



Development of currency in circulation in Slovakia, a comparison with V4 countries and the euro area, and the banknote allocation key in the euro area

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The aim of this study is to identify the factors affecting growth in currency in circulation in Slovakia. Above all, it examines the relationship between cash circulation and the development of economic activity, while taking into account such factors as the use of payment cards in the economy as well as the effect of the monetary-policy environment on currency in circulation. Included in the analysis is a comparison of currency in circulation developments in Slovakia with those in the V4 countries (plus Slovenia) and the euro area, and of the degree of cash use in these economies. Considering that currency in circulation in the Slovak economy has been growing relatively sharply, especially in 2005 and 2006, the question arises whether Slovakia, after entering the euro area, will not have a volume of banknotes greater than that determined by Decision ECB 2001/15 (banknote allocation key). This point is addressed in the last part of the analysis.

CURRENCY IN CIRCULATION IN SLOVAKIA AND ITS DETERMINANTS

The year-on-year growth of currency in circulation in Slovakia has been characterized by relatively high volatility. The currency separation in 1993 was followed by a gradual restoration of the "usual" level of cash holdings. The develop-

ment of currency in circulation was also influenced by the transformation process in the economy. Moreover, cash circulation was affected by several one-off factors, including in particular the currency crises of 1997 and 1998, Y2K, as well as the refunding of protected deposits held with failed banks (in 2000–2001) and the redemption

Chart 1 Year-on-year growth in currency in circulation



Source: NBS.



of bonds issued by the National Property Fund (NMF) during the second wave of coupon privatization (2001).

CURRENCY IN CIRCULATION AND ECONOMIC ACTIVITY

In theory, the main purpose of currency in circulation is to provide for cash transactions within the economy. Its development should therefore reflect both economic activity and changes in the price level. The broadest indicator of economic activity is gross domestic product. In cur-

rent prices, this indicator includes information on price developments as well.

In terms of pace of growth, there is not at first glance a clear relationship between currency in circulation (annual average) and nominal GDP. In the second half of the 1990s, the year-on-year growth of currency in circulation slowed down; this corresponded to the declining growth in nominal GDP. Between 1998 and 2002, currency in circulation was to a large extent affected by the one-off factors stated above, and therefore the relationship between economic activity and cur-

Chart 2 Growth in currency in circulation and in nominal GDP

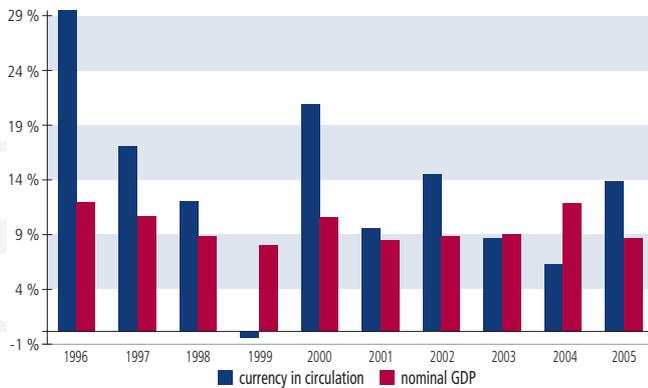


Chart 3 Growth in currency in circulation (current year) and in nominal GDP (lagged by one year)

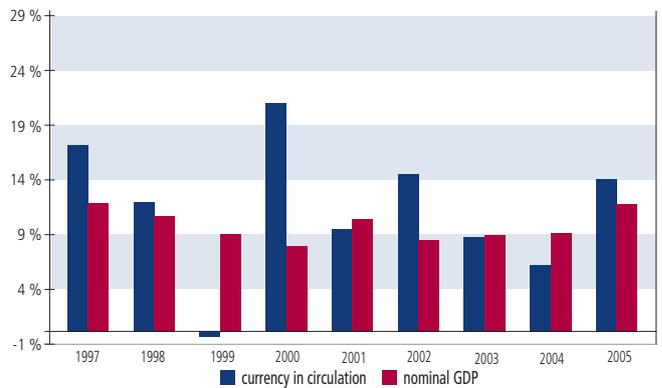


Chart 4 Year-on-year growth in currency in circulation and in nominal GDP

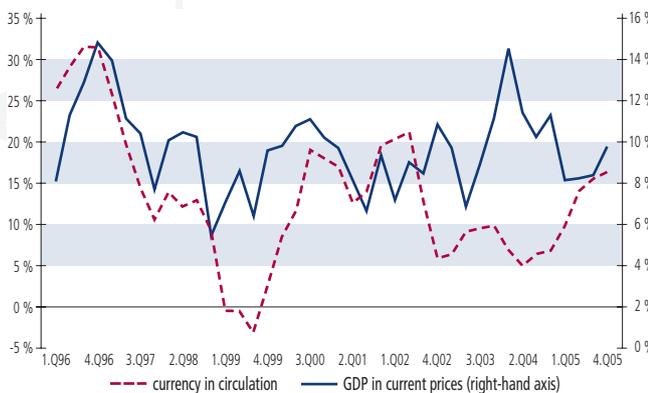


Chart 5 Year-on-year growth in currency in circulation and in nominal GDP lagged by four quarters

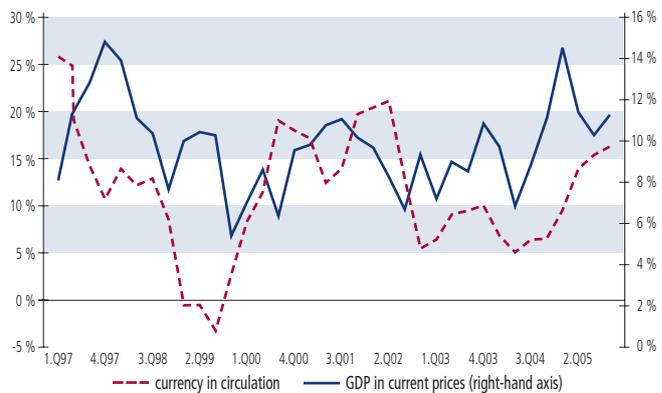


Chart 6 Year-on-year growth in currency in circulation, household final consumption and in retail sales

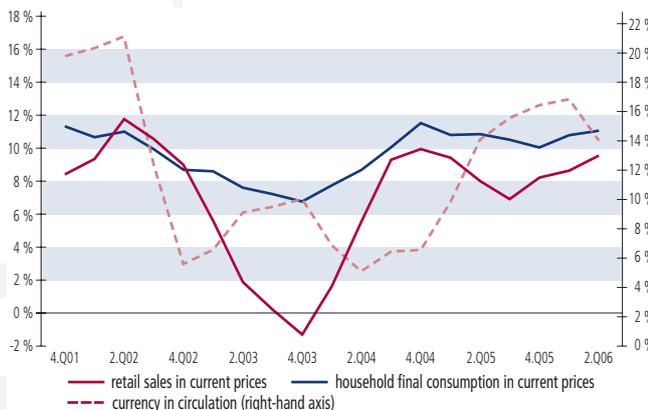
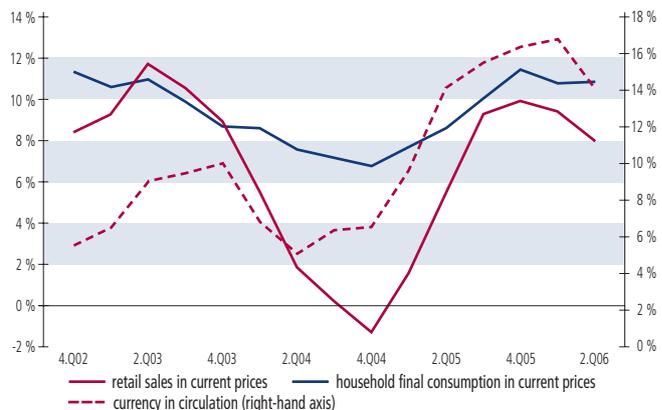


Chart 7 Year-on-year growth in currency in circulation, household final consumption and in retail sales lagged by four quarters



Sources: Statistical Office of the Slovak Republic (ŠÚ SR), NBS.



rency in circulation is not clear. In 2003 and 2004 the growth of currency in circulation was lower than the nominal growth in GDP. In contrast to this, the currency growth substantially outstripped that of GDP in 2005.

A somewhat stronger relationship between nominal GDP and currency in circulation may be observed if GDP growth is lagged by one year. This is particularly apparent in the years 2003 to 2005.

The lagged adjustment of currency in circulation growth to nominal GDP, as indicated by the annual data, might be observed in the quarterly figures as well. While up to 1998 the development of currency in circulation was more or less in line with nominal GDP growth, in the following years it was linked rather to nominal GDP lagged by 4 quarters.

While currency in circulation is used only for cash transactions, nominal GDP represents the development of economic activity in a broader sense and includes all transactions performed in the economy. In this regard, therefore, it may be preferable to choose another indicator as a measure of economic activity, one that corresponds more to the need for cash payment instruments. Since cash payments are made predominantly by the public, especially for consumption-related expenses, a more suitable indicator of economic activity would be the final consumption of households. An even narrower indicator related directly to retail market transactions is retail sales data. A look at the year-on-year growth developments in currency in circulation and in house-

hold final consumption (retail sales) proves that cash circulation is closely connected with these two indicators of economic activity. This relation becomes even more pronounced if final consumption and retail sales data are lagged by one year (four quarters).

PAYMENT CARDS, FEES FOR MAINTAINING CURRENT ACCOUNTS AND FOR ATM WITHDRAWALS, AND DEPOSIT INTEREST

Demand for cash could be affected also by such factors as the wider use of non-cash payments through payment cards, fees for maintaining current accounts, fees for ATM withdrawals, as well as the level of interest on deposits.

Unfortunately, insufficient data is restrictive to a more detailed analysis concerning the substitution of cash payments with non-cash payments by means of payment cards. More detailed data are, in general, available only for the first half of 2006.

Although there are significantly more POS terminals than ATM machines, a far greater number – and, more importantly, volume – of transactions are made through the ATM network. The average amount of ATM transactions is more than double the average amount of transactions carried out through POS terminals. This situation has persisted even though the number of POS terminals increased from 1996 to the first half of 2006 by more than 20,000 (by the end of the first half of 2006 there were 20,499 POS). Over the same period the number of ATM machines increased

Chart 8 Number of ATM machines and payment terminals as at 30 June 2006

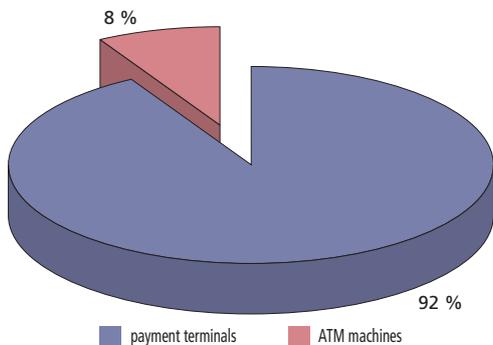


Chart 9 Structure of transactions by volume as at 30 June 2006

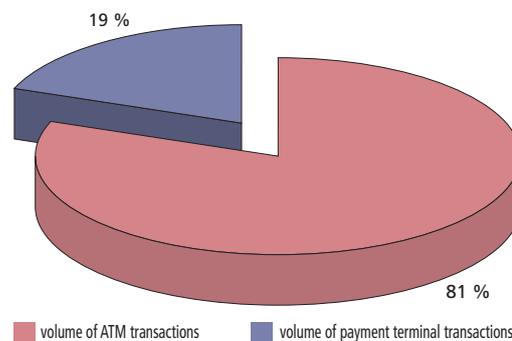


Chart 10 Structure of transactions by number as at 30 June 2006

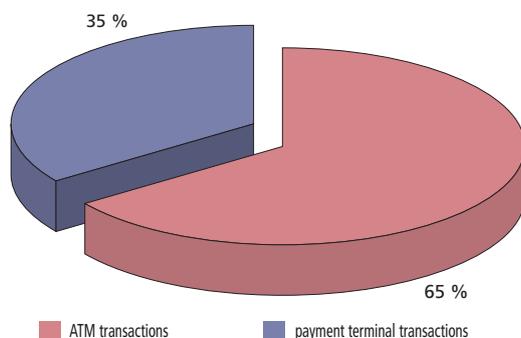
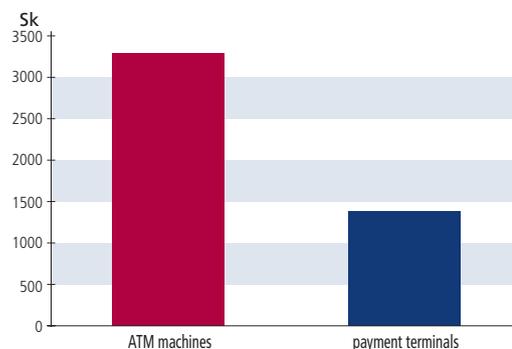


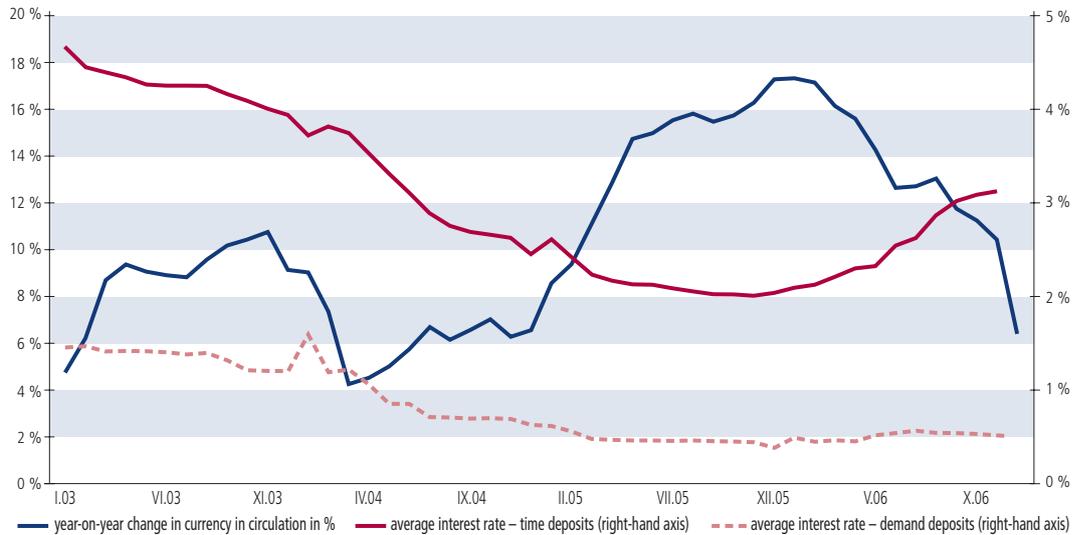
Chart 11 Average amount of a single transaction at ATM machines and at payment terminals



Source: Zdrúenie pre bankové karty Slovenskej republiky (Bank Cards Association of the Slovak Republic), www.zbk.sk.



Chart 12 Year-on-year currency in circulation growth and deposit interest

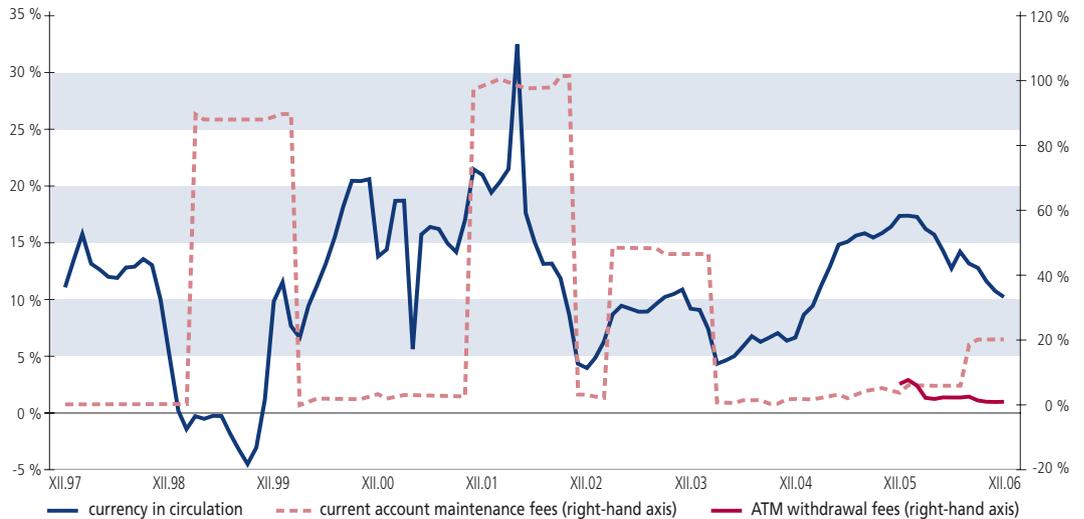


Source: NBS.

by just over 1,100 (for a total of 1,900 machines at the end of the first half of 2006). These data reflect the fact that alongside the sharp growth in the number of payment cards in the economy (by more than 3 million since 1996), economic agents are giving cash payments preference over non-cash payments by payment cards.

overall low level may have increased the preference of liquidity, in other words the preferring of cash over deposits. The rise in NBS key interest rates in 2006 could, through the increase in interest on customer deposits, have an opposite effect on currency in circulation in the near term. The rising demand for cash holdings could in

Chart 13 Year-on-year growth in currency in circulation and in current account maintenance fees



Sources: NBS and Statistical Office of the Slovak Republic (ŠÚ SR).

The greater preference for cash holdings may to a certain extent be related to the level of interest rates on deposit. With the low level of interest rates the opportunity costs (in terms of yields sacrificed) of cash holdings are decreasing. This makes it less motivating for economic agents to deposit their funds in bank accounts. By contrast, an increase in interest rates will make deposit products more attractive.

The development of year-on-year growth in currency in circulation may also be related, especially in recent years, to the monetary-policy environment. The reduction in interest rates and their

theory be related also to fees charged for maintaining current accounts or fees for ATM withdrawals. However, the following chart fails to suggest that an increase in current account fees would have a more substantial effect on currency in circulation growth. In 1998 and 1999 the slowdown in year-on-year growth in currency in circulation was not related to an increase in current account fees but rather to the 1998 currency crisis (the abandoning of the fixed exchange rate regime in October 1998). Data on the year-on-year increase in ATM withdrawal fees has been available since December 2005.



COMPARISON OF CURRENCY IN CIRCULATION DEVELOPMENTS IN SLOVAKIA WITH THOSE IN V4 COUNTRIES (PLUS SLOVENIA) AND IN THE EURO AREA

Slovakia's ratio of currency in circulation to GDP is among the highest in the V4, after the Czech Republic's. Its level is also higher than that recorded in the euro area, and during the period 2003–2005 this difference represented almost 2 percentage points relative to GDP. Hence, the Slovak and Czech economies report the highest preference for cash, not only within the V4 but

also in comparison with the euro area. At the same time, the ratio of currency in circulation to GDP has risen relatively sharply in Slovakia in recent years. Although this ratio increased in the other V4 countries from 2000 to 2005 as well, its sharper rise between 2003 and 2005 was recorded especially in Slovakia. Overall, for the period 1996 to 2005, the ratio of currency in circulation to GDP rose most sharply in the Czech Republic. The relatively substantial increase in this ratio reported in the euro area was largely related to the introduction of euro cash and its use as a means of payment also outside the euro area.

Chart 14 Ratio of currency in circulation to nominal GDP (average for periods)

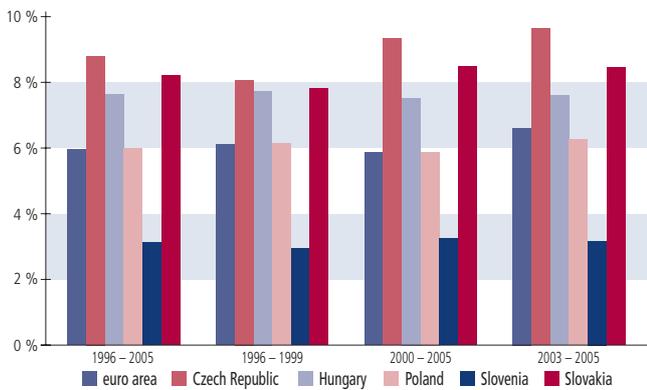


Chart 15 Change in the ratio of currency in circulation to nominal GDP

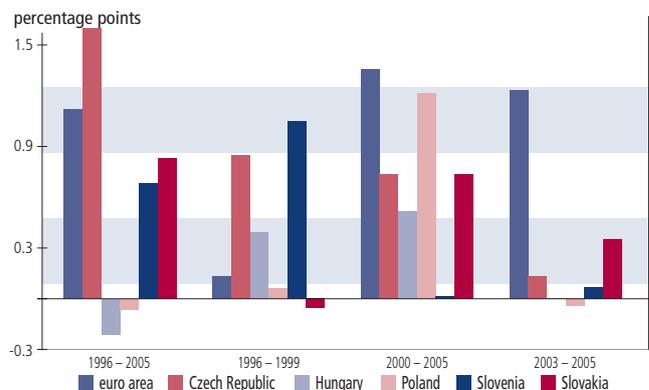


Chart 16 Average year-on-year increase in currency in circulation

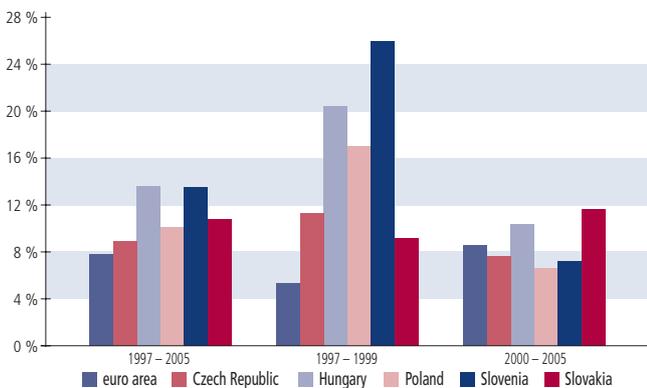
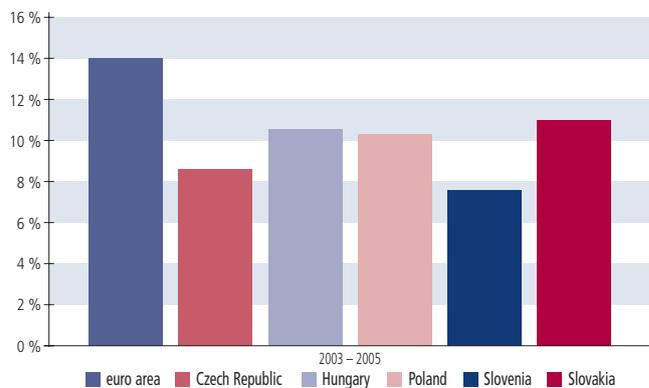


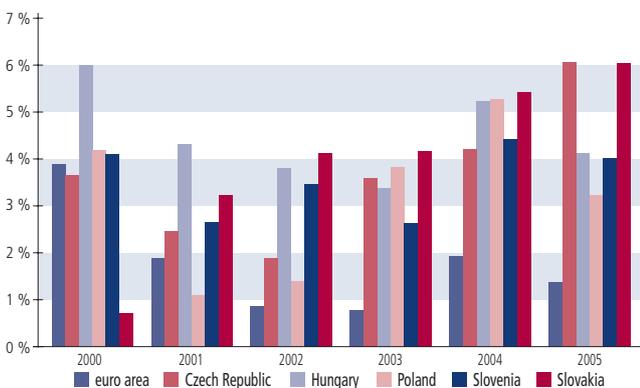
Chart 17 Average year-on-year growth in currency in circulation for the period 2003-2005



Sources: NCB, ECB.

Note: Data on currency in circulation for the euro area are available only from 1997.

Chart 18 Real GDP growth



Source: Eurostat.

Chart 19 Change in the GDP deflator

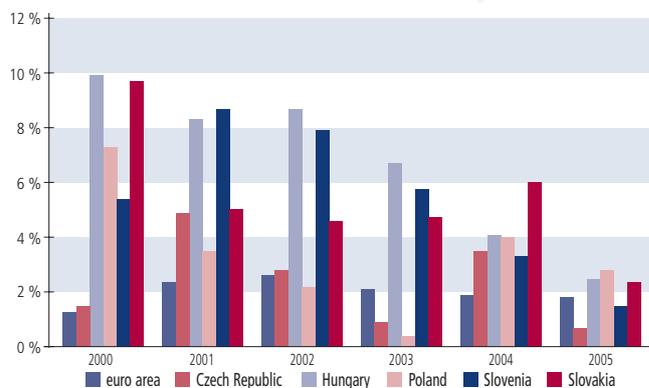
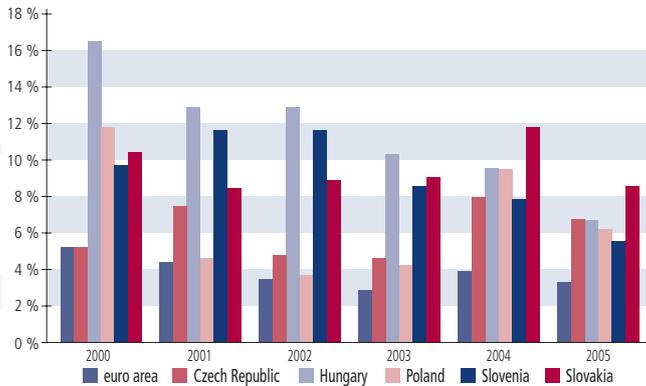




Chart 20 Nominal GDP growth in V4 countries and in the euro area



Source: Eurostat.

At the end of the 1990s Slovakia recorded the slowest growth in currency in circulation among the V4 countries, but in recent years Slovakia has moved into the first place. In 2000 and 2001, growth in Slovakia's currency in circulation was affected also by such factors as the refunding of protected bank deposits held with banks that had ceased to perform their activities, and the redemption of bonds issued by the National Property Fund (FNM). From 2003 to 2005, the relatively dynamic development of currency in circulation was on the one hand a result of relatively strong economic activity (in terms of real GDP growth) and, on the other hand, a result of relatively high inflation in 2003 and 2004. Nominal GDP growth was therefore recording the highest figures in the region, which was in turn reflected in cash holdings.

CURRENCY IN CIRCULATION IN SLOVAKIA AND THE BANKNOTE ALLOCATION KEY OF THE EURO AREA

The banknote allocation in the Eurosystem is tied to the key that assigns each national central bank (NCB) a certain share in the banknote issue of the euro area. If the banknotes issued by a NCB exceed its allocation under the key, the bank's liability towards the other members of the Eurosystem shall be raised by this amount. The

interest on this liability¹ will then affect the income of the individual NCBs.

It is therefore interesting to see how Slovakia would at present meet its share of the Eurosystem banknotes if it was a member of the euro area, or whether it is likely that following entry into the euro area, it will exceed the limit stipulated by the banknote allocation key.²

BANKNOTE ALLOCATION KEY

The allocation of euro banknotes to each NCB is laid down by Decision of the ECB 2001/15 of 6 December 2001 on the issue of euro banknotes. In accordance with this Decision, the ECB is assigned 8% of the total value of banknotes in circulation. For each of the central banks, a banknote allocation key is determined on the basis of the ECB's capital subscription key (capital key). Each NCB's share of the euro area banknotes corresponds to the value of the capital share adjusted by the banknotes issued by the ECB.

$$\text{Banknote allocation key} = \text{euro area members' capital share} \times 0.92$$

According to this formula, the share of the National Bank of Slovakia in euro area banknotes would be $0.7141 \times 0.92 = 0.65752\%$ of the total volume of issued euro banknotes.

Hypothetical shares of the V4 countries in the issue of euro banknotes (from 1 January 2004)

	Share in %
Národná banka Slovenska (National Bank of Slovakia)	0.65752
Česká národní banka (Czech National Bank)	1.34173
Narodowy Bank Polski (National Bank of Poland)	4.72696
Banka Slovenije (Bank of Slovenia)	0.30774
Magyar Nemzeti Bank (National Bank of Hungary)	1.27733

The currency in circulation in Slovakia relative to that in the euro area (after adding the other V4 countries plus Slovenia) came to around 0.60% in June 2006. The highest share of currency in circulation on that in the euro area was recorded in Poland (2.69%) and the lowest share was recorded in Slovenia (0.15%).

Slovakia would now, hypothetically, fulfil the banknote allocation key to around 85%. After the Czech Republic, which substantially exceeds this share, Slovakia and Hungary are the countries in this region with the most fulfilled share of the currency in circulation allocation.

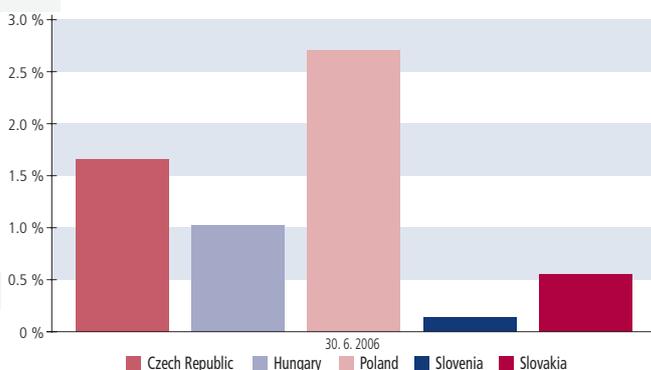
THE BANKNOTE ALLOCATION KEY AND ITS FULFILMENT FOLLOWING ENTRY INTO THE EURO AREA

Given that currency in circulation is now devel-

1 Interest is charged on a quarterly basis at the reference rate (marginal rate of the main refinancing operations of the Eurosystem).

2 Since the time series for the banknote issue volume is not available for the whole time horizon and selected countries, we approximate these time series by the issue volume of currency in circulation.

Chart 21 Currency in circulation of selected countries as a share of currency in circulation in the euro area

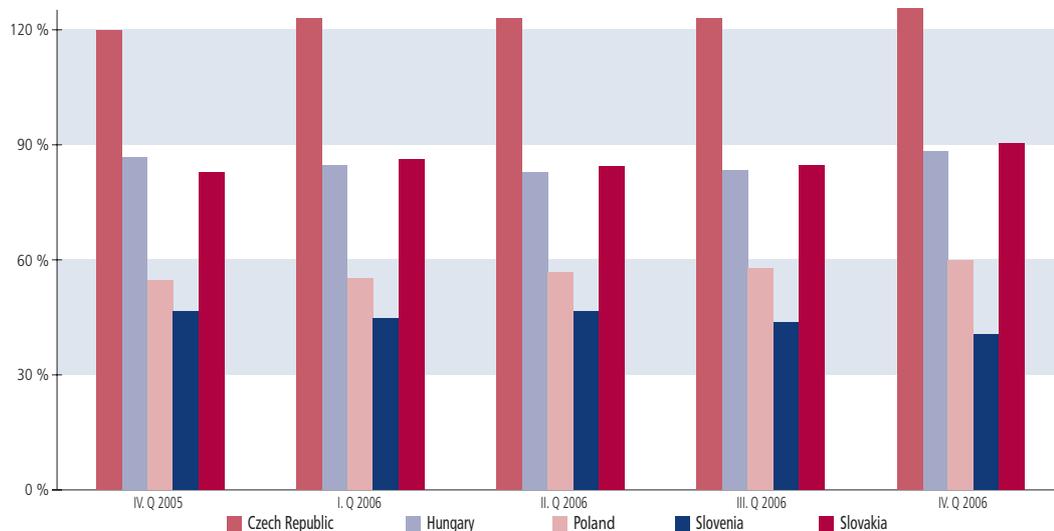


Sources: NCB, ECB.

Note: In order to calculate these shares, the currency in circulation of the individual countries was added to the volume of currency in circulation in the euro area.



Chart 22 Percentage fulfillment of the banknote allocation key (average for period)



Sources: NCB, ECB.

Note: In order to calculate these shares, the currency in circulation of the individual countries was added to the volume of currency in circulation in the euro area. In regard to the fourth quarter of 2006, the calculation of the quarterly average for the euro area was based on data only for October and November, on grounds of availability.

oping relatively dynamically, the question arises whether Slovakia would, after joining the euro area, exceed its share of banknotes laid down by the allocation key. This will, on the one hand, depend on the development of the NBS's share in the ECB's subscribed capital and will, on the other hand, be also contingent on the development of currency in circulation in Slovakia as a share of currency in circulation in the euro area.

According to the capital key, an NCB's share in the subscribed capital is determined by the respective country's share of population and GDP in the EU. In Slovakia's case, the share of GDP is gradually rising while the share of population is falling slightly. The increase in GDP share reflects the Slovak economy's progress in real conver-

gence, and therefore, it can be assumed that this increasing trend would continue in the future. Its acceleration since 2000 has been related to the gradual stabilization of the macroeconomic environment, the implementation of economic reforms, as well as accession to the European Union. Since the GDP share is rising more sharply than the share of population is falling, Slovakia's share of the ECB's subscribed capital should increase over time. Considering, however, the mechanism and timing of the capital share calculation, this increase will happen relatively slowly.

The possibility of exceeding the banknote share laid down by the allocation key will also be affected by the development of currency in circulation both in Slovakia and the euro area, i. e. by the

KEY FOR THE SUBSCRIPTION OF THE ECB'S CAPITAL

In accordance with Article 29 of the Protocol on the Statute of the European System of Central Banks and of the European Central Bank ("the Protocol"), the share of each NCB in the ECB's capital is determined by the key for the subscription of the ECB's capital. On the basis of the Protocol, each NCB's share in the ECB's capital shall be equal to the sum of:

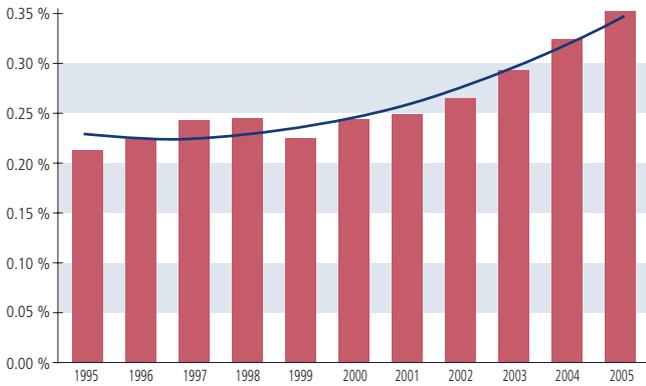
- 50% of the share of its respective Member State in the population of the European Community in the penultimate year preceding the establishment of the ESCB;
- 50% of the share of its respective Member State in the gross domestic product at market prices of the European Community as recorded in the last five years preceding the penultimate year before the establishment of the ESCB.

These percentage shares are rounded up to the next multiple of 0.05. The weightings of the shares assigned to the NCBs are, after the establishment of the ESCB, adjusted every five years by analogy with Article 29 of the Protocol. The adjusted key is to be used from the first day of the following year. Under Article 49.3 of the Protocol, an amendment introduced by the Accession Treaty, the ECB's subscribed capital shall be increased automatically upon one or more countries becoming Member States and their respective NCBs becoming part of the ESCB. The increase shall be determined by multiplying the current amount of the ECB's subscribed capital by the ratio, within the expanded capital key, between the weighting of the entering NCBs and weighting of the NCBs that are already members of the ESCB.

NCBs of the Eurosystem are required to pay up their share in the subscribed capital in full. NCBs outside the euro area are to pay up a minimal percentage of their subscribed capital (which as at 1 May 2004 represented 7%) as a contribution to the operational costs of the ECB.



Chart 23 Nominal GDP in Slovakia relative to GDP in the EU25



Source: Eurostat.

Chart 24 Population of Slovakia relative to the population of the EU25

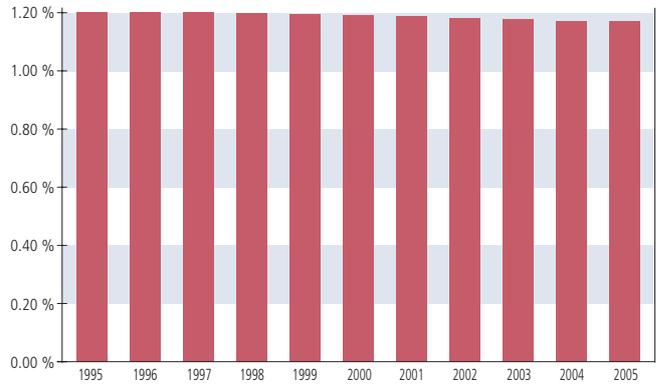
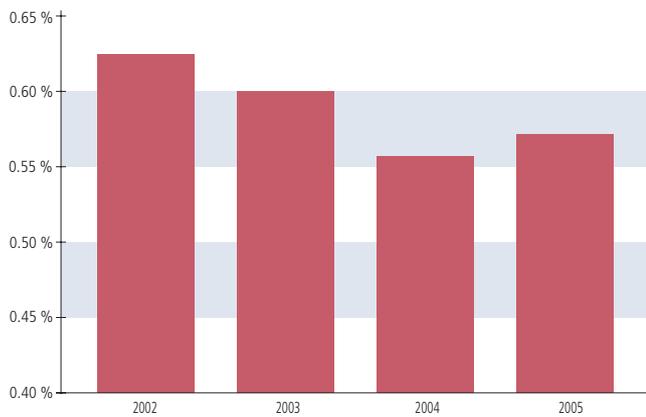


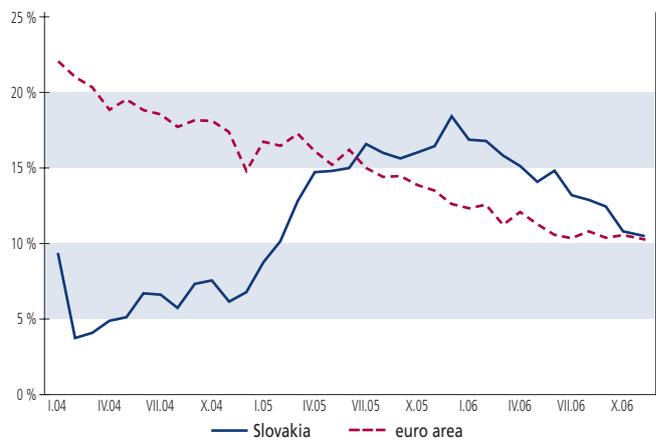
Chart 25 Ratio of currency in circulation in Slovakia to that in the euro area (annual average)



Source: NBS, ECB.

Note: Data for the euro area are available only up to November 2006.

Chart 26 Year-on-year growth in currency in circulation



ratio of currency in circulation in Slovakia to that in the euro area. In 2003 and 2004, currency in circulation growth in the euro area outstripped that in Slovakia, and, therefore, Slovakia's currency in circulation as a share of the euro area's declined slightly. The situation turned around in 2005 when currency in circulation growth in Slovakia rose sharply. Nevertheless, the average annual ratio of Slovakia's currency in circulation to the euro area's did not reach its 2002 level. The year-on-year growth in Slovakia's currency in circulation began gradually to slow down in 2006 and by the last months of the year it was similar to the growth in the euro area.

If currency in circulation growth in Slovakia exceeds that in the euro area over the long term, Slovakia will, despite the increase in its capital share, gradually fulfil the allocation key or exceed it. Given the real convergence taking place in the Slovak economy, real GDP and prices may be expected to increase at a faster pace than in the euro area. This will probably affect also the pace of growth in currency in circulation and possibly result in overfulfilment of allocation key. That said, the price level in Slovakia, as well as the level of household income may be a reason for the higher use of coins in comparison with the euro area (at present, the coins issued in Slovakia rep-

resent 1.7% on the Slovak currency in circulation and only 0.01% on the currency in circulation of the euro area).

CONCLUSION

Although currency in circulation in Slovakia has been affected by several one-off and non-standard factors, its pace of growth has to a large extent been determined by economic activity. This is confirmed by graphic analysis of the development of currency in circulation, gross domestic product, household final consumption and retail sales.

Despite the rapid development of the payment card market, households prefer cash transactions to payments through POS terminals. The higher demand for cash holdings could have been supported in recent years largely by the monetary-policy environment, with relatively low interest rates diminishing the attractiveness of deposit products.

The comparison with the V4 countries and the euro area also indicates that Slovakia is among the economies with the highest preference for cash holdings. At the same time, currency in circulation growth in Slovakia has been the most rapid among the V4 countries. This has been connected with both the economy's strong real growth and the higher rate of inflation. Thus, the



nominal GDP growth in Slovakia has been recording the highest figures.

If Slovakia (as well as the other V4 countries) were now a member of the euro area, it would fulfil the bank allocation key to around 85%. Currency in circulation growth in Slovakia is at present more dynamic than in the euro area, and considering the ongoing real convergence, this development may be expected to continue in the

future. The faster growth in GDP will, through the capital key, increase Slovakia's share of the currency in circulation in the euro area. Given the mechanism for updating the capital key, however, this change will happen only slowly. For this reason, economic convergence could result in Slovakia to overfulfilment of the share of currency in circulation stipulated by the allocation key.

BILITATE