

## SURVEY RESULTS ABOUT FOREIGN CURRENCY HOLDINGS IN FIVE CENTRAL AND EASTERN EUROPEAN COUNTRIES

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### Introduction

Substantial amounts of currencies are circulating outside the countries in which they were originally issued. Estimates for the US dollar and the Deutsche mark range from one third to about two thirds of total currency in circulation (Seitz, 1995; Doyle, 2000). Large amounts of these currencies are being held in South America and Central and Eastern Europe. Particularly in the latter part of the world, the Deutsche mark is often co-circulating with the national currencies. However, little is known about the exact location or the extent of currency substitution in those countries. This note contributes to closing this gap by presenting evidence from a sequence of surveys on foreign currency holdings in five Central and Eastern European Countries.

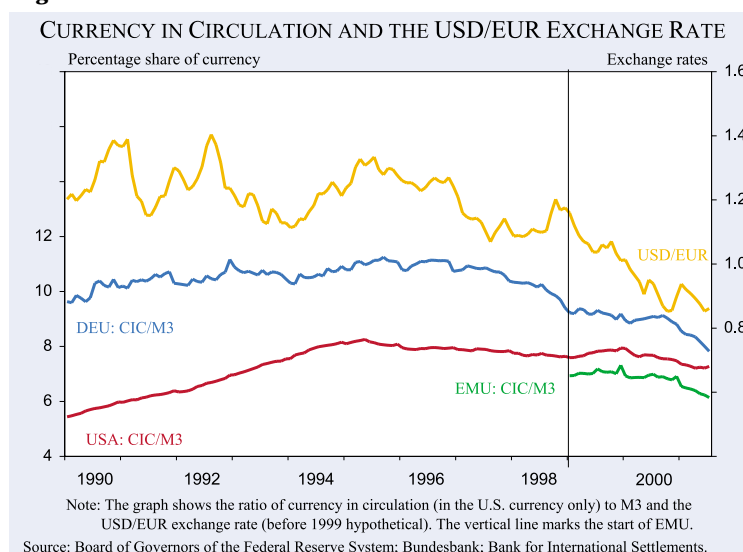
Knowledge of the extent of the usage of foreign currency is important for various reasons:

First, substantial amounts of co-circulating foreign currencies add uncertainty to the outcome of monetary policy as, for example, the money supply becomes endogenous and difficult to predict, etc. For the domestic economy, changes in money demand might be misinterpreted if the foreign demand component is wrongly estimated. Second,

estimates about the size of foreign currency holdings are important for assessing the likely demand for euros and thus for ensuring a smooth changeover in the first months of 2002. Third, an estimate of the size of currency circulating abroad is of interest from both a foreign and domestic fiscal policy perspective: from a foreign perspective, because the extent of unofficial dollarization or markization is likely to be related to the size of the foreign black economy and thus to the degree of tax evasion (Feige et al, 2000); from a domestic perspective, because concise estimates of the amount of currency circulating abroad facilitate an assessment of the size of the domestic black economy. Finally, it has been claimed that foreign cash demand has important repercussions for the exchange rate and – thus indirectly – for the monetary policy of the ECB and the Fed. Recently, Sinn and Westermann (2001) have related the weakness of the euro vis-à-vis the dollar to an alleged flight out of the Deutsche mark into the US dollar caused by uncertainties in relation to the introduction of the euro as a physical currency.

Figure 1 shows the ratios of currency in circulation to M3 for the United States, Germany and the European Monetary Union (EMU) as well as the USD/EUR exchange rate. As is clearly visible, since 1997 the DEM's currency-in-circulation ratio has decreased from about eleven percent to less than eight percent, with the decline accelerating during the last year. Due to the large DEM share in the euro money stock, this observation directly translates into the eurozone cash-in-circulation to

Figure 1



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M3 ratio, which has also been declining.<sup>1</sup> In contrast, the ratio of USD in circulation to M3 has remained roughly constant. As the USD/EUR exchange rate has also been trending downward since the beginning of EMU in 1999 one may be tempted to conclude that the correlation can be explained by a causal relationship between these two variables.<sup>2</sup> However, since the evidence on the decline in the demand for Deutsche mark that is presented by Sinn and Westermann is only very indirect it seems important to confront this argument with new data.

In this context, the first relevant question is whether the obvious decline in currency in circulation for the Deutsche mark is largely due to foreign or domestic demand (e.g. the liquidation of domestic hoardings). Should it be established that the foreign demand for marks is a substantial source of the decline then the second important question in connection with the exchange rate argument is whether Deutsche marks have been substituted for US dollars to a significant extent. The survey results presented in this study provide evidence that helps to shed light on both questions.

Conceptually, there are various methods – broadly categorized into indirect and direct methods – to estimate the amount of foreign currency holdings. Indirect methods like the “denomination displacement approach” or the “seasonal method” (Porter, 1996) rely on the analysis of domestic variables to project foreign demand. In contrast, direct methods rely on statistics “directly related” to the foreign currency demand as represented by, for example, customs reports or direct population surveys. Each approach has its advantages and disadvantages, and in general the estimates vary considerably across methods. In this note the results are based on population surveys.

### Data Description

In 1997 the Oesterreichische Nationalbank commissioned Gallup to conduct regular representative surveys in Croatia, Hungary, the Republic of Slovenia, the Czech Republic and the Slovak

<sup>1</sup> The decrease in the currency in circulation is not only restricted to Germany. For example, M0 has also decreased lately in the Netherlands. In contrast, the amount of lira and schilling in circulation has increased (for the schilling only slightly).

Republic. For each survey and in each country about 1,000 persons above the age of 14 years are interviewed in April/May and in October/November. The main focus of the surveys is to establish estimates foreign currency cash holdings in the respective countries. In particular, the respondents are questioned about their holdings of Austrian schillings (ATS), Deutsche marks (DEM), US dollars (USD), Swiss francs (CHF) and “other” currencies. Additionally, the surveys cover respondents’ plans for the future as well as their motives for holding foreign currencies. Furthermore, the surveys contain questions about travel habits, about where people tend to exchange foreign currency, where they plan to exchange their holdings into euros, etc.

It is well known, that survey results always need to be treated with caution. In particular this holds for those questions relating to individuals’ wealth where it is likely that respondents will not always reveal the truth. Furthermore, the surveys do not include commercial cash holdings (e.g. tourism) and certainly cannot measure criminal money. Therefore, it is likely that the estimated figures understate the true amount of currency circulating abroad. Nevertheless, if conducted repeatedly, the surveys provide valuable information because they allow to assess changes in the behavior of agents over time.<sup>3</sup>

### Results

The percentages of private persons that hold foreign currency are summarized in Figure 2. The graph shows both the percentage of respondents holding some kind of foreign currency (red line) and also a breakdown by currency (DEM, ATS, USD, CHF and “other” currencies). As can be seen, in May 2001 the share of respondents that held some kind of foreign cash was high (> 50 percent) in Slovenia and Slovakia, slightly lower (> 30 percent) in the Czech Republic, about 20 per-

<sup>2</sup> There has been much debate about the relevance of this argument and many observers doubt whether the demand for cash can exert significant influence on exchange rates, in particular in light of the huge daily turnover in the foreign exchange market. For example, see the statements made by Issing (“Germany: ECB’s Issing Downplays Cash/Capital Flow Effects on Euro FX”, Market News Service, 30.05.2001) or by Welteke (Germany: ECB’s Welteke – ECB Has Gained Credibility by Keeping Inflation Low”, Market News Service, 04.05.2001). For an alternative view, see Schaller (2001).

<sup>3</sup> Under the assumption that the “method bias” is constant over time.

Figure 2

FOREIGN CURRENCY HOLDINGS IN PERCENT OF RESPONDENTS



Source: Own calculations.

cent in Croatia and less than 10 percent in Hungary. Over time, this share has strongly declined in Croatia, Hungary, and lately also in the Czech Republic. In contrast, the share in Slovakia and Slovenia has shown little variation.

Split up across currencies, in May 2001 the mark share was the highest in all countries except Slovakia. The Austrian schilling was the second most important currency in all countries except

Croatia. In general, the holdings of foreign currency tend to be relatively dispersed across two or more currencies in all countries but Croatia, where the DEM has a predominant role leaving only marginal importance for the other currencies. Nevertheless, the results also show that the share of respondents holding DEM is higher in the Czech Republic and Slovenia than in Croatia. This result clearly reflects the fact that Croatians tend to use the DEM as a medium of exchange only for high and not for low

value transactions.<sup>4</sup> Typically, the USD is the third most important foreign currency. With percentages ranging from zero to five percent (more often at the lower end of this range), the CHF is only of little importance. Only the results for the Czech Republic show a slightly higher share of CHF holders, varying between five and seven percent. Because the number of respondents that hold CHF is so low, the results in relation to the CHF amounts are likely to be quite imprecise. Therefore, the CHF will be omitted from further analysis. Interestingly, “other” currencies which are summarized and questioned in one category play a substantial role in Slovakia (> 20 percent), in Slovenia (about 20 percent) and to some extent in the Czech Republic (between 10 and 20 percent). In Slovakia, other currencies play a more important role than the DEM, the ATS and the USD.<sup>5</sup>

The development of the median holdings of ATS, DEM and USD is depicted in Figure 3.<sup>6</sup> It is quite likely that the survey answers – and in particular those in relation to the amounts of foreign currency – display seasonality as well as random fluctuations over time. In order to prevent that outliers dominate subsequent analyses, two measures were taken: First, all observations that are two standard deviations away from the sample mean are eliminated. And second, the figures are averaged over time. Since we are interested in a comparison of the currency holdings before and after the start of EMU, the averages are taken over the period from May 1997 to November 1998 (blue bars) and from May 1999 to May 2001 (red bars). This procedure aggregates the effects of seasonality and limits the influence of outliers and thus yields a more accurate picture than the one obtained from comparing single surveys.

Since the start of EMU (Figure 3), the average of the median amounts of schillings held abroad have been in the range from ATS 440 (Slovakia) to 910 (Croatia). Median mark holdings are found to have been in the range from DEM 460 to 520 for Croatia and Slovenia and around DEM 170 for the remaining countries. Median dollar holdings have been

between USD 200 and 340 for the Czech Republic and Croatia and between USD 120 and 140 for Hungary, Slovenia and Slovakia. Interestingly, the Croatians hold the highest median amounts of all currencies and have even increased their holdings in each category. For Hungary, by contrast, the median amounts of all foreign currencies have decreased. In the Czech Republic the median USD and ATS holdings have increased, while DEM amounts have declined. In Slovakia the ATS amounts have risen while the other currencies have remained constant. In Slovenia, all median amounts have remained roughly unchanged.

Figures 2 and 3 taken together show that both the share of respondents that hold foreign currencies as well as the respective median amounts have varied over time. For example, in comparison to the first four waves, fewer Croatians held more DEM after the start of EMU. To get a measure of the absolute (net) amount of foreign currency that is held abroad – the number that is relevant from a monetary policy perspective – the weighted mean amount of foreign currency is calculated. This is done by weighting the class means of the categorized amounts with the percentage share of respondents that answered that their amount of foreign currency lies in the respective range.<sup>7</sup> Then, multiplying the resulting per capita average holdings by total population (older than 14 years) yields an estimate of the absolute amount of foreign currency. Once again, it should be mentioned that the resulting numbers yield just a crude picture – nevertheless, we consider changes over time as useful for projecting changes in the overall demand for the currencies analyzed.

The results are summarized in Table 1. The calculations yield that, since May 1999, on average about ATS 7.9 billion, DEM 4.1 billion and USD 1.5 billion have been held in the respective countries. These figures correspond to a share of currency in circulation of about 5.3 percent for the ATS, 1.7 percent for the DEM and 0.3 percent for the USD.<sup>8</sup> Furthermore, the results show that the highest amounts of ATS, DEM and USD among those five countries are held

4 According to Feige et al. (2000), in Croatia only large transactions are effected in DEM whereas common purchases are quoted and conducted in kuna. If small value transactions were also carried out in DEM, the share of persons holding DEM would have to be much higher.

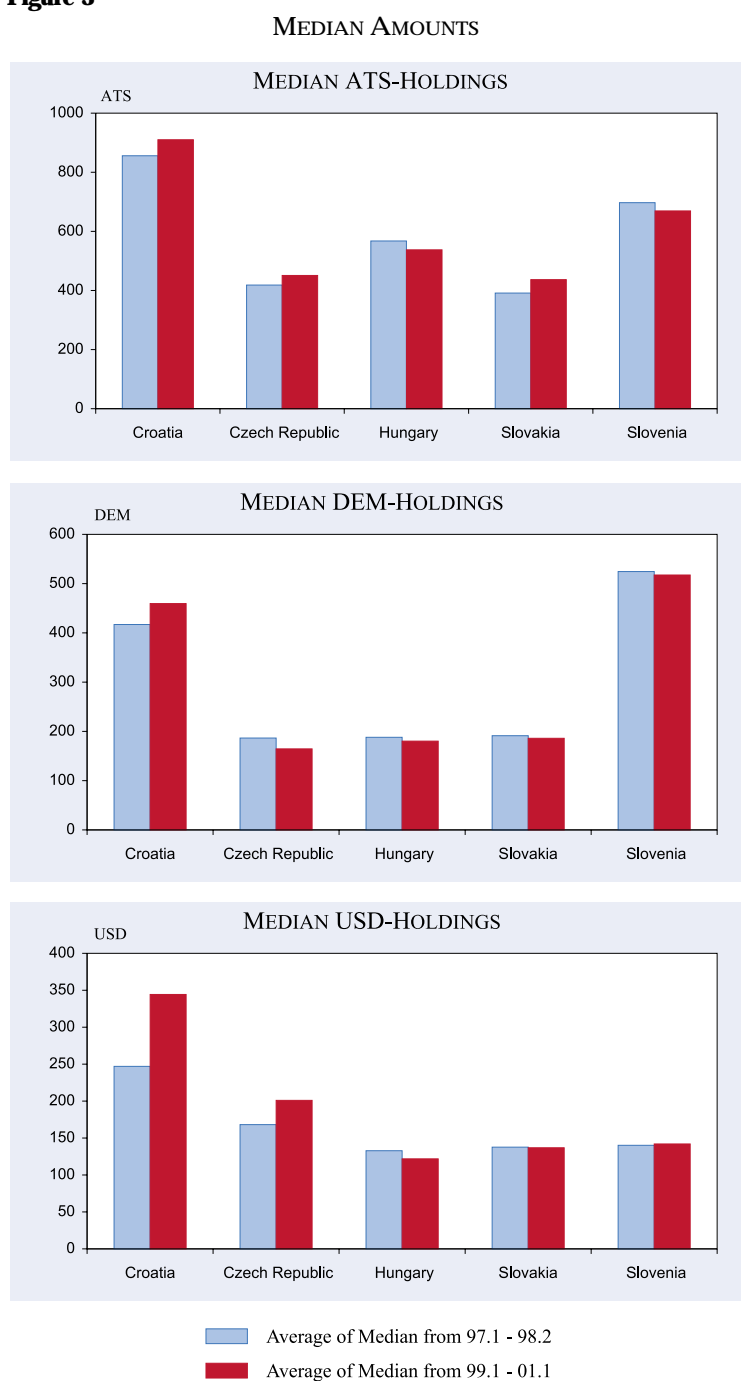
5 Supposedly, this result is due to the holdings of Czech koruna and Hungarian forint.

6 Typically, the majority of respondents do not hold foreign currencies. Therefore, only respondents actually holding foreign currency are included in the calculation of the median.

7 The survey does not ask about the precise amount but rather about categorized amounts (< 100, < 500, etc.).

8 There are not many studies which provide comparable estimates. For Croatia, one such study has been conducted by Feige et al. (2000), who use an indirect method to project the extent of currency substitution in Croatia. Feige et al.'s estimates for the weighted per capita mean in Croatia are larger than ours by a factor of seven to eight. Admittedly, this difference is large. However, Feige et al. (2000) classify their estimates as »unusually high.« So, while the survey results might suffer from a downward bias, Feige et al.'s estimates might overstate the true figure.

Figure 3



Note: The graph shows the average of the median amounts. Only respondents actually holding foreign currency are included in the calculation of the median. The checkered bars show the average median for the four biannual surveys from 1997 (Nov.) to 1998 (Nov.); the solid bars the average median for the five biannual surveys from 1999 (May) to 2001 (May).

Source: OeNB.

in the Czech Republic, followed by Slovakia for the ATS and the USD and by Croatia for the DEM. As shown in Table 1, from Nov. 1997–Nov. 1998 to May 1999–May 2001 the average share of ATS has increased from 4.1 percent to 5.3 percent. This development can be largely traced to a substantial increase in the Czech Republic, whereas the average

ATS holdings in the other countries have declined slightly. The DEM holdings have decreased in each country, with the strongest decline in Croatia. Also, in the Czech Republic and in Hungary, the DEM holdings have declined quite substantially. Expressed as a share of total DEM in circulation, the holdings have declined from 2 to about 1.7 percent (a change of approximately minus 16 percent). In contrast, the size of the stock of USD has increased. This increase is driven more or less by the Czech Republic and, to a lesser extent, by Slovenia. In terms of currency in circulation, the share – which is very small anyway – decreased slightly to around 0.3 percent.

It might be argued that averaging over the last five waves masks and mitigates any recent downward trend for the DEM. In order to analyze the more recent development, the percentage change during the last year (from May 2000 until May 2001) in the absolute amounts of DEM and USD is summarized in Table 2. As shown, the sum of DEM in all five countries together has decreased by a remarkable 33 percent, in fact pointing to an accelerating downward trend in the foreign demand for DEM during the last year. However, decomposing this effect by country demonstrates that this result is largely driven by a substantial decline in the Czech Republic (minus 56 percent) and by Croatia (minus 25 percent).<sup>9</sup>

Interestingly, the USD holdings have declined by about the same extent as the DEM holdings.

<sup>9</sup> The decline of minus 56 percent seems very large and may be caused by an outlier. However, the decline was also substantial from November 1999 to November 2000 (minus 17 percent). Anticipating the discussion below, it should be mentioned that the change for the USD during the same period also was substantial (minus 20 percent).

**Table 1****Foreign Currency Holdings**

		Croatia	Czech Rep.	Hungary	Slovakia	Slovenia	Sum	% of CiC
ATS	97.1–98.2	368	2,709	776	1,128	786	5,768	4.06
	99.1–01.1	317	5,058	744	1,104	647	7,807	5.25
DEM	97.1–98.2	1,325	2,027	374	453	700	4,901	2.01
	99.1–01.1	914	1,828	185	464	606	4,081	1.69
USD	97.1–98.2	143	737	87	287	31	1,467	0.35
	99.1–01.1	124	974	81	269	68	1,516	0.30

Note: Numbers represent the averages over the respective period and are in millions. % of CiC= percentage of currency in circulation.

Source: Own calculation.

Additionally, the change is also dominated by the Czech Republic with an individual decline of 56 percent. However, in contrast to the DEM holdings, the USD holdings increased by 16 percent in Croatia. Apart from Slovakia, the USD holdings also increased in the other countries.

Concerning the question about the existence of, and if so, about the extent of substitution between the DEM and the USD, the results do not allow to draw a clear conclusion. Overall, the comparison of the averages from 1997 until 1998 and from 1999 until 2001 unquestionably show that the demand for DEM has decreased both absolutely and expressed as a share of currency in circulation. In contrast, the absolute amounts of USD holdings have increased over the same period (but not to the same extent). This development points to the existence of some degree of substitution of DEM into USD. However, the development over a more recent period – from May 2000 until May 2001 – unveils that foreign demand has declined not only for the DEM but also for USD. In contrast to the longer-term perspective, this does not point to a

substitution. Bringing these two results together shows that there is evidence of the presence of substitution from 1999 to the beginning of 2000 but not thereafter.

The survey also looks into the motives of respondents for holding the respective foreign currencies.<sup>10</sup> Basically, the motive “shopping in my country” is of minor significance in all countries with one exception: in Croatia about 10 percent answer that the DEM and USD are held for domestic transactions. In turn, about 70 percent of the respondents answer that the DEM and USD holdings in Croatia have a store-of-value function.<sup>11</sup> For the remaining countries, the motives can be crudely summarized as follows: The ATS mainly serves as a medium of exchange for foreign transactions (holidays, shopping abroad). The USD is predominantly used as a store of value (except for Hungary where the motive “spending abroad” dominates). Finally, depending on the country, the DEM has an intermediary role as its holdings are motivated both by its store-of-value function and by its use as a transaction currency for spending abroad. For the countries in close proximity to Germany, like the Czech Republic, the transaction motive dominates. In contrast, in Slovenia and Croatia, the store-of-value function is more important.

As mentioned, the surveys also contain questions about future intentions. In particular, the answer to the question about planned conversions of schilling and mark should allow a rough assess-

**Table 2****Recent Developments in DEM and USD holdings**  
(Percentage Change from May 2000 to May 2001)

	DEM	USD
Croatia	- 25	16
Czech Republic	- 56	- 56
Hungary	- 8	135
Slovakia	- 7	- 5
Slovenia	3	61
Sum	- 33	- 32

Note: Numbers represent the percentage changes from May 2000 to May 2001 of foreign currency holdings in the respective country. Sum refers to the percentage change of overall DEM or USD holdings in all five countries together.

Source: Own calculations.

10 The exact question is: “For which reason do you keep this foreign cash mainly?” Three answers are possible: a) “shopping in my country”, b) „spending abroad (holidays, shopping, etc.) and c) “a general reserve (emergency secure value of my savings, etc.)”. See Stix (2001) for more detailed results.

11 Since large value transactions in DEM, for example the purchase of an appartement, take place only infrequently, it was expected that respondents in Croatia motivate their DEM holdings with the store of value function.

**Table 3**  
**Plans for conversion of ATS and DEM holdings into Euro**

		Euro	Other (USD, CHF, etc.)
General	May 2000	58	42
	May 2001	58	42
USD-holders	May 2000	47	53
	May 2001	44	56
DEM-holders	May 2000	55	45
	May 2001	59	41

Note: Numbers in percent of the respondents who know in which currency they will exchange their foreign currency holdings. USD- and DEM-holders refers to those respondents that currently possess USD and DEM, respectively. E.g.: Among those who held DEM in May 2001 and knew already about their conversion plans, 59% answered that they will convert their ATS and DEM holdings into Euro.

Source: Own calculation.

ment of the confidence in the euro.<sup>12</sup> In general, it turns out that in May 2001 the majority still did not know (about 58 percent). The answers of those that knew already are summarized in Table 3: about 58 percent planned to exchange their ATS and DEM holdings into euros, whereas 42 percent planned to convert them into “other currencies”, including USD and CHF. These figures have not changed from May 2000 to May 2001. Among current holders of USD, the majority planned to convert their ATS and DEM holdings into “other” (56 percent) and this number (insignificantly) increased during the last year. In contrast, among the DEM owners 59 percent opted to exchange their ATS and DEM stocks into euros – a significant increase from 55 percent in May 2000.<sup>13</sup> Even then, however, 41 percent of the DEM holders still did not plan to accept the conversion of Deutsche marks and schilling into euros, but rather planned to go into other currencies.

### Implications and Conclusion

Despite the care one needs to apply when working with survey data, we think that the results allow several conclusions:

First, the results about the total sum of foreign currency that is circulating in the countries included in the surveys undoubtedly show that the *foreign demand for DEM has declined*.<sup>14</sup> In contrast, the demand for ATS and USD has increased. Comparing the pre- with the post-EMU results

suggests that the decline in the average stock of DEM is about 15 percent. Furthermore, recent data show that this trend has been accelerating over the last year.<sup>15</sup> If the results obtained for these particular five countries were representative for overall DEM demand in Central and Eastern Europe, then this finding would imply that the decline in overall DEM in circulation as discussed in the introduction could largely be explained by a decrease in the foreign demand

component and not by a decrease in domestic demand, as the following crude calculation shows: If the estimates that about one third of DEM is located abroad are correct (Seitz, 1995), then a decline of 15 percent in the foreign demand for DEM translates into a decrease in overall German M0 of about 5 percent. In fact, this figure is close to the actual decline in German M0 from the second half of 1998 until the first six months in 2001 (about minus 3 to 5 percent).<sup>16</sup>

Second, while there was some evidence of a substitution of USD for DEM until the end of the year 2000, it is remarkable that recently the demand for both DEM and the USD has declined, leaving room for the interpretation that, from the end of last year, the relevant substitution did not occur between DEM and USD but between domestic and foreign currency (or foreign currency bank accounts). Indeed, there are many arguments in favor of this interpretation: The normalization after the war years in Croatia, increased political and financial stability, more confidence in the banking system, lower inflation rates in many Central and Eastern European countries would all explain such a development. For example, in Hungary, where the stock of all foreign currencies

14 This also corresponds to the view expressed by Bundesbank President Welteke who noted that the recent decline of German cash in circulation could be related to the repatriation of the large foreign cash holdings of deutschemarks (“Germany: ECB’s Welteke – ECB Has Gained Credibility by Keeping Inflation Low”, Market News Service, 04.05.2001). At the same time, President Welteke also noted that this return has been too small to have any significant impact on the euro exchange rate.

15 Interestingly, the surveys capture the recent acceleration in the decline in German M0 as shown in Figure 1.

16 Of course, this is only a very rough calculation which neglects any trends in within-EMU demand for DEM.

For example, it could be the case that the recent growth in Lire-circulation is caused by Italians who now exchange their holdings of DEM into Lire.

12 The exact question is: “In which currency do you plan to exchange your amounts of Austrian schilling and Deutsche mark?”

13 Those that hold DEM are much more relevant, in a quantitative sense, than those that hold USD (compare with Figure 1).

has declined, the banking system is to a large extent controlled by foreign banks, signaling financial stability and giving Hungarians the possibility to open foreign currency accounts. As foreign currency accounts earn interest, it is difficult to see why someone should hold substantial amounts of foreign cash – apart from criminal reasons. In our view, the decreasing shares of those that hold foreign currencies (Figure 1) in Croatia, the Czech Republic and Hungary provide support for this argument.

And third, the results about the planned conversion of foreign currency holdings show that in May 2001 a substantial proportion of people that held DEM (41%) did not plan to convert their DEM and ATS holdings into euros (Table 3). Even though this percentage has decreased from May 2000 to May 2001, this finding could be caused by some lack of information and uncertainties in relation to the euro changeover, as claimed by Sinn and Westermann (2001). However, as the information campaigns in relation to the introduction of the euro as a physical currency intensify, we expect that common consent on the euro will rapidly increase.

What are the monetary policy implications of these results? For the European System of Central Banks, in general, the implications are only marginal in the sense that changes in the demand for DEM have limited consequences for the amount of euros in circulation. If one third of all DEM circulates abroad then this would correspond to about 12 percent of euros in circulation (May 2001). Therefore, a 15 or even 20 percent decrease in the overall share of DEM in circulation abroad – from about 2 to less than 1.7 percent (see Table 1) – translates into a decrease of only about 2.4 percent in the overall eurozone cash-in-circulation. For wider monetary aggregates (like M3), which are important from a monetary policy perspective, the implications are even smaller. Another potential consequence is a reduction of seignorage revenues due to a reduced demand for cash. However, a priori it is not clear that the seignorage revenues are lost to the United States. In case domestic currencies are getting more important, the development could also imply a process of normalization in which Central and Eastern European central banks are gaining back the seignorage they lost during the years of fading confidence in their currencies after the breakdown of the Iron Curtain.

Overall, one can argue that the level of, or changes in, the foreign demand for euro or DEM or ATS poses some challenges for the euro changeover from a logistical point of view. Furthermore, as the analysis of the answers concerning planned conversions into euro show, a majority of respondents have not yet made up their minds into which currency to exchange their current holdings, suggesting that the majority of DEM holders are in a wait-and-see position. Here, the ECB and the other national central banks are challenged to make sure that the information campaigns that are currently under way provide comprehensive and transparent information about the details of the euro changeover.

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