Exporting stability to the European neighborhood – the role of deposit euroization in CESEE revisited after 25 years of EMU

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We review the prevalence of deposit euroization in ten Central, Eastern and Southeastern European (CESEE) economies since the inception of the euro area, using both macro and micro data. Specifically, we calculate the ratio of foreign currency deposits to total resident non-MFI deposits for households and nonfinancial corporates, and we build on findings from the OeNB Euro Survey. The macro data confirm that the relevance of deposit euroization continues to differ strongly across countries. The levels of deposit euroization are lowest in the inflation-targeting economies of Czechia, Hungary and Poland, while high and persistent levels of deposit euroization are observed in the Western Balkan economies of Albania, Bosnia and Herzegovina, North Macedonia and Serbia. Our micro evidence broadly confirms the macro picture, yet it further suggests that euro deposits are rather unequally distributed across the population and likely to be held more often by more affluent individuals.

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As a major global currency, the euro is in demand also beyond the euro area. In this article we look at the degree of deposit euroization in ten Central, Eastern and Southeastern European (CESEE) economies since the inception of the euro area and its possibly time-varying determinants. We first provide an update on the shares of euro deposits, describing developments over time and on a sectoral basis. We then review common drivers of deposit euroization as identified in the literature (Ize and Levy Yeyati, 2003; De Nicoló et al., 2005; Neanidis and Savva, 2009; Tkalec, 2013; Rajkovic and Urosevic, 2017; della Valle et al., 2018).

The main explanations as to why households prefer to keep savings in euro rather than in their national currencies include, on the demand side, inflation and exchange rate expectations, the interest rate differential between domestic and foreign currencies as well as minimum variance portfolio (MVP) motives aimed at reducing volatility through currency diversification. MVP motives add to our understanding of why households tend to retain foreign currency savings long after macroeconomic stabilization occurred, as the higher variance of domestic inflation relative to the variance of real depreciation offsets any cushioning effects from the real exchange rate. In addition, the persistence of high levels of deposit euroization is also explained by hysteresis effects (based on crisis experience) and network effects (widespread use of foreign currency deposits) (e.g. Oomes, 2001; Feige and Dean, 2004; Brown and Stix, 2015). On the supply side, major drivers include

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easy access to foreign funding as well as banks' hedging decisions on the currency structure of assets and liabilities (e.g. Luca and Petrova, 2008; Neanidis and Savva, 2009).

While the euro may serve to import stability to the region, high euroization can also represent a source of vulnerability given adverse exchange rate developments, and it may also contribute to funding risks in the banking sector (Basso et al., 2011). Hence, the countries with the strongest degree of euroization in the region all have macroeconomic stabilization programs in place to reduce euroization, especially foreign currency loans. However, the highly uncertain and volatile external environment, especially since Russia invaded Ukraine, has caused deposit euroization to rebound. Hence this update.

The time period we assess consists of four subperiods from January 1998 to July 2023 that are characterized by distinct macroeconomic conditions: the boom period in the run-up to EU accession which ended with the outbreak of the global financial crisis (up until September 2008), the financial crisis period including the euro area sovereign debt crisis (until end-2014), the period of ultra-low interest rates during quantitative easing in the euro area (until February 2020) and finally the period of heightened uncertainty starting with the outbreak of the pandemic and ensuing high inflation (since March 2020).

We review developments in deposit euroization in ten CESEE countries using both macro and micro data.[2] The set of countries comprises six EU member states (Bulgaria, Croatia, Czechia, Hungary, Poland and Romania) and four EU candidates (Albania, Bosnia and Herzegovina, North Macedonia and Serbia). Most of these countries have a long history of currency and asset substitution, having used the Deutsche mark (DEM), the Austrian schilling (ATS) and the US dollar (USD) as secondary currencies and safe haven assets before the euro. Unofficial euroization emerged in times of high inflation, currency and banking crisis, when foreign currencies were high in demand as a store of value (see also Reinhart et al., 2003).

We find that deposit euroization differs in level and dynamics between countries and sectors. Deposit euroization levels are lowest in Czechia, Hungary and Poland, while high and persistent levels of deposit euroization are observed in the Western Balkan economies of Albania, Bosnia and Herzegovina, North Macedonia and Serbia. In the highly euroized Western Balkan economies, the household sector shows higher levels of deposit euroization than nonfinancial corporates, while the opposite holds true for the less euroized countries in Central Eastern Europe. The rise in inflation since 2021 went hand in hand with rebounding deposit substitution in most countries. In general, deposit euroization has declined in most countries over the past 25 years, amid catching-up processes and macroeconomic stabilization. We further observe that the correlation between deposit euroization and its commonly found determinants has changed over time. On the microeconomic side, results from the OeNB Euro Survey show that foreign currency deposits – mainly euro deposits – are reported by a comparatively small number of individuals, often by relatively richer individuals.

This paper is structured as follows: Section 1 gives an overview of the existing literature on deposit euroization in CESEE. Section 2 presents sector data and

[2] *National monetary statistics cover the whole period since 1998; complementing micro data from the OeNB Euro Survey are available from 2007 onwards.*

provides some stylized facts for the past 25 years, looking also at the major driving factors as identified in the literature. Section 3 turns to microeconomic evidence and reports results from the OeNB Euro Survey, thus adding the individual perspective. Section 4 concludes.

1 Literature review

Manjani (2015) lists three main types of unofficial dollarization, which we apply to euroization: (1) monetary dollarization or currency substitution, i.e. the replacement of domestic currency with foreign currency for transaction purposes; (2) financial dollarization, i.e. economic agents' holding of foreign currency assets and liabilities; and (3) real dollarization, i.e. the indexation of wages, real estate and/or durable goods prices in foreign currency. Feige and Dean (2004) distinguish between "asset substitution" and "currency substitution." Asset substitution refers to holding foreign currency assets (cash and/or deposits) as a store of value, while currency substitution refers to the use of a foreign currency as a means of payment.

The major macroeconomic determinants of dollarization emerging from the literature are (1) the minimum variance portfolio (MVP) motive, which explains dollarization as a function of second moments of inflation and real depreciation in the long run (i.e. Ize and Levi Yeyati, 2003; Honohan and Ize, 2005) and (2) – at least in the short run – the interest rate differential (IRD) between local and foreign currency deposits (Basso et al., 2011; for CESEE: Tkalec, 2013; and Rajkovic and Urosevic, 2017). The interest rate differential – defined as the gap between short-term interest rates in the domestic market versus the euro area – affects returns on deposits, thus also influencing the currency composition of deposits. The intuition behind the MVP view is that risk-averse agents minimize the variance of their deposits by choosing an adequate currency composition. Hence, when they expect inflation to be more volatile than the real exchange rate, the domestic currency becomes less attractive as a store of value and deposit euroization will increase. This theory explains why high levels of deposit euroization can persist despite macroeconomic stabilization, as the higher variance of domestic inflation relative to the variance of real depreciation offsets any cushioning effects from the real exchange rate.

Della Valle et al. (2018) derive a three-phase model of unofficial euroization from the literature and use it as a framework to generate policy advice on how authorities can promote de-euroization. In phase 1, euroization is a rational choice of economic agents to hedge against large exchange rate depreciations during periods of acute macroeconomic instability and high inflation. In phase 2, once macroeconomic stability has been achieved and the likelihood of large exchange rate depreciations has diminished significantly, agents still seek insurance against tail risks – even if the exchange rate starts to move in both directions (Feige and Dean, 2004; Uribe, 1997). In this phase the interest rate differential and the perceived likelihood of adverse scenarios play a more important role. As monetary authorities seek to stabilize the real exchange rate (cf. inflation targeting vs. exchange rate stabilization objectives of national central banks in CESEE), the insurance value of foreign currency deposits fades and the euroization of deposits becomes motivated by MVP portfolio optimization (phase 3).

Turning to microeconomic determinants, the dollarization literature of the last two decades stresses the central role that trust and confidence play in households'

financial decisions (Kraft, 2003; Feige and Dean, 2004; Guiso et al., 2004; Coupé, 2011; Brown and Stix, 2015). Furthermore, there is strong evidence that crisis experiences have long-lasting effects on household preferences and hence financial choices (Osili and Paulson, 2008; Mudd et al., 2010; Brown and Stix, 2015; Malmedier and Nagel, 2016). Two studies (Stix, 2013; Brown and Stix, 2015) drawing on data from the OeNB Euro Survey concluded that currency and deposit substitution in Southeastern Europe (SEE) are mainly demand-driven. Network effects of asset substitution and doubts about the stability of the local currency increase the preference for saving in euro cash and euro deposits.[3] Furthermore, Brown and Stix (2015) confirm that the observed persistence of deposit euroization across the region is strongly influenced by individuals' experiences of banking and currency crises during the 1990s.

2 Deposit euroization at the macroeconomic level

At the macroeconomic level, we measure deposit substitution as the ratio of foreign currency deposits to total resident non-MFI deposits in the financial sector, whereby we distinguish between deposits of nonfinancial corporates (NFC) and households including nonprofit institutions serving households. As such, we exclude deposits of other financial institutes (OFI) and of the general government.[4] This facilitates the juxtaposition of macro data and survey data below.

The availability of monthly data at the sectoral level from January 1998 to July 2023 varies from country to country. For Hungary and Bosnia and Herzegovina, no sectoral breakdown of deposits is available before April 2001 and January 2006, respectively. Missing monthly entries for the sum of NFCs and households are calculated by applying backward rates of change using the available monthly information on the currency structure of resident non-MFI deposits. We regard this approach as quite reliable, because at the earliest available point in the time series, (i) the combined share of the two sectors in total resident non-MFI deposits exceeds 96% and 81%, respectively, and (ii) their combined holdings of total foreign currency deposits exceed 98% and 94%, respectively.

For North Macedonia and Serbia, only year-end data are available before 2001 and 2004, respectively. Missing monthly entries for the sectoral time series are linearly interpolated, hence developments during these years in the charts below must be taken with caution.

Note that changes in the definition of foreign currency deposits, namely the inclusion of deposits indexed to a foreign currency, cause a shift in the time series of Bosnia and Herzegovina (in January 2019) and Croatia (in June 2006).

[3] *Bittner and Scheiber (2022) present updated time series on CESEE residents' preferences for saving in cash since 2007 (i.e. one of the dependent variables used by Stix, 2013). The share of banked respondents indicating a preference to save in cash varies across the observed countries but remained remarkably stable across time, with the exception of Croatia, Hungary, Poland, Romania and Serbia. In these five countries, the share of respondents who prefer to save in cash increased significantly (at the 1% level) between 2009–11 and 2020–21.*

[4] *As a caveat, due to limited data availability, we do not exclude transactional deposits although the currency structure of the latter is defined by regulatory requirements rather than by agents' optimization decisions. This inflates systematically the local currency share in total deposits of the respective sector.*

2.1 Deposit substitution varies in both level and trend by sector and country

Our focus on NFCs and households is well justified as these two sectors dominate savings. At end-2022, around 60% of resident non-MFI deposits were held by households and around 30% by NFCs. Deposits of OFIs and general government played a minor role. There are three exceptions: In Albania, the share of household deposits was considerably higher at 78%, while in Hungary the share of NFCs was higher than that of households. In Bosnia and Herzegovina, the general government held 15.8% of total deposits.

Over time, these shares changed only gradually, reflecting mainly structural changes. In the relatively poorer countries of Bulgaria, North Macedonia, Romania and Serbia, the share of households in total deposits increased substantially, as hoarded foreign currency cash slowly returned to the banking system and as economic catching-up as well as growing remittances allowed more people to save. In the relatively richer CEE countries and Croatia, strong economic growth boosted NFC deposits faster than household deposits, shifting the shares in favor of NFCs. Euroization is more relevant for households than for corporates. For the latter it is mostly related to trade and FX income and therefore less relevant from a financial stability perspective.

Levels and developments in deposit euroization are highly heterogenous throughout the region. In the private sector (HH and NFC together), deposit euroization levels are lowest in the inflation-targeting Central and Eastern European (CEE) economies of Czechia, Hungary and Poland. In these countries, the euro accounted for 25% or less of all deposits in 1998. This was followed by a decline until the trend became reversed during the recent high inflation period that set in in mid-2021. Most recently, deposit euroization was further spurred by Russia's attack on Ukraine in 2022. Romania also started at a moderate level of 40%, followed by some fluctuation in deposit euroization between 30% and 40%.

The Western Balkan inflation-targeting countries (Albania and Serbia) as well as North Macedonia also started out at moderate levels ranging between 30% and 35% in 1998. Yet, deposit euroization increased in those countries, reaching levels beyond 50%. In Serbia the peak was even as high as 80% in 2012, falling back to 60% in 2020 before the latest uptick in 2022.

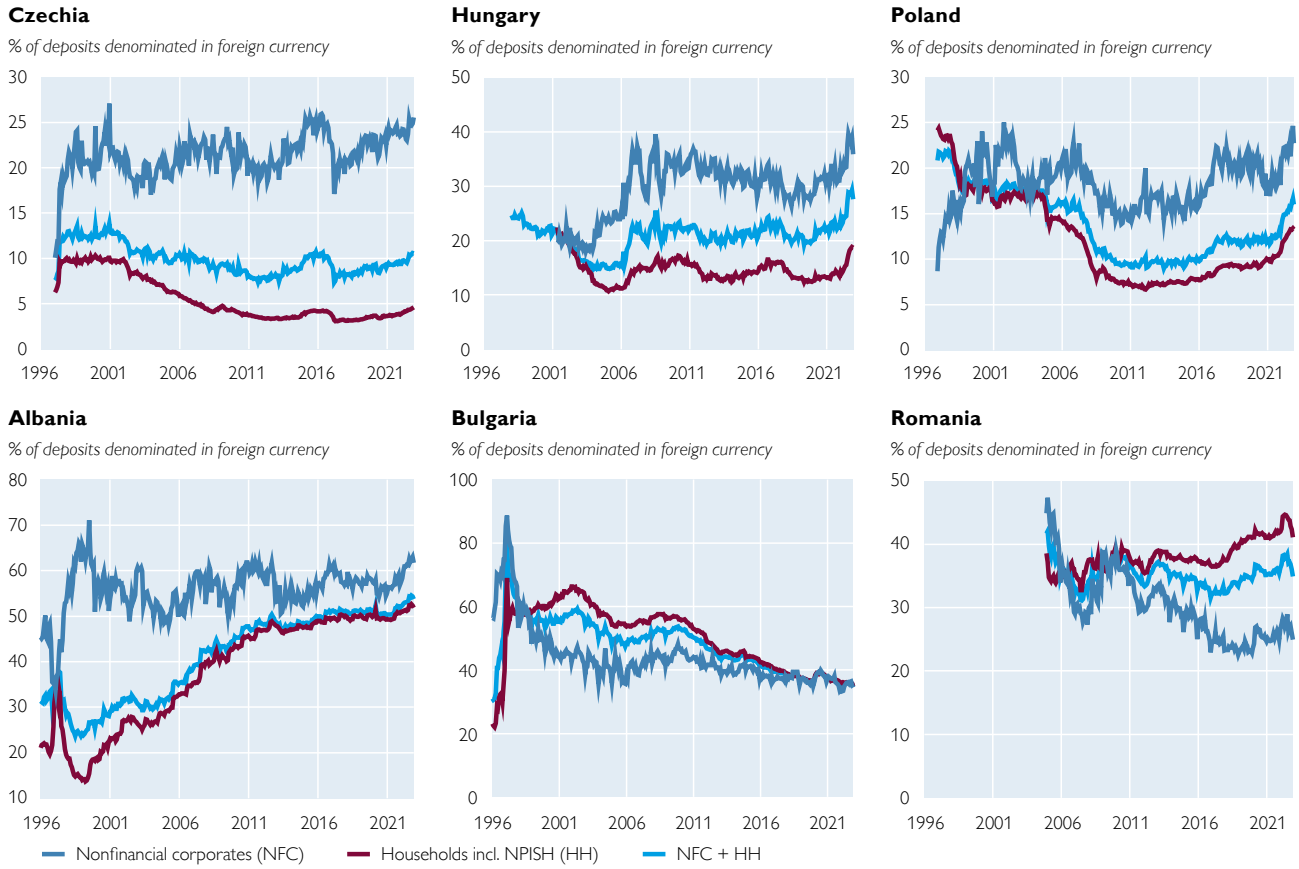
The remaining three exchange rate-targeting countries showed a high degree of deposit euroization already at the outset of the sample period: 60% in Bulgaria, 80% in Croatia and 100% in Bosnia and Herzegovina. In all these countries, deposit euroization has since declined substantially and continuously, to around 40% (Bulgaria and Bosnia and Herzegovina) and 50% (Croatia) at end-2022.

In the household sector, deposit substitution declined gradually from even lower levels in Czechia, Hungary and Poland during the economic boom years around EU accession until this trend was stopped by the global financial crisis, followed by a sideways movement. With the return of two-digit inflation rates in 2021 and 2022, deposit substitution increased in Poland and Hungary to about 15% while it remained at 5% in Czechia.

More persistent high shares of foreign currency deposits for households are observed in the SEE economies as these suffered a higher initial shock to trust in institutions, which is a major determinant of deposit euroization for households: hyperinflation in former Yugoslavia and Bulgaria, the Yugoslav wars, weak institutions and endemic corruption caused a prolonged period of macroeconomic and

Chart 1

Deposit substitution per sector



Source: National central banks, authors' calculations.

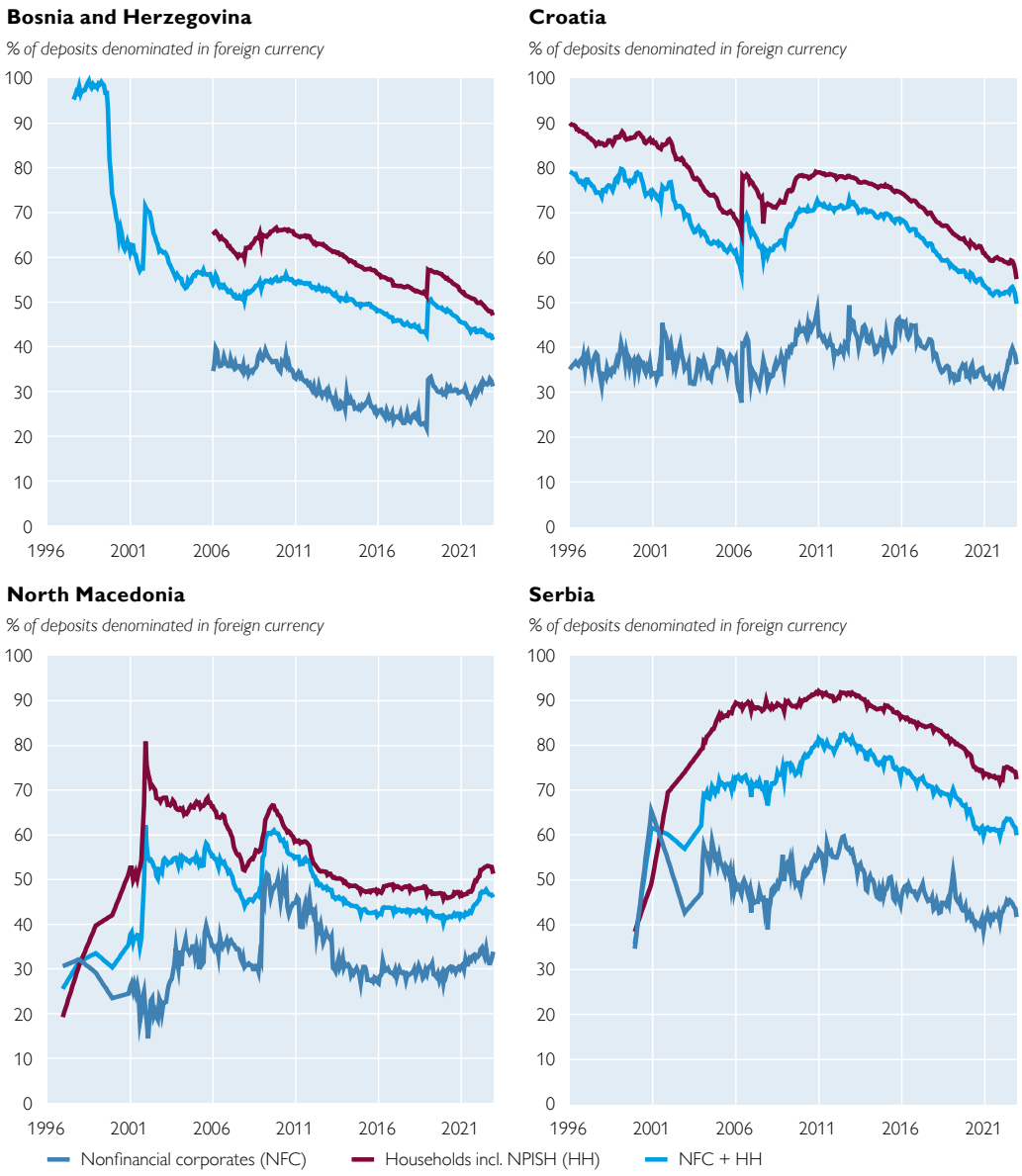
financial instability and as a result, muted real convergence. Due to persistent mistrust in the government, residents seek to insure themselves against weak policies and their adverse effects, such as for example frequent depreciations (see annex chart A1). Countries therefore often opted for various types of fixed exchange rate regimes to restore trust in the central bank and in the local currencies (cf. Begovic et al., 2016 – on the role of the currency boards in Bosnia and Herzegovina and Bulgaria in raising trust in local currencies).

All these countries started with euroization of household deposits well above 50%. In Bosnia and Herzegovina, Croatia and Serbia, deposit euroization was pushed up to 90% by extreme depreciation events.

In most countries, the global financial crisis interrupted a general downward trend and reinforced deposit substitution for a few years. Yet, the decline continued in Bulgaria, Bosnia and Herzegovina and Croatia. Serbia introduced a dinarization strategy in 2012 and 2017, which marked the beginning of a sustained decline in asset substitution. In North Macedonia, deposit euroization of households moved sideways while a gradual increase can be observed in Romania, possibly reflecting disappointment with local politics, corruption and thus a preference for higher insurance.

Chart 2

Deposit substitution per sector



Source: National central banks, authors' calculations.

Note: Deposits indexed to a foreign currency were reclassified as foreign currency deposits by Bosnia and Herzegovina in January 2019 and by Croatia in June 2006.

Albania represents a rather special case as our sample period is predated by the collapse of a nationwide pyramid scheme in 1996/97. The following episode of civil unrest (under a dysfunctional government) wiped out deposits. Since 1999, deposit substitution among households has been rising steadily from a rather low level. Interestingly, this long episode of rising deposit substitution has not been driven by an erosion of confidence in the local currency as we know from OeNB Euro Survey indicators: trust in banks and the government has even increased, beyond the levels observed in neighboring countries. Improved confidence in banks

may partly even explain the increase in deposit substitution, as savings in euro cash have been transferred to the banking system. The trend also reflects economic growth, macroeconomic stability as well as substantial inflows of remittances, which implies that more people are able to save.

Turning to deposits of NFCs, we see rather different patterns. In Czechia, Hungary and Poland, the shares of foreign currency deposits of NFCs are in general higher than those of households. These shares have risen to 25% and 35%, respectively, for households and NFCs, fluctuating with high volatility within a band of 10 percentage points. Again, structural factors are the main driver of euroization, such as strong FDI inflows, rising trade flows with the euro area, access to cheap (euro) credit. These factors also fueled a catching-up boom in the late 1990s and around the time of EU accession in 2004, driving up demand for euro deposits (cf. optimal level of deposit substitution for a small open economy, della Valle et al., 2018).

With the exception of Albania, deposit substitution of NFCs is lower than for households in the SEE economies. Again, we can clearly see a strong initial increase followed by a sideways movement within a fluctuation band, which however ranges at a significantly higher level than in CEE.

2.2 Macroeconomic environment matters for deposit euroization

Given these heterogenous developments over time and across countries and sectors, let us dive deeper into the motives for deposit euroization. Following the above-referenced literature, we looked very briefly at the most often cited determinants and how they relate with deposit euroization over the past 25 years. We rely on fixed effects panel regressions relating deposit euroization to the interest rate differential (defined as the difference between the average local 3-month interbank rate to the average euro area 3-month interbank rate), the monthly consumer price inflation rate, the real exchange rate against the euro (monthly average) and a proxy for the MVP share. We approximate the MVP share as *Var(inf)*COV(inf,xr)/ Var(xr)* whereby *Var(inf), Var(xr)* and *COV(inf, xr)* are calculated as the variance and covariance of 12-month rolling windows of the respective variables (consumer price inflation and exchange rate) respectively.[5] Country fixed effects are used in all specifications. More specifically, we use a fixed effects model to get a rough idea how these factors are associated with deposit euroization whereby we differentiate between the household and NFC sector. We further distinguish between the four subperiods with different macroeconomic environments (boom phase, global financial crisis, low interest rate environment, high inflation phase). The results should be taken as a very rough indication of a relationship between deposit euroization and its most obvious determinants – interest rate differential, inflation, exchange rate and MVP. We neither undertake a proper econometric identification nor do we take account of the long- versus short-term relationships between deposit euroization and its drivers. This would be beyond the scope of this study. Our simple framework is tailored more toward the household sector, hence we expect to find fewer and weaker correlations for the NFC sector. Results are displayed in tables 1a and 1b.

[5] *For the calculation of the MVP we use the nominal exchange rate for the countries with a floating exchange rate regime and the real exchange rate for those with a (quasi-)fixed exchange rate regime.*

Indeed, results for both sectors differ significantly. In the household sector (table 1a), the interest rate differential is often positively correlated with deposit euroization. Yet, the significance and magnitude of the coefficient varies between time periods. During the global financial crisis and its aftermath, the interest rate differential does not show any correlation with deposit euroization. In this period, deposits shrank in many countries as people moved into cash during the early stage of the crisis. This most likely reflects a loss in trust in the financial system and therefore a rising importance of factors that we do not capture in our simplistic analysis. In contrast, during the low interest rate environment, when inflation was low or when deflationary tendencies were seen in some countries, the correlation between the interest rate differential and deposit euroization was strongest. In this period, opportunity costs of holding the foreign, safer currency were lower. The overall interest rate level seems to influence the relationship between deposit euroization and the interest rate differential.

Overall, there seems to be a weak positive correlation between MVP and deposit euroization, but results differ somewhat between periods and subsamples. For instance, MVP appears to play a comparatively minor role in the countries with exchange rate targeting, judging from the different correlation coefficients between the total sample and the six inflation-targeting countries (right panel of

Table 1a

Panel regression: main determinants of deposit euroization

Households

	All countries					Inflation-targeting countries				
	full sample period	boom phase	global financial crisis	low interest rate environment	uncertainty and inflation phase	full sample period	boom phase	global financial crisis	low interest rate environment	uncertainty and inflation phase
	01/98-07/23	*01/98-08/08*	*09/08-12/14*	*01/15-02/20*	*03/20-07/23*	*01/98-07/23*	*01/98-08/08*	*09/08-12/14*	*01/15-02/20*	*03/20-07/23*
IRD	0.696***	0.417**	0.253	1.161**	0.466***	0.469*	0.270*	–0.015	0.971*	0.417***
	(0.180)	(0.153)	(0.363)	(0.377)	(0.110)	(0.192)	(0.111)	(0.074)	(0.414)	(0.048)
INF	–0.378	–0.067	0.15	–0.093	–0.044	–0.074	0.034	0.333**	0.009	–0.052
	(0.256)	(0.103)	(0.227)	(0.119)	(0.363)	(0.302)	(0.141)	(0.115)	(0.135)	(0.136)
RER	0.006	–0.169	0.02	0.048	0.019	0.013	–0.1	0.017	–0.01	0.04
	(0.071)	(0.111)	(0.053)	(0.045)	(0.036)	(0.072)	(0.122)	(0.045)	(0.035)	(0.025)
MVP	0.067***	–0.008	–0.098**	0.059	–0.019	–1.733*	–4.686*	2.227***	–0.514	–0.102
	(0.020)	(0.015)	(0.030)	(0.625)	(0.230)	(0.727)	(2.226)	(0.411)	(0.882)	(0.095)
Constant	39.029***	38.325***	42.833***	38.985***	38.088***	28.738***	22.813***	32.939***	31.050***	31.464***
	(0.549)	(0.587)	(1.548)	(0.721)	(0.186)	(0.611)	(0.471)	(0.409)	(0.787)	(0.155)
No of observations	2,272	677	675	558	362	1,503	435	450	372	246
No of countries	10	10	9	9	9	6	6	6	6	6
R2 within	0.184	0.13	0.065	0.182	0.290	0.207	0.158	0.065	0.313	0.512
R2 between	0.091	0.076	0.185	0.293	0.442	0.417	0.286	0.171	0.793	0.348
R2 overall	0.060	0.048	0.120	0.190	0.131	0.129	0.25	0.070	0.454	0.063
corr(ui, Xb)	0.164	0.158	0.317	0.395	–0.409	0.299	0.455	0.251	0.649	–0.297
F statistic	8.28	1.9	18.93	4.2	13.86	11.16	2.18	24.57	5.72	19.41
p-value	0.004	0.194	0.000	0.040	0.001	0.010	0.207	0.001	0.041	0.003

Source: Eurostat, wiiw, national central banks, authors' calculations.

Note: fixed effects panel regression; dependent variable: deposit euroization share of households in each country, independent variables: interest rate differential to the euro (IRD), monthly inflation (INF), real exchange rate (RER), minimum variance portfolio (MVP); standard deviations in parentheses, robust standard errors.

Table 1b

Panel regression: main determinants of deposit euroization

Nonfinancial corporates

	all countries					inflation targeting countries				
	full sample period	boom phase	global financial crisis	low interest rate environment	uncertainty and inflation phase	full sample period	boom phase	global financial crisis	low interest rate environment	uncertainty and inflation phase
	01/98-07/23	*01/98-08/08*	*09/08-12/14*	*01/15-02/20*	*03/20-07/23*	*01/98-07/23*	*01/98-08/08*	*09/08-12/14*	*01/15-02/20*	*03/20-07/23*
IRD	0.422**	0.111	0.64	0.155	0.341**	0.411*	0,074	0.610***	0,031	0.453***
	(0.183)	(0.143)	(0.389)	(0.540)	(0.135)	(0.183)	(0.200)	(0.107)	(0.566)	(0.069)
INF	0.097	–0.272	0.26	–0.415	0.268	0.257	0.142	0.476	–0.445	0.134
	(0.218)	(0.204)	(0.251)	(0.256)	(0.210)	(0.214)	(0.164)	(0.366)	(0.248)	(0.273)
RER	0.09	0.177	0.160**	0.287**	0.148	0.147	0.268	0.181**	0.354**	0.176*
	(0.081)	(0.166)	(0.054)	(0.089)	(0.088)	(0.081)	(0.183)	(0.048)	(0.093)	(0.083)
MVP	0.035***	0.009	–0.176***	1.574	0.288	–0.47	0.055	6.709***	2.117	–0.043
	(0.003)	(0.006)	(0.027)	(1.169)	(0.330)	(0.499)	(5.070)	(0.865)	(1.118)	(0.155)
Constant	31.973***	30.795***	33.449***	32.331***	32.450***	30.778***	27.036***	31.631***	33.185***	32.590***
	(0.603)	(0.546)	(1.691)	(1.036)	(0.306)	(0.652)	(0.839)	(0.561)	(1.203)	(0.239)
No of observations	2,272	677	675	558	362	1503	435	450	372	246
No of countries	10	10	9	9	9	6	6	6	6	6
R2 within	0.088	0.017	0.158	0.021	0.209	0.135	0.025	0.352	0.043	0.376
R2 between	0.095	0.025	0.411	0.556	0.057	0.130	0.061	0.838	0.739	0.210
R2 overall	0.074	0.015	0.312	0.287	0.002	0.081	0.081	0.662	0.409	0.013
corr(ui, Xb)	0.163	0.078	0.430	0.516	–0.150	0.176	0.243	0.745	0.619	–0.224
F statistic	54.57	1.49	38.67	3.76	4.38	330.37	1.02	73.46	11.01	25.16
p-value	0.000	0.283	0.000	0.052	0.036	0.000	0.479	0.000	0.010	0.001

Source: Eurostat, wiiw, national central banks, own calculations.

Note: fixed effects panel regression, dependent variable is the deposit euroization share of non-financial corporates in each country, independent variables: interest rate differential to the euro (IRD), monthly inflation (INF), real exchange rate (RER), minimum variance portfolio (MVP); standard deviations in parentheses, robust standard errors.

table 1a[6]) during the global financial crisis. In view of previous crisis experience. households in these countries may have feared strong devaluations of their local currency, which made foreign currency deposits more attractive as an insurance against adverse developments regardless of their costs. Remember that we observe a fall in deposits and in euroization in this period. During this period, also inflation shows a positive and significant correlation with deposit euroization.

Turning to nonfinancial corporates, we observe fewer and weaker correlations in line with our expectations (table 1b). Again, the interest rate differential is correlated with deposit euroization for the full sample period and particularly in the period characterized by rising and ultimately elevated inflation. This could be related to cash-management considerations. In sharp contrast to the household sector, exchange rate movements are more frequently correlated with deposit euroization due to valuation effects. Finally, the MVP share rarely shows a significant correlation. This is in line with our expectation that portfolio considerations do not play a role for firms in general, yet they seem to matter in crisis times.

[6] *The six countries comprise Albania, Czechia, Hungary, Poland, Romania and Serbia. These countries introduced inflation targeting at different time periods whereby changes to the monetary policy regimes leading to more strict inflation targeting were made in all countries during the observation period: Czechia and Poland introduced a form of inflation targeting in 2001, Albania in 2000, Hungary in 2001, Romania in 2005 (following loosely structured discretionary policy and forming of clear policy targets in the early 2000s) and Serbia in 2009 (following political and economic stabilization with loosely structured discretionary monetary policy in the 2000s).*

3 How important is deposit euroization at the individual level?

At the micro level, we refer to the OeNB Euro Survey, which has generated a wealth of information on euroization, trust in institutions, monetary expectations and financial decisions for our set of countries since 2007. During each wave, approximately 1,000 individuals are polled in a multi-stage stratified random route sampling procedure using national versions of a common questionnaire for all countries. The sample is representative of the given population with regard to age, gender and region and, where available, education and ethnicity. Interviews are carried out face-to-face at the respective respondent's home.[7, 8]

We base our descriptive evidence on four questions addressing the ownership and currency structure of saving deposits. Questions 1 to 3 below have been asked in every survey wave since fall 2007. Question 4 on the foreign currency share was asked in selected waves only, namely semi-annually from fall 2007 to spring 2009, and annually in spring 2010, fall 2011, fall 2012 and fall 2015.[9]

Box 1

OeNB Euro Survey questions on foreign currency deposits

Q1) Do you have any of the following bank products or assets? (Please refer only to those bank products or assets you hold personally or together with your partner.)
a) A current account (giro account)
b) Savings deposits (e.g., savings book, bank deposit, term deposit, postal bank deposit, etc.)
c) A wage card/debit card
Answer categories for each item: Yes / No / Don't know / No answer

Q2) [ONLY IF Q1=yes] You said that you hold savings deposits. Are any of these savings deposits denominated in foreign currency?
Yes / No / Don't know / No answer

Q3) [ONLY IF Q2=yes] In which currency are these foreign currency savings deposits denominated?
- *Euro*
- *US dollar*
- *Swiss franc*
- *Other*

Answer categories for each item: Yes / No / Don't know / No answer

Q4) [IF Q2=yes] If you think about the overall amount of money you hold in savings deposits, which share is denominated in foreign currency?
___ percentage of foreign currency savings deposits (answer between 1 and 100) plus
___ percentage of savings deposits in [LOCAL CURRENCY] (answer between 1 and 100)
= 100% (total savings deposits)
Don't know / No answer

[7] *Averages across groups of countries are not weighted for population size – otherwise Poland and Romania would dominate the results.*

[8] *For further information on the OeNB Euro Survey as well as access to the data see https://www.oenb.at/en/Monetary-Policy/Surveys/OeNB-Euro-Survey.html.*

[9] *Item non-response, i.e., the combined share of "don't know" and "no answer" responses for questions 1 to 3 averages 2%, ranging from 0.3% to 7% across countries. Item non-response for the self-reported share of euro deposits (question 4) averages 14%, ranging from 6% (North Macedonia) to 38% (Romania).*

Please note that during the COVID-19 pandemic in 2020 and 2021, OeNB Euro Survey fieldwork in Albania was fraught with various sampling and interviewing difficulties. Therefore, after careful additional data quality checks, we decided not to use data for Albania for the 2020 and 2021 survey waves. Furthermore, the data for the waves 2016 to 2019 and 2022 do not cover North Albania and are, therefore, not representative of the whole population (for details see Olbrich et al., 2024 as well as Methodology – Oesterreichische Nationalbank (OeNB)).

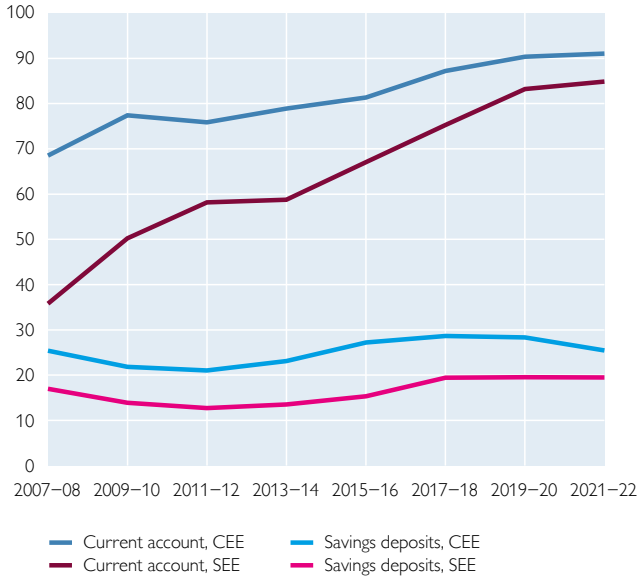
As a first and important observation, we see rapid progress in financial development in this period in the form of increased use of bank products. For the analysis here, we split our sample according to the general level of euroization into CEE (Czechia, Hungary, Poland) and the notably more euroized economies in SEE (Albania, Bosnia and Herzegovina, Bulgaria, Croatia[10], North Macedonia, Romania and Serbia). Current account usage increased from 60% in 2007 to 90% in 2022 in CEE and from below 30% to 80% in SEE over the same period. Yet, the ownership of savings deposits has hardly changed since 2007. Savings deposits are owned by around one in four persons (25%) in CEE and one in six persons (16%) in SEE (chart 3, left-hand panel).

Chart 3

Bank deposits: extensive margin

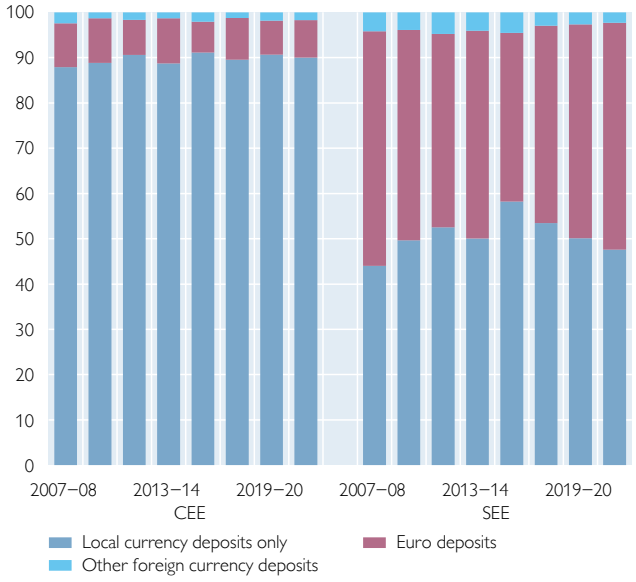
Ownership of current accounts and savings deposits by region

% of individuals



Currency denomination of savings deposits in CESEE

% of depositors



Source: OeNB Euro Survey.

Note: Weighted averages based on pooled data from survey waves in the period indicated in the legend, excluding respondents who answered "don't know" or refused to answer. The weights used are calibrated on census population statistics for age, gender, region and, where available, education and ethnicity (separately for each country). Current accounts in the left-hand panel include debit cards and/or wage cards. Right-hand panel data refer to a multi-punch question, so respondents reporting euro or other foreign currency deposits may also have local currency deposits.

[10] *Note that Croatia joined the euro area in January 2023, thus eliminating unofficial euroization. Yet, this does not affect our analysis as the latest survey wave was conducted in fall 2022.*

Table 2

Prevalence of savings, current accounts and deposits

	Has savings	Has current account	Has deposits	Only local currency	Euro[1]	Other foreign currency[1]	Agreement: "It's common to hold FCD in my country"[2]	Has other financial assets[3]
	1	2	3	4	5	6	7	8
	% of individuals			% of depositors			% of individuals	
Bulgaria	43.0	87.3	25.4	65.9	30.8	3.2	34.0	23.3
Croatia	53.4	95.8	33.3	38.3	61.0	0.9	47.6	40.0
Czechia	68.9	92.8	35.8	94.7	5.2	0.1	15.0	55.6
Hungary	40.5	88.0	19.6	87.0	11.2	1.8	13.9	32.1
Poland	52.3	92.3	21.0	85.0	11.0	4.0	15.3	34.2
Romania	26.7	71.6	11.5	70.9	26.5	2.6	40.6	14.4
Albania	33.9	59.1	35.5	63.9	35.6	0.4	55.4	31.3
Bosnia and Herzegovina	30.8	78.2	5.8	56.9	37.9	4.3	30.9	14.2
North Macedonia	46.9	94.3	27.1	34.9	61.9	3.1	54.8	27.6
Serbia	25.2	90.2	9.8	13.8	82.7	3.1	68.1	15.4

Source: OeNB Euro Survey.

[1] The responses refer to a multi-punch question, so euro depositors or other foreign currency depositors may also hold local currency deposits.
[2] Percentage of individuals who agreed with the statement on a 6-point Likert scale. FCD = foreign currency deposits.
[3] Other financial assets include life insurance, mutual funds, equities, bonds, pension funds, a savings plan with a building society, and other assets. Figures refer to 2021 and in Albania to 2019.

Note: Weighted averages based on pooled data from the 2021 and 2022 survey waves, excluding respondents who answered "don't know" or refused to answer. Averages for Albania use data from 2019 and 2022. The weights used are calibrated on census population statistics for age, gender, region and, where available, education and ethnicity (separately for each country).

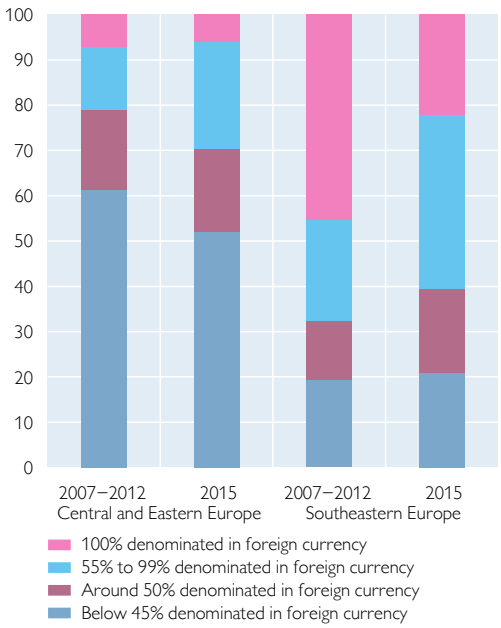
Turning to our main focus, the currency denomination of deposits, we see a stark difference between individuals in the inflation-targeting CEE countries and the remaining countries. In the former, most individuals only have local currency deposits; merely 10% report foreign currency deposits. This reflects the decline in foreign currency deposits already prior to the global financial crisis as shown in the macro series. In SEE the frequency of foreign currency deposits declined from 49% to 37% in 2015–16 and increased gradually to 43% in 2021–22 (chart 3, right-hand panel). Foreign currency deposits are mainly denominated in euro, with deposits in US dollar, Swiss franc or the British pound playing only a minor role.

Thus, we concur that the euro as a safe haven asset is still of importance in SEE. However, we should also bear in mind that euro deposits are rather unequally distributed across the population (table 2).

The share of individuals who report having any savings varies widely across countries, from around 25% in Serbia and Bosnia and Herzegovina to 69% in Czechia. A similar picture emerges for deposits (column 3). Of those who hold deposits in Croatia, North Macedonia and Serbia, a majority holds mainly euro deposits (over 60%, column 5), while the majority of savers in CEE (over 85%), Bulgaria, Romania and Albania (around two-thirds) as well as Bosnia and Herzegovina (57%) hold only local currency deposits (column 4). There is a weak correlation between self-declared holdings of euro deposits (column 5) and the perceived holdings of foreign currency deposits in a country (column 7, i.e., a self-reported measure of network effects). Savings deposits are more or less as much in demand as other financial assets taken together (column 8), which includes

Chart 4

Self-reported share of foreign currency deposits in total deposits by region and period



Source: OeNB Euro Survey.

Note: Weighted averages based on pooled data from survey waves in the period indicated in the legend, excluding respondents who to refused to answer whether they own (foreign currency) deposits. The weights used are calibrated on census population statistics for age, gender, region and, where available, education and ethnicity (separately for each country).

life insurance, mutual funds, stocks, bonds, pension funds, building society savings plans and other assets.

Turning to the intensive margin of deposit euroization, chart 4 depicts the self-reported foreign currency shares in more detail for those survey waves for which information is available (2007–2012 and 2015): individuals who reported to hold foreign currency deposits were asked to indicate the percentage share of their total deposits that is denominated in foreign currency (cf. question 4).

Among individuals in CEE who have foreign currency deposits, 55% hold less than 45% in foreign currency, 25% more than 90% in foreign currency. In SEE, the foreign currency share is significantly higher: almost 70% of holders of foreign currency deposits reported to keep at least 90% of their deposits in euro (majority 100%). These shares declined in SEE between 2007–12 and 2015 significantly but remained above CEE averages at a statistically significant level in 2015.

Squaring our survey evidence with banking sector statistics for the end of 2022, we observe from sector data that more than half of household sector deposits in Albania, Bosnia and Herzegovina, Croatia, North Macedonia and Serbia (= highest at 72%) are denominated in foreign currency, predominantly the euro. Bulgaria and Romania exhibit medium levels of deposits substitution of 35% and 41%, respectively. The rise in inflation since 2021 is associated with rising deposits substitution in Poland (13%) and Hungary (19%), too. Yet, the OeNB Euro Survey results suggest that deposits, and especially foreign currency deposits, are rather concentrated and therefore likely to be held more often by relatively richer individuals.

The rich set of socio-demographic and socio-economic variables of the OeNB Euro Survey allows to identify the factors that are associated with the ownership of euro deposits. To this end we set up a logit model using sampling weights and robust standard errors which are clustered at the primary sampling unit level. The binary variable of holding euro deposits is regressed on socio-demographic and socio-economic controls as well as country and time dummies using annual survey data covering all ten CESEE countries from 2015 to 2022.[11] The estimation results

[11] *We use the following controls: age, age square, gender, education, employment status, household net income terciles, dummy variables whether respondent's household owns euro cash, financial or real assets or receives income in EUR or remittances. Detailed results available from authors upon request.*

show that the likelihood of holding euro deposits increases strongly with higher educational attainment, higher net household income and holding euro cash and/or financial assets. Weaker but still positive and significant average marginal effects can be found for self-employed individuals, income in euro and/or remittances as well as wealthy households (proxied by owning a secondary residence or other real estate and living in a dwelling in excellent condition).

4 Summary and conclusion

Having used foreign currencies as secondary currencies and safe haven assets, many CESEE individuals or corporates have a long history of currency and asset substitution. Unofficial euroization emerged in times of high inflation, currency and banking crisis but was retained even longer after macroeconomic stabilization had been achieved.

Our sectoral breakdown of resident non-MFI deposits reveals different dynamics of deposits substitution for nonfinancial corporates and households as well as across countries over the last 25 years. Deposit euroization levels are lowest in the inflation-targeting economies of Czechia, Hungary and Poland while high and persistent levels of deposit euroization are observed in the Western Balkan economies of Albania, Bosnia and Herzegovina, North Macedonia and Serbia. In the highly euroized Western Balkan economies, the household sector shows higher levels of deposit euroization than nonfinancial corporates, while the opposite holds true for the inflation-targeting countries in Central Eastern Europe. In general, deposit euroization has declined in most countries over the past 25 years, yet the rise in inflation since 2021 is associated with rebounding deposit substitution in most countries.

At the end of 2022, more than half of household sector deposits in Albania, Bosnia and Herzegovina, Croatia, North Macedonia and Serbia (= highest at 72%) are denominated in foreign currency, mostly in euro. Bulgaria and Romania exhibit medium levels of deposits substitution of 35% and 41%, respectively. The rise in inflation since 2021 is associated with rising deposits substitution in Poland (13%) and Hungary (19%), too.

The literature emphasizes the role of the minimum variance portfolio (MVP) motives for euroization in the long run and the interest rate differential between local and foreign currency deposits as a driver of euroization dynamics in the short run. Our partial correlation analysis replicates these findings for the household sector and NFC deposits for four distinct episodes over the last 25 years. In particular, the impact of the interest rate differential on the currency composition of household deposits seems to vary across episodes, highlighting a rather rapid adjustment of household portfolios to different macroeconomic circumstances. Fluctuations in NFC deposits appear to be less affected by interest rate spread and portfolio considerations. They correlate more often with exchange rate movements, most likely reflecting valuation effects. However, our proxy for MVP seems to capture these complex and time-varying interactions rather incompletely and may suffer from omitted variable bias. Further empirical research on the drivers of deposit euroization in different macro-economic environments is warranted.

The macroeconomic importance of deposit euroization in CESEE is put in perspective by results from the OeNB Euro Survey which show that deposits, and especially foreign currency deposits, are rather concentrated and therefore likely

to be held more often by relatively richer individuals. Particularly, Southeastern European savers are very likely to hold most of their deposits in euro.

In general, deposit euroization has declined in most countries over the past 25 years amid catching-up processes and macroeconomic stabilization. Which goes to show that deposit euroization can be influenced by effective economic policies. In addition, the main drivers of deposit euroization are likely to differ depending on the overall macroeconomic environment. Further research is needed to explore these complex and time-varying relationships.

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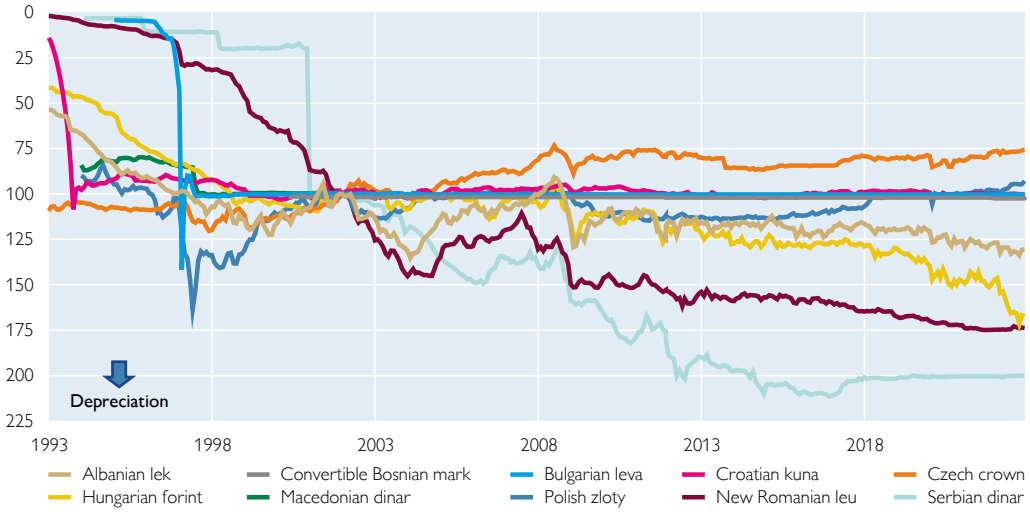
Annex

Chart A1

Bilateral nominal exchange rate vis-a-vis the EUR

Local currency/EUR, index 2002 January=100 (monthly average)



Source: wiiw database, Eurostat, Macrobond, National Bank of Yugoslavia.