

Implications of the euro cash changeover on the development of banknotes and coins in circulation

Following the introduction of the euro as a means of non-cash payment and unit of account in the participating Member States of European Monetary Union on 1 January 1999, the legacy national currencies were successfully replaced by euro banknotes and coins in January and February 2002. As of 1 March, the euro became the sole legal tender throughout the euro area for more than 300 million citizens.

In order to make the cash changeover to the single currency as smooth and swift as possible, the banking sector, security carriers, retailers and the cash-operated machine industry needed to be closely involved in the preparations at an early stage. The involvement of all leading players and the co-ordination of preparatory work was key to the successful launch of the euro banknotes and coins, and apart from some minor technical and logistical issues which arose, the changeover indeed went very smoothly. However, the success of the changeover depended not only on the co-operation of all professional parties directly involved, but also on a positive attitude and swift acceptance of the new means of payment by all citizens from the very beginning of 2002.

The introduction of the euro cash was already having an effect on the circulation of the legacy currencies more than one year before the official launch when the circulation of national banknotes started to decrease, in contrast to its long-term trend. In 2001, the last year of the transitional period, most participating national central banks experienced a significant flowback of national banknotes. In parallel, several euro area countries ran campaigns to withdraw hoarded national coins from circulation to alleviate the logistical burden arising from the simultaneous withdrawal of the legacy currencies and distribution of the euro banknotes and coins.

On 1 September 2001, following the unveiling of the visual appearance of the euro banknotes by the President of the ECB on 30 August 2001, the preparations for the launch entered their final stage. In accordance with national requirements, the 12 Eurosystem national central banks (NCBs) began frontloading euro banknotes and coins to the credit institutions, which subsequently sub-frontloaded to the retail sector and the cash-operated machine industry. The information campaigns both at the European and national levels complemented the operational preparations and enabled the more than 300 million citizens of the euro area to be properly informed about their new currency.

I Strong decline in currency in circulation in the run-up to the euro cash changeover

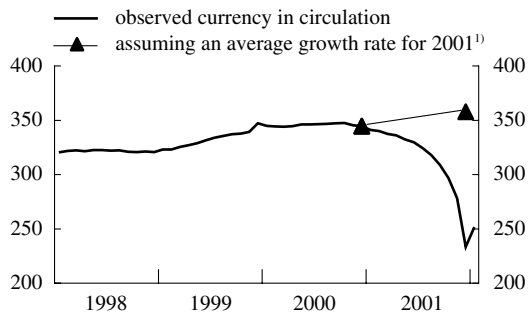
The run-up to the euro cash changeover was characterised by a significant decline in currency in circulation. From December 2000 to December 2001, euro area currency in circulation decreased by €116 billion or 32.3%. 11 of the 12 euro area countries reported a reduction in the amount of currency in circulation in 2001. However, the size of the reduction and the growth pattern differed considerably between them. This reflects differences in the demand for currency in individual euro area countries which, in turn, may be due to differences in the use of banknotes and cashless payment instruments, in banking secrecy laws or in

the heterogeneity of the denominations of the domestic currencies (see Table I). Moreover, the considerable demand for DEM-denominated banknotes and, to some extent, for FRF and ATS-denominated banknotes from outside the euro area is an additional reason for these differences.

To illustrate the impact of the euro cash changeover on the evolution of currency in circulation, Chart I compares the actual evolution of currency in circulation in 2001 with a notional development of currency in circulation, assuming that currency in 2001 grew at the same average annual rate as

Chart 1
Currency in circulation

(EUR billions)



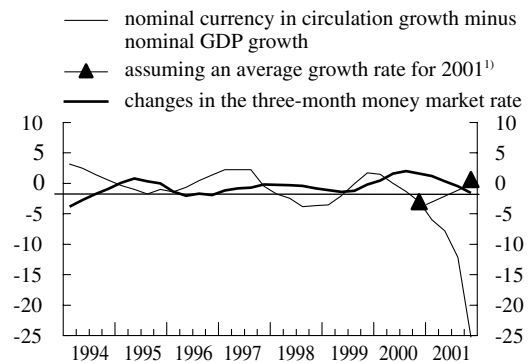
Source: ECB.

1) It is assumed that currency in circulation growth in 2001 corresponds to its average growth from 1994 to 2000.

between 1994 and 2000. This estimation of a notional level of currency in circulation, which excludes the euro cash changeover in 2002, would be roughly in line with the evolution of currency in circulation according to its traditional determinants, such as nominal GDP (reflecting the need for transaction balances) and short-term interest rates (an indicator of the opportunity costs of holding cash) (see Chart 2). Both approaches suggest that there might have been around €125 billion more currency in circulation at the end of 2001 if the cash changeover had not taken place.

Chart 2
Currency in circulation, GDP and opportunity costs

(annual differences in percentage points or annual percentage changes)



Source: ECB.

1) It is assumed that currency in circulation growth in 2001 corresponds to its average growth from 1994 to 2000.

Different phases in the decline in currency in circulation in 2001

The decline in currency in circulation in 2001 can be divided into different phases. In the first half of 2001, the decline was probably mainly driven by the reduction in currency hoards, mainly domestic currency hoards. This argument is confirmed by the observation that the driving force behind this decline was the reduction in the number of

Table 1
Legacy banknotes and their nearest equivalents in euro banknotes and coins

euro denominations	500	200	100	50	20	10	5	2 (coin)	1 (coin)	0.5 (coin)	0.2 (coin)	0.1 (coin)
Belgium		247.89		49.58	24.79	12.39	4.96	2.48				
Germany	511.29	255.65	102.26	51.13	25.56	10.23	5.11	2.56				
Greece					29.35	14.67		2.93	1.47	0.59	0.29	0.15
Spain				60.10	30.05	12.02	6.01					
France			76.22		30.49	15.24	7.62	3.05				
Ireland			126.97	63.49	25.39	12.70	6.35					
Italy		258.23		51.65	25.82		5.16	2.58	1.03	0.52		
Luxembourg			123.95		24.79			2.48				
The Netherlands	453.78		113.45	45.38	22.69	11.34	4.54					
Austria	363.36		72.67	36.34		7.27	3.63		1.45			
Portugal				49.88	24.94	9.98	4.99	2.49				
Finland		168.19	84.09		16.82	8.41	3.36	1.68				

Source: ECB.

high denomination banknotes. This was particularly pronounced in Germany and the Netherlands, as the DEM 1000 banknote and the NLG 1000 banknote represented the highest denomination banknotes in the euro area and were therefore particularly suited for hoarding purposes.

In the second half of 2001, and especially in the last quarter, the circulation of small denomination banknotes decreased as well, as the currency held for transaction purposes had probably also been reduced. Finally, the

flowback of banknotes from outside the euro area also contributed to the decline in currency in circulation. Evidence of this is reported by several central banks of eastern European countries which observed strong increases in foreign deposit holdings, probably linked to a substitution of euro currencies' banknotes for these deposits. This evidence is further supported by the statistics on the shipment of DEM-denominated banknotes, which indicate a substantial flowback of banknotes from outside the euro area in the second half of 2001.

2 'Countdown' to the introduction of euro banknotes and coins

Frontloading of euro banknotes and coins by the euro area NCBs

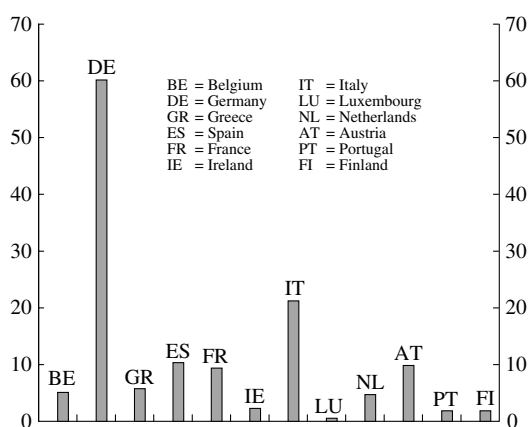
The timely and widespread frontloading of a large quantity of euro banknotes and coins was a key factor in meeting the objective – established by the commonly agreed scenario for the cash changeover – that the bulk of cash transactions in the participating Member States should be carried out in euro by mid-January 2002. Moreover, it ensured that the staff of banks and retailers became accustomed to the new banknotes and coins from the outset. The frontloading of banknotes started in Germany, Spain, Luxembourg, Austria and Finland at the beginning of September 2001. In Portugal and Greece the euro banknotes were provided to credit institutions as of October. Belgian, Irish and Italian banks received the euro banknotes as of November; French and Dutch banks during December 2001. All in all, around 6.4 billion euro banknotes worth some €133 billion were frontloaded by the euro area NCBs to credit institutions. The total volume of frontloaded banknotes, which varied considerably from country to country (see Chart 3), represented in terms of value 49% of the legacy currency banknotes in circulation at the end of December 2001. In terms of pieces, the total frontloaded volume amounted to 70% of the number of national banknotes in circulation at year-end 2001, as predominantly low value denominations were

put into circulation in the first weeks of January 2002 in order to reduce the retailers' need for change. Banks were therefore well prepared in terms of providing the new means of payment to the public. The success of the frontloading operation also shows that the conditions under which the new banknotes were provided to the banking sector prior to E-day were adequate.

The Eurosystem also supported the introduction of euro banknotes and coins on markets outside the euro area, especially where national banknotes of euro area countries were widely used. During the

Chart 3
Frontloading of euro banknotes by participating NCBs

(EUR billions)



Source: ECB.

month of December 2001, more than 20 central banks and several wholesale credit institutions outside the euro area were supplied with around €4 billion by the euro area NCBs. The countries frontloaded were mainly located in eastern and south-eastern Europe, Africa and Asia.

In parallel with the frontloading of the euro banknotes, the NCBs and several mints provided 37.6 billion euro coins to the banking system and post offices during the four-month frontloading period, which corresponded to more than 70% of total euro coin production. This quantity, representing 97% of euro coins in circulation at their peak in January 2002, shows that nearly the entire coin needs of the economy were distributed to the banking system prior to the massive flowback of the national coins. From a logistical point of view, the pre-distribution of the euro coins was essential in order to overcome the capacity limitations at banks and cash-in-transit companies.

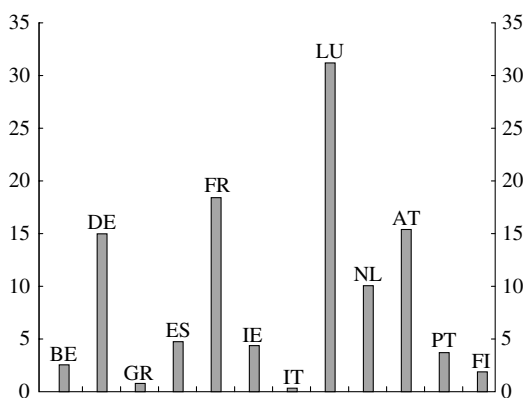
Sub-frontloading of euro banknotes and coins

Sub-frontloading to the retail sector and the cash-operated machine industry began in Spain, Germany, Luxembourg and Austria in September 2001, in Ireland in November and in the other euro area countries in December 2001. In terms of value, the banking sector distributed 10.5% of the frontloaded banknotes, worth more than €13.2 billion, to retailers and other eligible parties located within the euro area. Broadly speaking, sub-frontloading was in line with the initial forecasts; however, the level differed from country to country to a considerable extent (see Chart 4).

An important principle for the transition to the single currency was the recommendation that retailers and other businesses give change exclusively in euro as of 1 January 2002, as re-circulating national currencies would have prolonged dual currency circulation. Moreover, holding stocks in both the national currency and the euro for a longer period

Chart 4
Sub-frontloading of euro banknotes by credit institutions

(in percentage of amounts frontloaded)



Source: ECB.

BE = Belgium; DE = Germany; GR = Greece; ES = Spain; FR = France; IE = Ireland; IT = Italy; LU = Luxembourg; NL = Netherlands; AT = Austria; PT = Portugal; FI = Finland.

would have resulted in increased costs. In order to supply the retail sector with sufficient quantities of euro coins and to prepare for the adaptation of the cash-operated machines, euro area credit institutions sub-frontloaded more than 8 billion coins to non-banks.

According to the ECOFIN Council statement of November 1999, euro coins could be provided to the general public from mid-December 2001. All participating countries offered so-called starter kits/mini-kits to the public. Moreover, in a number of euro area countries banks were authorised to make up their own kits and even to sell some of their bulk stock in order to meet the high demand for the new coins. The counter value of the starter kits ranged from €3.88 to €15.24 and corresponded in most cases to a national banknote denomination in order to facilitate the exchange. Distribution via a wide range of outlets started in three countries on 14 December 2001 and in the others on 15 or 17 December 2001. Overall, the general public purchased more than 150 million starter kits comprising over 4.2 billion coins worth €1.6 billion. Thus, approximately 10% of the overall needs in terms of coins as a means of payment was sub-frontloaded to consumers.

3 Substitution of the euro banknotes and coins for the legacy currencies in the first weeks of 2002

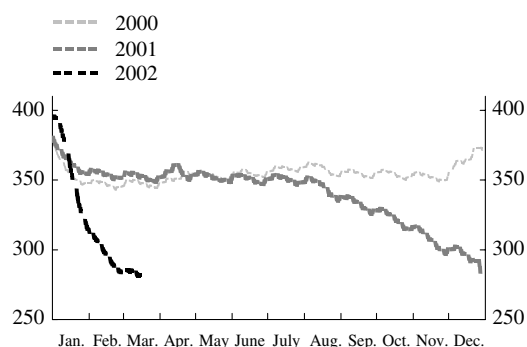
Development of total banknotes in circulation

The total value of banknotes in circulation¹ (i.e. euro banknotes and banknotes of the euro legacy currencies) went up to €403 billion as at 1 January 2002, compared with €270 billion as at 31 December 2001. This steep increase was due to the fact that all frontloaded banknotes were only accounted for as banknotes in circulation from 1 January 2002, when they became legal tender and were issued by the Eurosystem.

During the entire changeover period until the end of February 2002, the withdrawal of national banknotes by NCBs exceeded the issuance of euro banknotes on each day. As a result of this massive flowback of national banknotes, the total amount of banknotes in circulation decreased by more than €118 billion (–29%) to €285 billion between 1 January and 28 February, the end of the dual circulation period. In comparison with the total amount of banknotes in circulation at the same time in 2001, this figure was more than €66 billion – or 19% – lower. To some extent, this decline in circulation can be explained by the lower quantity of hoarded banknotes at the beginning of 2002. Chart 5

Chart 5
Banknotes in circulation in 2000, 2001 and 2002

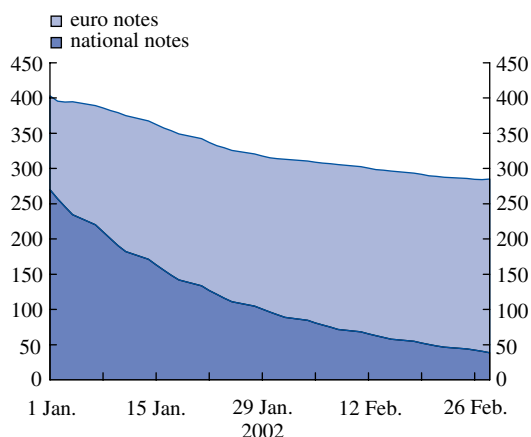
(EUR billions, daily figure)



Source: ECB.

Chart 6
Banknotes in circulation from 1 January until 28 February 2002

(EUR billions)



Source: ECB.

shows the development of the amounts of banknotes in circulation for each month in 2000, 2001 and 2002; Chart 6 gives an overview of the relationship between euro and national banknotes during the changeover period.

Swift increase of euro banknotes in circulation during the dual circulation period

During the first two months of 2002, euro banknotes in circulation increased continuously in terms of value from €133 billion to €247 billion – compared with €270 billion outstanding in euro legacy currencies at end-December 2001 – and amounted to a share of 86.5% of the total value of euro and national banknotes in circulation at the end of the dual circulation period. In March 2002, the share of euro banknotes in total banknotes (euro banknotes and banknotes of

¹ The definition of banknotes in circulation differs from that of currency in circulation in that the latter includes coins but excludes vault cash (i.e. cash held by MFIs). Typically, the amount of outstanding banknotes exceeds the amount of outstanding currency in circulation by far.

the euro legacy currencies) increased further to a value of 91.9%.

As regards the number of euro banknotes put into circulation by the Eurosystem, this figure rose by 23% to 8.1 billion pieces as at 15 January, when it reached its peak, from 6.4 billion pieces as at 1 January 2002. Subsequently, despite the continuous increase in value, the number of banknotes in circulation fell by 7.5% to 7.5 billion banknotes at the end of February. This might be explained by the fact that in the first two weeks of January 2002 there was a very high precautionary supply of small denomination banknotes by MFIs and a high demand – in particular for €5 and €10 banknotes – by the retail sector, in order to make it easier to give change in the first two weeks after the cash changeover. This explanation is further confirmed by the fact that the circulation of small denomination banknotes decreased between mid-January 2002 and end-February 2002, whereas the large denominations constantly increased during this period. In fact, the increase in high denominations is expected to continue throughout 2002, when currency hoarding will build up to some extent. Chart 7 shows

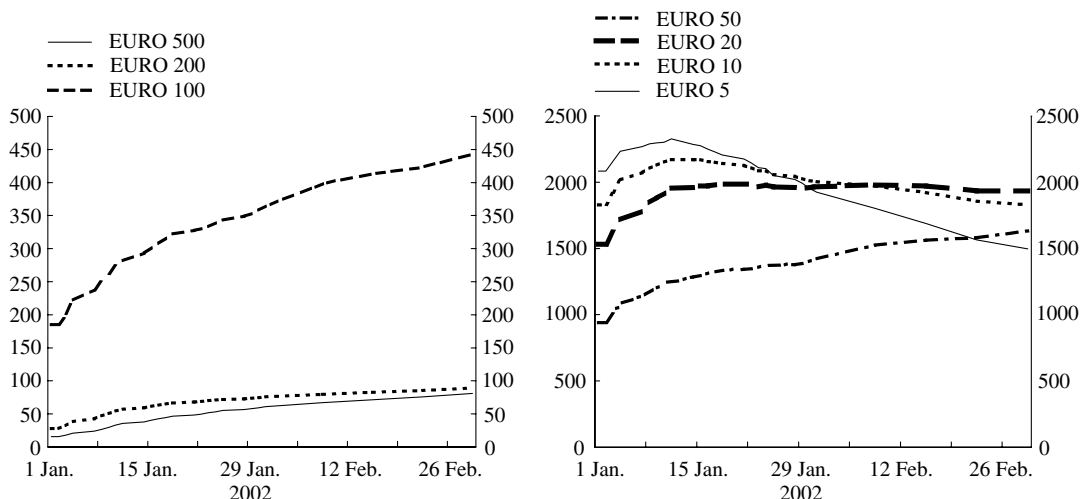
the development of the circulation of individual banknote denominations in January and February 2002.

In order for the introduction of the euro banknotes to go as smoothly as possible, it was essential that the almost 200,000 automated teller machines (ATMs) in the euro area were quickly adapted to dispense euro banknotes as soon as the New Year began. On 1 January, 81% of ATMs were already dispensing exclusively the euro banknotes and the adaptation of all ATMs was virtually completed on 4 January 2002.

Volume of euro coins in circulation reaches peak in mid-January

Given the high volume of euro coins distributed to banks and other professional target groups prior to 1 January 2002, the increase in circulation of the number of euro coins during the first two weeks of the changeover period only amounted to 2.6%. The circulation of euro coins reached its peak on 15 January 2002, when 38.6 billion coins worth €12.6 billion were in circulation. As of mid-January 2002, in line with the evolution

Chart 7
Denomination breakdown of euro banknotes in circulation during January and February 2002
(millions of pieces)



Source: ECB.

of euro banknotes, the number of euro coins in circulation started to decrease slightly and, on the last day of that month, returned to the level of 1 January 2002 (see Chart 8). At the end of the dual circulation period, there were 35.8 billion euro coins in circulation (i.e. 94.6% of the volume frontloaded).

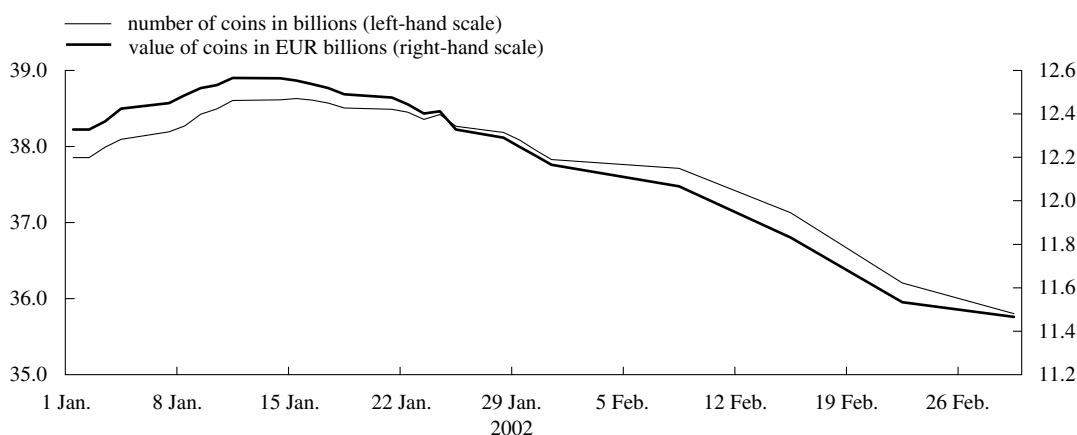
In terms of value, the circulation of euro coins increased gradually until 11 January 2002, from €12.3 billion to €12.6 billion (an increase of 1.9%). In contrast to the development of euro banknotes, which constantly increased in terms of value in the first weeks of 2002, the value of euro coins subsequently declined. Following the crucial period, during which the euro banknotes and coins were replacing the legacy currencies of the euro as the means of payment, banks and retailers started to reduce their stocks of euro coins as of mid-January 2002. Accordingly, from 11 January 2002 until end-February 2002, the value of coins in circulation decreased by 8.8% (see Chart 8). The evolution of the circulation of euro coins shows that economic agents had fairly well anticipated the demand for the new coins and held a sufficient level of coin stocks in preparation for higher needs in specific coin denominations at the beginning of 2002.

Withdrawal of the legacy currencies

Following the considerable decrease in the number of national banknotes in circulation in the course of 2001 from a total of 11.5 billion banknotes worth around €380 billion at the beginning of that year, around 9 billion banknotes (i.e. -21.6%) of the euro legacy currencies were in circulation at the start of the euro cash changeover, amounting to a value of €270 billion. High quantities of national banknotes were withdrawn from circulation in the dual circulation period in January and February 2002; between 4% and 6% of the remaining value of national banknotes in circulation were lodged each day at the NCBs during that period. This resulted in a decline in the value of national banknotes in circulation by €178 billion in January and €58 billion in February 2002. All in all, 75% of the volume of national banknotes were withdrawn from circulation (i.e. 6.7 billion banknotes) before end-February 2002. In terms of value, the flowback amounted to more than 85%. Considering that whenever NCBs need to “call in” old series national banknotes in order to replace them with a new series, it takes years for virtually all of the old banknotes to be returned. It can therefore be assumed that the return of

Chart 8
Euro coins in circulation during the changeover period

(number of coins in billions, value of coins in EUR billions)



Source: ECB

legacy currency banknotes will continue for some time to come.

In most euro area countries, national authorities, in conjunction with the central banks and commercial banks, had run campaigns to attract hoarded national coins from the general public prior to E-day in order to reduce the banks' workload during the dual circulation period. Besides, a range of charity schemes had been introduced in some countries to collect both national coins and coins issued by other Member States of the euro area. The total value of national coins in circulation declined in the course of 2001 by 9%, from €17.9 billion (i.e. the average circulation for 2000) to €16.3 billion (which corresponds to 116 billion coins). During the dual circulation period, the value of national coins in circulation decreased

further, by approximately €5.5 billion, corresponding to around 28.5 billion national coins which were returned to the NCBs. Hence, coin circulation decreased in terms of value by around 35% and in terms of pieces by around 27% between 1 January 2002 and 28 February 2002.

To conclude, it can be said that the technical part of the changeover process to the common currency within the euro area has been completed. However, economic agents will have to adapt their demand for currency for quite some time. It will likewise take time to assess whether the introduction of the euro banknotes and coins leads to changes in: (i) the hoarding behaviour of euro area residents; (ii) the relative performance of cash as a means of payment; and (iii) the demand for euro cash outside the euro area.