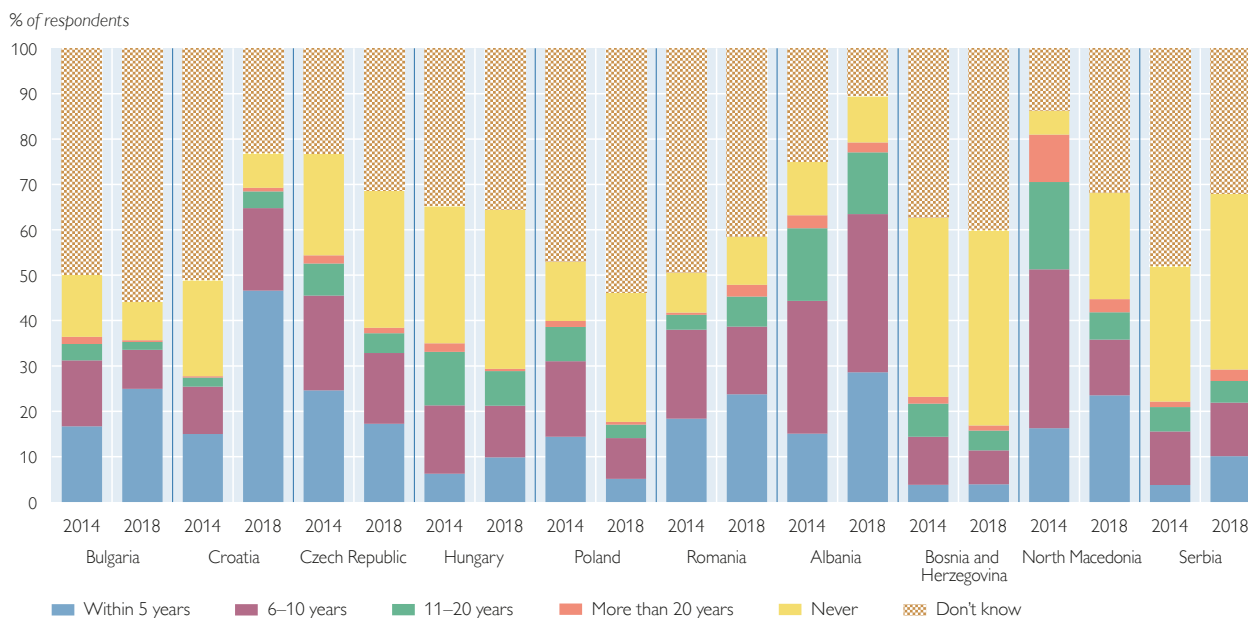
The OeNB Euro Survey asked respondents in 2014, 2017 and 2018 when, that is in which year, they expect the euro to be introduced in their country.

As chart 5 shows, a substantial share of respondents was undecided as to how soon the euro might be introduced in their country ("don't know" answers in chart 5).<sup>11</sup> In comparison with 2014, respondents in Bulgaria have become slightly more optimistic, whereas Czech, Hungarian, Polish and Romanian respondents turned out to be more skeptical. Particularly, the share of "never" replies increased substantially. The exception is Croatia, with declining shares of both "don't know"

<sup>10</sup> Scheiber and Stern (2016) conclude that currency substitution and the prevalence of payments in euro is largely demand driven and the constraints of access to banking or payment services play a minor role. Brown and Stix (2015) argue similarly in the case of deposit substitution. Beckmann et al. (2018) indicate that some CESEE households are faced with serious constraints of access to banking, which is related to the geographical distribution of banking services.

<sup>11</sup> For reasons of readability, the results for 2017 are not shown; data are available from the author upon request.

Chart 5

**Euro adoption expectations: varied responses across countries, many “Don’t knows”**

Source: OeNB Euro Survey.

Note: Results are weighted; respondents who refused to answer are excluded.

and “never” and with the most optimistic replies, showing a median expectation of euro adoption in four years’ time. This may well be associated with Croatia having drawn up a euro adoption strategy in 2017–18.<sup>12</sup>

Although the formal adoption of the euro needs to be preceded by EU accession and ERM II membership of at least two years, a majority of Albanian and North Macedonian respondents in 2014 expected their countries to adopt the euro within the next ten years. By 2018, this share had increased to 60% in Albania, while expectations of North Macedonians have been frustrated substantially. In Bosnia and Herzegovina and Serbia, the “don’t know” and “never” replies dominated in both survey waves.<sup>13</sup>

In the following, we present two simple regressions using data from 2014, 2017 and 2018. The first set of regressions examines the influence of selected variables on the probability of an individual holding euro cash (extensive margin). The second set of regressions analyzes the determinants of euro cash amounts given that a respondent holds euro cash in the first place (intensive margin). The explanatory variable of main interest is the expected date of euro adoption

<sup>12</sup> This shift in public mood in Croatia was already visible in the 2017 survey wave.

<sup>13</sup> The question arises whether residents’ expectations are realistic. For a comprehensive discussion of the prospect that the six CESEE EU Member States adopt the euro over the next couple of years, see Backé and Dvorsky (2018). At the moment, none of the six CESEE EU Member States is taking part in ERM II; therefore, it is legally possible for these countries to adopt the euro in three to four years, time at the earliest. Regarding the EU accession prospects of the CPCCs, in 2018 the European Commission set 2025 as the earliest possible target date. Against this background, at the time of the interviews in the fall of 2018, the CPCCs would be able to adopt the euro in 10 to 12 years’ time at the earliest. However, Grieveson et al. (2018) stress that the Western Balkan countries are faced with numerous challenges on the road to EU accession. They regard the time frame announced by the European Commission as highly ambitious. In their view, it is far from certain that any CPCC will be ready for accession by 2025. Respondents’ expectations regarding euro adoption do not in all cases take into account these timelines and thus cannot always be considered to be well-informed.



measured in years from the point in time when the interview was conducted. For the regression analyses, individual expectations are mapped into a set of dummy variables, each covering a period of two or more years. The base category are respondents who answered “don’t know.”

### 3.1 Propensity to hold euro cash: euro adoption expectations play a role but income in euro and remittances are more important

Table 1 presents the results of the first set of probit regressions. The dependent variable is a binary variable for respondents holding euro cash.

For each set of countries, we start out with a simple specification that relates dummies of expected euro adoption to the binary variable that indicates euro cash holdings (columns I and V). Subsequently, we add interacted country and year dummies (columns II and VI) in order to take into account the considerable heterogeneity across countries. In specifications III and VII, a set of socioeconomic control variables is included in the estimations. The socioeconomic controls comprise respondents’ gender, age, educational attainment, employment status, financial literacy score<sup>14</sup> and risk aversion. Finally, the most exhaustive specifications IV and VIII additionally contain a set of household characteristics (i.e. household income, household size, income in euro or remittances, as well as relative household wealth<sup>15</sup>). All reported estimation results are based on standard errors, which account for clustering at the regional level.

The estimation results for both regions show that respondents who have concrete expectations of euro adoption are more likely to hold euro cash (extensive margin). The average marginal effects decrease when we add socioeconomic and household controls. For CESEE EU Member States, the average marginal effect of the expectation of euro adoption in 2 to 3 years’ time or 4 to 5 years’ time increases the likelihood by 7 percentage points vis-à-vis the base category of respondents who answered “don’t know” (see specification IV). The average marginal effects decline the farther in the future euro adoption is expected to be. For CPCCs we find a different pattern: The average marginal effects peak at the 12-to-15-year or the 16-or-more-year horizon, increasing the likelihood of holding euro cash by 8 percentage points (see specification VIII). The average marginal effects become weaker and insignificant for expectations of earlier euro adoption.<sup>16</sup> Note that these results can only be interpreted as correlations but not as causal effects due to potential endogeneity.<sup>17</sup>

<sup>14</sup> The financial literacy score is the sum of correct answers to three knowledge questions on the concept of compound interest, inflation and exchange rate.

<sup>15</sup> The OeNB Euro Survey does not include direct measures of household wealth. As an alternative, we use a proxy variable which relies on interviewers’ assessment of the condition of the respondents’ home compared with neighbouring homes.

<sup>16</sup> Table A3 in the annex shows the results of several other country groups. Interestingly, we find two peaks in the country sets that include both EU Member States and CPCCs: an early peak at the 4-to-5-year horizon and a late peak of a similar size at the 12-to-15-year horizon. The comparison indicates that the late peak in the CPCC estimations is mainly driven by Albania and Bosnia and Herzegovina. In particular, the probit estimation including Croatia, North Macedonia and Serbia (i.e. countries with medium to high levels of currency substitution) exhibits an early peak.

<sup>17</sup> Reverse causality would be prevalent if residents expected sooner euro adoption because they hold euro cash themselves. Yet, the widespread use of euro cash is a general feature of some countries that all residents of these countries are equally exposed to. This difference in the general level of currency substitution between countries is econometrically captured by the country-fixed effects.

The group of six EU Member States can be split into two subgroups. On the one hand, there are Bulgaria, Croatia and Romania, which have explicitly stated their willingness to introduce the euro as soon as possible, with Bulgaria and Croatia already preparing ERM II accession and, to this end, cooperating closely with the SSM. On the other hand, there are the Czech Republic, Hungary and

Table 1

**Extensive margin: influence of expected euro adoption prospects on euro cash holdings (dependent variable)**

	EU Member States (BG, HR, CZ, HU, PL, RO)				CPCCs (AL, BA, MK, RS)			
	I	II	III	IV	V	VI	VII	VIII
Euro adoption expected... within 2 years	0.082** (0.037)	0.041 (0.036)	0.015 (0.030)	-0.001 (0.026)	0.151*** (0.052)	0.048 (0.045)	0.044 (0.042)	0.034 (0.029)
in 2–3 years	0.164*** (0.025)	0.111*** (0.014)	0.083*** (0.013)	0.067*** (0.011)	0.103*** (0.034)	0.045 (0.030)	0.033 (0.029)	0.023 (0.023)
in 4–5 years	0.197*** (0.028)	0.127*** (0.017)	0.092*** (0.014)	0.074*** (0.013)	0.105* (0.054)	0.078** (0.036)	0.057* (0.033)	0.046* (0.028)
in 6–7 years	0.106*** (0.020)	0.082*** (0.014)	0.053*** (0.013)	0.040*** (0.013)	0.039 (0.043)	0.034 (0.028)	0.015 (0.025)	0.010 (0.020)
in 8–9 years	0.120*** (0.033)	0.080*** (0.021)	0.054*** (0.021)	0.041* (0.022)	0.094*** (0.031)	0.052*** (0.015)	0.038*** (0.013)	0.025*** (0.012)
in 10–11 years	0.060*** (0.021)	0.055*** (0.019)	0.034** (0.017)	0.026 (0.017)	0.059 (0.040)	0.080** (0.032)	0.058** (0.029)	0.046* (0.027)
in 12–15 years	0.068*** (0.023)	0.063*** (0.020)	0.039** (0.019)	0.034* (0.019)	0.160*** (0.055)	0.119** (0.047)	0.100** (0.044)	0.086** (0.041)
in 16 or more years	0.053** (0.025)	0.071*** (0.024)	0.047** (0.022)	0.030 (0.021)	0.105** (0.042)	0.105*** (0.035)	0.080** (0.037)	0.074** (0.035)
never	0.016 (0.017)	0.004 (0.011)	-0.003 (0.010)	-0.005 (0.010)	-0.020 (0.020)	-0.005 (0.017)	-0.014 (0.016)	-0.008 (0.017)
Country, time and interacted fixed effects Dummy: 19 to 34 years old	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Dummy: 55+ years old			0.000 (0.009)	-0.004 (0.009)			0.021 (0.014)	0.024* (0.013)
Dummy: female			-0.027*** (0.009)	-0.020** (0.010)			-0.048*** (0.018)	-0.030 (0.019)
Dummy: high education			-0.007 (0.007)	-0.011 (0.007)			-0.022*** (0.007)	-0.026*** (0.006)
Dummy: medium education			0.144*** (0.013)	0.118*** (0.013)			0.107*** (0.018)	0.075*** (0.021)
Dummy: self-employed			0.040*** (0.011)	0.037*** (0.013)			0.041** (0.017)	0.031 (0.020)
Dummy: unemployed			0.093*** (0.011)	0.063*** (0.012)			0.119*** (0.008)	0.082*** (0.006)
Dummy: retired			-0.033** (0.013)	-0.025** (0.012)			-0.083*** (0.008)	-0.068*** (0.010)
Dummy: student			-0.067*** (0.011)	-0.043*** (0.011)			-0.034* (0.019)	-0.019 (0.018)
Financial literacy score			-0.010 (0.011)	-0.008 (0.013)			-0.058*** (0.017)	-0.044** (0.017)
Dummy: risk averse			0.018*** (0.005)	0.016*** (0.005)			0.007 (0.008)	0.008 (0.008)
Dummy: risk aversion: don't know/no answer			0.001 (0.009)	0.006 (0.008)			0.034* (0.019)	0.027 (0.016)
			-0.046*** (0.016)	-0.032** (0.015)			-0.031 (0.029)	-0.038 (0.027)

Source: Author's calculations.

Note: Average marginal effects from probit estimations using data from 2014, 2017 and 2018; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\* \*\* \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1.  $P$  ( $DepVar=1$ ) denotes the unconditional sample probability of the dependent variable. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes.

Table 1 cont.

**Extensive margin: influence of expected euro adoption prospects on euro cash holdings (dependent variable)**

	EU Member States (BG, HR, CZ, HU, PL, RO)				CPCCs (AL, BA, MK, RS)			
	I	II	III	IV	V	VI	VII	VIII
Dummy: high income				0.085*** (0.012)				0.089*** (0.020)
Dummy: medium income				0.035*** (0.008)				0.054*** (0.011)
Dummy: income don't know/no answer				0.041*** (0.011)				0.043** (0.021)
Dummy: income in euro				0.183*** (0.016)				0.215*** (0.019)
Dummy: remittances				0.099*** (0.012)				0.106*** (0.032)
Dummy: two-person household				0.000 (0.010)				0.008 (0.021)
Dummy: three-or-more-person household				-0.016 (0.013)				-0.003 (0.026)
Dummy: children				0.009 (0.009)				0.023* (0.013)
Dummy: house in better condition				0.068*** (0.009)				0.059*** (0.010)
Dummy: house in poorer condition				-0.043*** (0.015)				-0.063*** (0.020)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-8,614.1	-8,036.8	-7,577.1	-6,932.0	-6,687.0	-6,233.4	-5,948.5	-5,345.4
Pseudo-R <sup>2</sup>	0.03	0.09	0.14	0.19	0.01	0.08	0.11	0.17
Probability > chi-squared	188.1	1,164.3	4,745.3	11,684.6	112.8	..	..	..
Number of observations	17,773	17,773	17,611	17,189	11,685	11,685	11,536	11,131
P(DepVar=1)	0.20	0.20	0.20	0.20	0.27	0.27	0.27	0.27

Source: Author's calculations.

Note: Average marginal effects from probit estimations using data from 2014, 2017 and 2018; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\*, \*\*, \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1. P (DepVar=1) denotes the unconditional sample probability of the dependent variable. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes.

Poland, which either have not expressed an official view or said that euro adoption is not a policy priority. Although euro adoption expectations differ substantially among respondents across the two subgroups, estimations confirm the link between euro adoption expectations and the propensity to hold euro cash for both subgroups. As expected, countries with a clear policy priority exhibit stronger average marginal effects that even peak in the more distant future.<sup>18</sup>

For all regions, the receipt of income in euro or of remittances are strong predictors of euro cash holdings. High household income and living in a home that is in a relatively better condition as well as higher educational attainment (for EU Member States) or being self-employed (for CPCCs) are other variables that exhibit high marginal effects.

<sup>18</sup> For results see table A2 in the annex (columns I and II). For the subgroup consisting of the Czech Republic, Hungary and Poland, the average marginal effects peak at the 4-to-5-year horizon; yet this result is mainly driven by the Czech Republic. For the other subgroup (Bulgaria, Croatia and Romania), average marginal effects peak at the 8-to-9-year horizon.

Table 2

### Intensive margin: influence of expected euro adoption prospects on the amount of euro cash (dependent variable)

	EU Member States (BG, HR, CZ, HU, PL, RO)				CPCCs (AL, BA, MK, RS)			
	I	II	III	IV	V	VI	VII	VIII
Euro adoption expected...								
within 2 years	149.7 (295.4)	31.0 (278.4)	-14.4 (290.1)	-20.1 (283.6)	73.5 (148.2)	103.0 (166.5)	149.6 (161.8)	114.5 (148.6)
in 2–3 years	280.1** (106.3)	152.4** (64.2)	114.2* (64.7)	81.0 (59.3)	-168.2** (65.3)	4.5 (65.9)	13.9 (66.5)	19.1 (76.8)
in 4–5 years	242.1*** (77.3)	109.6* (60.3)	61.2 (55.6)	8.3 (59.4)	19.8 (85.2)	132.0 (128.6)	102.3 (94.1)	93.0 (77.7)
in 6–7 years	210.7** (97.8)	133.3 (82.3)	100.7 (85.2)	51.3 (86.7)	94.8 (80.1)	85.9 (94.4)	29.5 (91.5)	51.8 (99.1)
in 8–9 years	182.3 (118.0)	107.1 (74.6)	73.2 (82.5)	12.3 (68.3)	-3.3 (89.7)	202.8* (108.7)	164.0 (102.3)	129.4 (97.3)
in 10–11 years	25.1 (144.5)	-21.1 (155.5)	-75.6 (156.5)	-53.1 (162.5)	155.6 (134.5)	191.2 (152.0)	163.7 (139.5)	165.0 (127.2)
in 12–15 years	96.2 (110.4)	3.1 (92.4)	-77.5 (94.9)	-96.8 (97.5)	74.9 (231.1)	257.3 (182.4)	244.0 (188.8)	229.2 (190.6)
in 16 or more years	185.0 (145.6)	162.9 (146.1)	115.9 (150.3)	49.2 (153.4)	-138.5 (168.4)	-25.0 (158.0)	-3.3 (167.0)	21.2 (170.2)
never	-83.4 (64.6)	9.7 (57.9)	-17.6 (58.8)	-19.7 (51.9)	131.7 (106.2)	106.3 (72.8)	83.8 (64.7)	121.1* (64.0)
Country, time and interacted fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Dummy: 19 to 34 years old			-45.1 (40.5)	-59.5 (43.8)			145.8*** (35.0)	-137.3*** (35.6)
Dummy: 55+ years old			74.1 (53.9)	58.6 (52.8)			-24.9 (63.1)	38.0 (77.1)
Dummy: female			-107.1** (40.5)	-120.6*** (43.1)			-124.4* (63.2)	-125.1* (71.5)
Dummy: high education			134.5 (138.5)	88.9 (154.6)			83.7 (94.8)	-17.9 (96.2)
Dummy: medium education			20.3 (98.3)	34.3 (109.3)			-58.3 (111.3)	-67.9 (113.8)
Dummy: self-employed			245.6*** (81.4)	165.2** (67.5)			243.7 (151.0)	139.3 (145.1)
Dummy: unemployed			-172.0** (81.5)	-105.1 (76.2)			-93.0 (77.6)	-53.7 (75.3)
Dummy: retired			20.0 (52.3)	80.9 (54.1)			35.9 (76.2)	71.8 (82.4)
Dummy: student			345.4*** (107.3)	-267.6*** (97.7)			364.4*** (64.0)	340.3*** (52.9)
Financial literacy score			-66.4 (40.6)	-85.5** (39.5)			72.0** (25.5)	75.8*** (22.4)
Dummy: risk averse			-8.7 (44.5)	2.5 (47.8)			34.4 (60.7)	-32.3 (43.0)
Dummy: risk aversion: don't know/no answer			352.3*** (110.8)	-307.6*** (98.9)			14.0 (194.3)	-78.1 (184.4)

Source: Author's calculations.

Note: Ordinary least squares estimations using data from 2014, 2017 and 2018 and conditional that a respondent holds euro cash. Coefficients show changes in the amount of euro cash holdings (in EUR) that are associated with changes in the independent variables; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\*, \*\*, \* denote that the average marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes.

**Intensive margin: influence of expected euro adoption prospects on the amount of euro cash (dependent variable)**

	EU Member States (BG, HR, CZ, HU, PL, RO)				CPCCs (AL, BA, MK, RS)			
	I	II	III	IV	V	VI	VII	VIII
Dummy: high income				340.8*** (67.1)				444.3*** (77.4)
Dummy: medium income				183.1*** (47.9)				135.4*** (45.9)
Dummy: income don't know/ no answer				120.6 (81.4)				321.5** (127.7)
Dummy: income in euro				411.3*** (92.3)				332.6*** (91.6)
Dummy: remittances				0.5 (78.5)				147.1 (88.9)
Dummy: two-person house- hold				-44.6 (60.2)				-72.4 (101.9)
Dummy: three-or-more- person household				-124.3* (67.7)				-67.2 (110.8)
Dummy: children				21.3 (52.9)				36.1 (39.2)
Dummy: house in better condition				212.8*** (57.5)				166.7* (87.0)
Dummy: house in poorer condition				-64.7 (51.7)				-154.5* (82.3)
Constant	532.0*** (73.4)	429.4*** (128.5)	626.7*** (180.6)	372.9* (193.3)	714.5*** (57.9)	873.0*** (201.1)	909.9*** (232.3)	536.7** (217.9)
Log-likelihood	-26,074.3	-25,959.6	-25,740.4	-25,128.3	-21,158.2	-21,101.0	-20,877.2	-20,290.6
F-statistic	6.01	21.65	81.44	180.76	7.05	..	..	..
R <sup>2</sup>	0.02	0.09	0.12	0.15	0.01	0.05	0.09	0.14
Adjusted R <sup>2</sup>	0.01	0.08	0.10	0.14	0.00	0.04	0.07	0.12
Number of observations	3,097	3,097	3,077	3,014	2,494	2,494	2,473	2,411
Conditional mean of dependent variable in EUR	647	647	648	645	734	734	734	736

Source: Author's calculations.

Note: Ordinary least squares estimations using data from 2014, 2017 and 2018 and conditional that a respondent holds euro cash. Coefficients show changes in the amount of euro cash holdings (in EUR) that are associated with changes in the independent variables; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\*, \*\*, \* denote that the average marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes.

### 3.2 Prospects of euro adoption do not seem to affect the amounts of euro cash held

Table 2 shows the result of the OLS regression model that analyzes whether the amount of euro cash held is correlated with euro adoption expectations. The sample is now restricted to those respondents who reported to hold euro cash. The dependent variable is a continuous variable with the reported amount of euro cash.

Table 2 presents the results of the OLS regression in the same way as table 1. The reported coefficients show changes in the amount of euro cash holdings (in euro) that are associated with changes in the independent variables; again, the standard errors account for clustering at the regional level. Due to the considerably

lower number of observations regarding the size of euro cash holdings, the standard errors are rather high.

The main result for both country groups – CESEE EU Member States and CPCCs – is that the prospects of euro adoption do not seem to affect the amounts of euro cash held (intensive margin). The OLS estimations I, II and V do find a positive effect in a euro adoption expected to take place in 2 to 3 years' time or 4 to 5 years' time that is significant at the 5% or 1% level. However, the significance weakens and finally disappears when the variables on the socioeconomic and household characteristics are included.<sup>19</sup>

Again, high income and, particularly, income in euro as well as relatively better homes are robust predictors of higher euro cash amounts in both regions. Moreover, women, students and relatively poorer households are found to hold significantly lower amounts of euro cash.

Interestingly, the regressions for CPCCs yield a significantly negative and sizeable time dummy for 2017 and 2018, in combination with the country-time interaction term for Serbia (not shown), which suggests that the recent de-euroization policies in Serbia have helped drive down euro cash holdings.

#### 4 Summary and policy implications

This short study presents recent data on the use of euro cash in CESEE countries based on the OeNB Euro Survey. We find that euro cash holdings are currently widespread in Albania, Croatia, the Czech Republic, North Macedonia and Serbia. Median amounts vary considerably across countries and have decreased fairly substantially in those countries that had exhibited relatively high median amounts in 2007–08. The recent rebound in euro cash holdings may have been driven by rising incomes or a higher prevalence of remittances.

Nonetheless, the extent of currency substitution, i.e. the use of foreign currency cash as a safe haven asset or as a means of payment, continues its long-term downward trend in all CESEE countries. At the same time, the euroization of household deposits has remained virtually unchanged for the last decade as many respondents still prefer to save in euro, particularly in Croatia, North Macedonia and Serbia.

Furthermore, OeNB Euro Survey indicators show that a sizeable share of Southeastern European (SEE) residents continue to prefer savings in cash to saving deposits. The literature on cash preference and currency substitution shows that people in SEE continue to prefer euro cash for various reasons that are predominantly related to trust. In particular, monetary expectations, network effects, crisis experiences and weak institutions are important determinants of SEE individuals' preferences.

Apart from these well-established determinants of euroization, the question arises whether EU integration has an impact on currency substitution. A brief empirical analysis confirms that people's expectations of euro adoption affect their propensity to hold euro cash. We run two simple regressions using data from 2014,

<sup>19</sup> See table A2 for the robustness of results with respect to country groups. No combination of countries yields significant correlations between the amounts of euro cash held (for those holding some euro cash) and expectations of euro adoption, except for specification VIII (Albania and Bosnia and Herzegovina), where we do find a significant positive effect for the 4-to-5-year horizon and specification I (Czech Republic, Hungary and Poland), yet this result is exclusively driven by the Czech Republic.

2017 and 2018. The first regression, a probit estimation, finds a positive and significant influence of expected horizons for euro adoption on the likelihood that individuals hold cash. The average marginal effects decline in the six EU Member States as well as North Macedonia and Serbia, the farther in the future euro adoption is expected to be, while for Albania and Bosnia and Herzegovina, average marginal effects peak at the 12-to-15-year horizon. However, a second regression finds that the expectations of euro adoption do not seem to affect the amounts of euro cash held (for those respondents that hold euro cash at all). Finally, the regression results suggest that high income, income in euro or the receipt of remittances as well as higher wealth increases the likelihood that an individual holds euro cash and, among individuals who do, that they hold higher amounts of euro cash.

Apparently, the determinates of euroization that have been identified in former research are still at work. This finding rests on the new data points of the key indicators presented here with respect to euroization and CESEE respondents' preferences to save in cash or to save in foreign currency as well as the habit to make certain payments in euro. Consequently, the main policy implications are still valid.<sup>20</sup> If SEE countries aim to reduce the use of the euro both as a store of value and as a medium of exchange, they should continue to pursue stability-oriented macroeconomic policies. Furthermore, it seems important for the SEE countries to enhance trust in their local currencies by establishing a track record of reliable economic policy and fiscal institutions. However, in countries that have experienced periods of hyperinflation and/or currency crises, trust can be expected to build up only very gradually.

However, the country-specific historical background and the small size of many SEE countries may render the de-euroization process even more complex.

Finally, EU integration seems to improve the quality of institutions in CESEE countries. Brown and Stix (2015) have shown that better institutions and sound economic policies have a positive impact on SEE residents' monetary expectations, which in turn weakens the demand for foreign currency savings. We do not find evidence that the prospects of euro adoption correlate with the amounts of euro cash held, which gives reason to hope that further EU integration may not undermine current de-euroization strategies.

<sup>20</sup> See Brown and Stix (2015), Rajkovic and Urosevic (2017), Scheiber and Stern (2016).

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## Annex

Table A1

## List of variables used in the regressions

Label	Description
<b>Dependent variables</b>	
Euro cash holdings	Binary dependent variable that takes the value 1 if the respondent reported that he/she holds euro cash, either personally or together with his/her partner.
Euro cash amount	Continuous variable of reported euro cash amounts denominated in euro. Since euro cash amounts were reported in nine euro amount brackets ranging from less than EUR 25 up to EUR 4,000 or more, the values entered for the variable are the midpoints of nine brackets.
<b>Main explanatory variable</b>	
Expected euro adoption	The expected date of euro adoption is derived from the question: "When, in which year, do you think the euro will be introduced in [your country]?" For the regression analyses, individual expectations (measured as years from the point in time when the interview was conducted) have been mapped into a set of dummy variables each covering a period of two or more years as well as a dummy for the answer category "never." The base category: "don't know." Respondents who refused to answer are excluded.
<b>Individual sociodemographic characteristics</b>	
Age	Dummy variables for three age groups: 19 to 34 years, 35 to 54 years (base category) and 55 or more years.
Female	Dummy variable that takes the value 1 if the respondent is female, else zero (base category).
Education	Dummy variables; level of education (high, medium, low). Base category: low education.
Employment	Dummy variable; employment status (self-employed, unemployed, retired, student). Base category: employed.
Financial literacy score	The financial literacy score is the sum of correct answers to three knowledge questions on the concepts of compound interest, inflation and exchange rate. The score ranges from 0 to 3 correct answers.
Risk averse	Dummy variable: 1 if the respondent strongly agreed or agreed to the statement "In financial matters, I prefer safe investments over risky investments," else zero.
Risk aversion: don't know/no answer	Dummy variable: 1 if respondent said "don't know" or refused to answer.
<b>Household characteristics</b>	
Income	Dummy variables; levels of total monthly household income after taxes (high, medium, low, don't know/no answer). Base category: low income.
Income in euro	Dummy variable: 1 if the respondent reported that he/she or his/her partner receives income in euro, else zero.
Remittances	Dummy variable: 1 if the respondent reported that he/she or his/her partner receives money from abroad (e.g. from family members living or working abroad, pension payments, etc.), else zero.
Household size	Dummy variables; number of persons who live permanently in the household (two persons, three or more persons). Base category: single person.
Children	Dummy variable: 1 if children (up to and including 18 years of age) live permanently in the household.
House in better/poorer condition	Dummy variables that takes the value 1 if the interviewer indicated that the dwelling is in a better/poorer condition than the neighboring dwellings. Base category: similar condition as the neighboring dwellings.

Source: OeNB Euro Survey.

Table A2

**Robustness check for the extensive margin: euro cash holdings (binary dependent variable)**

	CEE	BG, HR, RO	CPCCs	CESEE	SEE	CSI high	Paying in EUR	AL and BA
	I	II	III	IV	V	VI	VII	VIII
Euro adoption expected...								
within 2 years	0,016 (0.064)	0,005 (0.029)	0,034 (0.029)	0,017 (0.020)	0,022 (0.022)	0,018 (0.033)	0,018 (0.025)	0,041** (0.020)
in 2–3 years	0.045*** (0.015)	0.086*** (0.016)	0.023 (0.023)	0.054*** (0.012)	0.061*** (0.016)	0.080*** (0.025)	0.053** (0.023)	0.015 (0.029)
in 4–5 years	0.065*** (0.024)	0.085*** (0.013)	0.046* (0.028)	0.067*** (0.013)	0.070*** (0.015)	0.110*** (0.020)	0.072*** (0.021)	0.017 (0.030)
in 6–7 years	0.015 (0.017)	0.066*** (0.018)	0.010 (0.020)	0.028** (0.011)	0.035** (0.015)	0.064** (0.030)	0.035* (0.020)	–0.001 (0.019)
in 8–9 years	–0.024* (0.013)	0.113*** (0.03)	0.025** (0.012)	0.035** (0.014)	0.063*** (0.017)	0.092*** (0.032)	0.058*** (0.021)	0.015 (0.018)
in 10–11 years	0.007 (0.018)	0.043 (0.032)	0.046* (0.027)	0.038** (0.016)	0.052** (0.020)	0.052 (0.034)	0.060** (0.025)	0.054* (0.031)
in 12–15 years	0,015 (0.025)	0.059** (0.028)	0.086** (0.041)	0.060*** (0.023)	0.083*** (0.030)	0.023 (0.046)	0.086** (0.038)	0.126*** (0.031)
in 16 or more years	0,009 (0.025)	0,054 (0.037)	0.074** (0.035)	0.058** (0.023)	0.076*** (0.029)	0.037 (0.043)	0.079** (0.034)	0.119*** (0.037)
never	0.003 (0.012)	–0.031* (0.017)	–0.008 (0.017)	–0.005 (0.009)	–0.010 (0.013)	–0.019 (0.020)	–0.012 (0.016)	–0.002 (0.024)
Country, time and interacted fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sociodemographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	–3,189.3	–3,697.8	–5,345.4	–12,318.4	–9,080.0	–4,828.9	–7,075.6	–2,194.3
Pseudo-R <sup>2</sup>	0.22	0.17	0.17	0.19	0.17	0.11	0.16	0.22
Probability > chi-squared	..	..	..	..	..	..	..	..
Number of observations	8,621	8,568	11,131	28,320	19,699	8,411	14,032	5,621
P(DepVar=1)	0.18	0.22	0.27	0.23	0.25	0.35	0.29	0.20

Source: Author's calculations.

Note: Average marginal effects from probit estimations using data from 2014, 2017 and 2018; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\*, \*\*, \* denote that the marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1. P(DepVar=1) denotes the unconditional sample probability of the dependent variable. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes (not shown). Specification I refers to the three Central and Eastern European EU Member States, i.e. the Czech Republic, Hungary and Poland. Specification II consists of three Southeastern European EU Member States, for which the adoption of the euro is a policy priority, i.e. Bulgaria, Croatia and Romania. Specification III refers to the four candidate and potential candidate countries (CPCCs), i.e. Albania, Bosnia and Herzegovina, North Macedonia and Serbia; it is identical with specification IV in table 2. Specification IV comprises all ten CESEE countries covered by the OeNB Euro Survey. Specification V refers to the Southeastern European countries, i.e. Albania, Bulgaria, Bosnia and Herzegovina, Croatia, North Macedonia, Romania and Serbia. Specification VI includes the three countries with a medium to high level of currency substitution, i.e. Croatia, North Macedonia and Serbia. Specification VII includes five countries where the share of respondents reporting payments in euro over the last six months surpasses 15%, i.e. the CPCCs plus Croatia. The final specification comprises Albania and Bosnia and Herzegovina.

Table A3

**Robustness check for the intensive margin: amount of euro cash (continuous dependent variable)**

	CEE	BG, HR, RO	CPCCs	CESEE	SEE	CSI high	Paying in EUR	AL and BA
	I	II	III	IV	V	VI	VII	VIII
Euro adoption expected...								
within 2 years	-215.8*** (64.7)	-16.7 (345.2)	114.5 (148.6)	56.5 (138.1)	79.0 (146.4)	68.6 (200.2)	88.8 (166.8)	188.3* (105.1)
in 2–3 years	142.3** (53.1)	13.1 (90.4)	19.1 (76.8)	68.5 (47.8)	52.7 (60.7)	14.7 (87.1)	28.4 (67.0)	35.0 (103.3)
in 4–5 years	136.4** (49.7)	-100.7 (82.8)	93.0 (77.7)	41.1 (49.5)	17.1 (64.4)	-64.6 (67.9)	21.4 (67.9)	225.3** (78.4)
in 6–7 years	92.9 (81.4)	40.6 (155.4)	51.8 (99.1)	54.9 (63.2)	58.2 (84.5)	30.8 (124.2)	45.5 (94.2)	78.0 (111.4)
in 8–9 years	133.2* (71.0)	-106.5 (91.4)	129.4 (97.3)	80.5 (58.6)	67.7 (72.1)	13.1 (109.5)	73.2 (82.6)	184.0* (88.5)
in 10–11 years	264.6 (169.0)	-405.2* (206.0)	165.0 (127.2)	88.9 (99.2)	55.5 (119.4)	5.6 (208.3)	37.2 (127.6)	87.1 (125.4)
in 12–15 years	-140.9* (70.6)	-104.6 (182.5)	229.2 (190.6)	123.2 (119.0)	175.2 (150.4)	95.8 (286.8)	166.0 (167.1)	240.7 (214.9)
in 16 or more years	11.9 (166.6)	99.0 (283.5)	21.2 (170.2)	2.8 (125.1)	1.8 (152.2)	75.3 (280.5)	14.9 (168.6)	-55.0 (96.0)
never	35.7 (56.4)	-112.7 (110.0)	121.1* (64.0)	53.1 (44.2)	70.3 (61.1)	92.9 (79.2)	84.4 (63.9)	41.4 (76.2)
Country, time and interacted fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sociodemographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	291.0 (182.5)	346.4 (286.0)	536.7** (217.9)	255.3 (166.0)	174.8 (184.9)	776.9*** (220.4)	638.3*** (210.7)	568.9** (274.9)
Log-likelihood	-11,309.2	-13,552.3	-20,290.6	-45,457.1	-33,885.5	-20,759.6	-28,598.4	-7,747.2
F-statistic	..	..	..	..	..	..	..	..
R <sup>2</sup>	0.15	0.13	0.14	0.14	0.12	0.11	0.12	0.17
Adjusted R <sup>2</sup>	0.13	0.11	0.12	0.13	0.11	0.10	0.11	0.14
Number of observations	1,424	1,590	2,411	5,425	4,001	2,426	3,368	942
Conditional mean of dependent variable in EUR	405.5	859.3	735.7	685.2	784.8	907.7	813.6	571.1

Source: Author's calculations.

Note: Ordinary least squares estimations using data from 2014, 2017 and 2018 and conditional that a respondent holds euro cash. Coefficients show changes in the amount of euro cash holdings (in EUR) that are associated with changes in the independent variables; standard errors are adjusted for clustering at the regional level and reported in parentheses. \*\*\*, \*\*, \* denote that the average marginal effect is statistically different from zero at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see annex table A1. Base categories are: expected euro adoption: don't know, age: 35 to 54 years, male, low education, employed, not risk averse, low income, single household, house in similar condition as neighboring homes (not shown). Specification I refers to the three Central and Eastern European EU Member States, i.e. the Czech Republic, Hungary and Poland. Specification II consists of three Southeastern European EU Member States, for which the adoption of the euro is a policy priority, i.e. Bulgaria, Croatia and Romania. Specification III refers to the four candidate and potential candidate countries (CPCCs), i.e. Albania, Bosnia and Herzegovina, North Macedonia and Serbia; it is identical with specification IV in table 2. Specification IV comprises all ten CESEE countries covered by the OeNB Euro Survey. Specification V refers to the Southeastern European countries, i.e. Albania, Bulgaria, Bosnia and Herzegovina, Croatia, North Macedonia, Romania and Serbia. Specification VI includes the three countries with a medium to high level of currency substitution, i.e. Croatia, North Macedonia and Serbia. Specification VII includes five countries where the share of respondents reporting payments in euro over the last six months surpasses 15%, i.e. the CPCCs plus Croatia. The final specification comprises Albania and Bosnia and Herzegovina.