

Are Euro Cash Holdings in Central and Eastern Europe Driven by Experience or Anticipation?

Results from an OeNB Survey

Although euroization is an important phenomenon in emerging markets, still very little is known about who holds how much euro and for what purposes. In this paper, we employ unique survey data to analyze various aspects of foreign currency holdings in five Central and Eastern European countries (CEECs). This allows us to study the impact of expectations and hysteresis on individual behavior. Our results show that a substantial share of the population in the countries under review holds euro cash. We find little evidence that inflation or exchange rate expectations are important determinants of euroization, whereas variables related to a country's economic history seem to be of some significance. Our results also indicate that the demand for euro and its use in domestic payments increases as the date of euro adoption approaches.

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1 Introduction

In emerging market economies, quite many people hold foreign currencies. Typically, they do so for a wide variety of purposes, e.g. for carrying out transactions, either at home or abroad, for storing value or for speculation. Currency substitution is, however, not restricted to cash – a significant share of deposits but also loans is denominated in foreign currencies.

Currency substitution has long been an issue in many CEECs.⁴ In the 1970s and 1980s, for instance, hard currencies (mainly German mark and Austrian schillings) entered the former Yugoslavia owing to tourism and remittances. Other countries were affected by this development more recently, with hyperinflation, currency devaluations or bank failures during and right after the initial transition process giving rise to distrust in the respective national currencies.⁵

Notwithstanding the importance of foreign currencies in some countries, estimates about the degree of cash substitution are rare. This is due to the very nature of cash, given that banknote shipment data do not allow making reasonable estimates about the degree of cash substitution. To overcome this problem, several different indirect measurement methods have been proposed.⁶ Another option is to rely on surveys. Although survey results typically yield a significant underestimation of foreign currency amounts, they have the advantage of delivering data on various behavioral aspects in relation to

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⁴ Feige (2003) offers a comprehensive overview of currency and asset substitution. He finds very high rates of de facto dollarization for several countries of the Commonwealth of Independent States, whereas the rates are more moderate in CEECs. Rates in excess of 50% were only identified for Croatia, Macedonia and Romania. The lowest de facto dollarization (below 20%) is found for the Czech Republic, Hungary, Poland and Slovakia.

⁵ For a general discussion of currency substitution, see e.g. Calvo and Végh (2002).

⁶ For examples of methods proposed in the literature, see Fischer, Köhler and Seitz (2004), Porter and Judson (1996) and Šošić (2007).

foreign currency holdings. These data are especially interesting in the CEECs for two reasons: First, the CEECs' macroeconomic situation has more or less constantly improved over the past few years, and second, they were confronted with a major change in the monetary regime in their direct neighborhood – European Monetary Union. As a consequence, the number of foreign currencies available as a substitute for the domestic currency diminished, creating several special changeover effects. Monetary union has, however, also had a significant influence on the CEECs' national monetary policy strategies and perspectives.

The Oesterreichische Nationalbank (OeNB) has a special research focus on the CEECs, and it has been heavily affected by the logistical aspects of cash substitution. This is why the OeNB has, since 1997, commissioned several surveys on foreign currency holdings in five CEECs.⁷ Some of their results concerning currency substitution are presented in this paper. In a nutshell, we aim at shedding some light on the question who holds how much euro and for what purposes.⁸

This paper is organized as follows: Section 2 gives an overview of the reasons for cash substitution in CEECs, while section 3 discusses empirical evidence on the extent of cash substitution in the region. Given that the OeNB surveys have been conducted for ten years, we can analyze trends that were observed during the transition process in the respective countries and during the creation of the euro area in their direct neighborhood. In section 4, we present evidence on certain reasons for holding euro cash, focusing, in particular, on the following question: Is it experience that determines the extent of cash substitution at the individual level (i.e. country-specific past events, e.g. currency crises or periods of high inflation) or anticipation (i.e. expectations about the timing of euro introduction, expected inflation or exchange rate movements). Section 5 concludes.

The five countries covered by the OeNB survey – Croatia, the Czech Republic, Hungary, Slovakia and Slovenia – display similarities but also differences. The similarities include their strong economic linkages to the EU-15 and their small and medium size. Differences exist with respect to the progress of European integration: Slovenia, having fulfilled the convergence criteria, introduced the euro on January 1, 2007, whereas Croatia is not even an EU Member State yet. The Czech Republic and Hungary have recently postponed euro introduction to 2010 or even beyond; both countries still use the exchange rate instrument. Slovakia, by contrast, has been an ERM II

⁷ Survey results are published in Stix (2001, 2002 and 2003). An overview can be found in ECB (2005).

⁸ It should be noted that we focus on unofficial euroization. Unofficial (or *de facto*) euroization is broadly used to indicate that the euro is used alongside the national currency but is not legal tender. In contrast, official (or *de jure*) euroization occurs when the monetary authority of a country decides to grant the euro the usually exclusive legal tender status. Prominent (albeit small) examples are Kosovo and Montenegro in the Western Balkans, where the U.N. interim administrations introduced first the German mark and then the euro mainly because of the lack of established monetary authorities. And although some economists argue in favor of a unilateral euroization for pre-ins, i.e. EU member countries that have not yet adopted the single currency, (Portes, 2001; Belke et al, 2002) and Southeastern European (SEE) countries (Levy Yeyati, 2005), it is not very likely that the number of such cases will increase, as it contradicts the three-stage concept on which introduction of the euro is built within the EU framework.

member since November 2005, but due to relatively high exchange rate volatility, the timing of euro adoption is still an open question.

2 Currency Substitution in the CEECs – an Overview of Explanations

2.1 Low Confidence in the Domestic Banking System

De facto euroization is often a response to a history of banking crises or of political influence on banks, which sometimes even led to the confiscation of bank deposits. For instance, in the former Yugoslavia, households were allowed to hold a foreign currency deposit to store remittances or earnings from tourism. When the central state needed the reserves (first for funding prestigious projects and later for financing the war), the deposits were converted to domestic currency. Even though the interest rate was high at the time, the real value of the deposits was eroded quickly by the high inflation rate (Barisitz, 2003).

In many transformation countries, two waves of crisis occurred in the banking sectors. The first one was in 1992/1993, when the transformation process started and the existing one-tier systems were abolished.⁹ In fact, the state-owned central banks, which were also active in the banking business segment, were split up into “pure” central banks and state-owned commercial credit institutions. In parallel, market-oriented commercial banks were established from scratch.

In many cases the newly created two-tier systems were not sustainable, and another wave of crisis followed in the late 1990s. Examples are the Czech Republic, Bulgaria, Romania and Slovakia (from 1996 to 2001). The consolidation of the state-owned banking sector was brought about by the closing down of unprofitable institutions (see e.g. Croatia), but also by enhanced privatization efforts. Several foreign banks, mainly from Austria, Italy and the Netherlands, entered the CEE banking markets. They mostly acquired already existing domestic banks, but also started a few greenfield investments. Overall, the share of foreign banks is significant in most countries, reaching almost 100% in a few of them. This development has counteracted the above-mentioned skepticism and has convinced many people to refrain from holding cash, in particular when their opportunity costs in the form of lost interest income would have become too high otherwise.

Especially when the German mark and the Austrian schilling were replaced by euro banknotes and coins in January 2002, cash reserves in the CEECs were switched mainly into euro.¹⁰ As people’s trust in the newly established national banking systems had increased, many took the opportunity to open a bank account. In some countries, they were even obliged to do so, as the conversion to euro of assets denominated in the euro’s constituent currencies was only allowed via a bank account. This led to a marked increase in the number of foreign currency deposits.

⁹ Yugoslavia had a two-tier system already in the 1970s under the Tito regime.

¹⁰ The OeNB survey revealed that on average, about 71% of the respondents exchanged their German mark holdings for euro, 21% for local currencies, 4% for U.S. dollar, 1% for Swiss franc and 2% for other currencies.

2.2 Tourism, Remittances and Banknote Migration

In several republics of the former Yugoslavia, tourism played an important role already in the 1970s and 1980s. Given the special structure of the low-price segment (mainly private dwellings were offered for rent) and the restriction for the local population to buy foreign currencies, the volumes of privately held foreign currency reserves (mainly DEM, but also ATS and SFR) were substantial. Households used the hard currencies for importing goods that were not available domestically or as a store of value.

Emigration, mainly to Germany and Austria, but also to other industrialized European countries, provided another source of foreign currency. The associated remittances from abroad were often not converted in domestic currency, given the lack of confidence in the domestic financial sector. With the fall of the iron curtain, the opening up of the borders and EU membership, many people started to migrate daily, and thus constituted another group of people who stored value in euro.

The CEECs belong to those countries in which remittances play a significant role, regardless of the measure chosen to assess the remittances volume (OECD, 2006). Among the top 30 emerging market economies in terms of remittances received as a percentage of GDP (in 2002), we find Bosnia and Herzegovina (18.4%), Albania (15.6%) and Latvia (7.5%). The following CEECs are among the top 30 emerging market economies in terms of total remittances received (in U.S. dollar million; 2002 data): Poland (3,824), Ukraine (1,670), Romania (1,646), Croatia (1,400) and the Czech Republic (1,343). Owing to their quite advanced economic stage, the remittances sent to the CEECs are relatively high per capita (roughly 165% above the average of all emerging market economies).¹¹

Banknote migration data also confirm the key role of foreign currencies in the CEECs. Schautzer (2006) shows a strong net inflow of euro banknotes to Austria from its neighboring countries, mainly the Czech Republic, Hungary and Slovakia.¹² This inflow to Austria (which is nearly eight times as big as the outflow) is mainly attributable to geographical circumstances: Commercial banks from the CEECs are looking for the cheapest, and therefore shortest, way to dispose of their euro cash. Contrary to expectations, tourists from euro area countries account only for a minor share of cash inflow to Austria.

The findings of Schautzer (2006) are in line with an ECB report on the issuance of euro banknotes. The report shows that since 2003, the OeNB has issued fewer banknotes than it has received. While the vast majority of euro banknotes delivered to non-euro area countries were provided by the Deutsche Bundesbank, the bulk of returning banknotes were delivered to the OeNB. In fact, the number of returning banknotes was much higher than the capital key

¹¹ Country-by-country data by the OECD (2006) show that the following CEECs are among the top 30 emerging market economies in terms of the highest remittances per capita: Croatia (USD 320), Slovenia (USD 288), Latvia (USD 270), Bosnia and Herzegovina (USD 234), and the Czech Republic (USD 132).

¹² The 2004 data presented in Schautzer (2006) show that the inflow from the Czech Republic to Austria came to EUR 470 million, whereas the outflow from Austria was only EUR 53 million. The respective figures for Hungary are EUR 424 million (inflow) and EUR 89 million (outflow), and for Slovakia EUR 146 million (inflow) and EUR 17 million (outflow).

suggests. This implies that the OeNB has faced a substantial increase in its banknote sorting and redistribution activities.

2.3 Exchange Rate Regimes, Exchange Rate Developments and Inflation Expectations

Temporary or chronic macroeconomic instability, undermining the domestic currency's function as a store of value, can be another reason for currency substitution. Given that people are strongly affected by periods of hyperinflation, we can assume that such events will stay in their memories for a long period of time. As interest rates hardly offset inflation, cash holdings in foreign currency are a widely chosen alternative. Especially in the first half of the 1990s, the catching-up process in the CEECs went hand in hand with extraordinarily high inflation rates. Inflation was measured month to month, with some countries (e.g. Poland) even suffering from four-digit annual inflation rates. In the mid-1990s, inflation rates came to 30% to 40% in Hungary. At the end of the 1990s, the successor states to the former Yugoslavia, e.g. Croatia, still posted spells of high inflation.

The exchange rate is another macroeconomic indicator that determines the domestic currency's storage-of-value function. Exchange rate expectations are driven by several factors, one of them being the exchange rate regime in place. Most of the CEECs have fixed pegs, currency boards or managed floats. The only exception is Poland, which runs a pure float. As a result, nominal exchange rates have been extraordinarily stable, although surprises in either direction cannot be excluded, as the most recent history has shown in Slovakia or Latvia. In this vein, cash holdings in foreign currencies are often used as a safety net against exchange rate risks.

Moreover, euroization is a hysteretic phenomenon, reflecting the fact that yesterday's good news are forgotten quickly, whereas bad news have a tendency to stick in the mind. Therefore, it does not come as a surprise that the demand for hard currencies remains high in countries affected by euroization even after macroeconomic stabilization has been achieved (see e.g. Feige et al., 2003; Feige and Dean, 2004; Mourmouras and Russell, 2000). Given that strong currency movements occurred in the past in several CEECs, people will probably still keep an eye on exchange rate movements.¹³

3 Empirical Evidence

3.1 OeNB and Eurobarometer Surveys

Since 1997, the OeNB has commissioned representative surveys in Croatia, the Czech Republic, Hungary, Slovakia and Slovenia. For each survey about 1,000 persons above the age of 14 were interviewed per country in April/May and in October/November. The main focus of the surveys is to collect data on foreign currency cash holdings in the respective countries. In particular, the respondents are asked about their cash holdings in euro and U.S. dollar as well as about their motives for holding foreign currencies. Furthermore, the surveys

¹³ In fact, many countries were affected by sharp exchange rate movements (depreciations, but also appreciations). For instance, the currency crises in the Czech Republic (1997) and Slovakia (1998) were followed by sharp appreciations.

contain questions about exchange rate and inflation expectations, deposits safety, travel habits, the respondents' expectations regarding the timing of euro adoption, etc.¹⁴

The European Commission (EC) also commissioned several surveys in all new EU Member States, which were undertaken annually between 2004 and 2007. These so-called Eurobarometers on the introduction of the euro in the new Member States do not convey much information on foreign currency holdings. Still, they provide a first-hand view of the population's experience with, and perception of, the euro, of their expectations and fears concerning the adoption of the euro, etc.¹⁵ As in the OeNB survey, about 1,000 persons were questioned in each country. The first wave relied on face-to-face interviews, whereas the second and third waves were predominantly based on telephone interviews.

As the focus of the Eurobarometer surveys is different from that of the OeNB surveys, the results from both combined provide a rather comprehensive set of information on the role of the euro in some CEECs. For those few questions that cover similar aspects we will compare the results. The latest surveys used in this paper are from October/November 2006 (OeNB survey) and from March/April 2006 (EC survey).

It is a well-known fact that survey results in general must be interpreted with caution. They are influenced by sampling and interviewing techniques, the exact wording of the questions, etc. Also, random fluctuations can be sizeable if the number of observations is low. In particular, caution is required for those questions that are related to personal wealth (e.g. the amount of foreign money kept at home), as respondents will not always reveal the truth. Furthermore, the surveys do not cover commercial cash holdings (e.g. tourism revenues), and they certainly cannot cover criminal money. As a result, the estimated figures on foreign cash holdings are likely to understate the true amounts significantly.¹⁶ Therefore, the absolute figures indicated here should not be taken literally. Instead, we focus on changes over time and on relative differences across countries.¹⁷

3.2 General Results

3.2.1 Foreign Currency Cash Holdings

Chart 1 summarizes the evolution of foreign currency holdings as a percentage of respondents since 1997. It shows that in each of the countries under review, a substantial share of the population has held foreign currencies. Before the introduction of euro banknotes and coins, the German mark was the most frequently held foreign currency in the region. The Austrian schilling usually ranked second and was almost as popular as the German mark in some countries (notably Slovakia and Hungary), while the U.S. dollar ranked third.

¹⁴ The complete questionnaire is available upon request from the authors.

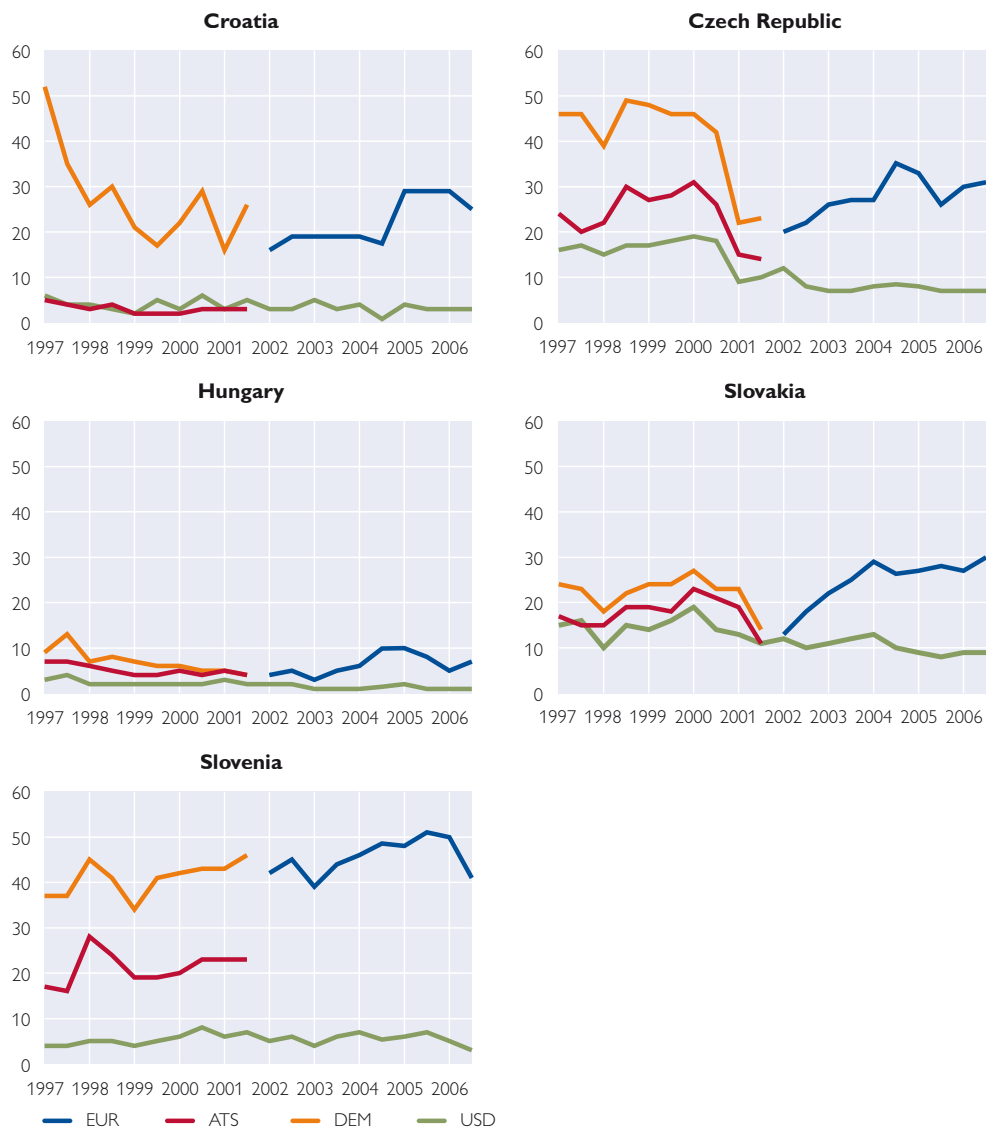
¹⁵ See the Appendix for more detailed information about the surveys used in this contribution.

¹⁶ Šošić (2007) provides relatively precise estimates of the amount of foreign currency in circulation in Croatia, using data from currency in- and outflows around the time of the euro cash changeover. The results of the OeNB survey for Croatia are lower than Šošić's estimates by a factor of five.

¹⁷ Provided that the surveys are conducted repeatedly and the respondents' underreporting behavior remains constant, temporal trends derived from the surveys should be relatively reliable.

Chart 1

Percentage of Respondents Holding Foreign Currency



Source: OeNB.

Croatia was an exception in this respect, with the U.S. dollar being the second-most important foreign currency. When the euro cash changeover approached, the share of respondents holding German mark declined (except in Slovenia).

The 2002 surveys revealed that in the course of the cash changeover, a substantial fraction of the stock of German mark, Austrian schilling and other euro area currencies that were in circulation in these five countries were exchanged into euro.¹⁸ A sizeable percentage of respondents exchanged their foreign currency holdings for local currencies, whereas only a low percentage converted their cash holdings to U.S. dollar (Stix, 2004).

¹⁸ For a more detailed discussion of the conversion in the five CEECs, see Stix (2002, 2004). In short, the exchange of German mark into euro was particularly strong in Croatia and Slovenia.

Before and around the euro cash changeover, the share of respondents holding foreign currency declined. After that, however, we observe an upward trend again more or less in all five countries under review (see chart 1). In Croatia, the share remained largely constant until the end of 2004 and increased thereafter.¹⁹ In the Czech Republic and Hungary, the share increased and declined again after 2005. In Slovakia, the share increased steadily and has remained relatively constant since 2004. In Slovenia, the share trended upward and declined only in the second wave of the survey in 2006. This drop might be related to the fact that Slovenia was about to introduce the euro in 2007. In absolute terms, some 41% of Slovenians, 31% of Czechs, 30% of Slovaks, 25% of Croats and 7% of Hungarians held euro in October/November 2006. In Slovakia and Slovenia, the percentage of the spring 2006 survey was higher than it had been for the German mark in any year since 1997 (when the surveys were started). In Croatia, it again reached the German mark levels of the late 1990s.

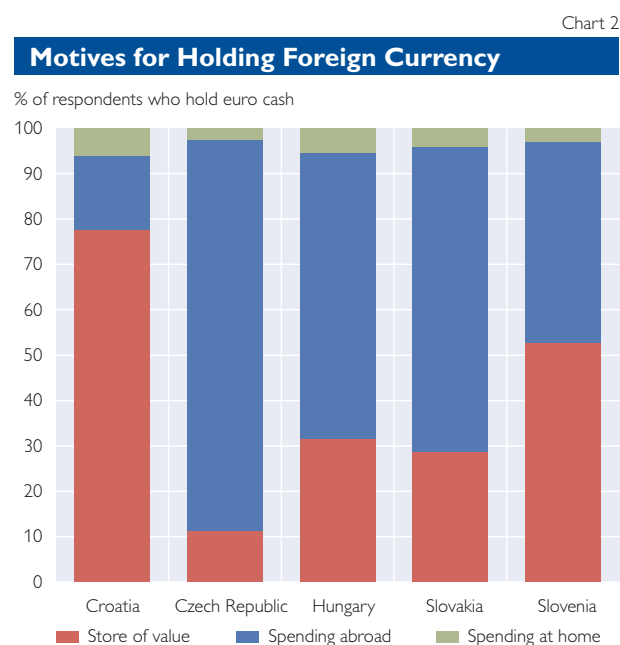
Chart 1 also shows the share of respondents holding U.S. dollar. In all countries, this share is substantially lower than the corresponding euro share. In addition, there is no clear trend discernible.

3.2.2 What Are the Motives behind Euro Holdings?

The OeNB surveys also collect information on the motives underlying the decision to hold euro (see chart 2). In particular, respondents were asked to choose their main motive for holding euro cash out of the following three answers:

as a store of value, for shopping abroad or for shopping at home.

The store-of-value motive is most important in Croatia and Slovenia, where it was decisive for 78% and 53% of euro holders, respectively. In the other countries, this motive was significantly less relevant (Hungary 31%, Slovakia 29%, Czech Republic 11%). The motive of making transactions abroad was chosen by 86% of euro holders in the Czech Republic, by between 60% and 70% in Hungary and Slovakia, and by 44% in Slovenia. The corres-



Quelle: OeNB.

Note: The question was "For which reason do you keep euro cash? Do you keep euro cash mainly ...?" The data are from 2006. Only valid replies are considered.

¹⁹ We cannot offer a good explanation for this increase nor are we aware of any institutional changes that would explain it.

ponding value in Croatia is only 16%. Finally, the results indicate that the motive of making domestic transactions was hardly ever chosen as a reason for holding foreign currency – only the results from Croatia and Hungary suggest that this motive is of some importance.

A comparison of the 2006 results with those from 2002 reveals some changes over time: In Croatia, the share of respondents who indicated that they hold foreign currency for domestic purchases declined from around 15% to 7%, while the store-of-value motive became more important. In all other countries, the store-of-value motive has lost importance. At the same time, the number of respondents who indicated that they hold euro for transactions abroad increased. Overall, this development can be seen as a reflection of increased confidence in the banking system and the domestic currency, of economic stabilization (disinflation policies), higher purchasing power and, consequently, the increased role of tourism.

3.2.3 Euro Amounts

The share of the population which has foreign currency holdings is certainly an important indicator. However, it is the amount of foreign currency circulating in these countries that is relevant from a monetary policy perspective. To obtain such estimates, respondents were asked to indicate the amount of foreign currency they hold.²⁰ Chart 3 shows the temporal evolution of the median euro amounts derived from the respondents' answers to this question.²¹ As the number of observations is quite low for some countries, the resulting figures can be subject to considerable random fluctuations (e.g. 5% of Hungarians said they hold euro so that the medians are calculated on a basis of only 50 observations per wave. For other countries like Slovenia, the results are based on 500 observations per wave).²² Therefore, we will not interpret individual figures but rather focus on the cross-country and the temporal dimensions.

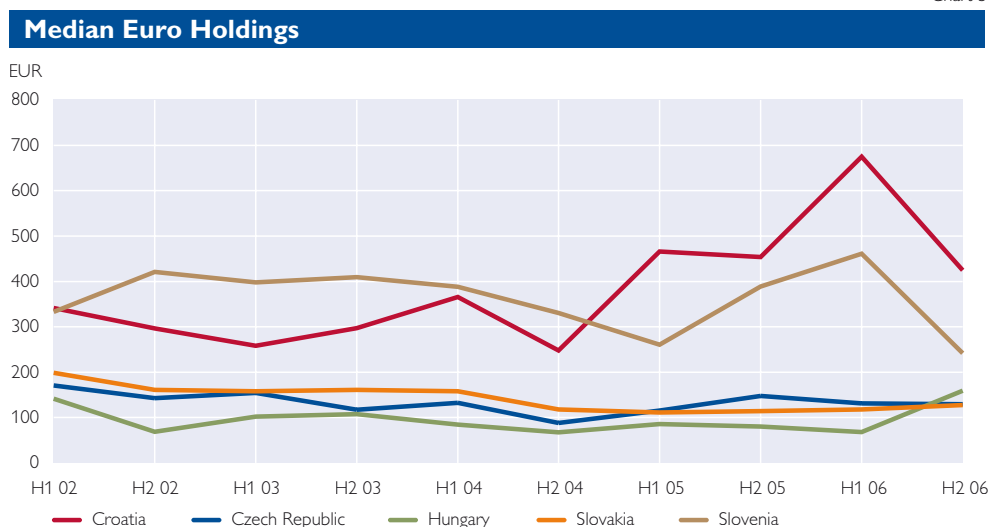
The highest median amounts were held in Slovenia and Croatia, countries in which the store-of-value motive is most important. The median amounts held by respondents from the Czech Republic, Slovakia and Hungary were roughly equal. Regarding the temporal dimension, we observe an increase in euro holdings in Croatia during 2005 and the first half of 2006 as well as a more moderate increase in Slovenia for the same period. In the second half of 2006, however, median amounts fall sharply in Croatia and Slovenia. No clear trend is discernible for the other countries.

²⁰ The survey does not ask about precise amounts but rather about categories (<EUR 20, EUR 20 to EUR 50, EUR 50 to EUR100, EUR 100 to EUR 250, etc.).

²¹ As the median can be calculated in various ways, we abstain from interpreting absolute figures. We have calculated the median amounts by linearly interpolating between class boundaries.

²² Notice that the median can be calculated in various ways. Therefore, we abstain from interpreting absolute figures. We have calculated the median amounts by linearly interpolating between class boundaries.

Chart 3



Source OeNB.

Note: Values are based on categorized answers. The median is calculated by linearly interpolating between category boundaries.

Table 1

Median Euro Amounts by Motive

	Store of value or domestic purchases in EUR	Spending abroad in EUR
Croatia	592	238
Czech Republic	270	120
Hungary	90	88
Slovakia	142	109
Slovenia	552	210

Source: OeNB survey.

Note: Median values are calculated by linearly interpolating between category boundaries. Aggregated data are from the first wave in 2005 to the second wave in 2006. The motives "as a store of value" and "for shopping at home" are aggregated into one category.

It can be expected that the amount held is determined by the motive for holding foreign currency. For instance, this amount should be lower if cash is held for the purpose of making purchases abroad (it may even include unspent cash from the latest visit to the euro area) rather than for hoarding. Table 1 shows median holdings broken down by the three motives. For Croatia, Slovenia and the Czech Republic, the results clearly show that those who hold euro as a store of value or for making purchases within their home countries typically keep higher amounts than those who hold euro for making purchases abroad. Only for Hungary and Slovakia, the median amounts are more or less equal in size.²³ Furthermore, an analysis of the mode, i.e. the amount held by a relative majority of respondents, reveals clear differences across countries: In Croatia and Slovenia, the mode is in the range of EUR 2,000 or more (for those holding euro for reserve purposes), whereas for the other countries it lies in a range of EUR 100 to EUR 249.

This result confirms that the degree of de facto euroization depends on the underlying motives. If people mainly hold foreign currencies for the purpose of spending the money abroad, the amounts will be small, as was the case in the Czech Republic, Hungary and Slovakia. If people tend to use euro cash as

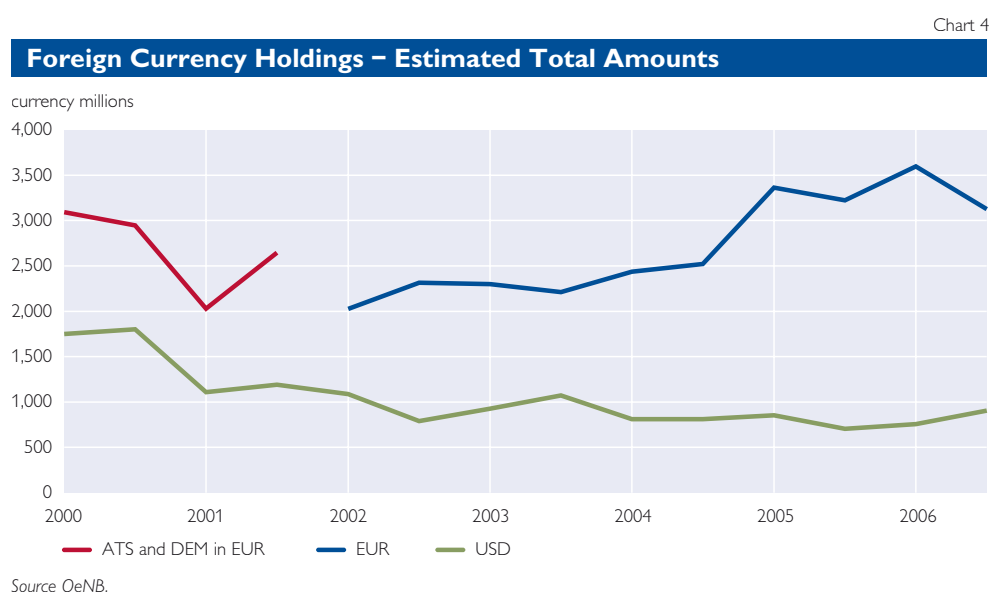
²³ This could possibly be explained by the fact that respondents had to choose one motive. If they hold euro both as a store of value and for shopping abroad, and both motives are of about equal importance, it is likely that the fact that respondents have to decide for only one motive washes out the difference between motives in table 1.

a store of value or for domestic expenditures, the amounts are higher, which was the case in Croatia and Slovenia.

The actual amounts in circulation can be calculated from the survey responses by weighting the class means of the categorized amounts with the percentage share of respondents who answered that the amount of their foreign currency holdings lies in the respective range. Then, by multiplying the resulting average per-capita holdings by the total population figures (for residents above the age of 14), we obtain an estimate of the amount of foreign currency held in the respective country. It should be emphasized that the resulting figures represent only crude estimates that incorporate neither illegal nor other undisclosed cash holdings. Therefore, these estimates are very likely to understate the true amounts by a sizeable factor. Notwithstanding these limitations, we still consider these estimates to be useful, as trend changes over time might be indicative of changes in the overall demand for foreign cash.

Chart 4, which shows the cumulated results for all five countries, indicates that the combined holdings of German mark and Austrian schilling decreased by about one-third between 2000 and early 2002. This is in line with the evidence presented in chart 1. For the period after the cash changeover, our calculations suggest that the demand for euro cash in the five countries increased again slowly until end-2004. Thereafter, the amount increased further, surpassing even the 2000 level. This overall increase is mainly due to a substantial rise in Croatia and, to a lesser extent, in Slovenia.²⁴

For the U.S. dollar, the projections reveal a downward trend for the period from 2000 to 2004, with the 2004 value coming to about one-half of the 2000 value.



²⁴ These estimates imply per capita cash holdings of EUR 380 in Slovenia, EUR 313 in Croatia, about EUR 100 in the Czech Republic and Slovakia and only EUR 14 in Hungary on average in 2006.

Table 2

To what Extent Is Euro Cash Used for Domestic Payments?

	A			B		C		
	Perceived possibility to pay in euro			Who pays in euro?		Did you make payments in euro?		
	Yes			Only tourists make payments in euro		Yes		
	H1 05	H1 06	H2 06	H1 06	H2 06	H1 05	H1 06	H2 06
Croatia	30	34	32	21	26	8	11	9
Czech Republic	53	59	55	54	53	3	4	6
Hungary	40	38	41	30	33	3	2	3
Slovakia	37	43	49	55	54	1	5	6
Slovenia	58	64	63	26	34	7	15	16

Source: OeNB survey.

Note: The values refer only to respondents who gave a valid reply. The exact wording of the questions was “When you think about the past 6 months: Have you noticed that it is possible to pay in euro in your country (e.g. when shopping, in restaurants, when making purchases, etc.)?” (A), “Who is making payments in euro in your country?” (B), and “Have you made any payments in euro during the last six months (in your country)?” (C).

3.2.4 To What Extent Are Euro Used for Domestic Payments?

The survey results reveal that only a small fraction of respondents holds euro for domestic purchases. However, these percentages may be seen as lower bounds, as respondents must choose one single motive. It is possible that people who select store-of-value considerations as their main motive also use euro in domestic transactions. To take account of this fact, the OeNB surveys contain several additional questions on the use of euro cash in the respondents’ home countries.

The first question addresses cash payments in euro in the respondents’ home countries over the past six months (see table 2, column A). Among the respondents who gave a valid answer, 63% of Slovenians, 55% of Czechs and 49% of Slovaks were aware of the possibility to make payments in euro.²⁵ In Hungary and Croatia this percentage is considerably lower at 32% and 41%, respectively. In a temporal dimension, the data show an upward trend in Slovakia and Slovenia.

Respondents who noticed that it was possible to make payments in euro were then asked who made these payments – tourists, inhabitants or both. Here, 54% of Slovaks and 53% of Czechs replied that it was only tourists (table 2, column B). The values were lower for Slovenia and Hungary at 26% and 34%, respectively. In Croatia, three out of four respondents who noticed payments in euro replied that it was not only tourists who made them.²⁶

So far, the questions focused on the respondents’ opinion about other people’s euro payments. As a check, the OeNB survey also addresses the respondents’ personal behavior, asking people directly whether they themselves had made payments in euro in their countries during the last six months. The results are summarized in table 2, column C. Slovenia and Croatia posted the

²⁵ E.g. 58% of Slovenians answered “yes” while 34% did not notice any payment transactions in euro and 8% provided no answer. We focus only on these respondents who gave a valid answer to allow for a cross-country comparison as the share of invalid responses varies across the CEECs.

²⁶ Respondents were also asked whether they thought that payments in euro were made more often than half a year ago. In general, the majority of respondents from all five countries answered “yes.” In Slovenia, 72% of those who noticed euro payments thought the frequency had increased.

highest share of respondents who replied that they had made payments in euro. Over time, there is a clear increase in this share in Slovenia, and, albeit from a low level, in the Czech Republic and Slovakia.²⁷

Overall, the results concerning euro payments can be summarized as follows:

- Between one-third and two-thirds of the population in the five countries under review have noticed that it was possible to make payments in euro in their countries. This share is particularly high in Slovenia and the Czech Republic and relatively high in Slovakia.
- However, the majority of respondents from the Czech Republic and Slovakia thinks that these payments are most likely attributable to tourists only. In Croatia, Hungary and Slovenia, the majority thinks that euro payments are attributable to both inhabitants and tourists.
- Judging from the respondents' replies regarding their own behavior, euro payments by inhabitants seem to be important in Slovenia (where this share more than doubled between 2005 and 2006) and Croatia.

The European Commission's Eurobarometer surveys also collect data on the motives for holding foreign currency, albeit with a rather different focus, concentrating more on where people have used euro cash. Although the specific questions are barely comparable, some aspects of the survey results are in line with the findings from the OeNB surveys.²⁸

One important finding of the EC surveys is that the vast majority of respondents who have already used euro banknotes have used them abroad. When it comes to using euro cash in the respective home countries, the results of the spring 2006 wave show that this share is highest in Slovenia, which is in line with the OeNB survey's findings. Also, both surveys find that the frequency of using euro cash for payments at home is about three times as high in Slovenia as in the Czech Republic and Slovakia. However, according to the Eurobarometer results, the share of those who have used euro cash at home in Hungary is only about one-half as high as in Slovenia; this is not confirmed by the results of the OeNB survey.²⁹

4 Evidence on Economic Reasons for Holding Euro Cash

In this section, we present evidence about the economic aspects of using and owning foreign currencies. A typical approach of macroeconomic (time series) studies would be to regress a measure of euroization on explanatory variables

²⁷ The number of observations is rather small for all countries, which somewhat limits the statistical reliability of the results.

²⁸ The questions in the EC survey are "Have you used euro banknotes (coins)?" and "You said you already used euro banknotes (coins). Was it ...?" Answers are "in your country," "in your country and abroad" and "abroad." In the following, we will focus on banknotes only and disregard the results for euro coins. Another important difference between the surveys is that the questions of the EC survey do not address the time aspect, whereas the OeNB survey specifically asks about the last six months. This implies that the absolute values are not comparable.

²⁹ Concerning Hungary, the evidence is somewhat ambiguous even within the OeNB survey. In particular, judging from the replies to the general question on the respondents' motive to hold euro cash, the role of domestic purchases in euro seems to be more important than the evidence from the direct question about respondents' own behavior suggests. The difference between the latter finding and that of the EC survey might be rationalized if Hungarians do not often make payments in euro (the EC survey does not focus on the last six months) or are more hesitant than others to reveal their behavior in the direct question.

such as an aggregate measure of inflation and exchange rate expectations, a ratchet variable, etc. The use of survey data, in contrast, allows us to present evidence about various variables that affect individual behavior. In particular, we first analyze those factors that are associated with a backward-looking perspective (“experience”). They include people’s confidence in the banking system and the role of remittances and tourism. Then we analyze the factors related to a forward-looking perspective (“anticipation”), focusing on exchange rate and inflation expectations as well as the expected timing of euro introduction.

The use of microdata has some shortcomings. In particular, some aspects can be dealt with only indirectly, and it is not always possible to identify the direction of causality. Furthermore, as our analysis focuses on descriptive results based on univariate analyses, we cannot simultaneously control for more than one potentially important explanatory variable.

4.1 Deposit Safety

As already mentioned, the literature argues that the degree of confidence in the domestic banking system is likely to affect the extent of currency substitution (e.g. Feige et al., 2003). Hence, one would expect currency substitution to be particularly strong in countries that have not yet established a solid and stable banking system or in countries that experienced banking crises recently.³⁰

Until the end of 2005, the OeNB surveys included a question on the perceived safety of bank deposits in the respective countries. In particular the question was “From your point of view – how safe are deposits at banks in your country? (in the sense of loosing the savings due to bankruptcy of banks, fraud, etc.)” Possible answers ranged from “very safe,” “rather safe,” “rather unsafe” to “very unsafe.”³¹ The results in brief: In Croatia, the share of respondents who believe that deposits are very or rather safe increased from less than 50% in April/May 2002 to 60% in October/November 2006.³² In the Czech Republic, this share increased from 43% to 64% and in Hungary from 62% to 76%, while remaining constant in Slovakia at around 69%. In Slovenia, the share was 78% in 2002 and remained rather constant around this high level, declining to 64% only in October/November 2006.³³ Overall, the results suggest that since 2002, the level of confidence in deposit safety has remained high in those countries where it had initially been high and has increased in countries where it had been low.

We try to establish whether there is a correlation between a person’s perception of deposit safety and the likelihood of this person holding foreign cash. A first approximation would be to analyze if there is any difference in the perception of deposit safety between those who do not hold foreign cash and

³⁰ For evidence on the role of deposits and loans, see Backé et al. (2007).

³¹ It should be noted that we are mainly interested in individual behavior and not in the interpretation of aggregate statistics. Given the fact that the figures are barely comparable across countries, we will refrain from interpreting the absolute levels.

³² The percentages are calculated for the aggregate population including those without an opinion. Therefore, the sample also includes respondents who do not have any idea about deposit safety or who do not have a deposit.

³³ In November 2005 there was a spectacular bank robbery in Ljubljana. The decline in perceived deposit safety may be associated with it.

Table 3

Does Perceived Deposit Safety Affect the Level of Cash Substitution?

	Percentage of respondents with only a local currency savings account and foreign cash balances for reserve purposes	Percentage of respondents with a foreign currency account and no foreign cash balances
Croatia	77	78
Czech Republic	72	80
Hungary	87	89
Slovakia	75	82
Slovenia	76	88

Source: OeNB.

Note: The figures denote the percentage of respondents who believe their savings deposits are very safe or safe. The data refer to two subsets of respondents: The first group (left column) has savings accounts in local currency only and keeps foreign cash at home, while the other group (right column) has savings accounts in foreign currency but does not keep foreign cash at home. For instance, in Croatia, 77% of the first group believe that their savings are very or rather safe. Aggregated data are from the first wave in 2004 to the last wave in 2005.

those who do. However, such a comparison may yield distorted results, given that sample selectivity is likely to be an issue. For instance, people who hold foreign cash have higher incomes, a higher likelihood of being employed, etc. Typically, such variables also affect the respondents' views on sentiment variables, e.g. deposit safety.

Thus, we aim at defining two groups with rather similar sociodemographic characteristics that differ only in terms of their foreign cash holdings. In light of these considerations, we selected the following two groups: respondents who have a savings account in local currency only and keep foreign cash as a store of value and respondents who have a foreign currency account, but no foreign cash. This means that the members of the first group have euro at the bank, while the others keep euro cash at home. The results are summarized in table 3.

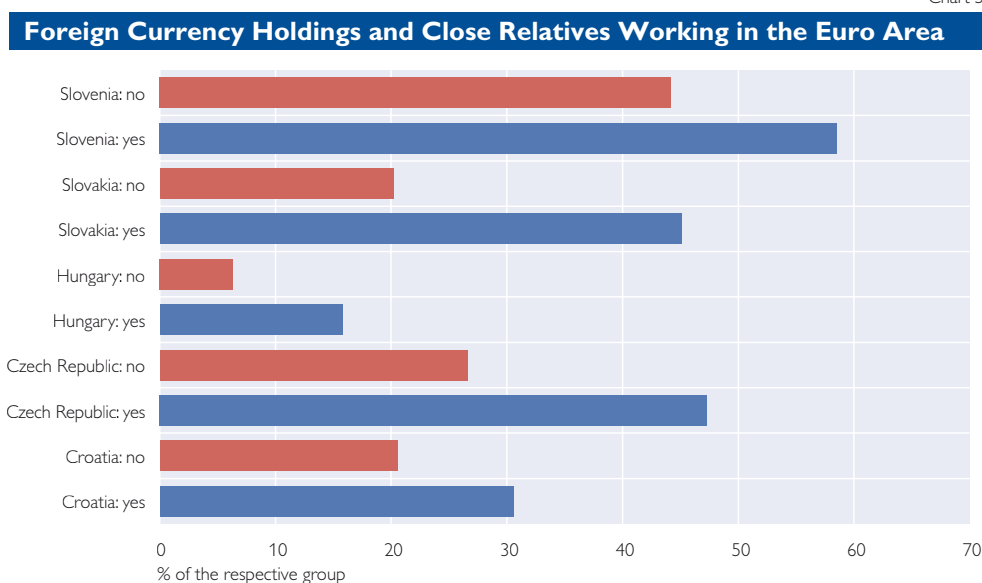
Our expectation is that those who hold euro cash are more pessimistic about deposit safety than the others. The results from Croatia and Hungary clearly do not confirm our assumption, while the expected result is obtained for the Czech Republic and Slovakia (the difference might be different from zero also statistically). For Slovenia, the difference is quite large. Hence, the results of our univariate analysis suggest that at least in some countries, perceived deposit safety seems to be correlated with the decision to hold foreign cash instead of putting it in a bank account.

4.2 Remittances and Tourism

The role of remittances from a macroeconomic perspective has already been highlighted. In addition, we want to analyze their role from a microeconomic perspective. To this end, the OeNB survey contains the following question: "Do you have any close relatives who are working in the euro area?" This information allows us to analyze whether the share of respondents holding euro is higher for those who have such a close relative than for those who don't.³⁴

³⁴ However, this variable can only serve as a proxy measure, as the mere fact that people have a close relative who works in the euro area does not necessarily imply that they receive remittances.

Chart 5



Source: OeNB.

Note: The bars represent the percentages of respondents who hold euro cash for two groups: those who have (yes) and those who don't have (no) close relatives working in the euro area. In Croatia, for instance, 31% of respondents who have close relatives working in the euro area hold euro cash, compared with only 21% of those who don't have any close relatives working in the euro area. Data are from the first half of 2004 to the first half of 2006 based on 5,000 observations for each country.

Chart 5 shows the share of respondents who hold euro broken down into the two groups – those with and those without close relatives working in the euro area. As is visible, there is a clear difference between the two groups that ranges from about 10 percentage points (pp) for Hungary and Croatia to 14pp in Slovenia and 20pp to 25pp in the Czech Republic and Slovakia.³⁵ Thus, the results suggest that euro holdings are more widespread among people who have close relatives working in the euro area.

The role of tourism (or the number of visits to the euro area) is another issue that may have an impact on the degree of cash substitution. The OeNB survey results show that since 2002, the share of respondents who traveled to the euro area in the year prior to the respective survey has increased from 23% to 29% in Croatia, from 7% to 17% in Hungary and from 44% to 59% in Slovenia. Only in the Czech Republic and Slovakia did this share remain constant, albeit at high levels of 43% and 35%, respectively. Does this increase in the number of visits to the euro area induce an increase in the amount of euro cash in circulation in these countries?

³⁵ It could be argued that these differences have nothing to do with remittances, as people may hold euro to visit their relatives. To account for this argument, we repeated the analysis, excluding those respondents who hold euro for the purpose of making purchases abroad. The previous result was confirmed: We again find differences between these two groups ranging from 4pp (which is most likely not different from zero statistically) to 9pp.

Table 4

Euro Cash Holdings and Frequency of Visits to the Euro Area

Number of trips to the euro area over the last 12 months	Croatia	Czech Republic	Hungary	Slovakia	Slovenia
No trip	18	8	3	10	31
1 to 5 trips	42	55	28	53	57
More than 5 trips	58	83	33	71	69

Source: OeNB.

Note: The figures denote the share of respondents who hold euro cash. The values represent averages over the surveys from 2004 to 2006 and are based on 5,000 observations per country.

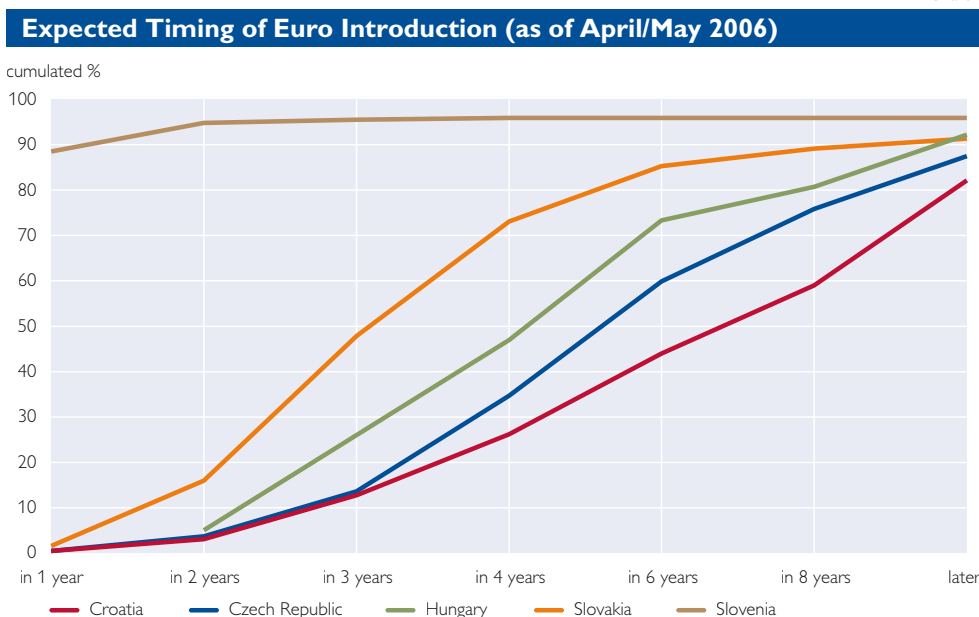
Table 4 shows a cross tabulation of euro ownership and the number of visits to the euro area. Among those who did not visit the euro area in the year prior to the respective study, the share of respondents who held euro cash was 31% in Slovenia, 18% in Croatia, 10% in Slovakia, 8% in the Czech Republic and 3% in Hungary. It is noticeable that the ratios are sizeable only in Croatia and Slovenia, where the store-of-value motive plays a substantial role. In the other countries, where the majority of euro holders uses these balances for trips to the euro area, the shares are much lower. However, ownership rates increase sharply with the number of visits to the euro area. For example, 69% of those Slovenians who took more than five trips to the euro area held euro cash, which is more than double the share of Slovenians who did not travel to the euro area at all. In other countries, the ratio is 3 to 11 times higher relative to those who did not take a trip to the euro area. In sum, the results clearly illustrate that increased tourism flows have an impact on euro cash holdings in the five CEECs.

4.3 Expected Timing of Euro Introduction

Another interesting question is whether the prospective introduction of the euro affects the behavior of individuals, inducing them to hold more euro cash.

Both the OeNB surveys and the EC surveys contain information on the expected date of euro adoption and arrive at rather similar results: First, the overwhelming majority of respondents from the CEECs expects that the euro will be introduced at some point in time. According to the OeNB survey, for example, the share of respondents from the Czech Republic, Hungary, Slovakia and Slovenia who believed that the euro will never be introduced lies between only 1% and 3% on average. Even in Croatia, which is not an EU member country yet, this share was just 9%. Second, more cross-country variation can be found concerning the expected timing of euro adoption. Chart 6 depicts the responses (cumulated for each country) regarding the expected date of euro introduction. The figures are from the OeNB's May 2006 survey.³⁶ Not surprisingly, the earliest date of adoption was expected in Slovenia, followed by Slovakia, where 50% of respondents thought that the euro would be

³⁶ We chose survey data of May 2006 to facilitate a comparison with the EC survey and also because Slovenia adopted the euro in 2007 – in fall 2006, almost all Slovenians expected the euro to be introduced in January 2007.



Source OeNB.

Note: The chart shows cumulative responses to the following question: "When do you personally think that your country will introduce the euro?" For Hungary, the categories "within the next 12 months" and "in one to two years" are merged. The missing values to 100% represent those who replied "never" or "don't know."

introduced within the next three years and 73% within the next four years. In Hungary, 47% expected the euro to be introduced within the next four years, while it was around one-third in the Czech Republic and roughly one-fourth in Croatia.³⁷

The EC surveys additionally ask about the most desired time frame for adoption of the euro. Respondents could choose among the following answers: "as soon as possible," "after a certain time" and "as late as possible." In all new EU Member States, there is a preference for earlier adoption, as the share of respondents favoring "as late as possible" decreased relative to earlier surveys.³⁸ This could reflect an increase in familiarity with, and acceptance of, the euro among respondents.

On the basis of the answers concerning the expected date of euro adoption, we can analyze whether there is a systematic difference in terms of the respondents' euro cash holdings between those who expect the euro to be introduced earlier and those who think it will take longer or never happen at all. The results are summarized in table 5, which shows the share of respondents from Croatia and Slovenia who hold euro cash as a store of value broken down into groups according to their expectations regarding the timing of euro

³⁷ The EC survey arrives at the same ranking for these three countries: Euro adoption is expected first in Slovakia, then in Hungary and last in the Czech Republic. However, it seems that the respondents of the EC survey are more optimistic in all countries, expecting earlier introduction dates than the respondents of the OeNB survey. For example, the EC survey shows that 70% of respondents from the Czech Republic expect the euro to be introduced by 2010, whereas it is only 35% in the OeNB survey. This difference may be attributable to a different wording of the questions. While the answers in the OeNB survey refer to the number of years relative to the date of the survey (in 1 to 2 years, in 2 to 3 years, etc), those in the EC survey refer to absolute years.

³⁸ With the exception of Cyprus.

Table 5

Euro Cash as a Store of Value and Expected Timing of Euro Introduction

	Croatia	Slovenia
Within the next 2 years	29.1	28.3
In 2 to 4 years	27.4	24.3
In more than 4 years	24.2	22.8
Never	19.0	–
Don't know	15.3	17.1
Average	23.1	27.2

Source: OeNB survey.

Note: The table shows the percentage of respondents who hold euro cash as a store of value (basis: whole population). For example, in Croatia, 29.1% of those who expect the euro to be introduced within the next two years hold euro cash as a general reserve (implying that 70.9% of this group do not hold euro cash as a reserve). Aggregated data are from 2005 and the first wave in 2006. – means that the number of observations is too low.

adoption. We concentrated on these two countries, as they alone have a sufficient number of respondents who hold euro as a store of value.

The results reveal that the share of respondents who believe the euro will be introduced earlier is larger than the share of those who think it will be later.³⁹ Also, for Croatia, we find that euro holdings are lowest among those who expect that the euro will never be introduced or who do not have an opinion. However, the effect does not seem to be very strong. The direction of causality is also a subtle issue. Yet, if we interpret causality to go in this direction, the figures in table 5 provide additional indirect evidence of a link between the anticipated date of euro adoption and euro cash holdings.

4.4 Exchange Rate and Inflation Expectations

The OeNB survey contains questions on inflation⁴⁰ and exchange rate expectations⁴¹. The answers to these questions can be used to evaluate whether inflation or exchange rate expectations are correlated with currency substitution. After all, high inflation rates and exchange rate depreciations reduce the rate of return on assets in local currency relative to euro. Consequently, when people think inflation and/or depreciation of the local currency will be high, we may expect them to shift the currency composition of their assets toward a stronger currency. On the basis of the survey data, we can analyze whether the share of respondents who expect inflation to increase (or the currency to depreciate) is higher among the group which holds foreign cash than among those who don't.

However, any evidence obtained in this way can only be indicative at most. This caution is justified mainly for three reasons, the first of which is related to sample selectivity: It does not make much sense to compare the results for those who hold foreign currencies with those who don't, because people who do not hold foreign currencies are in general seemingly more pessimistic about

³⁹ This result could partly be due to sample selectivity, as richer people (who have larger euro holdings) are generally found to have a stronger pro-EU attitude.

⁴⁰ "Compared with the last 12 months, how do you think will prices develop in your country over the coming 12 months?" Possible replies: Prices will "rise more sharply than in the past," "rise at roughly the same pace as before" or "drop compared with the past 12 months."

⁴¹ "How do you think will the exchange rate of your country's currency develop over the next 2 years?" Possible replies: The currency will "lose value against the euro," "stay the same" or "gain value against the euro."

inflation and exchange rate developments. Therefore, we have to define two groups which differ only in terms of their foreign currency holdings. Second, the direction of causality is again an issue, and third, an appropriate assessment of how inflation and exchange rate expectations affect agents' behavior would require comparing returns on investment in local and foreign currencies. We do not have this information, however.

With these potential pitfalls in mind, we chose to restrict the sample to those respondents who only hold saving deposits in local currency. Of this group, we compare the following two subsets: those who keep foreign cash at home as a store of value and those who don't.⁴² Table 6 shows the results for inflation expectations and table 7 for exchange rate expectations. The figures in table 6 represent the share of respondents who expect the inflation rate to increase. One would expect this share to be higher among those who hold foreign cash (right column) than among those who hold only assets denominated in local currency (left column). This is, however, only the case in the Czech Republic and Hungary, and even in these two countries the difference is not sizeable. In all other countries, the difference is either negligible or has the opposite sign. This result suggests that, on average, no correlation seems to exist between expected inflation and the decision to hold foreign currencies.

A rather similar picture emerges for the impact of exchange rate expectations. The figures in table 7 represent the share of respondents who believe that the exchange rate will depreciate against the euro. One would again expect a higher share among those who hold foreign cash (right column) than among those who hold only assets denominated in local currency (left column). This holds true only for the Czech Republic and Hungary, but the difference is again negligible. In all other cases, the sign of the difference is opposite to our expectations: The share of respondents who believe the exchange rate will depreciate is higher among those who only have assets in local currency than among those who also have foreign currency assets.

Table 6

Inflation Expectations and Currency Substitution

	Percentage of respondents who don't hold foreign cash as a store of value	Percentage of respondents who hold foreign cash as a store of value
Croatia	43	31
Czech Republic	26	31
Hungary	30	32
Slovakia	31	30
Slovenia	45	43

Source: OeNB survey.

Note: The figures refer to the percentage of respondents who expect inflation rates to increase. The data refer to a subset of respondents who only have savings accounts in local currency, broken down into two groups – those who don't keep foreign cash at home and those who do. In Croatia, for instance, 43% of the group that does not keep foreign cash expect inflation rates will rise, while 57% expect inflation to remain stable or decrease. Aggregated data are from the second wave in 2004 to the last wave in 2005.

⁴² We repeated the tests with several other subsets, but the results remained the same qualitatively.

Table 7

Exchange Rate Expectations and Currency Substitution

	Percentage of respondents who don't hold foreign cash as a store of value	Percentage of respondents who hold foreign cash as a store of value
Croatia	47	48
Czech Republic	21	32
Hungary	61	55
Slovakia	25	17
Slovenia	58	54

Source: OeNB survey.

Note: The figures refer to the percentage of respondents who expect the exchange rate to depreciate. The data refer to a subset of respondents who only have savings accounts in local currency, broken down into two groups – those who don't keep foreign cash at home (left column) and those who do (right column). In Croatia, for instance, 47% of the group without foreign cash balances expect the local currency to depreciate relative to the euro, while the remaining 53% of this group expect the exchange rate to remain stable or appreciate. Aggregated data are from the second wave in 2004 to the last wave in 2005.

These results are somewhat surprising but may be explained by the caveats mentioned above. A more sophisticated regression-based analysis would possibly help to shed more light on this issue. Still, our findings indicate that in times of moderate inflation and exchange rate movements, the two variables do not influence the degree of currency substitution significantly. Therefore, the continued use of foreign currencies is more likely attributable to past developments (e.g. surging inflation, banking crises) than to expected inflation and exchange rate developments.

5 Conclusions

Although euroization is an important phenomenon in CEECs, still very little is known about who holds how much euro and for what purposes. To some extent, this is explainable by the fact that economic analyses mostly have to rely on macroeconomic data which, given the high level of aggregation, conceal important aspects. In this paper, we choose a different approach. In particular, we employ unique survey data on various aspects of foreign currency holdings in five CEECs. This allows us to study the various motives behind (cash) euroization as well as the connection between expectations about certain key economic variables and the degree of euroization. The analysis relies predominantly on surveys commissioned by the OeNB that were conducted in Croatia, the Czech Republic, Hungary, Slovakia and Slovenia.

Our results show that a substantial share of the population in the respective countries holds euro cash. In the second half of 2006, this applied to about every second (adult) Slovenian, every fourth to every third Croat, Czech and Slovak, and, markedly lower, to every fourteenth Hungarian. A closer look reveals that significant amounts of euro cash are held in only two countries, namely Slovenia and Croatia. Both are former Yugoslav republics in which currency substitution (mostly by German mark) had been a widespread phenomenon in the wake of economic turbulence and political turmoil. In the other three countries covered by the OeNB survey – Hungary, the Czech Republic and Slovakia – foreign cash holdings are relatively small in value, as they are mainly motivated by regular shopping tours to or vacations in the euro area.

Will the degree of euroization increase as the date of euro adoption approaches and economic ties become closer (e.g. increased trade and tourism)? Or will it decrease in line with the countries' continued economic stabilization? We find some evidence that the degree of cash euroization is in fact associated with distrust in the banking system: People who perceive deposits as unsafe are more likely to hold euro than people who don't. In contrast, we found no clear influence of inflation and exchange rate expectations on euro cash holdings. This could possibly reflect the fact that, compared with the 1990s, both exchange rate and inflation movements have been rather moderate over the last few years. The impact of moderate developments on people's behavior is much weaker than that of large changes. Therefore, it seems that past events ("experience") play a bigger role in explaining why people continue to hold substantial balances in foreign cash than inflation or exchange rate expectations.

In addition, we find that the rise in tourism has increased the transaction demand for euro cash (although most of these balances are low in value). More importantly, our evidence also suggests that the expected timing of euro introduction affects cash holdings: Those who expect the euro will be adopted earlier are more likely to hold euro cash as a store of value than those who think it will be introduced at a later point in time or never at all.

Given this evidence, we can now turn to the question posed in the title of this paper: Are euro cash holdings driven by experience or anticipation? All in all, our results support the notion that euroization is driven both by experience and anticipation. Furthermore, the development observed over the last years – increases in the demand for euro since its introduction in 2002 – suggests that the increase in demand due to anticipation is stronger than the decrease in demand due to economic stabilization.

Finally, our results also allow for an assessment of how euro circulation has evolved in the run-up to the euro. In Slovenia, which introduced the euro in 2007, the share of the population holding euro cash went up from 42% in spring 2002 to about 50% at end-2004. After that, it remained broadly stable before dropping to 41% in October/November 2006. We observed that also the amounts of euro cash held by Slovenians declined in the second half of 2006. At the same time, the share of those respondents who made domestic payments in euro increased substantially. Thus, the case of Slovenia suggests that both euro amounts in circulation and the euro's use in domestic payments increase in the years before the introduction. Euro cash balances were reduced again only shortly before the actual introduction.

As the empirical analysis in this paper is based on descriptive statistics, it would be interesting to test whether a multivariate analysis confirms our conclusions and findings. As this issue affects both the effectiveness of monetary policy and cash logistics, we consider this a worthwhile undertaking.

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Appendix

Table A1. Description of surveys

EC surveys	Country coverage: 10 new Member States. Sample size: approximately 1,000 per country. Each national sample is representative of the population aged 15+.		
	Flash Eurobarometer 183 http://ec.europa.eu/public_opinion/flash/fl183_en.pdf	March/April 2006	“Telephone interviews were conducted in each country with the exception of the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland and Slovakia where both telephone and face-to-face interviews were conducted.”
	Flash Eurobarometer 175b http://ec.europa.eu/public_opinion/flash/fl_175b_en.pdf	September 2005	“Telephone interviews were conducted in each country with the exception of the Czech Republic, Latvia, Lithuania, Poland and Slovakia where face-to-face interviews were conducted due to low telephone penetration rates. In Estonia, both telephone and face-to-face interviews were conducted.”
	Flash Eurobarometer 165b http://ec.europa.eu/public_opinion/flash/flash165b_en.pdf	September 2004	face-to-face interviews
OeNB surveys	Country coverage: Croatia, Czech Republic, Hungary, Slovakia, Slovenia. Sample size: approximately 1,000 per country. Each national sample is representative of the population aged 15+.		
	Biannual waves starting from 2004	April/May October/November	face-to-face interviews