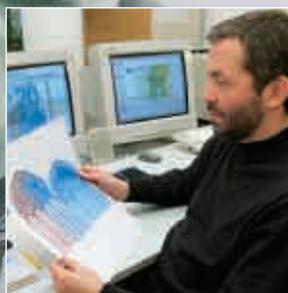




EUROPEAN CENTRAL BANK

EUROSYSTEM



A SHORT  
HISTORY OF  
THE EURO  
BANKNOTES  
AND COINS

# HOW THE EURO BECAME OUR MONEY



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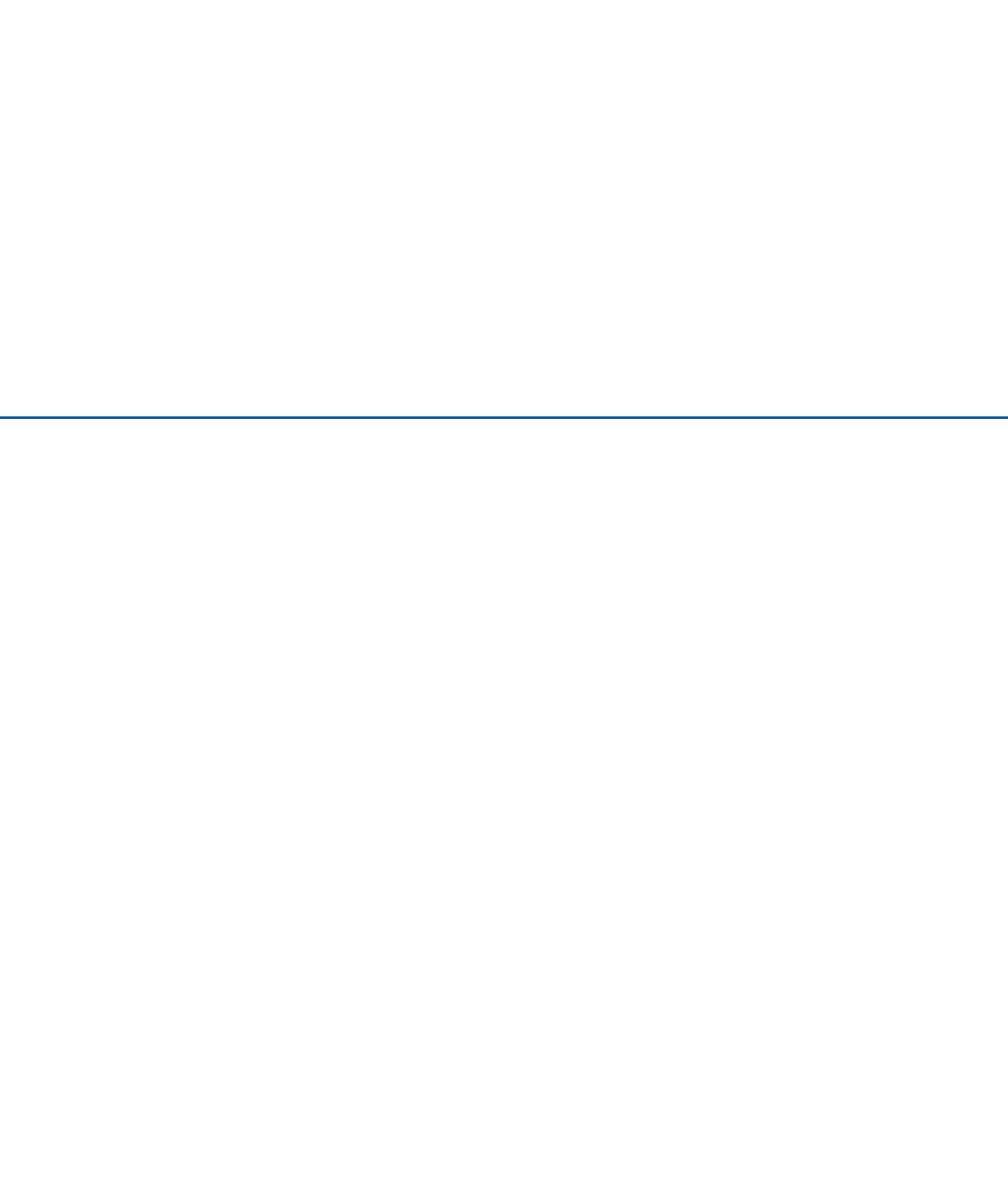
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# **HOW THE EURO BECAME OUR MONEY**

## **FOREWORD**





Europe's single currency – the euro – came into being on 1 January 1999. But it remained a “virtual” currency, mainly used by banks and the financial markets – for three years thereafter. For most people, it did not become a “real” currency, visible and tangible, until 1 January 2002. That was the starting date for the introduction of euro banknotes and coins. They are now an everyday fact of life for more than 300 million people in Europe.

The introduction of the new cash in 12 European countries – like the launch of the currency itself – was a historic event, involving years of meticulous planning and preparation. “How the euro became our money” tells the story behind the history; it covers the long sequence of decisions and actions which took the cash from drawing board to printing plant, from central bank to wallet.

There were numerous challenges – as well as difficulties and risks – to be overcome by the European Central Bank (ECB), the central banks and governments of the euro area countries, the European Commission, banknote printing works, mints as well as by people in many other fields, especially banks and shops.

The logistical preparations for the banknotes and coins go back to 1992, when nobody knew what they would look like, and when the new currency did not even have a definitive name. The design issue was resolved in 1996 when the ECB's predecessor, the European Monetary Institute, chose the final banknote designs after holding a competition. By 1998, the pilot print run was launched. Delivery of the cash to banks and shops started four months before €-day, 1 January 2002. During this period, millions of cash dispensers and vending machines in the euro area were modified.

Communications too formed an essential part of the preparations. Everyone had to know what the euro would look like and how they would exchange their old currencies for the new one. The message was spread as broadly as possible via TV commercials, print adverts, the internet and other channels, and a pivotal role here was played by the Euro 2002 Information Campaign, conducted by the ECB and the 12 national central banks in the euro area. Governments, public institutions as well as commercial and voluntary organisations also worked closely together to ensure the information was received by all.

In the end, the launch went smoothly, and the new banknotes and coins have become an integral part of our lives, at home and abroad. I hope you will enjoy reading about how this happened, about how the euro cash became our money.

A handwritten signature in black ink, consisting of a stylized 'J' and 'C' followed by a series of horizontal lines.

Jean-Claude Trichet  
European Central Bank





# CHAPTER I

## A DECADE IN PREPARATION

*The Limburg Government building in Maastricht where the Governing Council of the ECB met to mark the tenth anniversary of the Maastricht Treaty, which was signed in 1992.*

## ISSUING EURO BANKNOTES AND COINS

Euro banknotes and coins were put into circulation in 2002, but the planning and preparation of their introduction goes back to the early 1990s. On 7 February 1992, the Treaty on European Union was signed in Maastricht. It describes the competencies of the European Central Bank (ECB) and of the governments and central banks of the 12 euro area countries with regard to the issuing of euro cash. It stipulates that the ECB has the exclusive right to authorise the issuance of banknotes within the euro area, but both the ECB and the national central banks (NCBs) may issue them. However, since the ECB is not involved in any cash operations, it is the NCBs that actually put the banknotes into circulation and withdraw, process and store them.

The banknotes in circulation are reflected in the balance sheets of the ECB and the NCBs according to a fixed key, regardless of the country in which they are actually circulating. In fact, the number of banknotes circulating in any one country can no longer be determined because of unrecorded cross-border cash flows in the euro area due, for example, to tourism.

Responsibility for euro coins lies with the national governments, coordinated by the European Commission in Brussels. Euro area governments are the legal issuers of euro coins and, as such, are responsible for the designs and technical characteristics of the coins and for their minting. The ECB, however, is responsible for approving annually the volume of euro coins to be issued; it also acts as an independent assessor of the quality of the minted coins.

## NAMING THE CURRENCY AND CREATING THE € SYMBOL

At the meeting of the European Council in Madrid in December 1995, Europe's leaders decided on the currency's new name: the euro. Other suggestions were rejected because of their national connotations. These included the "ducat", "ecu", "florin", "franken", or using the euro as a prefix to existing currency names – "euromark", for example. They agreed that the name should be the same in all official languages of the European Union (EU), taking account of different alphabets, and easy to pronounce. Above all, it had to be simple and representative of Europe.

The currency also needed to have a symbol. Like the name, the symbol had to be clearly associated with Europe, easy to write and attractive. A list of thirty possibilities drawn up by European Commission staff was reduced to ten and these became the subject of a public survey. From this shortlist, two possible symbols emerged and the final choice was made by the then President of the Commission, Jacques Santer, and Yves-Thibault de Silguy, the Commissioner in charge of Economic and Financial Affairs at that time.

The euro symbol was inspired by the Greek letter epsilon, reflecting the cradle of European civilisation. E is of course the first letter of the word Europe. The two strong parallel horizontal lines are intended to symbolise the stability of the currency. The official abbreviation of the euro, EUR, has been registered with the International Organization for Standardization (ISO).



## FIXING THE DENOMINATIONS

In November 1994, the Council of the European Monetary Institute (EMI), the ECB's predecessor, decided on a sequence of 1:2:5 for the seven euro banknote denominations: €10 and €100; €20 and €200; and €5, €50 and €500. This sequence is in line with the common denominational split of most of the world's currencies and also corresponds to the sequence of the euro coins: 1 cent, 10 cent and €1; 2 cent, 20 cent and €2; 5 cent and 50 cent, as agreed by the EU's Economic and Financial Council (Ecofin).

The decision to have a very high-value banknote – €500 – was made after careful evaluation. Prior to the changeover to euro cash, six of the euro area countries – Austria, Belgium, Germany, Italy, Luxembourg, and the Netherlands – had national banknotes worth between €200 and €500, and were using them increasingly. In 2000, for example, the demand for DM 1,000 banknotes (equivalent to €511) was 15 times higher than in 1975 and represented 34% of the total value of Deutsche Mark banknotes in circulation. Moreover, in countries outside the European Union with relatively unstable monetary regimes, where inflation is high and/or there is little trust in the banking system, people often hold the cash of low-inflation currencies as a store of value. Before the introduction of euro banknotes, high-value notes such as the DM 1,000 were held.

Three EU countries – Greece, Italy and Austria – used very low-value banknotes (below €2) prior to the euro cash changeover. But the issuance of both very high and very low denominations would have created a banknote series with too many denominations. It would also have made the notes less user-friendly and complicated their handling and storage. Therefore, €2 was chosen as the highest-value coin and €5 as the lowest-value banknote.

## TIMING THE INTRODUCTION OF THE NEW CURRENCY

At the Madrid European Council, the heads of state and government agreed that euro banknotes and coins would start to circulate alongside the national currencies at the latest by 1 January 2002. The precise date, sometime between 1 January 1999 and 1 January 2002, was left open in order to take account of the different preferences of various cash users and the long lead times for printing banknotes and minting coins.

The date of 1 January 2002 had both advantages and disadvantages. The peak period for banknote use is at the end of the year: circulation is around 10% higher than average because of the Christmas season and the first few days of January are traditionally a sales and stocktaking period for retailers. A number of other dates were considered but, in the end, 1 January 2002 was agreed to be the most convenient date, marking the start of the calendar year and being the date expected by national public administrations. The Madrid European Council also decided that the euro should circulate alongside the national currencies for a maximum of six months, although subsequently, the pros and cons of shortening this period were discussed. A shorter period would reduce the costs of handling two currencies simultaneously for banks, retailers and the public, while a longer period would make it easier to adapt vending machines. A compromise was reached and it was decided to shorten the transition period. In November 1999, Ecofin agreed that the period of dual circulation should last between four weeks and two months. Banks would continue to change national currencies into euro after that period but those currencies would no longer be legal tender.



Some of the national banknotes replaced by the euro. \_\_\_\_\_



Government leaders at the Madrid European Council meeting, 15–16 December 1995.



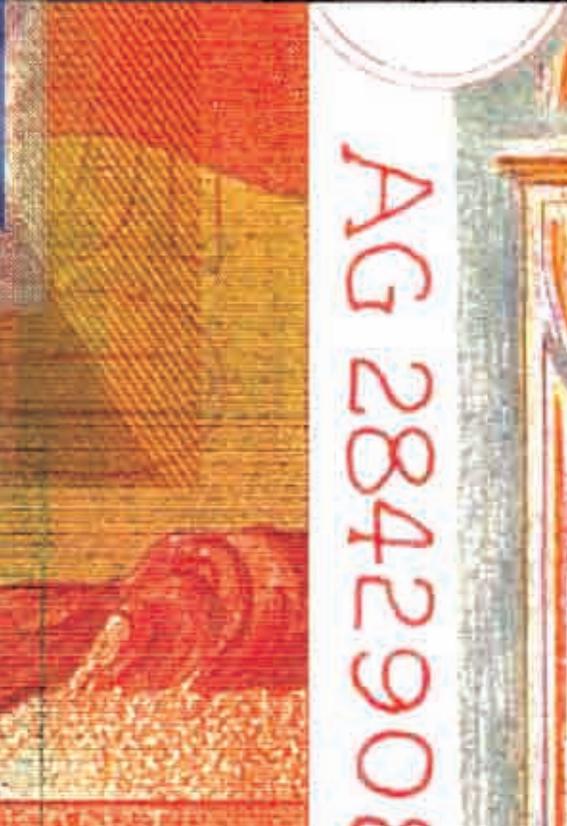
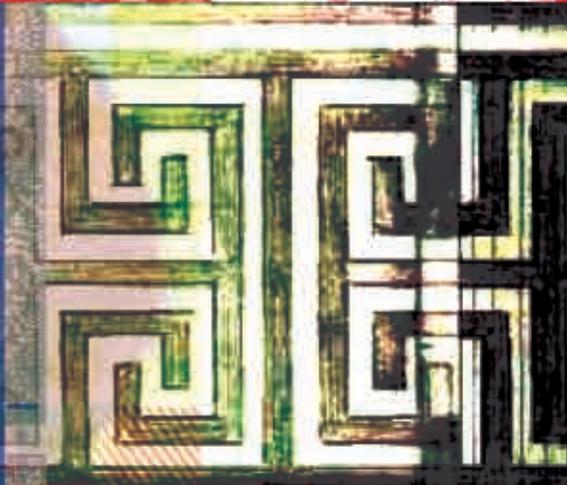
The Madrid European Council meeting, with Felipe González (left), then Spanish Prime Minister and President-in-Office of the Council, and Jacques Santer, then President of the European Commission.



EYP 2110

RO 50 EURO  
RO 50 EURO

0200500



## CHAPTER 2

## DESIGN

*A collage of entries for the euro banknote design competition.*

## SELECTING A DESIGN THEME FOR THE BANKNOTES

The most important factor in the design of a banknote is its “resistance” to counterfeiting. But a banknote – and especially a series of banknotes destined for use in a large group of countries – should also look attractive. Euro banknotes needed to be acceptable to everyone in the euro area, if not beyond. The notes would be circulating across borders in a variety of cultures and had to avoid any national or gender bias. This impartial approach was taken into account when choosing the design theme. The notes should also allow the incorporation of aesthetically appealing design features.

In November 1994, the Council of the European Monetary Institute asked the Banknote Working Group to make proposals for design themes for the euro banknote series. The group, which was made up primarily of the chief cashiers (the persons responsible for issuing banknotes) of the national central banks and general managers of the printing works owned by the central banks, worked closely with an external advisory body, the Theme Selection Advisory Group, which consisted of experts in the fields of history, art, psychology, general design and banknote design.

The Advisory Group was asked, first, to suggest themes that would create a sense of unity or form a “family” of the seven banknote denominations, and second, to select the three best themes and rank them. As the banknotes needed to be quickly and easily recognisable as European both inside and outside the European Union, it was decided that they should depict the flag and/or stars of the EU. These symbols have become increasingly used by the different nations with different histories that live and work as partners on the same continent. 18 themes were initially selected, but many of them tended to reflect a national focus or interest:

- Ages and styles of Europe
- Heritage of Europe
- Abstract theme and security
- Aims, ideals and aspirations of the European Union
- Collective memory of Europe and cultural achievements of Europe
- Fauna, flora and the natural environment
- Great European figures associated with a single discipline
- Aspects of Europe (things vital to the existence of a united Europe, e.g. communications)
- Great European poems and narratives
- Several portraits on both sides of each banknote denomination
- Landscapes
- Cities that played an important role in Europe’s history, e.g. university towns
- Monuments
- Myths and legends (Scandinavian, German, Greek, Roman and Celtic)
- European scripts and written work
- Maps of Europe through the ages
- The “founding fathers” of the European Union
- Cosmology

In the end, the Advisory Group proposed the following three themes:

- “Ages and styles of Europe”: one side of the banknote would show portraits of ordinary men and women taken from European paintings, drawings and sketches across the ages; the other side would show architectural styles. The idea was to choose a theme that stressed the common cultural heritage of the nations of Europe and carried a clear European message worldwide. After all, Europe’s most famous buildings or landmarks are better known than the continent’s leaders.

- “Heritage of Europe”: one side of the banknote would show illustrations of famous men and women from the past; the other side would show achievements in fields such as music, painting, science, architecture, literature, medicine and education. All seven banknotes would incorporate, as a background, a map of Europe without borders, a feature which would harmonise the appearance of the series. This theme was broader than the “Ages and styles” theme as it allowed seven distinct disciplines to be portrayed. However, striking a balance between the countries and also between the depiction of men and women was likely to be difficult.
- “Abstract theme and security”, later renamed “Abstract/modern design”, involved geometric shapes and non-figurative design elements. It offered a high degree of design flexibility and would make it easier to include a wide range of security features, such as holograms and colour-shifting inks. It also allowed very different approaches, so impartial designs were fairly easy to achieve.

In June 1995 the EMI Council approved two of the three proposals: “Ages and styles of Europe” and “Abstract/modern design”. It also agreed that the only words to appear on the banknotes would be the name of the currency and the initials of the ECB in the different languages. A Feature Selection Advisory Group was commissioned to define the periods and the related architectural styles for the “Ages and styles of Europe” theme:

Period	Style
Eighth century BC to fourth century AD	<i>Classical (Greek and Roman)</i>
Eleventh and twelfth centuries	<i>Romanesque</i>
Thirteenth and fourteenth centuries	<i>Gothic</i>
Fifteenth and sixteenth centuries	<i>Renaissance</i>
1600 to 1750	<i>Baroque and rococo</i>
1850 to 1914	<i>Age of iron and glass</i>
From the 1930s onwards	<i>Twentieth century architecture</i>

The group also selected design motifs typical of each style for optional use by the designers. Most members of the group concluded that it was virtually impossible to find totally anonymous features that would – in the case of portraits – be both attractive and impartial in terms of country and gender. For this reason, many of the draft design proposals made reference to sculptures, such as the head from a statue of an athlete (Classical period, envisaged for the €5 banknote) and the sculpture of a head in Parma Cathedral by Benedetto Antelami (Romanesque period, for the €10 banknote).

At the time of these discussions, specific national design features for the banknotes were still an option. They would identify the country that issued the banknotes. A national feature, for example, the portrait of a monarch, could cover up to one-fifth of the reverse side. The rest of each banknote would be identical.

Design briefs were drawn up which specified the criteria to be met by the designers. Apart from being attractive, easy to recognise and difficult to fake, the banknotes needed to incorporate security features in certain positions, have particular colours and clearly contrasting value numerals. These specifications extended to 30 pages and mainly covered the technical descriptions of the security features. Some excerpts from the design brief for the “Ages and styles of Europe” theme are reprinted on pages 32 and 33.



Several designers used the Epebe of Antikythera (a classical Greek statue) as a design motif for the euro banknotes.



The euro banknote designs are based on the "Ages and styles of Europe" theme.

## CREATING USER-FRIENDLY BANKNOTES

Changing an element of daily life as fundamental as banknotes and coins means that everyone is affected. Visually impaired people – and there are more than 7 million of them in the euro area – are particularly affected. The European Monetary Institute worked closely with the European Blind Union from 1995 onwards in respect of both the design and size of the banknotes. This vulnerable group, for obvious reasons, had to be able to handle them easily; if they could do so, then everyone else could.

Each banknote – whether €5 or €500 – had to be readily identifiable by people with residual or no sight. For example, the differences in height between the lower, more commonly used denominations were quite distinct. The €100, €200 and €500 banknotes were made the same height – to facilitate automatic handling – but repetitive embossed patterns were placed on the €200 and €500 banknotes to differentiate them.

Large and bold value numerals were placed in a standard position throughout the series, on both sides, and sharply contrasting colours were used. They were derived principally from the colour wheel of the Swiss painter and art teacher Johannes Itten (1888-1967). The colours chosen for successive denominations were taken from opposing segments of the colour wheel and thus strongly contrast with each other. The same is true for denominations that have digits in common, like the red €10 and green €100 banknotes.

## RANKING THE DESIGNS

The designers were nominated by all the central banks in the European Union (except Denmark's) and each central bank could name up to three designers. All those chosen had experience of banknote design and were familiar with the challenge of combining attractive designs with effective security features. They were asked to submit draft designs for the complete series of banknotes showing one or both themes within seven months. Each proposal would be presented to the EMI Council as a colour copy, but no production technique was specified, so some designers produced hand paintings or drawings while others produced computer-generated designs.

A total of 29 designers or design teams submitted 27 proposals with the “traditional” theme and 17 with the “modern” theme by the closing date of the competition, 13 September 1996. Each design series was then given a random three-digit number to make it anonymous, and sent to the EMI. At all selection stages, the draft designs were only identifiable by their respective number. This ensured that the EMI Council and the advisory bodies would assess the entries objectively, and not be influenced by the country or origin.

Towards the end of that month a jury of independent experts in marketing, design and art history met under the chairmanship of the EMI in order to select the five best designs for each theme. The designs were judged mainly on the basis of creativity, aesthetics, style, functionality as well as

likely public perception and reception. The jury agreed that a European “look” for the banknotes would be of paramount importance. This also explains why portraits did not feature very largely in the designs chosen by the jury: even a slight similarity to a real person could be interpreted as demonstrating national bias. During the selection process, the jury was encouraged to make comments on design details in case a design series was generally well regarded but required amendments.

The ranking took place in a three-step procedure; those design series not supported by a minimum number of jury members were discarded. Robert Kalina’s design – which would be selected by the EMI Council two months later – was ranked second in the category “Ages and styles of Europe”. The jury said that *“it clearly represents European money. Although it is based on only one main design idea, it excels on account of the interesting and meaningful selection of architectural features. ... A very clear distinction between the denominations is achieved by the skilful use of colours and the strong numerals.”* Initially, the design series was chosen because of its concept, not its beauty. When the jury’s ranking was combined with the public’s response in an opinion poll, Kalina’s design was judged to be the best.

The jury’s shortlist was as follows:

**Abstract/modern theme**

1. Klaus Michel and Sanne Jünger
2. Roger Pfund
3. Robert Kalina (Oesterreichische Nationalbank)
4. Maryke Degryse (Banque Nationale de Belgique/Nationale Bank van België)
5. Terry Thorn (Harrisons & Sons)

**Ages and styles of Europe**

1. Yves Zimmermann
2. Robert Kalina (Oesterreichische Nationalbank)
3. Ernst and Lorli Jünger
4. Inge Madlé (Joh. Enschedé)
5. Daniel and Johanna Bruun

## CONSULTING THE PUBLIC AND MAKING THE FINAL DECISION

All ten design series shortlisted by the jury were shown to a cross-section of the public in October 1996 in the countries likely to be participating in the euro area. A market research company spent a week interviewing 1,896 people about the designs. The interviewees were aged between 15 and 86, with 43 being the average. 787 of them said that they handled a large number of banknotes in their daily work.

A higher proportion of interviewees (35%) preferred the abstract/modern designs by Maryke Degryse to the traditional designs by Robert Kalina (23%). But most interviewees – 76% – felt that Kalina’s banknotes better expressed the idea of “Europe”; only a few said it reminded them of a particular region or specific country. His traditional series was felt by 60% to inspire confidence. It is interesting to note that studies show that, in general, the more a banknote is immediately liked, the more it inspires confidence.

The interviewees were asked around 30 questions under the headings of perception, emotion and acceptance. All designs, except the series by Roger Pfund and the modern series from the Jünger team, were perceived as banknotes at first glance. Those two series, and the one by Terry Thorn, reminded the respondents more of pieces of art than means of payment.

The poll revealed that in Robert Kalina’s design:

- the architectural drawings are the main eye-catcher, but people said they quickly noticed that Europe was a key element;
- the European identity that is depicted is multiple, unique and dynamic, and it combines the continent’s past with its future.

In parallel to the public survey, the EMI’s Banknote Working Group assessed the draft designs from the following perspectives:

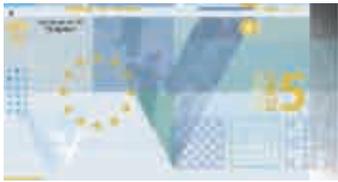
- production, e.g. would the design create production problems resulting in extra spoilage/wastage and/or a sharp increase in production costs?
- security, e.g. does the design properly incorporate the security features and would they be compatible with it?
- public acceptability, e.g. can the denominations be easily identified, also by visually impaired people?

The first draft designs of banknotes are usually modified to comply with printing requirements, so the final design differs from the earlier versions. The Banknote Working Group concluded that if certain changes were made all the shortlisted series could be converted into printed banknotes.

In December 1996, all 44 designs – anonymised colour copies – were presented to the EMI Council on dark cardboard panels. The Council was informed about the jury’s ranking, the results of the public survey and the technical comments of the Banknote Working Group. The Council members quickly approved the traditional series designed by Robert Kalina; they found the message it conveyed so striking that most of them ranked it first. This decision was announced on 16 December 1996 at two parallel press conferences: one at the EMI in Frankfurt by the EMI President, Alexandre Lamfalussy, and the other at the Dublin European Council by the Governor of the Netherlands’ central bank, Willem F. Duisenberg (who was designated as Lamfalussy’s successor at the EMI and later appointed as the first President of the ECB).



A jury of experts assessed and ranked the 44 series of draft designs in 1996.



Some of the shortlisted designs for the "abstract/modern" theme: €5 – Klaus Michel and Sanne Jünger; €10 – Roger Pfund; €20 – Robert Kalina; €50 – Maryke Degryse; €100 – Terry Thorn; €200 – Klaus Michel and Sanne Jünger; €500 – Terry Thorn.



Some of the shortlisted designs for the “Ages and styles of Europe” theme: €5 – Yves Zimmermann; €10 – Robert Kalina; €20 – Ernst and Lorli Jünger; €50 – Inge Madlé; €100 – Daniel and Johanna Bruun; €200 – Ernst and Lorli Jünger; €500 – Inge Madlé.

## DESIGNING THE EURO COINS

The designs for the euro coins were selected at the same time as the euro banknote designs. The selection was coordinated by the European Commission and each coin would have a “common European side” and a “national side”.

For the common European side, each designer had to propose a complete series of coins based on one of these three themes:

- architectural and ornamental style
- aims and ideals of the European Union
- European personalities.

In March 1997, a European panel, chaired by the Secretary-General of the European Commission and composed of independent experts from a wide variety of fields (including art, design and numismatics as well as consumer representatives) selected nine series from among the 36 entries. The directors of the European mints were consulted on the high-volume mintability of the design proposals. In June 1997, the Amsterdam European Council selected the winning series, designed by Luc Luycx from the Royal Belgian Mint. His design was also favoured by a majority of interviewees (64%) in a public opinion poll conducted throughout Europe prior to the final selection.

The designs on the common sides of the coins feature the continent of Europe depicted in different ways. They are intended to symbolise the unity of the European Union. Islands are only depicted if they are of a certain size, i.e. over 2,500 km<sup>2</sup> for single islands and over 5,000 km<sup>2</sup> for archipelagos.

Each country had its own selection procedure for the design of the national side. The only common elements were the date of minting and the 12 stars symbolising the EU.

For historical, and often constitutional, reasons, the reigning monarch is depicted on coins minted by countries that are monarchies. Coin design in republics tends to show greater continuity. For example, in Ireland, the motif of the Celtic harp was stipulated without a design competition.

The three independent states of Monaco, San Marino and the Vatican City do not have their own currencies; they use euro banknotes and coins. Special agreements with France and Italy, both acting on behalf of the EU, have made it possible for these countries to mint and issue their own euro coins in line with the common specifications.



Luc Luyx of the Royal Belgian Mint, designer of the European side of the euro coins, at work in Brussels.

© European Community



Shortlisted coin designs for the European side.

## PREPARING THE FINAL DESIGNS

In its analysis of the printability of the draft banknote designs, the Banknote Working Group proposed some changes that were necessary for technical reasons and mainly concerned the position of the security features. For example, the security thread was embedded along the vertical middle axis, which is also the banknote's main folding line. As the area where the thread is embedded has slightly lower tear resistance, the thread needed to be repositioned so as to minimise the likelihood of a banknote being damaged by folding.

Apart from such technical modifications, the Banknote Working Group suggested some changes to the original designs, especially to make them more acceptable to the public. These changes involved the architectural features, the map of Europe and the EU flag. In particular, bridges, windows and gateways had to be revised to make sure that they did not closely resemble real ones, otherwise there would have been comments about a national bias. But the representations did have to be typical examples of the respective age and show the structural engineering correctly. For example, a bridge on a banknote, if transferred to the real world, should be strong enough to bear the weight of traffic.

The idea of showing a map of Europe was welcomed by the Council of the European Monetary Institute. But opinions differed sharply about how this could actually be done and, in particular, about what kind of map projection should be used. One option was to use maps from different ages, but these were sometimes difficult to recognise as representations of Europe. Moreover, they might have been regarded as focusing on Europe's past rather than its future. It was therefore agreed to use images based on satellite photographs.

After some adjustments to improve the clarity and printability of the map were made, the precise geographical area to be covered and the level of

detail were considered. It was decided to include geographical Europe, but only those areas or islands that were larger than 400 km<sup>2</sup>. This limit was chosen because large-scale offset printing did not permit the consistent printing of a line representation of any area smaller than 400 km<sup>2</sup>. As the euro banknotes would also circulate in territories near and outside geographical Europe, the map had to be positioned so that they could be fitted in. North Africa was featured in order to include the Spanish possessions Ceuta and Melilla and the Canary Islands. The French overseas *départements* of French Guiana, Guadeloupe, Martinique and Réunion were placed in small boxes.

Finally, the designs had to show a correct depiction of the EU flag, in blue with yellow stars, on the front of the banknotes.

In July 1997, the revised designs were published, but the details of the security features were not revealed until late August 2001, so as not to reveal valuable information to counterfeiters at an early stage and enable them to prepare copies of the security features before the banknotes were put in circulation. Therefore, so-called "dummy designs" were published, with several security and design features shown in a distorted way. For example, the holograms were replaced by guilloches (an ornamental pattern of circles or loops) and the EU flag depicted in grey and white was shown on the banknotes' reverse side.

National features on the euro banknotes were eventually rejected because even though they might have made the banknotes more acceptable in their respective countries, they might have had the opposite effect in other countries. In addition, having uniform banknotes enhances their security as they can be easily cross-checked.



Robert Kalina, designer of the euro banknotes, at work at Austria's central bank in Vienna.



Europe is shown on the back of the banknotes. The French overseas départements appear in tiny boxes at the bottom.

## DESIGN BRIEF FOR A SERIES OF EURO BANKNOTES

### – Ages and styles of Europe –

The European Monetary Institute wishes to launch a competition for the design of a series of banknotes which reflect Europe's cultural heritage.

### I Purpose of the Design Brief

The challenge of the banknote design lies in the ingenious combination of security features and artistic interpretation.

When creating euro banknotes, the same considerations apply as when planning, developing and producing national banknotes.

Banknotes should be

- easy to recognise;
- secure against counterfeiting;
- aesthetically attractive.

The fulfilment of these requirements influences and restricts the creative freedom of a banknote designer.

The banknotes must be clearly and identifiably European and should embody a cultural and political message that is readily acceptable to the citizens of Europe.

[...]

### 3 Broad outline of the banknote production process

The banknotes will be made of cotton fibres and will be produced by offset, intaglio (only on the front of the note), silkscreen (only on the back of the note) and letterpress printing (only the banknote numbers, on the back of the note). Additionally, a foil will be applied to the front of the note.

### 4 Design features for the banknotes

[...]

... it is imperative that the designs ensure a proper balance between men and women and that national bias is avoided.

[...]

Any portrait should appear on the front (A) side of the banknote and will be printed in intaglio. Both eyes should be visible on all portraits. The architectural features should be depicted on the back (B) side of the banknote.

The relative position and size of the security features should be consistent on all banknotes (see Appendix 3 for a description of the security features). The security features for public recognition should not be concentrated in one area alone but should be distributed over the whole surface of the banknote; they should be integrated into the general design; and they should be easy to recognise.

The offset design on the back of each banknote must include a specific 'European feature' occupying no more than 20% of the surface of this side and created in such a way that it can be replaced by a (locally designed) 'national feature'.

The twelve stars symbol of the EU must be included in the design on the front and could appear on the back of the banknotes (see appendix 4 for a description of the 'twelve stars' symbol).

[...]

## **5 Dominant colours**

The banknotes will be designed in different dominant colours which are specified in Appendix 3.

## **6 Location and size of words and numerals**

The name of the single currency will appear once on each side of the banknotes, in both the Latin and Greek alphabets, i.e. EURO and ΕΥΡΩ.

The denomination numerals should appear at least twice on each side of the banknotes. They should be very distinct and clearly legible and should be presented against a contrasting (light) background for easy readability. The area surrounding the numerals should be designed in a way that makes it more difficult to upgrade the value of a banknote by adding one or more zeros, i.e. turning a €5 banknote into a €500. The numerals should be located in a standard position throughout the range of denominations on both the front and the back of the banknotes, in a position that aids the orientation of the banknotes for insertion into machines.

[...]

## **7 Technical specifications and security features**

[...]

## **Appendix: Excerpt from the design brief for the euro banknotes**

European Monetary Institute  
12 February 1996





# CHAPTER 3

# PRODUCTION

*Cleaning an intaglio printing plate. Banknote printing calls for very high quality standards.*

## PRINTING PROTOTYPE BANKNOTES

Most of the banknote printing works in the European Union contributed to the production of the euro banknotes, many of them making all seven denominations. This was because substantial printing capacity was needed to meet the deadline for the changeover to euro cash. In fact, most printing works operated two or three shifts.

Very stringent specifications were needed to ensure that banknotes of the same denomination were identical. National currencies had only been produced in one or two locations so it was fairly easy to achieve the same appearance and to get their machine-readable security features to trigger the same responses. But to do this with 15 printing works (plus nine paper mills and 20 or so suppliers of other raw materials), early test runs were essential. Two test series for the banknotes were prepared: the “test or prototype banknotes” and the “zero-production run”.

## TEST BANKNOTES

The test banknotes aimed to establish whether banknotes of sufficiently uniform quality could be produced. Prototype printing began early in 1997 in order to identify potential problems at the earliest possible stage. The test banknotes involved all the production techniques that would later be used for euro banknote production. They also included all the security features, but had different designs (the design of the test banknotes was finalised in 1996 before the close of the design competition). An EMI working group consisting of experts from several NCBs and printing works was established to prepare the test materials needed for printing.

The predominant colour of the test banknotes was brown and the size was similar to that of the €50

banknote (140 x 77 mm). To avoid any confusion with the final design, the value numerals “00” were chosen. The main motif was a portrait which was repeated in the watermark. Two basic prototypes were created: one simulated the low-denomination banknotes, incorporating a glossy stripe and a hologram stripe; the other had a hologram patch showing the word “TEST” and included colour-shifting ink in the value numerals “00” on the reverse.

Ten printing works and eight paper mills helped to produce the test banknote. For some of the printing works, it was the first time they had used both colour-shifting ink with silkscreen printing and hot-stamped holograms on banknotes.

The visual and machine-readable features of all the test banknotes underwent exhaustive laboratory checks. For example, the banknotes’ chemical and physical resistance was tested to determine their durability, with the banknotes being soiled and subjected to physical strain, such as folding. Several bundles of test banknotes were also tested in the national central banks’ (NCB) high-speed sorting machines. These are used in NCB cash departments and branches to check if banknotes lodged by commercial banks are genuine and good enough to be re-issued, and if each packet contains the right number of banknotes. Up to 40 banknotes can be processed per second. In order to avoid any disruptions during sorting, the machines were tested beforehand and the sensors adjusted to the banknotes.

The banknote experts found fewer differences between the test banknotes produced in the various locations than they had expected. Differences were minimised further by modifying the technical specifications for the banknotes and fine-tuning the printing works’ production equipment.

The test banknotes were also evaluated by members of the public. People in several European countries were asked if they could see any differences between the test banknotes produced by different printing works. Their verdict was that the banknotes looked identical.

Once the test banknote project was completed, each printing plant knew what it could do with its existing equipment and what it needed to do to produce real euro banknotes. This experience, combined with the details of the final design that had by now been selected, formed the basis of the preliminary general specifications for the banknotes. The final version of the general specifications comprised 80 pages. The specifications were in fact revised several times as a result of the two test series and even slightly modified during actual large-scale production.

## CREATING PRINTING PLATES

In the banknote field, the term “origination” relates to high-quality image preparation and the transformation of designs into production tools, such as printing plates and production forms for the different manufacturing steps. The originators at the banknote printing works created the printing plates and production forms by referring to the preliminary general specifications for the euro banknotes, which cover the design, characteristics and appearance of the security features.

The test banknote project raised awareness of the importance of clear and strict procedures for developing the origination materials and, in particular, for accepting deliveries from different

originators and exchanging approved origination materials (e.g. printing plates) between the printing works. This was a new, more challenging way of working for most of the printing plants, as they had previously produced origination material solely for national purposes.

In February 1998, the EMI Council approved the general specifications for the euro banknotes. The origination of the seven denominations of the new currency then had to be finalised on this basis within six months. It was a demanding timetable, not only because of the technical workload, but also because of the coordination required between printing works with different cultures and procedures. For most of the denominations, two different printing works were responsible, one for the front of the banknote and one for the back.

Ten printing works agreed to participate. The banknote designs were transformed into a master set of digital files, films and plates to be used for producing a proof. This master set was duplicated in order to make the printing plates for the production process. Naturally, all this work was closely coordinated with the designer. Defining the standards for the exchange of digital information for creating the printing plates was unexpectedly difficult, mainly because the existing international standards did not cover the accuracy required for banknote images. Nevertheless, all agreed documents and materials were delivered on time in August 1998 and, after an in-depth review, the denominations were finally accepted by the ECB's Governing Council in mid-December 1998, paving the way for volume production.

## ZERO-PRODUCTION RUN

The second test series entailed the production of a small number of banknotes with the complete design and all the security features in accordance with the general specifications. From September 1998, each of the seven denominations was produced on standard equipment in at least two printing works. The €20 banknote, which was expected to be one of the most frequently used banknotes, was produced in nine printing works.

The objectives of the zero-production run were fourfold: to check that the origination complied with the common general specifications; to refine the general specifications; to establish a common acceptance procedure; and to confirm that the quality management system ensured production homogeneity.

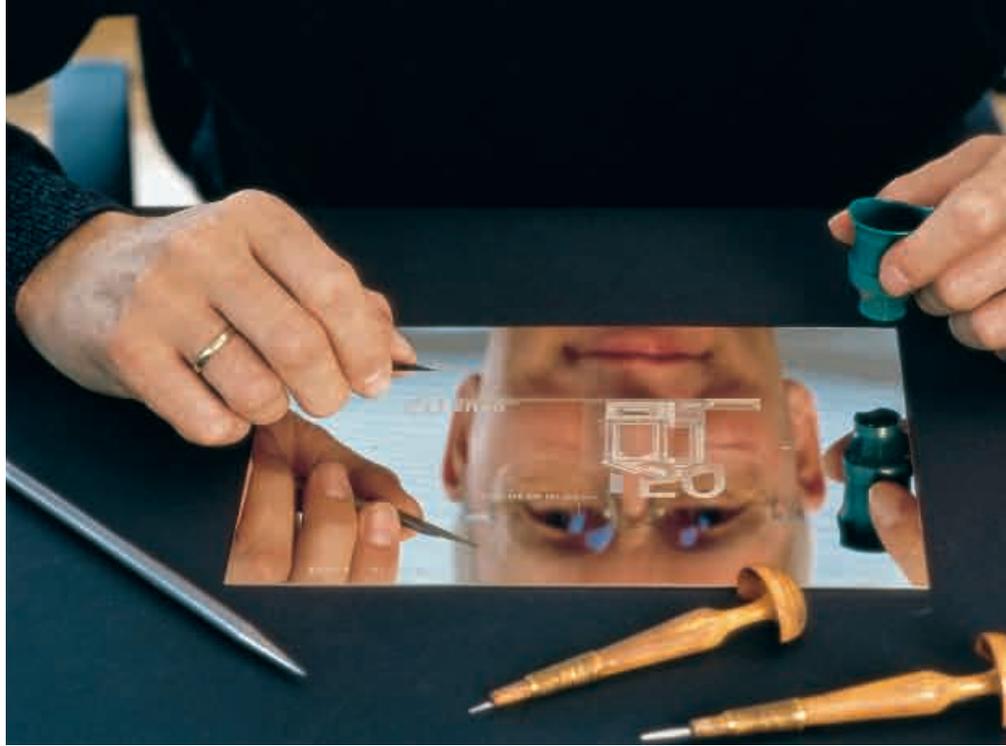
By December 1998, the zero-production run had been completed for most of the denominations. During the next three months, the participating NCBs and the ECB carried out extensive checks on the banknotes. They were examined with the naked eye and under a magnifying glass to see if the tolerances defined for each of the single elements on the banknote were acceptable. They also underwent laboratory and high-speed sorting tests.

After an exhaustive acceptance procedure in the various printing works, cross-checking was organised, with laboratories and cash departments of other NCBs testing the banknotes. 11 laboratories evaluated the properties of 150,000 banknotes of each denomination from each production site.

The results showed that, in principle, all the printing works could produce euro banknotes to the same standards. Some adjustments to the specifications, e.g. to the tolerances of hidden (covert) as well as visual (overt) security features, had to be made. The security thread had to be narrowed to ensure that it could be properly embedded in the paper by all the paper mills. Furthermore, the production processes of the printing works, which had been tested under real conditions, had to be modified in some cases.

Reference banknote sheets for each denomination were produced and these then set the standards for the subsequent large-scale production. In addition, a catalogue of acceptable and unacceptable banknotes (defective and limit samples), showing their specific characteristics, was created for reference purposes at the printing works.

Prior to the start of large-scale printing in 1999, the general specifications became the “Technical Specifications” for the seven denominations – each of them being a 200-page document containing data, graphs and drawings, including reference banknotes and sets of chemical and physical tests to check the resistance of the banknotes to e.g. sunlight and washing powder, as well as tearing, folding, crumpling etc.



Hand-engraving of the master intaglio plate.  
Banknote manufacturing combines craftsmanship  
with high-tech production methods.



Test banknotes showing the security features of euro banknotes.



Final inspection of banknote sheets in Greece.

## ESTABLISHING A QUALITY MANAGEMENT SYSTEM

An additional objective of the zero-production run was to substantiate the common quality management system. This was because the production of euro banknotes was more demanding than for any national currency on account of the large number of printing works, the many raw material suppliers and the variety of equipment, techniques and processes used by those printing works.

Achieving the appropriate production quality was the next step; it meant that “Quality Control for the Acceptance of the Euro Banknotes” had to be defined, i.e. detailed procedures for supervising production at the printing works. These procedures were implemented by each printing plant and were based on international standards for quality management and for the statistical inspection of production batches. In this way, the banknotes that did not comply with the specifications for each of the selected parameters could be identified.

The quality management system was then documented in detail based on these ISO standards (the International Organization for Standardization). All manufacturers were required to prepare their own individual quality manuals in such a way as to meet the basic requirements. Thus, the quality manuals covered not only the final products but also the acceptance procedure for each production stage. A reporting structure for the statistical inspections was established between the printing works and the NCBs and the ECB.

In addition, to ensure consistency for the different steps of production, the ECB assessed the visual appearance of the first production sheets – known as control sheets – at the start of the print run of each denomination and for each printing works, compared them with the reference banknote sheets and eventually approved them. Once the production standards were accepted, a “ready for printing” decision was issued. This procedure is still followed in current production runs.

## LEGAL AND SECURITY ISSUES WITH SUPPLIERS

Around 40 companies were involved in the production of the banknotes, including suppliers of high-security raw materials, such as banknote paper, special printing inks and hologram patches and stripes. Among other issues, patent rights and monopolistic supplies were taken into account.

Prior to the start of banknote production, contracts were signed which ensured that the raw materials could be used by the printing works without infringing existing patent rights. The contractual arrangements also guaranteed continuity of delivery: where a single supplier was providing a particular feature, contingency arrangements guaranteeing supply were established and price ceilings agreed.

Typically, the ECB entered into master licensing and master supply agreements with the companies. The NCBs based their individual delivery contracts on these framework agreements.

As the design of the euro banknotes progressed and the security features were selected, practical measures to protect the detailed design information from premature disclosure and the security features from loss or theft had to be considered. Any disclosure of information or loss or theft of the security features would give criminals an opportunity to produce counterfeit euro banknotes before the public had become familiar with them, thus undermining confidence in the new currency.

Practical security measures were taken to protect both the information and the features during development, production and transport. They reflected the best security practices used by the NCBs to protect their own currencies. The measures had to take account of the risks arising in each country as a result of the introduction of a common currency. To put it simply, criminals, like the euro, do not recognise national borders.

A system of inspections was developed to ensure that all manufacturers of the security features of the banknotes had physical security measures and internal process controls that complied with these security requirements. The inspections were (and are) repeated at regular intervals to ensure that the security measures keep pace with the changing risk environment.



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Euro banknote paper is made from cotton waste from the textile industry.

## PAPER-MAKING

Euro banknote paper is made of the highest quality pure cotton fibres. This composition gives it greater physical and mechanical resistance than normal paper-based products, an essential characteristic considering that banknotes pass from hand to hand many times and are not always treated “kindly”.

The first step in making banknote paper is to bleach the cotton fibres with caustic soda and hydrogen peroxide in water at high pressure and high temperature. For environmental reasons, chlorine is not used. After the fibres are bleached, dyes are added to the fibre pulp to obtain the specified final tint of the paper.

The second step is to “refine” the fibres, which consists of cutting and “fraying” the cotton fibres to improve both the mechanical and physical properties of the final paper. A careful balance has to be reached between fibre “shortening” and “fraying”. Very short fibres will produce paper with high specific volume and good “see-through” properties together with a clear watermark, but with weak mechanical characteristics. Highly frayed fibres will produce extremely strong paper but with extremely bad “see-through” properties and

watermark quality.

The third step in the process is on the paper machine. Banknote paper machines are very different to standard paper machines as they use a unique cylinder-mould process, in which the “refined” pulp is fed into a vat containing a partially submerged, wire mesh-covered mould cylinder. The cylinder rotates continuously and a fibre-mat forms over its surface as a deposit of the pulp as the water is filtered through the cylinder cover. The fibre mat is then transferred into the main part of the paper machine. The fibre-mat constitutes a paper web that leaves the cylinder surface with approximately 5% of solids (fibres and additives) in 95% of water. The paper web is then wet pressed, dried, sized with chemical glue, given a final drying and pressing, and then rolled up as finished paper with 5% of water in 95% of solids in reels weighing up to 2.5 tonnes each. Different chemical additives are applied to the paper substrate during the manufacturing process to meet the demanding physical and chemical specifications for the banknotes.

The last step in the process is to cut the paper



*Cotton fibres after the bleaching process.*

reels into sheets for printing. Euro banknote sheets are packed in “reams” (stacks of 500) in the size required by the printing works, to accommodate from 24 to 60 banknotes per sheet. As the paperweight is 85 grams per square meter, the weight of one ream varies from 10-20 kg, depending on the actual size.

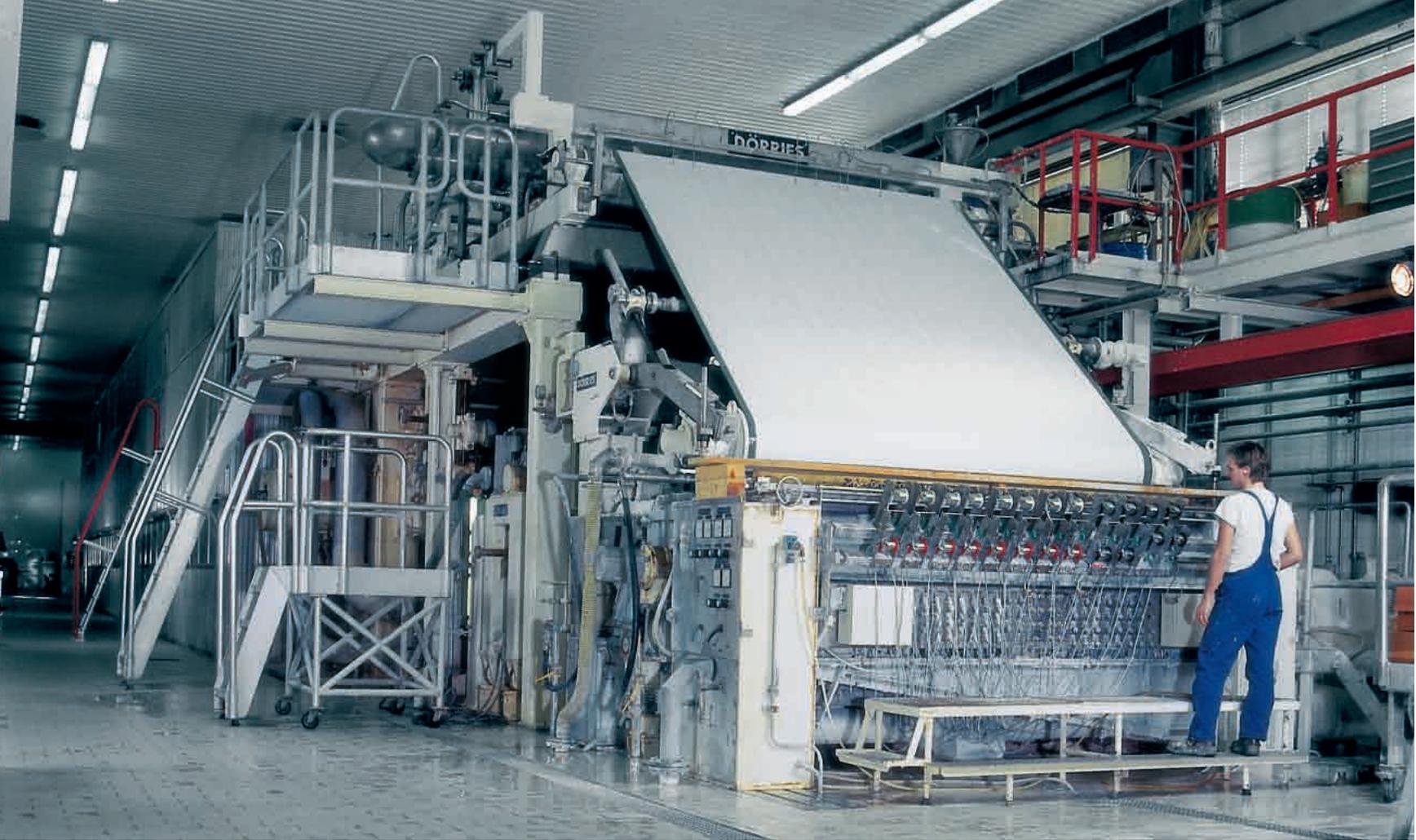
During production, quality controls of the highest standards are applied to both product and process, as banknote paper is very sophisticated. The latest computer-aided-manufacturing and computer-based inspection systems are used to ensure compliance with these quality standards.

Security is the other key characteristic of euro banknote paper. Watermarks, security fibres, security threads and special inks are some of the security features included in the banknote paper to make the banknotes as difficult to counterfeit as possible. Watermarks can be easily seen as ghost-like images inside the paper when a banknote is held against the light. The cylinder mould cover used for screening the fibres from the pulp has images embossed in a regular pattern that causes a variation in the deposited fibre-mat thickness. When the paper dries, the image embossed in the mould cover is reproduced in a unique way.

The euro banknotes include two different kinds of watermark for use by the public. The first shows the banknote’s main motif in a three-dimensional multi-tonal image. Just below it, the second watermark indicates the banknote’s face value. This

can be seen in clear characters when the banknote is held against the light. Watermark origination is an artistic process that has been enhanced by the use of computer-aided design and computer-aided manufacturing.

Two other security features usually applied to the low-denomination banknote paper as part of the paper-making process are the hologram stripe and, on the reverse side, a glossy stripe. The process for applying these security features are not typical paper-making ones, but as it is more efficient to do it in a reel-to-reel machine before cutting the reels into sheets, paper-makers usually perform this task. The hologram stripe is hot-stamped onto the paper, while the glossy stripe is usually printed by silkscreen.



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Cylinder mould paper machine producing a paper web.

## PRINTING

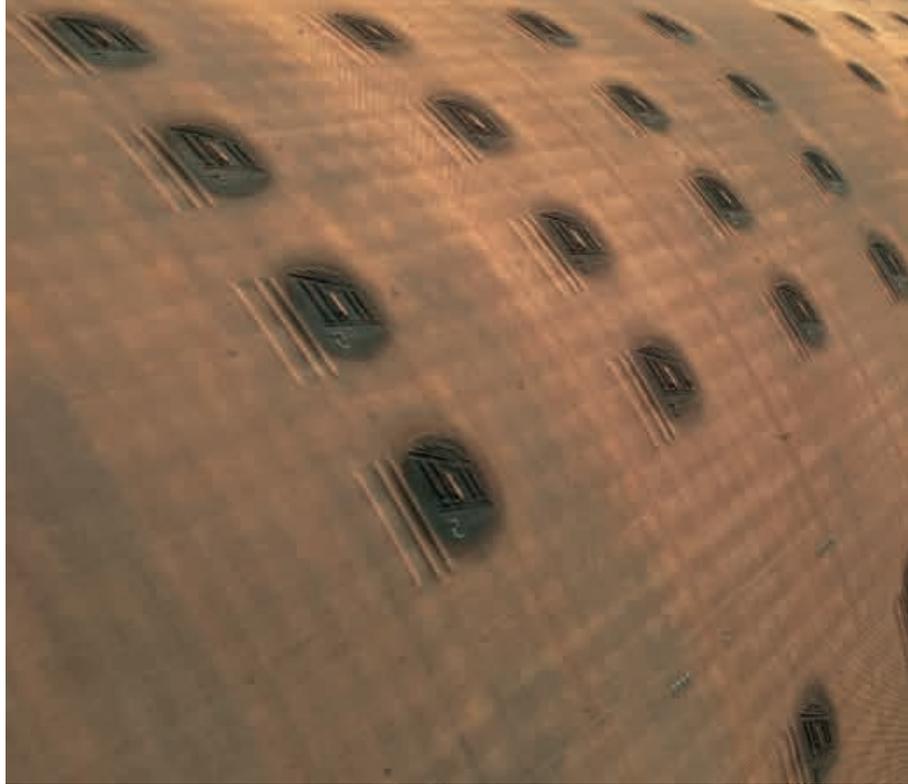
Euro banknotes entail four printing techniques: offset, intaglio, silkscreen and letterpress. Different types of plates or forms and special inks are used for these processes.

Printing of high-denomination banknotes usually starts with offset printing, providing the pattern for the graphic background of the banknote. Offset printing is an indirect printing technique, as the inks are not directly printed from the plate onto the paper. Rather, they are first transferred from four printing plates (each clamped to a print cylinder) onto a rubber printing blanket. From there, the inks are transferred onto the paper. The special configuration of the offset machines used for euro banknote printing means that the front and back of the banknote are printed simultaneously. This

allows an accurate alignment of the images on the front and back and can be checked by looking at the see-through number (the incomplete marks on both sides which combine to form the value numeral when the banknote is held against the light).

Intaglio printing – an Italian word meaning “to cut in” – gives banknotes their special feel. The initials of the ECB in the five linguistic variants, the value numerals and the windows and gateways can be felt with the fingertip. These image elements are engraved into the intaglio plate, forming recesses. From an original plate, which is usually made of copper, the printing plates are made by means of a galvanic bath. The ink applied to the printing plate fills the engraved areas and the surface (non-image

*Cylinder mould for the production of €5 banknote paper, showing the embossed images for the watermarks.*



areas) is wiped clean of ink by a counter-rotating roller. This roller is cleaned of the residual ink by solvents and a doctor blade. During printing, the ink is transferred from the plate, which is fixed to a print cylinder, onto the paper. In this process, the paper is compressed into the ink-filled recesses, leading to an embossing of the paper and the creation of the ink relief on the banknote. To achieve the desired relief, very high printing pressures of around 30 tonnes are needed.

After intaglio printing, another security feature is printed on the reverse side: the colour-shifting ink, which forms the value numeral on the high denominations (for low denominations, the glossy stripe is applied using the same printing technique at the paper mill). Both of these inks are applied by silkscreen printing, which ensures the thick ink films necessary to achieve the full optical effects of these features. The hologram patch is then hot-stamped onto the paper (for the low-denomination banknotes, a continuous hologram stripe is applied using a similar process). This process uses machinery capable of operating at speeds of 8,000 sheets an hour.

The sheets are then numbered using a printing technique called letterpress. They are fed into a numbering press, where the banknote numbers are applied on the reverse side of the banknotes by two different numbering units. After numbering, the sheets are automatically cut into banknotes and packaged. The sheets are cut length- and cross-wise, producing packets of 100 banknotes, which are banded and stacked together in bundles of ten packets. The bundles are then shrink-wrapped in transparent plastic film.

The sheets and the print quality are checked at various stages during the production process. These checks are either carried out online (i.e. during production) or offline (i.e. a sample is removed from production) and also on a spot check or 100% basis, depending on the parameters to be checked. For example, the printing works have introduced a final automatic quality check of their banknotes on high-speed processing machines at the end of the production process. Defective banknotes are either automatically removed and subsequently destroyed, or shredded immediately in the machine.

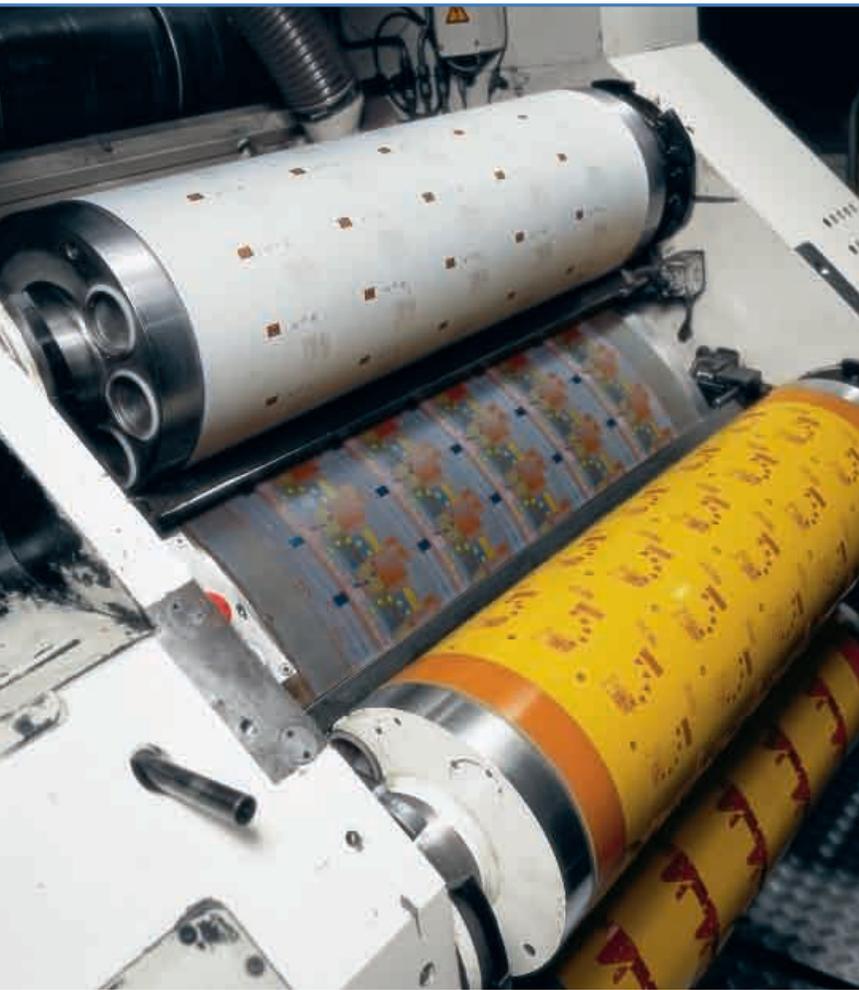


Plate cylinders for printing €50 banknotes and a rubber printing blanket in an offset printing machine.



Plate cylinder for printing €50 banknotes in an intaglio printing machine.



A silkscreen printing machine for applying colour-shifting ink to €50 banknotes.



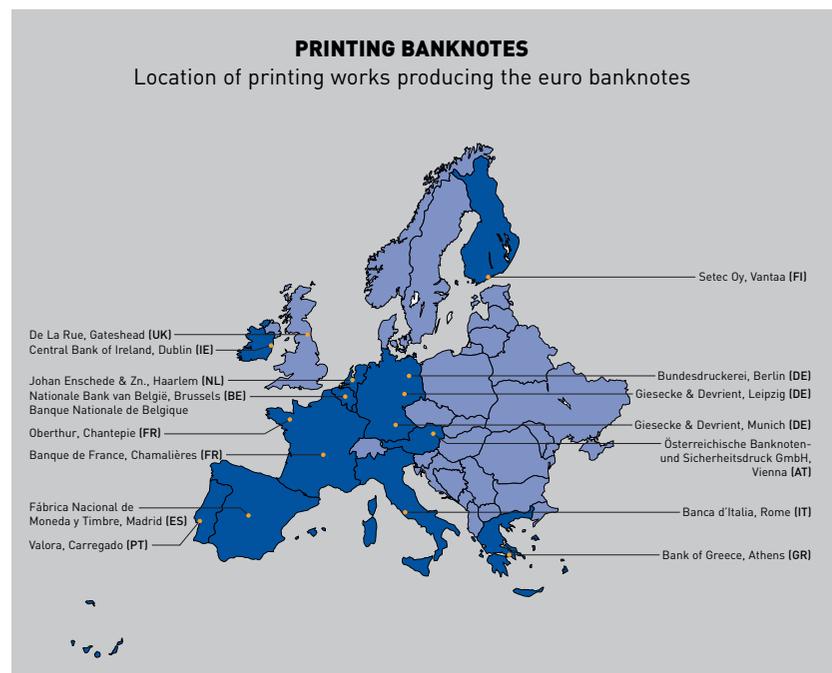
A numbering press. Each banknote carries a unique serial number.

## MANAGING THE LARGE-SCALE PRODUCTION OF EURO BANKNOTES

In 1996, the EMI Council decided that all the printing works in the European Union that were producing national banknotes should be involved in making the initial stock of euro banknotes. This was because enormous volumes needed to be produced to a tight deadline: sufficient stocks of euro banknotes had to be available in 500 NCB branches several months before the introduction of euro cash on 1 January 2002 so that they could be delivered in good time to the commercial banks. Two production scenarios were considered:

- “non-pooling”, in which each NCB would be responsible for producing its own national euro banknote requirements. In other words, each denomination would be produced by each NCB; and
- “pooling”, in which each NCB would produce only a limited number of denominations but it would do so to meet the need for those particular denominations throughout the euro area.

Pooling would be more efficient. If, say, all the €50 banknotes were to be produced by four printing works instead of 15, pooling would make the banknotes more uniform and involve less coordination. But these efficiency gains had to be offset against the effort and cost of distributing the huge number of banknotes needed for the launch. One difficulty with the pooling arrangement was that



Map showing the banknote production sites which printed the initial volume.

it could not be set up until the countries adopting the euro became known. But the printing works had to order some printing equipment before that decision was made. Fortunately, the test banknote project and the subsequent zero production run showed that there was no compelling technical reason to pool. It was therefore decided to print the initial volume on a non-pooling basis.

Of course, the national central banks could make bilateral pooling agreements with each other. This was especially useful for producing low volumes of the high denominations, i.e. €200 and €500. For some smaller countries in particular, it was more efficient not to produce these denominations but rather to order a proportion of a bigger country’s production volume and benefit from the economies of scale.



Although the ECB was responsible for coordinating the entire project, each national central bank was in charge of procuring its banknotes from its selected printer. Consequently, there was no centrally organised production. Instead, there were eventually no fewer than 70 combinations of central bank/printing works/denomination for banknote production in 2001.

Large-scale production of the banknote paper started in early 1999 and printing began that summer in Belgium, France, Germany, Italy, the Netherlands and Spain. It was gradually extended to other printing works in the months that followed. The printing works that were the first to start production of each denomination produced the reference banknotes. After these had been approved by the ECB, all printing works had to produce their banknotes to the same standard. Some printing works were still producing national banknotes and started euro banknote production later. Greece started printing in late 2000 as it did not become a euro area country until 2001.

Towards the end of the production run for the launch of the euro, the total production capacity needed was one billion banknotes per month, which meant 33 million per day, 1,400,000 per hour, 23,000 per minute or approximately 400 per second. Some plants worked day and night, with three shifts, and on public holidays too. A total of 15 printing works produced euro banknotes for the launch of the new currency: three were in Germany, two in France and one in each of the remaining euro area countries except Luxembourg. One was in the United Kingdom, i.e. outside the euro area.

An offset printing machine.

## HEALTH NOTE

The seven euro banknotes as well as production materials from all sources were tested according to the most stringent European health and safety regulations. These tests, which were based on the ISO 10993 standard, were carried out by the Netherlands Organisation for Applied Scientific Research. They confirmed that euro banknotes do not cause any health problems in normal use.



€-day



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## CHAPTER 4

# CHANGEOVER

## ESTIMATING HOW MANY BANKNOTES TO PRINT

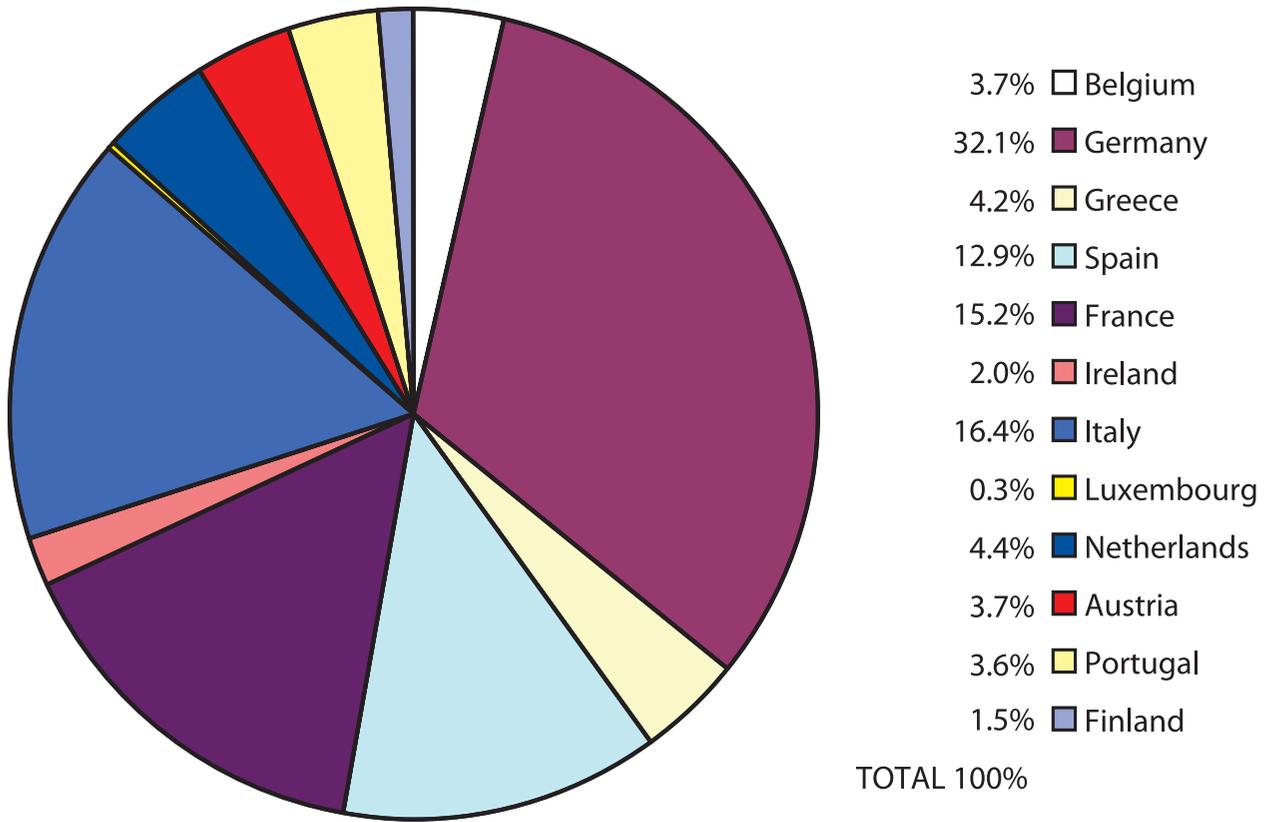
The national central banks (NCBs) estimated their own euro banknote requirements for the launch and for the rest of 2002. The first estimate of the prospective demand was made in 1998 but it was updated annually, and planned production volumes adjusted accordingly. In the last few months prior to the changeover, the commercial banks requested more low-denomination banknotes than expected and their demands had to be met.

The initial production run of banknotes consisted of “launch stocks” which would replace the national banknotes in circulation prior to introduction of the euro banknotes, and of “logistical stocks” which would ensure a continuous supply of banknotes throughout the year. The difficulty for the NCBs was to estimate the demand for each euro denomination, as the values of the national banknotes were different from the euro denominations. The likely effects of replacing some national denominations with euro coins and introducing high euro denominations had to be carefully assessed.

Finally, the demand from countries outside the euro area had to be taken into account. In particular, Deutsche Mark banknotes were used extensively outside Germany, especially in central and eastern Europe. In value terms, it was estimated that around one-third of DM banknotes (equivalent to €32-45 billion) was used outside Germany. It was impossible to know how much of this would be changed into euro and to what extent other euro area countries bordering on eastern Europe would exchange these banknotes.

The initial production volume was fixed in 2001 at 14.9 billion banknotes (representing a value of more than €633 billion), of which nine to ten billion were to be the launch stocks, replacing the national banknotes in circulation, and around five billion banknotes would make up the logistical stocks. The estimate for the launch stocks was derived from national banknotes in circulation (11.7 billion banknotes at end-2000), although it turned out that fewer banknotes were needed. One year after their introduction, 8.2 billion euro banknotes were in circulation. By the end of 2006, this figure had increased to 11.3 billion.

In addition to the launch and logistical stocks, the ECB’s Governing Council decided in early 2001 to establish a “central reserve stock” (CRS) of euro banknotes as a back-up in the event of production problems, quantity and quality shortfalls and/or surges in demand for particular denominations. The CRS consisted of 1.9 billion banknotes (made up of the banknote denominations that are most commonly used for payments, notably €5, €10, €20, €50 and €100) and was mainly produced by a consortium of European printing works that still had some spare capacity. The ECB placed this order and bought the banknotes. NCBs in need of banknotes from the CRS had to buy them from the ECB. Around 30% of this stock was used before and during the changeover. The remaining part of the CRS was fully transferred to the Eurosystem Strategic Stock.



Initial production volume showing each national central bank's share. 



Foil-wrapped euro banknotes in storage at the Banco de España in Madrid.

## BANKNOTE CIRCULATION AND BANKNOTE STOCKS

Banknotes (and coins) are said to be “in circulation” after being issued, usually to commercial banks, by a national central bank (NCB). The circulation figure decreases when the banknotes are sent back to an NCB. “Banknotes in circulation” means banknotes issued minus banknotes returned. Banknotes are also “in circulation” if they are not being used in payments, but are stored at banks or deposited in piggy banks.

The NCBs store new and used banknotes. After being checked for “fitness”, i.e. that they are physically sound, and for authenticity, used banknotes can be re-issued. Unfit banknotes are shredded and counterfeits are reported to the police. Two types of banknote stocks are held by the Eurosystem: logistical and strategic.

Logistical stocks are the working stocks of the NCBs and meet the demand for banknotes in normal situations, including seasonal peak demand.

They are held:

- to replace unfit banknotes returning from circulation;
- to accommodate an expected increase in circulation;
- to meet seasonal fluctuations in demand;
- and to optimise banknote transportation between NCB branches.

The bigger an NCB’s network, the more stocks are required, as each branch has to meet the potential demand for all denominations at any time.

Over time, there may be imbalances (surpluses or deficits) in the logistical stocks at an NCB because of people travelling from one euro area country to another and taking euro banknotes with them. Should an NCB run short of a particular denomination it will draw on the Eurosystem Strategic Stock if the surplus logistical stocks of other NCBs are insufficient.

*Armed escort for euro cash at the banknote printing works in Carregado, Portugal.*



## STOCK MANAGEMENT SCHEME FOR THE CHANGEOVER

As a result of the regular revision of the NCBs' banknote production plans and the establishment of the CRS, it was assumed that the Eurosystem had sufficient stocks of euro banknotes prior to the cash changeover. But in the months just before the launch, because of the very high volumes of low-denomination banknotes being provided to commercial banks, there were doubts about whether each NCB's supplies would indeed be sufficient to meet demand in early 2002. This was particularly true for the €5 banknotes. For this reason, the Eurosystem established a stock management system to minimise the risk of any regional shortages.

This system allowed NCBs facing an imminent banknote shortage to quickly access the CRS. In addition, all the NCBs made a commitment to assist each other by making available any surplus banknotes. If an NCB were running short of banknotes, it first had to resort to the CRS. If the CRS could not handle the request, the remaining NCBs would be ready to make emergency transfers of any surpluses from their logistical

stocks. To this end, NCBs updated their forecast in December 2001 regarding the maximum quantities needed until the end of February 2002 and also provided the ECB with detailed data regarding the inventory levels of banknotes they required to ensure a smooth banknote supply. This information, together with daily updates on the number of banknotes put into circulation as of 1 January 2002, enabled the ECB to monitor the demand for, and supply of, euro banknotes during the critical days of the changeover.

Between November 2001 and January 2002, a few NCBs requested more than 500 million €5 and €10 banknotes from the CRS. But the bulk of these banknotes were not actually issued during the changeover period, as the quantities initially provided to banks turned out to cover most of their needs, and during the first weeks of January 2002, withdrawals by banks from NCBs remained low. Nevertheless, the stock management system helped to prevent any disruption and paved the way for a permanent stock management system after the cash changeover.



Delivery of euro cash to a supermarket in Austria in late 2001.

## EARLY DISTRIBUTION OF BANKNOTES AND COINS

In the last four months of 2001, while the banknotes and coins of the national currencies were still circulating, businesses all over the euro area, notably banks and shops, built up stocks of euro banknotes and coins in two steps known as “frontloading” and “sub-frontloading”. In the first step, the NCBs delivered banknotes and coins to the commercial banks, which, in turn, distributed the new cash to shops, bank branches etc. The new cash was not yet legal tender and its circulation was prohibited. But frontloading and sub-frontloading ensured that banknotes and coins were widely available well before 1 January 2002 and that cash transportation companies could use their 7,600 vehicles more efficiently, thus avoiding bottlenecks in the cash supply towards the end of 2001. Others also benefited from this early distribution of cash:

- banks filled their 200,000 cash dispensers with euro banknotes;
- retailers prepared their cash registers;

- banks and operators of vending machines started filling their machines with euro.

A shortage of the new banknotes and coins in the early days of 2002 would not only have been bad publicity for the new currency, but it would also have prolonged the simultaneous circulation of national currencies and euro cash, which was limited to a maximum of eight weeks. Only sufficiently large and timely deliveries of cash would ensure a smooth changeover and thus maintain and enhance both public and financial market confidence in the new currency. In volume terms, close to 80% of the initial banknote demand and 97% of the total coin needs (including the coin starter kits for the public) for the changeover were delivered by the end of 2001.

Because of differing circumstances – the size of each euro area country, its economy, its cash supply infrastructure and the national changeover

Customer buying a starter kit  
of euro coins at a bank in Paris.



scenario – each NCB started to frontload and sub-frontload at different times. The maximum period was four months, i.e. starting on 1 September 2001. An earlier start was not justified for logistical reasons and would have increased both the security risk and the risk of the premature circulation of euro cash. Often, the schedules for supplying the banknotes differed from that of coins. As a general rule, coins were delivered earlier because the logistical burden of transporting coins was higher than that of transporting banknotes and because their face value, and thus the security risk, was lower.

Banks and retailers that received the cash were legally or contractually obliged by the supplying NCB not to pass it on to consumers before 1 January 2002. Any early circulation of euro banknotes and coins would have disrupted plans and created confusion. The banks had to take out insurance to cover the risk of destruction, theft or robbery as well as the risk of premature use of the frontloaded cash by the public. Euro banknotes

delivered to banks remained the property of the central banks until 00.00 on 1 January 2002 in each country. Alternatively, if the arrangements for the retention of ownership were not feasible or enforceable under the national legislation, the frontloaded euro banknotes had to be secured by collateral.

Unlike banks, shops and other organisations, the public did not receive euro cash before the launch, with one important exception: they could obtain coin starter kits in the second half of December 2001, either from banks or directly from the NCBs. The starter kits contained small amounts ranging from €3.88 (equivalent to 23 Finnish markkas) to €15.25 (equivalent to 100 French francs). The idea was to familiarise the public with the coins and to make the changeover easier. People were expected to use the euro coins for payments in the early days of 2002 in order to give retailers more change.



*Tight security for a shipment of euro leaving a Banca d'Italia branch near Rome.*

The NCBs said in their information campaigns that the starter kits should be spent rather than collected, but inevitably people were interested in keeping them as a memento of the historic event and were reluctant to spend them. The kits were produced only in small quantities and in some countries they were sold out within 48 hours.

But why were banks willing to build up large stocks of euro cash well in advance of the launch date? Cash does not bear interest and creates liquidity costs for banks. These additional costs needed to be neutralised. To encourage banks to accept early deliveries of banknotes and coins, a debiting model was agreed on. It needed:

- to reflect banks' additional cash holdings in euro;
- to be simple and easy to implement;
- and not to interfere in the relationship between banks and their clients.

According to the “linear debiting model”, the cash was not debited to the respective bank at once, but one-third of it was debited at face value to the banks on 2, 23 and 30 January 2002 respectively.

These dates took account of the main refinancing operations, in which the ECB provided (and provides) liquidity to commercial banks, in early 2002. The ECB's Governing Council agreed that the debiting model should remain the only instrument at Eurosystem level that would neutralise the costs incurred by those involved in the cash changeover. But at national level, the introduction of restricted and specific exceptions was possible, provided that the foreseen measures facilitated the cash changeover. For example, some NCBs offered financial incentives to banks which accepted early deliveries of low-denomination banknotes or which returned national currency early.

Since a significant number of banknotes issued by the NCBs were circulating outside the euro area, early deliveries of cash were made to these areas as well, although they were of a more restricted kind. An ECB guideline governed the distribution of cash to commercial banks outside the euro area by banks located inside the euro area as from 1 December 2001. Banks were allowed to distribute euro banknotes to their branches and headquarters located outside the euro area. In

Armed guards protect a euro-carrying truck as it comes off a ferry in Greece.



addition, banks were allowed to pass cash on to their subsidiaries, as well as to other banks with headquarters and/or branch networks outside the euro area.

A subsequent ECB guideline extended the possibility of the early delivery of euro banknotes outside the euro area. Banks outside the euro area that specialised in the wholesale distribution of banknotes could receive cash from NCBs and pass it on to their customer banks outside the euro area. In addition, NCBs outside the euro area could receive euro banknotes and deliver them to banks in their jurisdiction. But passing on cash to retailers, for example, was not allowed outside the euro area.

The distribution of euro banknotes to any location outside the euro area was only allowed from 1 December 2001. In terms of value, €4.1 billion was delivered to specialised credit institutions and NCBs outside the euro area. Germany's Bundesbank was responsible for 78% of the distribution and the French central bank for 12%. Eastern Europe, including the western Balkans and Turkey (where

the parallel circulation of Deutsche Mark banknotes was quite large), received more than half of all banknotes shipped outside the euro area. Large amounts were also transferred to North Africa and to international wholesale banks in, for example, Switzerland and the United Kingdom.

## FRONTLOADING AND SUB-FRONTLOADING

“Frontloading” was the physical delivery of euro banknotes and coins from NCBs to commercial banks or their appointed agents (cash transportation companies) between 1 September and 31 December 2001. The passing-on of frontloaded banknotes and coins as from 1 September 2001 to third parties, such as shops, restaurants as well as manufacturers and owners of vending machines, was called “sub-frontloading”. The instruments of frontloading and sub-frontloading, including the debiting model for the frontloaded and sub-frontloaded amounts, were governed by ECB guidelines.

## FACILITATING THE CASH CHANGEOVER FOR RETAILERS

Many retailers were concerned that they would have to hold large amounts of coins during the early days of 2002, given that shops were to be the main distribution channel for the new coins (whereas most banknotes would be issued via cash dispensers). The coin starter kits were intended to alleviate their concerns and, for the same reason, banks were encouraged to put low-value rather than high-value banknotes in their dispensers. Also, official bodies were urged to make welfare payments (which are often paid in cash) in low-value banknotes.

The public too was called on to help. In the Euro 2002 Information Campaign they were asked to: minimise mixed payments, i.e. of national currency and euro; start using euro banknotes and coins as soon as possible; offer the exact amount in payment wherever possible.

## PUTTING EURO CASH INTO CIRCULATION

The total amount of banknotes in circulation during the first days of the cash changeover exceeded forecasts. If the banknotes coming into circulation are likened to the water filling a bathtub, then the bathtub became increasingly full, and fuller than expected. This was caused by the high flow rate from the “euro tap”, which could be opened wide thanks to the large volumes of cash delivered before the changeover. But the “drainage pipe” for the national banknotes was of a more limited capacity, which led to the slow removal of national currencies from circulation.

During the changeover period, the ECB monitored the volume of euro banknotes and coins issued and the volume of national currencies withdrawn on a daily basis. The chart on page 63 shows the

total number of banknotes in circulation after the launch of euro cash. As all frontloaded banknotes were recorded as being “in circulation”, the circulation went up to a value of €403 billion on 1 January 2002, exceeding the banknotes in circulation at the same point in time in 2001 by 6%.

The total number of banknotes in circulation went down day by day, as the volume of national banknotes withdrawn invariably exceeded the issuance of euro banknotes. On 28 February 2002, for the first time, more euro banknotes were issued than national banknotes withdrawn. On that day, the total value of banknotes in circulation amounted to €285.1 billion, which was about one-quarter less than on 28 February 2001.

The demand for €5 and €10 banknotes was extremely high at the beginning of the cash changeover period because the Eurosystem had urged banks to distribute mainly low-value banknotes. After the first days of the changeover, the circulation of these low denominations decreased rapidly – by more than 30% (€5) and nearly 20% (€10) within just one month. The demand for high-value banknotes, by contrast, increased steadily. This is reflected in the average value of a euro banknote in circulation, which increased from €28 in January 2002 to €44 by the end of that year. In December 2006, the average value of a euro banknote in circulation was €55.

The share of cash payments in the total volume of payments increased in most euro area countries in the first two weeks of January as people used up their national currencies and familiarised themselves with the euro. This situation began to return to normal during the second half of January. The share of the euro in cash payments averaged 75% by 7 January and exceeded 90% by mid-January.



*1 January 2002, just after midnight: some brand new euro banknotes are closely examined in Maastricht.*

## WITHDRAWING NATIONAL BANKNOTES AND COINS

Most national authorities tried in advance to reduce the workload of banks, retailers and cash transportation companies during the changeover period by encouraging the public to deposit national coins at banks long before January 2002. In addition, charities organised campaigns to get people to donate their “old” coins. The total circulation of national coins decreased by 9% in value in 2001: from €17.9 billion at the end of 2000 to €16.3 billion 12 months later. In volume terms, 107.5 billion national coins were still in circulation at the end of 2001, which was more than twice the total volume of coins produced for the introduction of the euro.

This discrepancy can be explained by the hoarding behaviour of some coin users. Low-value coins in particular are often collected over a long period of time (e.g. in piggy banks) and thus disappear from circulation. Furthermore, these coins may end up being retained by collectors, who may pay little attention to the overall value of their holdings. These small coins are used in payments only to a limited extent, and the change received is not necessarily spent on other purchases. In addition, commercial banks do not exchange coins that tourists bring home and thus these coins are also “lost”. Coin hoardings and losses make it necessary for new coins to be put into circulation constantly, thus increasing the circulation figure.

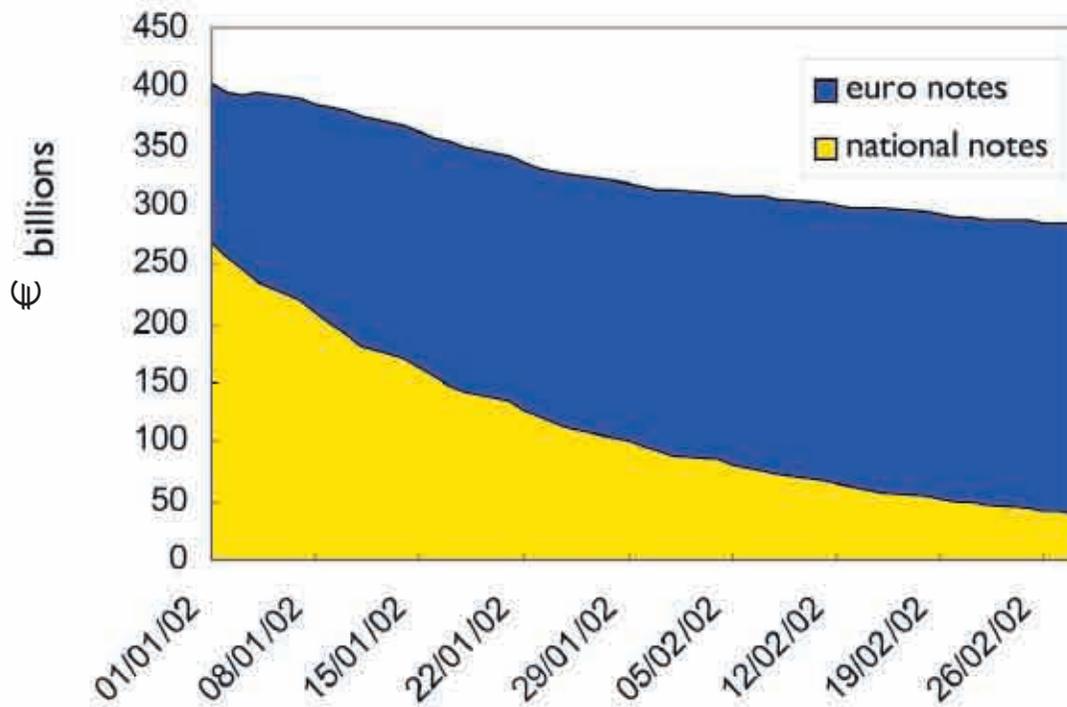
In terms of value, about one-third of the national coins were withdrawn from circulation by the end of February 2002, so that the circulation figure decreased from €16.3 billion to €11.3 billion.

In 2001, the value of national banknotes in circulation dropped by nearly one-third to €270 billion. The fall continued sharply from 2 January 2002. Each day, returns to NCBs amounted to 4-6% of the remaining national banknotes in circulation. By the end of February 2002, the value had shrunk to €53.8 billion. In value terms, by the end of 2002, 95.1% of the national banknotes in circulation had been returned.

Since the old national banknotes can still be exchanged for euro by the NCBs that issued them for a very long or even unlimited time, residual volumes will remain “in circulation”. Some national banknotes and coins are likely to have been kept for sentimental reasons or as collectors’ items.

In order to reduce the likelihood of robbery, “marking schemes” for the national banknotes were implemented in Belgium, France, Italy, Luxembourg and Spain as from 1 January 2002. Banknotes were invalidated by punching holes through them or cutting off a corner so that they could no longer be exchanged or used in payments. As a consequence, the insurance premiums paid by banks and post offices for transporting cash were reduced, easing their financial burden.

### Value of banknotes in circulation from 1 January until 28 February 2002



The rise of the new notes and decline of the old in early 2002 – as shown by the blue band that broadens and the yellow band that narrows.



A cash machine expert tests euro coins from different mints at a Deutsche Bundesbank site near Frankfurt.

## ADAPTING CASH DISPENSERS AND CASH-OPERATED MACHINES

Cash dispensers normally account for around 70% of banknote withdrawals from bank accounts. But during the first ten days of the euro cash changeover in January 2002 people made much greater use of over-the-counter service in the 218,000 banks and post offices to withdraw euros or change national currency. In some countries, such as Germany and Spain, where banks were open to the public on 1 January, the volume of cash supplied to individuals at counters was even higher than that withdrawn from cash dispensers.

The Eurosystem encouraged a timely and quick conversion of the dispensers, so that most of them only paid out euro banknotes (and not national currencies) from 1 January 2002.

The companies that needed to adapt their cash equipment (e.g. cash dispensers and vending machines) to the euro had an opportunity to test the new banknotes long before the changeover. As banknote production progressed, the printing works made available more and more denominations for testing purposes. There were three phases:

- In May and September 2000, two centralised test series were offered to equipment manufacturers. A total of 54 companies from countries inside and outside the EU (including Japan and the United States) participated. The tests took place in secure premises belonging to the Bundesbank near Frankfurt, under the supervision of the ECB. Each company had a small test booth in which it could analyse the banknotes with its own equipment. A general information package on the euro banknote specifications, including information about the positions and characteristics of the security features, enabled the companies to determine which features could be checked by their sensors in order to determine whether a banknote was genuine.



*Cash machine experts testing euro banknotes at a Deutsche Bundesbank site near Frankfurt.*

- As from March 2001, these tests were organised in all 12 countries of the euro area plus the United Kingdom. More than 150 organisations participated in the tests. This time, service suppliers (including companies that maintain cash dispensers) and banks were also invited.
- As from 1 September 2001, companies conducted laboratory tests on early shipments of banknotes at their own premises. In order not to discriminate against equipment manufacturers from countries outside the euro area, which were not allowed to receive euro banknotes, these companies had the chance to buy euro banknotes from the Bundesbank.

Following thorough preparation by the manufacturers and operators of cash dispensers and by the banks, conversion of this equipment was rapid throughout the euro area, rising from 90% on 2 January 2002 to virtually 100% two days later. The number of withdrawals from dispensers was very high during the first week of January 2002, reflecting people's enthusiasm for and curiosity

about the new currency. In the Netherlands, for example, five million withdrawals were made from dispensers on the first two days of the year. The volume of withdrawals remained high until the middle of the second week, when it started to drop back to normal levels.

Cash-operated machines were modified at a somewhat slower pace than other aspects of the cash changeover. This was no surprise considering the vast number of machines (ten million coin-operated machines, some of which also accepted banknotes) to be adapted and the limited number of technicians available to carry out the work in a relatively short period of time. People in those countries where machines did not accept euro cash and where the adaptation took longer did however benefit: if they were unable to pay for certain services, e.g. parking, travelling, they were not fined. But all the teething problems were overcome after the first few weeks.

## EXCHANGING NATIONAL BANKNOTES AT FACE VALUE

When the exchange rates of the national banknotes and coins of the euro area countries were irrevocably fixed on 1 January 1999, those notes and coins, legally speaking, became sub-units of the euro. From then on, it was possible for, say, someone in Portugal to send money, denominated in euros, via bank transfer to a bank account in the Netherlands. But he or she could not use euro banknotes and coins for the simple reason that they were not introduced until 2002.

In order to reflect the irrevocable fixing of exchange rates and also to achieve some interchangeability between national banknotes of the euro area countries during this three-year transitional period, the NCBs offered to change national banknotes free of charge. The majority of NCBs offered this service to the public at all their branches, so that in total 500 NCB branches were involved. Professional clients – commercial banks and bureaux de change – could in most countries only exchange

national banknotes at one location. Coins were not accepted as their shipment back to the country of issue would have posed logistical problems due to their weight and bulk. Germany's Bundesbank sent back the largest number of foreign banknotes (661 million of them) to their countries of origin. In second and third place were the central banks of France and of Luxembourg, which returned 93 million and 27 million banknotes respectively.

This exchange of banknotes at face value was originally due to end on 31 December 2001 with the introduction of euro banknotes and coins. However, to facilitate the changeover, the ECB's Governing Council decided to permit the exchange of national banknotes until 31 March 2002, by which time euro banknotes had replaced nearly all national banknotes.





**La MISE**  
**L'Éuro: on y en a**  
**on y en a**  
L'avenir  
L'avenir

Gros incendie  
**L'avenir**  
L'avenir



## CHAPTER 5

# COMMUNICATION

Headlines for the new currency in Luxembourg on €-day.

## PREPARING THE PUBLIC FOR THE CHANGEOVER

The introduction of euro cash was a complex and ambitious undertaking, requiring organisational, logistical, technical, financial and administrative efforts by all those directly involved, not least the public. The involvement of banks, retailers, cash transportation companies, the vending industry and the coordination of preparatory work was essential. In many countries, changeover boards were established, consisting of public administrations and business associations. From 1997, discussions were also held at European level. For example, the EMI and its successor, the ECB, organised regular meetings with national government experts to discuss a wide range of issues, including legislation, dual display of prices, rounding-up and down of prices, accounting, and VAT and other taxation questions. The EMI and the ECB organised “third-party meetings” at European level to discuss matters related to the cash changeover.

Initially, the ECB had intended not to disclose the design and security features of the euro banknotes prior to 1 September 2001, when the delivery of cash started and the security features were made public. But given the numbers of professional cash handlers, e.g. shop assistants, checkout staff etc.,

to be trained, the business community did not think that four months would be sufficient for conducting training sessions, given that the trainers themselves would first need training. Consequently, “train the trainer” sessions in NCB branches began in January 2001, although special training kits were not distributed until after the presentation of the banknotes’ security features on 30 August 2001.

The ECB realised that visually impaired and other vulnerable people needed to know about the new currency at an early stage. From March 2001, under the European Commission’s “Euro Made Easy” programme, the ECB distributed 30,000 sets of sample banknotes to organisations for the blind for training purposes. Sets were also made available to train people with other disabilities.

The sample banknotes possessed the “feel” of the real euro banknotes as banknote paper was used and raised print was included. To ensure that the sample banknotes could not be mistaken for genuine ones, their reverse sides were left blank and their front sides were marked with the words “NO VALUE”. Dummy designs, not the final one, were produced using offset print.



*Giant-size euro banknotes are unveiled on the Eurotower in Frankfurt, headquarters of the ECB, on 30 August 2001.*

## EURO 2002 INFORMATION CAMPAIGN

As the technical and logistical preparations for the cash changeover continued, it became clear that people needed to learn about the new cash. While information about the benefits of a common currency area and the conversion rates had already been publicised, people still needed comprehensive practical advice on the changeover.

The ECB decided to launch a wide-ranging initiative to inform the public about the new banknotes and coins. In November 1999, following a public tender, an international advertising agency was selected to help the ECB and the NCBs carry out a “Euro 2002 Information Campaign”.

The campaign focused on:

- the appearance of euro banknotes and coins,
- their denominations,
- their security features and
- the changeover.

The strategy was to have an integrated communications campaign, with different media sending the same messages. From the outset, it was decided to use a “megaphone approach” to optimise the resources available and spread the information as widely as possible, the idea being that each target group would pass on information to others (e.g. retailers giving leaflets to their customers), with larger audiences being targeted as the campaign progressed.

While the overall aim of the information campaign was to reach everyone in the euro area, certain groups were to receive tailor-made information. These included national authorities, such as the police, cash handlers (e.g. shop assistants and bank employees), the travel and tourism industry, educational institutions, the media as well as vulnerable groups, including blind and partially sighted persons.

The campaign included:

- a partnership programme, involving public and private-sector organisations,
- an advertising campaign in autumn 2001,
- a comprehensive website, including a children’s zone, and
- a year-long series of public relations and press activities to raise awareness, provide information, and to encourage people to learn about the new money.

A range of information materials was produced to meet different needs. Since the campaign was to be held across the euro area, it was decided to produce all campaign materials centrally and then to adapt them for national use. This ensured that the messages and style were consistent. Centralised development meant that once the concept had been agreed, the material would have to be modified for each country. For some materials, this simply meant translating the text, but for others, national considerations, e.g. the length of the changeover period, had to be included. Each piece of the campaign material was produced in the EU’s eleven official languages (at that time) and a public information leaflet in 23 languages. Some materials were also translated into even more languages. In Spain, for example, there were translations into the co-official languages of the Balearic islands, the Basque country, Catalonia, Galicia and Valencia; and in Ireland, some materials were published in the Irish language.

A number of dilemmas, identified at the start of the campaign, had to be resolved. The main one concerned the security features of the euro banknotes. On the one hand, the public had to be able to recognise them, but on the other hand those features should not be revealed too early and give counterfeiters plenty of time to prepare. As a result,



Partnership Programme logo.

two sets of materials were produced for the Euro 2002 Information Campaign: those containing images of euro banknotes without their security features (dummy designs), and those showing the actual euro banknotes.

The total budget allocated by the ECB for this campaign was €80 million. In the end, more than 30 different publications had been developed and produced, with quantities ranging from one single master copy to over 17 million (the public information leaflet) in various languages and distributed across the euro area and beyond.

## PARTNERSHIP PROGRAMME

The partnership programme, which was the cornerstone of the campaign, emerged from the “megaphone” idea of using partners to pass on information to others. Official partners had access to

information about the new banknotes and coins that they could communicate to staff, customers and the public. Partners had a choice of materials to which they could add their own logo alongside that of the ECB or their respective national central bank under the partnership programme logo.

The success of both the national and international partnership programmes was largely due to the fact that partners recognised the value of receiving accurate, first-hand information. They were kept in touch with developments throughout the campaign via newsletters, meetings and training sessions. Partners in the international programme passed information on to 300,000 cash handlers through the training sessions alone. Additional news, examples of best practice and materials for downloading were made available from a restricted area of the campaign’s dedicated website. By the end of the campaign, the partnership programme had more than 2,400 national partners and 100 international partners.

## NATIONAL COMMUNICATION EFFORTS

The Euro 2002 Information Campaign focused on issues that affected everyone: the denominations of the euro banknotes and coins and their appearance and security features. General information on the changeover was also provided, but in less detail.

Each euro area country also undertook its own communication activities in parallel with, but complementing, the Euro 2002 Information Campaign. Two particular pieces of country-specific information had to be communicated:

- the national changeover arrangements, and
- the fixed conversion rate of the national currency to the euro.

In general, the national central bank, the ministry of finance and the government as a whole played an essential part in each country. Chambers of commerce and the banking and retail sectors also played a role. The changeover arrangements varied considerably from country to country because of the specific cash supply infrastructures and cultures. No harmonised dates for the early delivery of cash were set and the composition of the coin starter kits was at each country's discretion. In some countries, the changeover period was very short or even non-existent (e.g. in Germany); in others, it covered the maximum period of eight weeks. National currencies could, and in some cases still can, be exchanged for euro by the national central banks and commercial banks.

Public relations and press activities were a prominent part of the communication mix and ranged from press releases and press conferences to information designed for specific target groups, such as banks

and retailers, since they were important channels for introducing the new cash. Dedicated call centres and websites reinforced the communication measures in each country and many of the national central banks complemented the Euro 2002 Information Campaign mass media campaign with television commercials and print adverts.

There was concern in many countries that unused coins stored in homes could result in long queues at banks during the changeover period. Various campaigns were organised to encourage households to return their coins early. The "Operation Piggy Bank" campaign in Belgium, for example, appeared on television, in the press and in schools, as a means of getting families, through their children, to exchange Belgian francs in piggy banks for euro. Campaigns to attract hoarded coins were also run in Austria, Finland, Germany and Ireland.

The conversion rates for 11 of the 12 countries were agreed on 31 December 1998 and came into force on 1 January 1999. For some countries, conversion was simple (e.g. €1 ≈ DM 2), but for other countries, such as Greece, which joined the euro area on 1 January 2001, it was more complicated: 340.75 drachmas equalled €1. Each of the euro area countries therefore produced information on converting the national currency into the euro. For instance, in France credit card-sized leaflets made of tear-proof and stain-resistant material were distributed; they showed the values of different amounts of euro in francs, and vice versa. In Ireland, a calculator and an information leaflet were distributed to each household.



Students promoting the new currency at a shopping centre in Dublin.

## CAMPAIGN RESEARCH

From the outset, the effectiveness of the Euro 2002 Information Campaign was tested by means of qualitative research, which was used to define the creative style of the campaign, and quantitative research, which identified gaps in knowledge that needed to be filled as well as public attitudes towards the changeover and the new banknotes and coins. This made it easier to fine-tune the campaign strategy. Given that the campaign was not only important but also unprecedented, research was for obvious reasons a vital part of the strategy. After all, there would be no time to redesign and relaunch the campaign if the messages were not getting through to the general public.

Qualitative research started immediately, testing ideas that would be used in all campaign materials. As these materials would be used throughout the euro area, they had to appeal to people from very different countries, from Finland to Portugal, from Ireland to Greece. Themes were needed that would catch the attention of as many people as possible without alienating anyone.

To meet this goal, research was conducted with focus groups; small groups of adults, elderly people, children and managers of small businesses were interviewed. The responses from all these groups showed that the campaign needed to become much more engaging. In addition, messages had to be kept simple and only one should be used per advertisement, whether on TV or in print, to avoid confusion.

These findings formed part of the creative development process and a second wave of research started in November 2000. It revealed that the campaign material had been significantly improved. But it also became evident that a more human touch was still necessary, with people looking at or using the euro banknotes, and overall stronger sound and visuals, to produce a more dynamic image.

The final creative materials included a “speech bubble” with the campaign slogan: “*the EURO. OUR money*”. This slogan too was tested in the campaign’s quantitative research. The general feeling was that its simplicity conveyed the message that euro banknotes and coins “belonged” to ordinary people.

The quantitative research programme assessed the knowledge and attitudes of people in the euro area towards the introduction of the euro cash, particularly the practical aspects of the changeover. Four waves of quantitative research took place between September 2000 and February 2002. The first wave was intended to serve as a starting point for the campaign, followed by a mid-term review in February 2001. A third wave, carried out in November 2001, served primarily as a spot check before the introduction of the new cash, and also as a partial evaluation of the campaign. In February 2002, the final wave of research took place to evaluate both the overall campaign and the changeover.

Fieldwork for each wave of research took place in all euro area countries. Random face-to-face interviews were conducted with 500 people from each country, including adults, children and cashiers. For each of the first three waves of research, the aim was to find out how much people knew about the new currency. For example, knowledge of the security features of the banknotes had increased by 12% among adults and 17% among managers of small businesses by the end of the third wave.

# *the* **EURO.** **OUR** *money*

The campaign slogan, which was translated into 23 languages.



Specialists from Publicis, the agency chosen by the ECB to organise the Euro 2002 Information Campaign, prepare adverts.



Screenshot of the Euro 2002 Information Campaign's dedicated website.

## CAMPAIGN WEBSITE

The Euro 2002 Information Campaign's dedicated website was launched on 1 March 2001. It provided information on the euro and in particular highlighted the key messages of the campaign. In addition, the site hosted special sections for key target groups, such as the media, partnership programme members at national or international level, and children. The site had seven different sections in the colours of the seven euro banknotes. In line with other campaign materials, the site was in the EU's eleven official languages at that time, and provided links to the websites of the national central banks.

Each section had a particular focus. *Euro banknotes & coins* contained the most important information in the campaign: the appearance, denominations and security features of the new cash. Another section, *Getting ready for the euro*, concerned the different cash changeover arrangements and included a sub-section *Travelling in the euro area*.

Three sections were aimed at specific audiences. *Information for organisations* helped business people to prepare their staff and to deal with early cash deliveries, as well as offering communication materials that could be downloaded. *News and events* was mainly for journalists and provided press releases, press kits and media contacts, as well as a campaign overview. The *Children's zone* featured a game to help children learn about the banknotes and coins, and those between the ages of eight and twelve could take part in an online competition, "Be a Euro SuperStar".

The website received a steady stream of visits in the run-up to the changeover, with most of the hits – over one million – occurring in December 2001 and January 2002. The site played a vital supporting role in the campaign, particularly for the partnership programme, for which it served as a low-cost distribution channel, in addition to providing the PR and press programme.

## PRESS ACTIVITIES AND PUBLIC RELATIONS

A PR and press programme, a key part of the Euro 2002 Information Campaign, featured coordinated activities which made both the press and public more aware of the new banknotes and coins.

A “countdown calendar” was drawn up to provide the media with authoritative information at specific dates. Media kits were put together for seven key dates, starting on € -365, i.e. 1 January 2001, and ending on € -1, 31 December 2001. Each kit contained a range of written and illustrative materials, such as leaflets and CD-ROMs, and was sent to approximately 300 national and international media contacts, mainly in the euro area.

There was also a series of campaign conferences, which took place in 11 of the 12 countries in the euro area. Each conference brought together national players to draw attention to the national aspects of the cash changeover and the preparations being made by key industries, including the financial, retail and travel sectors. Each conference attracted significant media attention, thanks in part to a number of well-known participants, and proved to be an effective communication channel.

One PR activity was aimed at children between the ages of eight and twelve, not only because they needed to learn about the new currency, but also because they could play a vital role passing information onto their parents and other family members. The prize-winners, 24 “Euro SuperStars”, were invited to an award ceremony hosted by the ECB in Frankfurt on 31 December 2001. They received a special “piggy bank”, which displayed a set of euro banknotes, and a laptop computer from the then ECB President, Willem F. Duisenberg, after seeing a musical show that brought to life the characters from the “Be a Euro SuperStar” competition poster.

In addition to the Euro SuperStar event, which included a special press conference on the eve of the changeover, the ECB also hosted two other events.

One was a press conference on 1 March 2001 which outlined the main themes of the campaign and revealed the campaign slogan. The other event, also a press conference, took place on 30 August 2001 and received very wide coverage. The President of the ECB showed, for the first time, the real euro banknotes. As the security features had been a closely guarded secret until then, the conference attracted a lot of attention, with over 500 journalists, 39 camera crews and many TV stations broadcasting the event live from Frankfurt’s Neue Oper. Two images from the event were printed in newspapers around the world: one of Willem F. Duisenberg holding up a star containing the euro banknotes and one of a banner around the ECB’s Eurotower showing the banknotes.



Poster for the children’s online competition, “Be a Euro SuperStar”.

## MASS MEDIA CAMPAIGN

This was the most visible part of the Euro Information Campaign and it comprised three main elements: online advertising, and national and international media campaigns. The goal was to ensure that at least 80% of the euro area population saw each advertisement at least 2½ times, with additional attention paid to housewives and the elderly.

The strategy was to gradually improve people's knowledge through a series of advertising "bursts", consisting of a series of seven television commercials and eight print adverts, which first appeared at the end of September 2001. The last wave of print adverts ran in February 2002, focusing again on the security features of the banknotes and bringing the campaign to a close. In total, the TV commercials were shown more than 10,000 times and almost 800 print insertions were made in publications throughout the euro area between September 2001 and February 2002.

In addition to the mass media campaign in the euro area, an international campaign targeted audiences in other European countries, as well as Asia, North America and Latin America. In each region, the aim was to reach the top 10-20% of the population (in terms of education and income) as well as potential travellers to the euro area. In order to achieve this goal, print adverts were placed in international newspapers and magazines, such as the Financial Times and Time. Posters were also displayed at airports in the euro area, as well as at London Heathrow, complemented by in-flight information, in both electronic and print form.

The campaign involved a range of materials, including:

- An information kit on euro banknotes and coins for the general public, with facts about the appearance and denominations of the new cash, as well as changeover details.
- Training materials to help train cashiers, shop assistants etc. Each kit contained an interactive CD-ROM, a brochure and video, with detailed information on how to recognise genuine euro banknotes.
- A series of print adverts which provided information on how to recognise the hologram and watermark of a euro banknote.
- A public information leaflet which was distributed to most households in the euro area. 17 million of them were produced, in 18 different versions, with master copies in an additional 12 language versions for people from outside the euro area.







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## CHAPTER 6

# SECURITY FEATURES OF EURO BANKNOTES

 Hologram stripes being applied to euro banknote paper.

The appearance of the euro banknotes and coins was an important part of the Euro 2002 Information Campaign. They were widely publicised and people were soon able to distinguish the different denominations at a glance. The security features of the banknotes were a major focus of the campaign as well. Both the public and professional cash handlers needed to know about these features in order to be able to recognise a genuine banknote.

The banknotes are produced using sophisticated printing technology and their security features make them easy to distinguish from counterfeits. The euro banknotes can be checked in various ways. Some users check features that can be seen with the naked eye, such as the watermark. Others, particularly when paying or receiving cash in a supermarket, check if the banknote paper is crisp and firm and if the print is raised in some parts.

Cashiers and shop assistants can check other features by using an ultraviolet (UV) lamp. The euro banknotes also incorporate several covert features, which can be detected by sensors in vending machines and in the high-speed sorting machines of the central banks. The most sophisticated hidden features can only be checked by high-tech sensors, which are only available to central banks and known by a few sensor manufacturers. It is therefore highly unlikely that central banks could accidentally put counterfeit money received from banks or retailers back into circulation.

The security features differ depending on the banknote: the low-value banknotes (€5, €10 and €20) include a hologram stripe on the front and a glossy stripe on the back, whereas the high-value banknotes (€50, €100, €200 and €500) have a hologram patch on the front and a colour-changing number on the back.

As counterfeiters tend to concentrate on only certain features of a banknote, and with varying success, users should always check several security features by feeling, looking at and tilting the banknote. FEEL concerns those features that are tangible. LOOK refers to those features that are visible if the banknote is held against the light. TILT covers those features that “move” or undergo a colour shift. Cashiers may check more features with the aid of simple devices. All the publicised security features of the euro banknotes are shown below.

## FEEL

- *Paper*  
*Feel the crisp and firm banknote paper.*
- *Raised print*  
*Feel the raised print with your fingernail.*

### Watermark

Hold the banknote against the light and a shadow-like image and the value numeral become visible.



### Security thread

Hold the banknote against the light and a dark line running through the banknote becomes visible.



### Feel of the paper

Feel the banknote paper. It should be crisp and firm. Run your finger across the front of the banknote and you will feel that the ink is thicker in some parts.



### Hologram

Tilt the banknote. In the €50, €100, €200 and €500 banknotes the hologram shows the value of the banknote and a window or doorway.



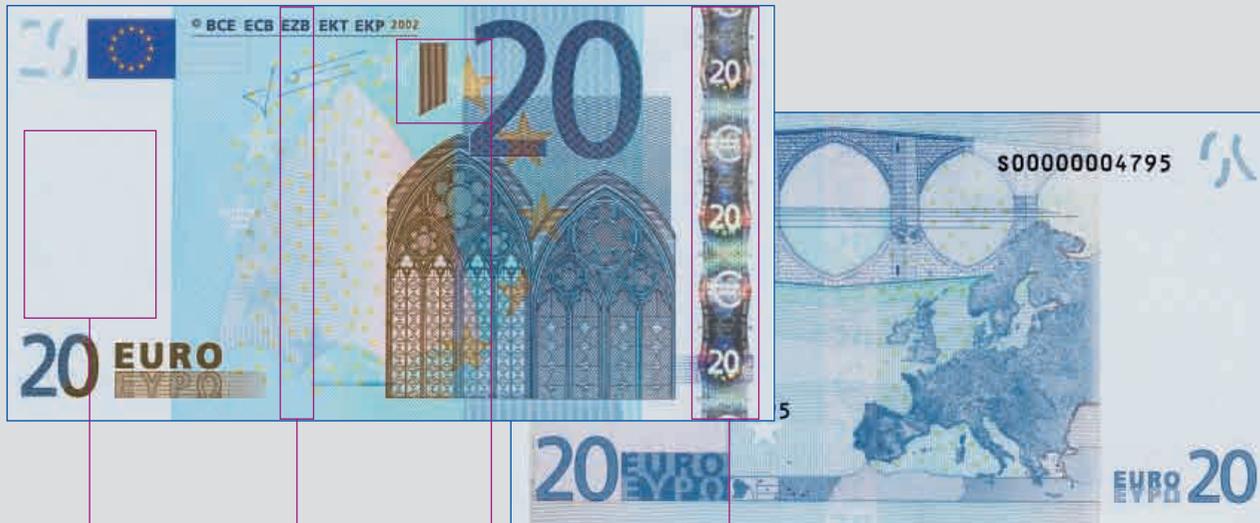
### Colour-changing number

Tilt a €50, €100, €200 or €500 banknote. The number will change colour from purple to olive green or brown.



## LOOK

- **Watermark**  
*Hold the banknote against the light and the watermark will appear. Put the banknote on a dark surface and the light areas become darker. This effect is very easy to see in the value watermark.*
- **Security thread**  
*Hold the banknote against the light – the thread will appear as a dark stripe. The word “EURO” and the value numeral are printed on that stripe.*
- **See-through number**  
*Hold the banknote against the light and the incomplete marks printed in the top corner of the banknote, on both sides, combine perfectly to form the value numeral.*
- **Perforations**  
*Hold the banknote against the light and you will see perforations in the hologram stripe or patch which form the € symbol.*



#### Watermark

Hold the banknote against the light and a shadow-like image and the value numeral become visible.



#### Security thread

Hold the banknote against the light and a dark line running through the banknote becomes visible.

#### Feel of the paper

Feel the banknote paper. It should be crisp and firm. Run your finger across the front of the banknote and you will feel that the ink is thicker in some parts.



#### Hologram

Tilt the banknote. In the €5, €10 and €20 banknotes the hologram shows the value of the banknote and the euro symbol (€).

## TILT

- **Hologram patch** (€50, €100, €200 and €500 banknotes)  
Tilt the banknote and the hologram image will change between the value numeral and a window or doorway.
- **Hologram stripe** (€5, €10 and €20 banknotes)  
Tilt the banknote and the image will change between the value numeral and the € symbol. At the edges, tiny letters show the value.
- **Colour-changing number** (€50, €100, €200 and €500 banknotes)  
Tilt the banknote – the value numeral will change colour from purple to olive green or brown.
- **Glossy stripe** (€5, €10 and €20 banknotes)  
Tilt the banknote. A gold-coloured stripe will appear. It shows the value numeral and the € symbol.

## CHECK WITH AN ULTRAVIOLET LAMP

- *UV fluorescence*  
*Under UV light,*
  - *the paper itself does not glow*
  - *fibres embedded in the paper glow red, blue and green*
  - *the flag of the European Union looks green and has orange stars*
  - *the signature of the ECB President turns green*
  - *the large stars and small circles on the front glow, as do the map, bridge and value numeral on the back.*

## CHECK WITH A MAGNIFYING GLASS

- *Microprinting*  
*Microprinting has been used at different places on the banknote. A magnifying glass is necessary to see it. The microprinting is sharp, not blurred.*

## DID YOU KNOW?

- *Some properties of the banknotes may deteriorate if the banknotes are not treated properly. For example, the paper of an accidentally washed banknote may glow under a UV lamp. To double-check if a banknote is genuine use the feel-look-tilt test.*
- *Euro banknotes bear the signature of Willem F. Duisenberg, the first President of the European Central Bank, or of Jean-Claude Trichet, who succeeded him on 1 November 2003. Banknotes with one signature or the other are equally valid.*





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## CHAPTER 7

# CURRENT AND FUTURE DEVELOPMENTS

 Promenade in Dun Laoghaire harbour, Ireland.

The circulation of euro banknotes has risen strongly since their introduction in early 2002, both in terms of numbers and value, and there are signs that by end-2006 a considerable share – as much as 15% of the overall value of euro banknotes in circulation – was held outside the euro area. As a lack of public trust in euro banknotes could endanger their function as a means of payment, the ECB has monitored the cash supply situation and circulation developments, both in terms of volume and banknote quality, from the outset. By monitoring the stock levels of the national central banks (NCBs) and coordinating cross-border bulk transfers from NCBs with surplus stocks to those NCBs with low stock levels, the ECB has ensured that banknote demand is met efficiently at any location and at any time in the euro area and beyond.

The Eurosystem not only ensures that freshly printed banknotes are of uniformly high quality but also that the banknotes remain in good condition after they leave the vaults of the central banks. Any decline in their quality during circulation as a result of wear or soiling could mean, for example, that they are rejected by vending machines. If such banknotes were not withdrawn, it would also be more difficult to spot counterfeits. Accordingly, common minimum issuable quality standards have been defined for the processing of euro banknotes by the NCBs' high-speed sorting machines, which are able to authenticate and check the condition of a banknote in a fraction of a second. Where needed, NCBs have taken steps to make sure certain denominations are returned to them more frequently, in order to take worn banknotes out of circulation.

The Eurosystem is also carefully monitoring new developments in the organisation of the cash cycle that are being initiated by commercial banks. Back in 2002, common minimum terms of reference for banknote quality and authentication were agreed with the manufacturers of cash recycling machines and the European Credit

Sector Associations. Cash-recycling machines are stand-alone, customer-operated devices capable of receiving, processing and dispensing banknotes in a fully automated process. The terms of reference ensure that the banknotes are reliably checked for authenticity and fitness before they are dispensed. In December 2004, these terms of reference were extended to include the “Framework for the detection of counterfeits and fitness sorting by credit institutions and other professional cash handlers”. The framework contains requirements to which banks and cash transportation companies have to adhere when issuing banknotes which they have received from their customers – either through cash-recycling or staff-operated banknote handling machines. The new framework further minimises the risk that banks could accidentally issue counterfeit banknotes. One way of doing this is to allow banks and cash transportation companies only to operate cash recycling and handling machines which have been successfully tested by a central bank.

The euro is maturing well and the Eurosystem has gained considerable experience from introducing the banknotes and coins and managing their circulation. The experience will be drawn on to introduce the euro cash in the new members of the European Union. From 2007 onwards, the euro will gradually replace the national currencies of the 12 countries which have joined the European Union since 1 May 2004: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia. The first of the 12 to join the euro area was Slovenia in January 2007.

As a hard and widely tradable currency, the euro is an attractive target for counterfeiters. However, the number of counterfeits is only a tiny fraction of the around 11 billion euro banknotes in circulation. In order to keep ahead of the counterfeiters, the Eurosystem is constantly monitoring the counterfeit situation and advances in printing and



*In a symbolic act, Jean-Claude Trichet, President of the European Central Bank, welcomes the ten new members of the European Union to the European Central Bank in 2004.*

reproduction, as well as developing new security features and new banknote production techniques.

A security feature starts to “age” as soon as a banknote series is issued – the counterfeiters’ knowledge of the security features obviously increases as time goes by. Consequently, issuing authorities usually upgrade, i.e. improve, banknote series after they have been in circulation for a few years.

The planning of a new series of euro banknotes is in fact well under way. It will incorporate new security features but in other respects it will represent a continuation of the current series: the banknotes will have the same denominations – from €5 to €500 – and they will be based on the current design concept, the “Ages and styles of Europe”, making them immediately recognisable as euro banknotes.

The first step in the development of the new series has involved drawing up a list of the security criteria. Different groups of banknote users have been consulted with a view to creating user-friendly banknotes which are easy to handle in shops and elsewhere, and easy to check with the naked eye and by machine sensors. Then comes the industrial validation phase, in which the security features are tested in respect of their resistance to wear and other quality factors, as well as their suitability for large-scale production.

It will take some time to develop and produce the new euro banknotes, and they will be put into circulation gradually, over a period of years. The sequence and timing of their introduction will depend on the availability of new security features and on the counterfeit situation. The first new banknote is expected to make its appearance towards the end of the decade.

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Deutsche Bundesbank  
European Community  
European Central Bank

ISBN: 92-9181-985-9 (print)

ISBN: 92-9181-986-7 (online)

