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Editorial

■ J. Darío Negueruela *Banco de España*

This fourth issue of **BILLETARIA** incorporates a change, in that the majority of the articles in the “Opinion” section relate to a single theme. As it was announced in the previous issue, we asked for expert collaborations focused on one specific topic, to permit indepth analysis of this topic from a wide range of viewpoints. The aim is not for the entire issue to concentrate on one single theme (as you will see, the other sections remain the same), but to try to offer a broader and at the same time more indepth view of the topics analysed. In this case the topic chosen could scarcely be more important in the present circumstances: *central bank communication policies in the field of cash management*.

Communication policy has now become one of the key elements of the role of a present-day Cash and Treasury Department. The security and confidentiality issues that characterised cash management activities in the past are no longer the only parameters by which policies or measures are judged. The diversity and complexity of the modern world have added new parameters to our activities: productivity, efficient management, public service, innovation, technology, communication and distribution are all factors that must now be considered. Communication policy is part of our day-to-day activities and it goes further than information, as it is an efficient management of the message in a two way communication channel that allows the content to be understood between all the parties involved.

This edition includes a wide range of collaborations full of insight. The Banco de Portugal, the Banque de France and the European Central Bank offer different views of the importance of communication policy for a central bank. The Oesterreichische Nationalbank explains the communication strategy adopted in Austria. The US Federal Reserve and the Bundesbank focus on the use of digital tools in modern communication policies, whilst the Banco de México and the Banco de España present their experience of public opinion surveys on cash matters. We are extremely grateful to all concerned. At the 9th Meeting of Latin American Central Bank Treasurers held in Bogota at the beginning of September 2008 a full day was devoted to the subject of communication in the field of cash management. A wide range of communication models and strategies were presented, all of which would have been unthinkable only a few years ago, demonstrating once again just how things are changing in this respect.

In the present edition, we begin with an interview with Thomas A. Ferguson, recently retired from his post of Director of the Bureau of Engraving



and Printing of the United States and well known to all and sundry in the banknote world. His experience, knowledge and contacts are a source of riches for us all and we are certain that our readers will appreciate the value of his words. The interview was conducted by Jaime Pacreu, another gentleman who needs no introduction.

The next issue will focus especially on polymer banknotes and will be coordinated by Mr. Manuel Galán, General Director of Currency Issue at the Banco de México.

To conclude, we would like to express our most sincere thanks for all the support received by **BILLETARIA**, both from our collaborators and our readers, and we would like to ask you to help us once again by completing the **survey** you will find attached. All your comments, views and criticisms will be extremely useful, to help us to improve future editions of the review, whilst the information on the number of copies desired will allow us to adapt our distribution figures more closely to our readers' needs. Thank you all very much. We look forward to hearing from you.

Collaborators

J. Darío Negueruela	Director of the Cash and Issue Department. Banco de España.
Jaime Pacreu	Former General Director of Currency Issue at the Banco de México.
Thomas A. Ferguson	Former Director of the Bureau of Engraving and Printing of the United States.
Manuel Castelhanho	Director of the Treasury and Issue Department. Banco de Portugal.
Olivier Radelet	Principal Project Manager for Banknote and Coins Communication. European Central Bank.
Stefan Augustin	Director of the Cashier's Division and Branch Offices. Oesterreichische Nationalbank.
Anton Schautzer	Expert. Oesterreichische Nationalbank.
Sonja Danburg	Financial Analyst. Federal Reserve System of the United States.
Armand Pujal	Chief Cashier. Banque de France.
Jorge de la Vega	Issue Planning and Organization Manager. Banco de México.
María Luisa Leyva	Head of the International Currency Division. Banco de España.
Wolfgang Söffner	Former Chief Cashier of the Deutsche Bundesbank.
Raquel Cabrera	Expert of the Issue and Valuables Department. Banco Central de Cuba.
Hélder Rosalino	Deputy Director of the Treasury and Issue Department. Banco de Portugal.
Eduardo Kropnick	Head of the Technical Advice Unit. Banco de España.
Fernando León	Head of the International Currency Unit. Banco de España.
Mashiro Takagi	Head of Electronics Systems Operation. Toshiba Europe GmbH.
Yolanda Barrera	Photographer.

Interview with Thomas A. Ferguson, former Director of the Bureau of Engraving and Printing of the United States

■ **Jaime Pacreu** *Former General Director of Currency Issue at the Banco de México*

Thomas Ferguson has a B.A. in Economics from Lafayette College and a Masters in Public Administration from the University of Southern California.

He served in a variety of positions at the Bureau of Engraving and Printing in Washington DC during his 32-year career in the U.S. Federal Government, including Chief - Currency Production, Assistant Director Research and Technology and Deputy Director. For the last eight years of his career he served as Director of the Bureau of Engraving and Printing; in this position he was responsible for 2,500 employees in two facilities that produced an average of 9 billion banknotes per year as well as 15 to 20 billion postage stamps. Mr. Ferguson chaired the currency redesign efforts for the U.S. government that resulted in the Series 1996 and Series 2004 currency. The series 1996 design represented the first significant change to U.S. currency in 70 years and the series 2004 represented the first introduction of multi-color backgrounds to the U.S. dollar. He is currently the Principal in T.A. Ferguson Consulting LLC and provides firms and nations with advice on currency and security document design, protection, and production.

The original idea for this interview came from a good friend, Dario Negueruela. Following his recommendation, at the Banknote 2008 Conference held in Washington we asked Thomas A. Ferguson to share his experience in an interview to be published in *Billetaria*, an invitation that he accepted immediately. Part of this interview was conducted at the Conference, followed by an exchange of e-mails. I have had the privilege of knowing Tom Ferguson for almost two decades. Our relationship started with a professional exchange of experiences between two public officers involved in banknote-related activities, in my case at the Banco de México and in Tom's case at the Bureau of Engraving and Printing of the United States. Over the years I have been able to verify Tom's extensive knowledge of the subject, as well as his willingness to share it with his colleagues around the world. These qualities, together with his professional achievements, were the reasons for his choice, by the members of the International Association of Currency Affairs (IACA), as the first person to receive the Lifetime Achievement Award in the currency business. The Award was presented in 2007 in Bangkok, Thailand.

Tom has many other qualities that make him an exceptional person, including in particular his ability to explain complex concepts in a simple and entertaining manner. This is one of the reasons why he is always invited to speak at international currency-related meetings; he has been a constant speaker at the Banknote Conferences, the Currency Conferences and the Pacific Rim Banknote Printers Conferences.

For many years I have had the good fortune to share enriching and frequent professional exchanges with Tom, but what I most value is his friendship; he is a person who, beyond the professional level, has managed to enrich the lives of others through his relationships with family and friends.

Q. Tom, can you tell us about your beginnings: how and when did you start your professional career in the currency business?

A. After college I took a national civil service examination to qualify for a position with the federal government. As a result of that examination I was offered an entry level position at the Bureau of Engraving and Printing (BEP) in the Quality Control area. I had no previous desire to work in the currency field or for that matter any intention on spending the next 32 years at the BEP. After a few years in Quality Control I began a progression through several positions in supervising production areas. I found that the work was interesting and challenging so I continued to stay there and before long I was hooked on the currency industry.

Q. What came after those first steps?

A. One of the most important steps in my career was a move to head the Production Scheduling office. This position planned and coordinated all the manufacturing steps required for all the products produced by the BEP. This provided me with a detailed understanding of all the processes in the security printing field, from design and engraving through printing, inspection and packaging. This position also required me to interact on a daily basis with the BEP's customers on order quantity and delivery schedules. In this position I began my long and very positive relationship with the Federal Reserve.



From left to right: J. Dario Negueruela, Thomas A. Ferguson and Jaime Pacreu.

I think the most fun I had in my career was when I was leading the effort to redesign the U.S. currency in 1996. This was the first redesign in 70 plus years and involved managing an internal effort as well as coordinating and “selling” the effort to many external groups and agencies such as Congress, the Department of the Treasury and other political entities. It was exciting and very satisfying to see the notes go into circulation.

Q. Can you tell us something about your promotion to Director of the BEP?

A. I remember that about one month after being named Deputy Director I was attending a Pac Rim conference in India when Larry Rolufs, then the Director, called and told me he was retiring in three weeks. After that I acted as Director while the political leaders of the Department of the Treasury performed a nationwide search for a new Director. At the conclusion of the period they appointed me Director. There were a number of issues we were faced with at that time but everyone pulled together and we got through them.

Q. What are your feelings about the security features we, as an industry, provide for the public? Are they really robust? Are they easy to use? Do we teach the public how to use them properly?

A. The security features available for the use of the public are really quite robust and effective. The vast majority of counterfeit notes are readily detectable as the security features have not been duplicated or in most cases even simulated. In most cases, the public has failed to utilize the features that have been provided for their protection.

One can argue that the problem is that the features are too complex for the general public or that we have done an inadequate job in educating them. I do not believe that either of these two arguments is correct. Features such as watermarks, color shifting devices and imaging shifting devices are fairly easy to understand and to use, and despite millions of dollars of public education they are not well known nor are they used by the majority of the public. I believe that in most cases the public is not concerned and does not really look at their banknotes. Our industry produces banknotes that are in fact secure and difficult to counterfeit if the features are properly used and we need to continue to do everything we can to educate the public and instill in them the knowledge of how to authenticate their currency.

Q. We would like you to share with us some of your views on the current situation and expectations for the future regarding:

■ **The use of banknotes**

A. Banknotes remain a very efficient medium of exchange that is available for use to everyone and is universally accepted. For these reasons it will remain an integral part of everyone’s daily life. However, the continued expansion of other forms of money, such as credit cards, debit cards and other electronic means will eventually reduce the role of banknotes to some degree. Thus the growth in banknotes will slow and eventually flatten, but I do not see a decrease in currency in circulation for many years.

■ **The security features of banknotes**

A. Countries will continue to add new and innovative

features to their currency as counterfeiters continue to improve and find ways to challenge the existing security features. The challenge will be in deciding when to eliminate the older features that the public has become used to using and replacing them with new features that will require considerable public education.

■ **The industry, regarding state-owned printers**

A. Having spent my career in a state-owned print works I believe there is a role for the government in the production of a nation’s currency. However, I do believe that the competitive nature of the private sector leads to efficiencies and new innovations. Thus, I think the best situation is that there remains a combination of private and state printers that continue to push each other to be better and to produce ever more secure banknotes.

■ **The industry, regarding suppliers**

A. The very nature of our business requires a great deal of trust and confidence in suppliers so it is difficult for new companies to gain credibility in the banknote business. This results in reliance on a relatively small number of suppliers for equipment and supplies. I do not believe this has harmed the industry, but we do need to continue to bring in new people with new ideas and a fresh viewpoint.

Q. Is there anything else you would like to tell the BILLETARIA readers?

A. The banknote industry has provided me with a great career. I have had the opportunity to travel around the world and have made friends as well as business acquaintances everywhere I have gone. It is an industry where we all know each other and even competitors can enjoy a friendly chat after the work day is over. For those just starting out or for those thinking of getting into the banknote industry I highly recommend it.



Premises of the Bureau of Engraving and Printing in Washington.

The importance of a communication policy on cash in a central bank

■ Manuel Castelhana *Banco de Portugal*

Nowadays, communication policies play a fundamental role in the management of organisations, not only as a key instrument in their public image strategy but also as a central element of their relationship with stakeholders. Within this paradigm, the “communication function” should therefore be based on an organisation’s mission and its strategic objectives, providing a privileged vehicle for the projection, consolidation and protection of its public image.



Not so long ago, central banks considered their role as currency issuers (issuing and putting into circulation banknotes and coins) as eminently operational. There were virtually no requirements regarding interaction with stakeholders and their management practices followed an approach very similar to a taylorist industrial business reality. In effect, the mission of issue departments was believed to be essentially limited to stock management, provision of treasury services to the banking system and distribution and sorting of banknotes and coins. First and foremost, this wide array of responsibilities required a high level of operational proficiency based on a traditional management philosophy aimed at optimising internal productivity. Against this background, central banks focused all their attention on their own performance issue-wise, disregarding for the most part their involvement with stakeholders.

These days, however, treasury and issue departments are increasingly concerned about and aware of the need to meet public information expectations/needs, given that cash is widely used and is without doubt, although not always consciously, one of the main links between a central bank and the population. This change in the stance of treasury and issue departments has led to a new behavioural paradigm, recognising that adoption of good practices by the population when handling cash and protection against the complex phenomenon of counterfeiting increasingly depend on implementing communication and information policies able to reach different population segments through means and strategies that are appealing in their message and effective in their results.

Reasons justifying a communication policy

In fact, a number of central banks, both within and outside the Eurosystem, have been approaching, in particular, communication policies specifically focused on cash, and in several cases these policies are well-developed and have had quite positive results.

Broadly speaking, four main reasons can be identified to justify the need to create and develop a communication policy on cash that will be sustained over time:

1. Central banks have an exclusive right to issue currency, as a result of which they benefit from seigniorage income (monetary income). In return they assume an inalienable public service obligation, not only to pro-actively release information on the characteristics (security features) of banknotes and coins, but also to provide a clear and quick response to requests and questions on the basic concepts inherent to their use as a means of payment.
2. A communication policy focusing on cash that conveys consistent and sound messages through effective initiatives strengthens the central bank’s image as the entity responsible for currency issue and circulation, while promoting and consolidating an image of credibility for this means of payment that will tend to work as insurance in the event of a crisis (a possible surge in counterfeiting).
3. It is well known that the fight against banknote and coin counterfeiting rests on three main pillars: (1) producing banknotes and coins with security features that are increa-

singly sophisticated and difficult to counterfeit; (2) providing users of cash with the skills required to check its authenticity; and (3) repressive measures on the part of judicial, judiciary and police authorities against counterfeiters. Central banks should fundamentally act under the second pillar, aiming to protect citizens from any loss of value arising from the acceptance of a counterfeit banknote and, in general, to deter the global counterfeiting phenomenon.

4. Against a background of progressive dematerialisation of cash, given the growing use of electronic means of payment, the responsibility of central banks in clarifying and promoting neutrality across the different means of payment available to the public is of increasing importance.

Accordingly, communication is now undoubtedly an essential task for treasury and issue departments. And it is becoming ever more important, considering the increasing complexity of the operation of payment systems and the growing demand for a close relationship between central banks and citizens, providing a channel through which central banks may meet citizens’ expectations of credible and quality information.

Cash communication has an

■ Olivier Radelet *European Central Bank*

Euro cash communication reached a peak when the national central banks and the governmental authorities of the European Monetary Union joined forces to embark on public information campaigns for the introduction of euro banknotes and coins in 2002. These campaigns were considered a unanimous success in all 12 countries of the euro area at the time and remain today a benchmark for public institution campaigns.

On 1 January 2007 Slovenia became the first country to join the euro area after the introduction of euro banknotes and coins in 2002. The euro information campaign in Slovenia recorded satisfaction levels in public opinion polls well over 70%. The same applied to Cyprus and Malta when the euro was introduced in these two countries on 1 January 2008.

Many national central banks (NCBs) as well as the European Central Bank (ECB) developed new areas of competence at the time of the Euro 2002 Information Campaign to enhance the way in which they addressed the public at large. This area of communication has



its own technicalities and codes that cannot be compared with the NCBs' communication on monetary policy and economic and financial matters with the financial markets.

All went quiet for a while on the euro cash front after the Euro 2002 Information Campaign, but it was only a matter of time before euro banknotes and coins communications made a comeback. Ten new Member States joined the European Union in May 2004 and two new Member States joined in January 2007 and this, together with confirmation of the planned launch of a second series of euro banknotes, made it inevitable.

In order to prepare for this, in July 2004 the Eurosystem Communications Committee established a Working Group on Euro Cash Communication.

Furthermore, a Euro Banknotes and Coins Communications team was set up in early 2006, responsible for:

- Coordinating communication activities for Member States adopting the euro and on euro cash in general.
- Developing and implementing communication concepts and producing print and electronic media for the public on euro banknotes and coins.

The success of the euro information campaigns is based on several factors, including, in particular, coordination and the level of finan-



cial investment in communication of all the public authorities concerned, chiefly the Ministries of Finance, the Eurosystem and the European Commission. Furthermore, the experience gained over the years in the area of cash communication has yielded tools that can help make optimum use of the communication instruments available.

A picture tells a thousand words

The euro banknotes and coins communication tools dating back from 2002 needed to be modified in various ways. To this end, a survey was carried out in the first half of 2006 in a total of ten euro area and non-euro area Member States. The main objective was to find out if certain features of the Euro 2002 Information Campaign, such as the colours, the photographs and particularly the logo “*the EURO. OUR money*”, met public expectations.

The outcome came as somewhat a surprise as the responses were very similar from country to country: most respondents preferred a similar campaign rather than a radically different one from that conducted in 2002.

The public regard the ECB and the NCBs first and foremost as authoritative institutions and expect them to communicate accordingly. The respondents also said that the institutions' communications should be given a “human touch” and should be made more accessible. Some of the terms used in the communications were judged to be difficult for the public to understand.

encouraging future!



Banners covering façades.

the € symbol, which is widely recognised and is used more than the actual word.

The research also indicated the need to have pictures of real-life situations. A photographer was commissioned to carry out photo-shoots of people handling cash in the euro area countries. A stock of pictures now exists for the ECB and the NCBs to draw on and use in their communication activities.

International versions

The research showed that people are interested in seeing big pictures of euro banknotes, but that they hardly ever read the accompanying text. The ECB has developed materials addressing this issue, featuring large pictures of banknotes and coins but with no accompanying text. These materials are not linked to changeovers in specific countries; in these cases, international publications are produced containing details of the introduction of the euro, banknote security features and training materials in the respective languages.

For this purpose the ECB has developed a multilingual logo. It uses the same layout of the refreshed logo mentioned above but includes the phrase "OUR money" in all the official European Union languages.

The ECB now has a complete toolbox of communication materials and activities. It produces information of various technical levels, ranging from the most technical level for professional cash handlers, such as guides for trainers and an aide-memoire for cashiers, to specialised publications such as the talking card for the visually impaired and easily accessible products for the general public.

Slovakia gets ready

In November 2008, some 2 million public information leaflets will be produced by the ECB and distributed by the National Bank of Slovakia to all households, together with lenticular cards that permit two or more images to be seen according to the viewing angle. This type of card is particularly eye-catching and can easily be carried in a wallet like a credit card.

In addition, the ECB will provide other brochures, as well as posters and banknote training material. The ECB and the NCBs have also initiated a small-scale partnership programme, inviting companies and associations to produce their own material, incorporating other visual elements provided by the ECB, and to distribute ECB publications.

To mark the changeover, important Public Relations events have been organised, such as euro conferences and covering public buildings with euro banners, and Jean-Claude Trichet, the President of the ECB, has opened a Euro Exhibition that focuses particularly on how to discover euro cash in an interactive way.

Prospects: the euro second series

As of mid-2007, the ECB drew up communication plans for the next big challenge for euro cash communication in the euro area: preparation of the communication campaign for launch of the euro second series. The aim is to take stock of the past experience of the NCBs in the introduction of new banknotes series and to use best practice to support communication on a young currency that is growing in confidence and importance worldwide.



The cash-related communication strategy of the Oesterreichische Nationalbank

■ Stefan Augustin and Anton Schautzer *Oesterreichische Nationalbank*

When people think about their country's central bank, their most likely association will be that of banknotes and coins. They imagine the huge amounts of money the central bank stores in its vaults or issues to the economy. They think of the availability and value of cash and the quality of banknotes and coins in circulation. And they are concerned about counterfeits. Within the euro area, cash in circulation has an additional dimension as the euro is the most evident symbol of the European integration process. In a nutshell, a currency's stability and security is a matter of public concern. Providing banknotes is one of the most prominent services rendered by central banks.



Screenshot from the OeNB website.

Aware of this, the Oesterreichische Nationalbank (OeNB) puts great effort into its cash-related communication policy. Within the OeNB, it is the Cashier's Division that is in charge of informing the public about banknotes and coins. Its activities are coordinated with, and often assisted by, the OeNB's Communications Division. Nevertheless, the Cashier's Division enjoys some degree of independence in its communication activities, benefiting from its practical experience in cash-related matters.

In its communication strategy, the Cashier's Division focuses on informing the public about the security features of euro banknotes, making use of several information channels.

Cash training sessions

The Cashier's Division offers cash training sessions both for the general public and for cash experts (bank clerks, cashiers, members of the police force). Training sessions are tailored to meet the needs of the specific target group. Participants learn how to perform the authenticity check (Feel – Look – Tilt) by comparing genuine and counterfeit banknotes. Naturally, the information provided for cash experts is prepared in greater detail. In 2007 the OeNB held 393 cash training sessions for a total of 5,400 participants from the banking sector, business enterprises, schools and the public administration (the police, bill collectors, etc.).

The OeNB website

The OeNB website also contains important information on banknote security features. Again, the information provided is specifically designed for different user groups. The pages containing general information are accessible to all Internet users, while the restricted area for cash experts requires registration. By the end of 2007, some 2,000 users had registered for access to the restricted area. Registered users may also subscribe to a newsletter which is sent out via e-mail.

Means of Payment Newsletter

As cash and cashless payment transactions adjust to a continuously progressing economic environment, the OeNB decided to provide close to real-time information on current developments in Austrian and European payment transactions via a specific newsletter. This Newsletter is distributed via e-mail on a quarterly basis. It contains news and identifies trends in the fields of cash, card payments and electronic payment transactions and is addressed to experts in commercial banks and business enterprises.

Mass media

Various forms of cooperation with newspapers, radio and TV stations ensure that information on banknote security features reaches

a broader public. Quite often, the message conveyed is combined with a prize competition.

One example of the OeNB's successful media cooperation was the MEHRSCHEINCHEN¹ campaign conducted together with the Austrian radio station Ö3. As the largest Austrian radio station with an average daily audience of some 2.8 million people and a market share in the order of 30%, Ö3 proved to be an ideal partner when it came to reaching a wide



1. The name of the campaign is based on a pun using the German quasi-homonyms "Meerschweinchen" (guinea pig) and "Mehrscheinchen" (which translates literally as "more little banknotes").



Euro Bus.

audience. In 126 radio announcements the different security features of euro banknotes were mentioned 192 times. During the campaign listeners were invited to participate in a prize competition. By the end, 119 participants had won 1,000 EUR each and one participant had hit the 100,000 EUR jackpot. Throughout the campaign the Ö3 website provided information on the MEHRSCHEINCHEN campaign and the security features of euro banknotes.

Subsequent opinion polls revealed that the campaign had increased people's general knowledge about, and their emotional commitment to, the euro and that it had helped to fur-



ther improve the OeNB's corporate image. People who had followed the campaign in particular said that it had improved their knowledge of the security features. The campaign audience felt that they were much better informed than the general public: 42% of those who had listened to the campaign described themselves as well informed (compared to 36% of the general public).

In 2007 the OeNB successfully engaged in cooperation with the Austrian daily newspaper "Heute". With a print run of about 500,000 copies a day, "Heute" is the largest freesheet distributed in Vienna and several other Austrian cities. Over a ten-day period, readers were invited to answer questions about the security features by sending an SMS. The campaign aimed to motivate people to actively test the security features of the cash they were carrying to be able to answer the questions. The OeNB received a total of 13,277 answers by SMS. Every day there was a chance for one participant to win 500 EUR. At the end of the campaign, one participant won the first prize, which amounted to 5,000 EUR. By choosing a daily newspaper as a partner for this campaign, the OeNB focused its efforts on Vienna and the surrounding area as this is where most counterfeit banknotes are detected.

Special events

Special events held at fairs and in shopping malls aim to convey information on security features in places where money traditionally changes hands. The structure and contents of these events are similar to those of the cash training sessions provided for the general public, but they address more people within a shorter period of time and focus particularly on the Feel – Look – Tilt security features.

Euro Bus

The Euro Bus is a mobile information service provided by the OeNB. It has been touring Austria since 2002. People can visit the Euro Bus to exchange their schilling banknotes and coins for euro cash and receive information on the euro in general and on banknote security features in particular. Through this initiative of the Cashier's Division, the OeNB has been able to reach more than 443,000 people.



Illustration promoting the MEHRSCHEINCHEN campaign.

Conclusion

The OeNB has every reason to be proud of its successful cash-related communication strategy. According to surveys, the Austrian population is well informed about the security features of euro banknotes, making life difficult for counterfeiters who generally avoid introducing counterfeits in places where banknote security features are thoroughly checked. Therefore, the OeNB considers it one of its key tasks to maintain high information standards and thus strengthen the public's confidence in the security of the euro.

The use of digital commu

■ **Sonja Danburg** *Federal Reserve System of the United States*

This article describes how the United States government leveraged digital communication tools to educate the public about the redesigned \$5 note. The case study demonstrates that reliance on new technology for a currency public education program can be cost effective and can reach a wider audience than a purely traditional approach.

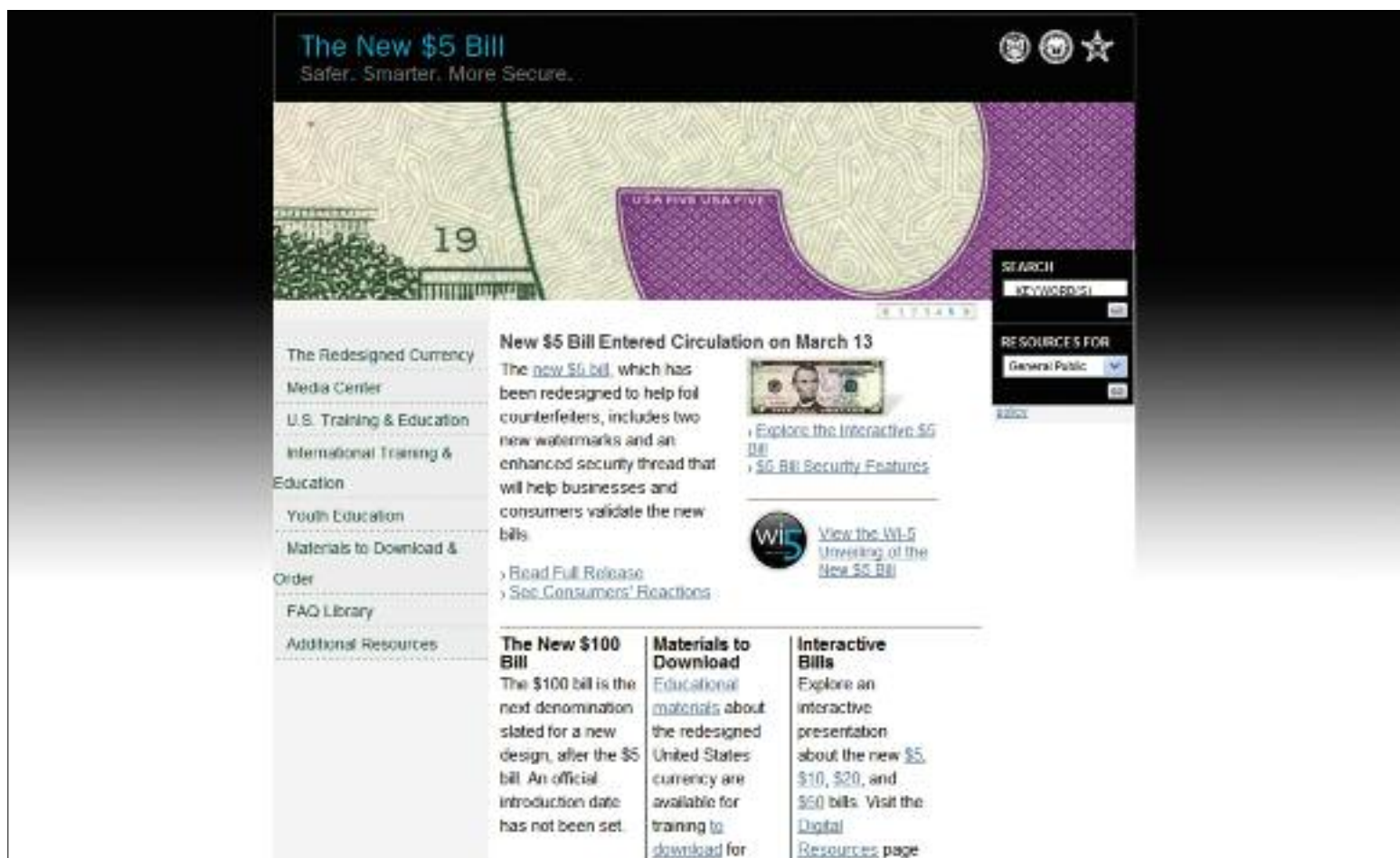
The United States government unveiled the redesigned \$5 bill on September 20, 2007. The \$5 note is the fourth new currency design introduced by the United States government since 2003. The challenge was to devise a fresh approach for communicating the redesign to maximize media interest and ensure an orderly transition to the new notes. With the large-scale launch of a new \$100 note on the horizon, it was also important that the \$5 strategy was as

cost effective as possible. Given this balance of goals and constraints, the Federal Reserve decided to make use of new communication tools to broadcast its message.

The first phase of launching a new United States note is unveiling the design to the public. This event typically takes place six months before the day of issue at an in-person press conference at a location of historical significance. For the launch of the redesigned \$5, the Federal Reserve public relations partner recommended that the Federal Reserve move away from the traditional unveiling model to an all-digital event. The use of the internet to unveil the new \$5 note would create a novel media hook, thereby garnering greater coverage of the event. It would also allow people from around the world to participate. The digital unveiling was branded "Wi-5", a play on the term 'Wi-Fi', which highlighted the high-tech nature of the event.

The Wi-5 unveiling event

- On September 17, 2007, a new front page was added to the United States government's currency education website, www.moneyfactory.gov. Against a black backdrop, a large digital clock counted down to the day and the hour of the unveiling of the new \$5 bill.
- At precisely 9 a.m. on the day of unveiling, the countdown clock was replaced by a video revealing the design of the note for the first time. As well as various shots of the note, the video featured officials from the Federal Reserve Board, the Bureau of Engraving and Printing, the Treasury Department and the United States Secret Service providing information on the new design.
- Once this video ended, viewers were automatically redirected to the redesigned currency education website: www.moneyfactory.gov/newmoney.



Screenshot of the redesigned currency education website.

Communication tools



Screen capture of the United States currency webpage of You Tube.

■ Immediately following the digital unveiling, a live online Q&A session for reporters, financial institutions and other stakeholders was held. More than 250 people logged on to join the online Q&A event, including journalists from news outlets such as Reuters and The Chicago Tribune and stakeholders from financial institutions and foreign central banks. This Q&A featured principals from the four agencies responsible for United States currency: the Federal Reserve Board, the Bureau of Engraving and Printing, the Treasury Department and the United States Secret Service.

In addition to hosting the unveiling and online Q&A, the redesigned website included a range of downloadable digital resources. These included educational videos or podcasts intentionally featuring young government employees describing changes to the note. These alternate spokespeople presented a more relaxed and youth-oriented face to the campaign. The site offered screen savers, desktop wallpaper and buddy icons that allow users to outfit their computers, social networking pages and websites with images of the new note. The redesigned website also included audience-specific web pages, with special pages created for key stakeholders, including cash handlers and law enforcement.

The Federal Reserve distributed a social media advisory along with its traditional media advisory

to reach the online community. This advisory was coupled with targeted outreach to internet users or bloggers who have posted comments on or discussed United States currency in the past.

The digital unveiling event cost approximately 10% less than an in-person press conference, but garnered a 50% increase in media coverage. It was the first non-physical event ever listed on the Associated Press Daybook, the essential guidebook used by journalists to determine what events to cover. The moneyfactory.gov website received record amounts of traffic and downloads during the week of the unveiling. More than 300,000 domestic and international visitors logged on during the first week, with an average length of stay of 11 minutes. The \$5 unveiling video has been viewed by more than 150,000 visitors, while the podcasts were downloaded 30,000 times in the week following the unveiling.

While digital tools were employed most intensively for the unveiling, the Federal Reserve also incorporated new technology in subsequent phases of the public education campaign. For instance, an online video of consumers reacting to the new security features on the \$5 bill was filmed the day it was issued. This video is posted on the moneyfactory.gov website, was distributed through a social media alert and is

posted to the United States currency page of YouTube. The video has been viewed over 2,520 times.

Additionally, in order to build relationships with members of the social media, the Federal Reserve invited bloggers who write about the United States currency to the ceremony marking the issue of the new \$5 note on March 13, 2008. These same relationships will be helpful when the Federal Reserve launches the redesigned \$100 note.

Summary and conclusions

The incorporation of digital tools in to a new currency public education program enabled the United States government to reach a wider audience with the Federal Reserve public education messages. This approach also allowed the Federal Reserve to generate new media interest, set a precedent for the credibility of online events and expand its communication network, while also saving money. The success has proven the usefulness of digital tools, which the Federal Reserve will continue to develop in advance of the launch of the new \$100 note. The Federal Reserve will use these digital tools to complement the traditional media outreach tools that it will employ for the launch of the \$100 note.

Communication on cash is essential for the Banque de France

■ Armand Pujal *Banque de France*

Thanks to its experience and know-how in the field of cash, the Banque de France is able to communicate its messages easily, with the emphasis in all cases on a dual objective: to guarantee confidence in the euro and perform its functions within the Eurosystem. The relationships established with the different stakeholders are particularly important, enabling the Banque de France to inform, exchange points of view and provide training on specific aspects such as banknote recycling or the fight against counterfeiting.

Communication on cash is essential because the public assigns special importance to banknotes and coins. People remain faithful to cash, even though the proportion of payments they make in cash is decreasing. The public sees cash as a safe asset, as is reflected in the numbers who flock to withdraw cash from ATMs at the first sign of financial turbulence or economic crisis.

Communication may be divided between that addressed to the public and that addressed to professional cash handlers. In the case of the public, since the initial launch of the euro in 2002 the Banque de France has used the Eurosystem campaigns as its key element of communication. However, it is firmly committed to communication with professional cash handlers and, more specifically, to the transfer of information on banknote security features and training.

Moreover, the Banque de France is involved in a constant exchange of views with professional cash handlers and holds regular meetings at which it informs the private sector of all cash-related decisions taken by the European institutions that affect the cash handling sector in France.

Information addressed to the public

The Cash and Communication Departments of the Banque de France work closely together to

keep the public informed of all cash-related developments. In collaboration with the European Central Bank, a wide range of information is distributed, such as leaflets, posters and pamphlets on banknotes, procedures for verification of the authenticity of cash or banknotes stained by anti-theft devices.

Banknotes stained by anti-theft devices

Vigie Billet, the French equivalent of Banknote Watch, designed an information campaign, with the participation of banks, post offices, ATM managers and cash-in transit companies, to prevent banknotes stained by anti-theft devices from being recycled. The aim of the campaign was to encourage people to refuse to accept banknotes that may have been stolen, in an attempt to combat theft. This was a large-scale campaign in France where these devices are in widespread use.

un billet maculé est probablement un billet volé

N'acceptez pas les billets maculés.

Si vous en détenez, vous ne devez pas les remettre en circulation. Vous pouvez les présenter à votre agence bancaire, à votre bureau de Poste ou à la Banque de France.

pour plus d'informations : www.vigiebillet.com
01 40 68 08 18

Vigie Billet
un billet maculé est probablement un billet volé

Communication campaign on banknotes stained by anti-theft devices.

The Communication Department's Documentation Centre offers the public extensive information on various aspects connected with banknotes and coins, in the form of figures, leaflets, posters, reports and briefs. The Cash Department collaborates by providing answers to more technical questions, such as requests for statistics or queries relating to the rules on reproduction of banknotes.

The Cash Department also provides specific information on the Banque de France website (<http://www.banque-france.fr>), in French and English, on aspects such as the features of euro banknotes and coins, the Eurosystem Banknote Recycling Frame-

work and the last date on which the central bank will exchange French franc notes for euro notes. When the Banque de France wants to reach a wider audience, it also uses television advertising.

The Banque de France plays an important role in the "Yellow coin" charity project that collects euro cent coins for donation to children's hospitals. The Banque de France conducts advertising campaigns to encourage donations, along with other financial institutions; it also distributes the cardboard boxes necessary for packaging the collections and sorts the coins received.

Training and assistance

One of the functions of the Banque de France is to guarantee the quality of the cash cycle and maintain the confidence of the public and professional cash handlers. To maintain this confidence, the Banque de France considers it essential to provide information on security features and on the procedures for checking these features, via appropriate communication policies and training programmes.

Training courses on banknotes and coins are organised free of charge for bank and supermarket cashiers; these courses are based on the Feel-Look-Tilt test recommended by the Eurosystem for verification of the authenticity of banknotes. The Banque de France has some 200 instructors who can train 25,000 professional cash handlers per year; this represents approximately 100 persons trained per working day.

Since 2005, and as a consequence of issue of the Decree on Banknote and Coin Recycling, the Banque de France provides nationwide assistance to professional cash handlers on cash recycling. Since

the end of 2006, 42 experimental groups have been created to provide professional cash handlers that have signed recycling agreements with the central bank with information and assistance on procedures, banknote sorting machines, etc.

The Banque de France also pays particular attention to the needs of its clients, primarily credit institutions and cash in transit companies, and conducts an annual survey among these professional groups to determine their level of satisfaction with cash handling management. The latest survey, conducted among 138 credit institution cash managers and 41 cash in transit company representatives, resulted in a very high degree of satisfaction of almost 75%; it also highlighted the credibility and objectivity of the Banque de France. Moreover, the survey grants the central bank the opportunity to make improvements in cash handling management on the basis of the needs expressed, and forms part of the ISO 9001-2000 quality certification process used to certify all cash handling activities in France since 2004.

Relations with professional cash handlers

■ **Local level:** Regular meetings enable the Banque de France to keep a close eye on cash management trends at a local level and to affirm its commitment in this respect. Monitoring committees include representatives from the Banque de France and from large shopping centres and hypermarkets, cash in transit companies, credit institutions and public bodies.

Regular meetings are also held with professional cash handlers that recycle or are interested in recycling, to provide information and advice, as appropriate.

■ **National level:** The banks and the French banking federation, either on a bilateral basis or through the French committee for bank organisation and standardisation, form part of a working group on cash matters that meets on average once a month. Meetings are also held with cash in transit companies and with Fedesfi, their professional body, and with representatives from large shopping centres and hypermarkets.

Another working group on cash aspects of business continuity includes representatives from the central bank's Cash Department, banks, cash in transit companies, large shopping centres and hypermarkets and public bodies.

The Banque de France also plays a fundamental role as the link between the Eurosystem and France's professional cash handlers. Accordingly, the steps taken to increase the level of convergence of the cash services provided by the national central banks of the Eurosystem and, more recently, the scenarios for issue of the second series of euro banknotes, were all discussed extensively with these professional groups.



Collection of coins for charity.

Surveys on use of banknotes and coins in Mexico

■ Jorge de la Vega *Banco de México*

Cash user surveys are an extremely important tool: they provide knowledge and data that can help in the decision-making process and they serve as a measuring gauge of cash management. These surveys provide us with a better understanding of the habits and customs of the different population groups that use banknotes and coins, and of the needs and difficulties they face in their day-to-day transactions. They also enable us to track a series of variables that may be used as indicators to assess our performance as the bank of issue. Accordingly, these market research studies and surveys play an important part in ensuring that the Banco de México fulfils its legal mandate as effectively as possible.



Participants at a group session on banknotes and coins.

Since 2002 the Banco de México's Issue Department has conducted annual studies and surveys of different kinds and scope: telephone surveys, quantitative, qualitative or focal group surveys, as well as indepth studies. These have enabled the central bank to detect certain aspects relating to the public's use of banknotes and coins, such as the degree of deterioration of banknotes, the lack of change for transactions or perceptions regarding counterfeit notes, which would otherwise have remained unidentified.

It was through one such survey that the Banco de México became aware that the public's chief complaint about polymer banknotes was that they tore very easily. Investigating this problem, it discovered that the way in which credit institutions opened packets of new polymer banknotes meant that tiny cuts were being made on the edge of the notes. This made them much more susceptible to subsequent tearing and led to a significant reduction in their lifetime. Thanks to this information, the Banco de México changed the way in which new banknotes were packaged, to prevent any damage occurring when the packets were opened.

Types of surveys

The sample design and questions to be asked are provided by the Banco de México, but the actual surveys are conducted by a third party, either a market research company or an official agency with the necessary infrastructure for this purpose. In this respect the Banco de México has the support of the Mexican Institute for Statistics, Geography and Data Processing (INEGI), the body responsible for providing the public with statistical and geographical data.

■ Telephone surveys

A national survey is conducted annually, on the basis of some 800 telephone calls. The aim is to determine, inter alia, how the interviewees prefer to pay for their purchases, which banknote denominations they use most and which they use least and what difficulties they face when using banknotes.

■ Quantitative surveys

Quantitative surveys have also been conducted annually, although they are now becoming more frequent, in exchange for a more limited scope, to enable quarterly indicators to be constructed. Two types of surveys have been conducted:

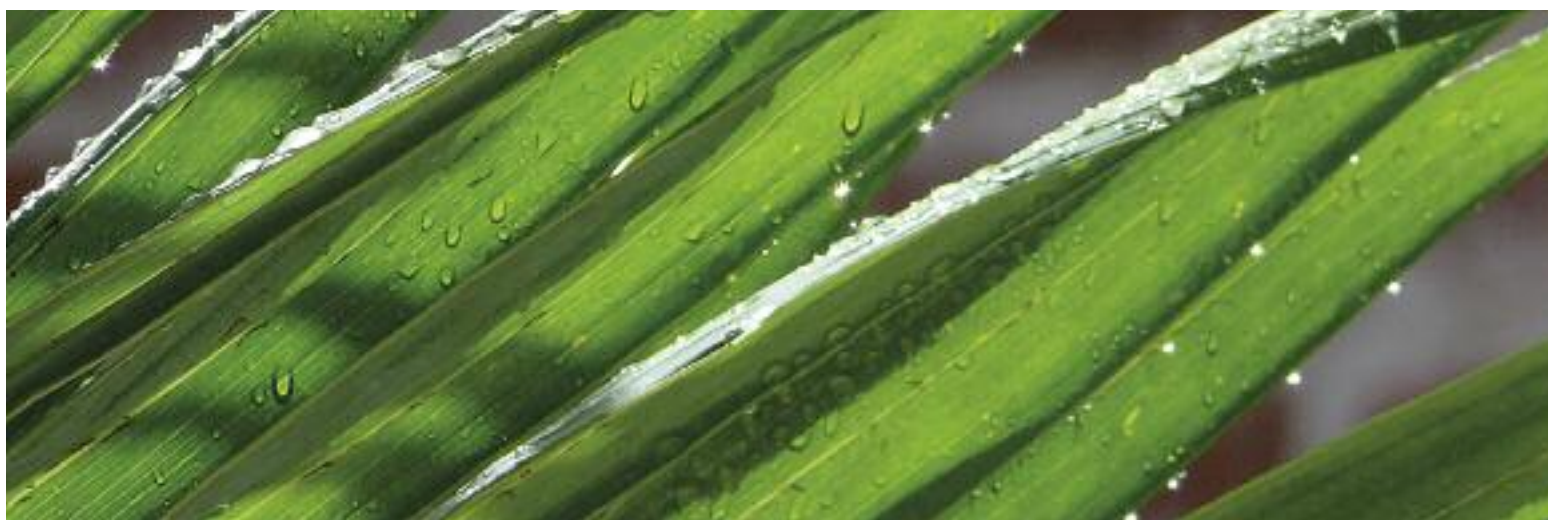
- General surveys: Designed to obtain information on problems relating to the availability of change, banknote quality and perceptions regarding counterfeits. The surveys consist of 17 questions and are conducted across all states, with a sample total of almost 38,000 interviewees. The information obtained permits comparison of data by regions.
- Specific surveys: Nationwide surveys with different sections, each dedicated to a specific topic, comprising 50 to 80 questions for almost 2,000 interviewees.

■ Qualitative surveys

Sessions held with groups of seven to ten people, with a moderator who poses questions and directs the conversations to facilitate more detailed discussion of topics of interest. Practical activities and workshops are also organised, for example to determine whether or not the public are fully aware of banknote security features, whether they are able to distinguish between genuine and counterfeit notes, etc. The discussion groups, made up of people from different socioeconomic and age groups, represent the different sectors involved in the cash cycle, such as retailers, intensive cash users and consumers.

■ Studies

Studies conducted on a biannual basis, combining elements of both quantitative and qualitative surveys. A group of persons is selected to keep a daily record of their cash transactions and experiences over a specific period, indicating any problems they face regarding change,



the condition of the banknotes they receive, if they detect any counterfeits, etc. Following compilation of these data, group sessions are held to discuss the different experiences recorded.

Results of an indepth study conducted in 2006

The study consisted of seven group sessions organised in different areas of Mexico (including both urban and rural populations). Each session had a moderator and a total of eight to ten participants from different socioeconomic groups. None of the participants were interconnected but each of them was the household member responsible for the majority of their respective household's spending.

For a period of two weeks prior to the group sessions the participants kept a record of all their cash transactions, enabling them to become aware of the kind of transactions they made and of the quality and security features of the banknotes and coins they handled. On the basis of the data recorded a series of discussions was then held, for example on the degree of ease with which they were able to make cash transactions, their perception of whether or not there was sufficient cash in circulation, their experience with the credit institutions in terms of cash, their experience of banknote deterioration and their awareness of banknote security features.

■ Cash transactions and enough volume of cash in circulation

Of the total of 3,754 transactions recorded, 88% were successful. The unsuccessful transactions recorded by the participants were due to a lack of change (8%) or to their refusing to accept or being unable to pass on a damaged banknote (4%). At the discussion sessions the participants commented that in places such as public markets, the traders had systems whereby they can obtain change between themselves. They also indicated that there were sufficient banknotes and coins in circulation, unlike the situation in the past when coins had been scarce and it was not unusual to have to wait for change or for traders to offer change in kind, for example in the form of sweets.

The number of transactions recorded per day also provided an interesting insight: four transactions or less per day in almost 70% of the records and nine transactions per day in almost 20%. Moreover, the records of banknote denominations used for payment and received in change showed a clear trend for high-denomination notes to be used for payment and, as was to be expected, for low-denomination notes to be used for change.

■ Services offered by credit institutions

The study showed that just over 50% of the participants obtained their

cash from the ATM network. In general, the quality of the banknotes obtained from the ATMs was deemed acceptable, save in the case of certain banks which were perfectly well identified. The Banco de México subsequently used this information to conduct a quality check sample on the banknotes used to load ATMs by the banks mentioned and detected, in effect, that the notes were of a poorer quality than those found in ATMs belonging to other credit institutions. Accordingly, the corresponding steps were taken to ensure that these banks enhanced their banknote processing, to raise the overall quality of the banknotes in circulation.

The study also showed that the public made very limited use of the banknote and coin change services offered by the banks, either because they did not require these services, as they had found alternative means of obtaining change, or because they did not like the service offered. Some people who used the service found it deficient, chiefly because the counters did not have the denominations they required or due to a certain degree of discrimination between customers and non-customers. Once again this information proved very useful, leading to the creation of a supervisory mechanism designed to ensure that the banks meet the agreements made with the Banco de México.

■ Perception of banknote deterioration

In general, the daily exercise of examining banknotes for the study had no significant impact on the participants' existing perception of banknote quality. The number of unfit banknotes detected varied in accordance with the participants' socioeconomic level. Those from low socioeconomic groups or rural locations recorded a higher number of unfit banknotes, as well as a high number of cash transactions and a majority of purchases in small stores. Moreover in general they did not receive their income through the banking system and they did not carry their banknotes in a wallet.

In terms of differences in deterioration between polymer and paper banknotes, the study showed that the majority considered that both kinds of notes presented deterioration, but in different ways: polymer banknotes due to ink loss and tearing and paper banknotes due to soiling.

■ Awareness of security features

During the two-week period none of the participants received counterfeits. However the study showed that the vast majority of people did not check the authenticity of the banknotes they received, including those who said that they were aware of a number of security features. The minority of the participants who said that they did check the security features only did so in the case of high-denomination notes, as these imply greater financial loss and the probability of their being counterfeits is higher.

Banco de España National Cash Survey

■ **María Luisa Leyva** *Banco de España*

Since 2005 the Banco de España has conducted the “National Cash Survey” every year to discover how the public views the banknotes and coins in circulation in Spain. Interviews for the fourth 2008 edition of the Survey finished in October.

Key methodology

- A specialist market research firm hired by the Banco de España selects the interviewees and conducts the interviews.
- The Survey is conducted on a nationwide basis using sampling techniques, enabling the information obtained to be analysed by age, sex, level of education, socioeconomic level, etc., as well as by geographical area.
- The interviews are conducted in person. All interviewees are adults (18 years of age or over) belonging to two clearly differentiated groups: the general public and small shopkeepers.
- The Survey consists of over 2,300 interviewees.
- The questionnaires contain approximately 80 questions. Interviewees are asked to give information on their level of education and their annual income.
- The interviews last for approximately 20 minutes.
- Confidence level of results for overall data: 95.5%.

Objectives

- To learn how the general public and small shopkeepers view cash. The Survey includes questions on the design and quality of the banknotes and coins in circulation.
- To determine how aware the public are of banknote security features and how often

they use them to check the authenticity of their notes.

- To investigate the extent of counterfeiting and the public’s view of this phenomenon. The aim is to learn where counterfeit banknotes appear, how regularly and in which denominations, and to discover what people do with them.
- To analyse the degree of public satisfaction with the distribution of banknotes in Spain.
- To gain an idea of public opinion on the cash services provided by the banking system in general, and by the Banco de España in particular.

Results

The Surveys have provided important information on aspects such as the public’s view of the design, colour and size of the different banknote denominations, their knowledge and opinion of the technical features of banknotes and their reaction to counterfeiting. The Surveys have also provided valuable data on how different means of payment are used and on how the public value the quality of service provided by the banking system and the Banco de España.

The Surveys also provide highly valuable first-hand information on how the public view banknotes and coins and the bank of issue, granting the Cash and Issue Department of the Banco de España an insight into the public’s preferences and opinions, their level of awareness and their view of the role played by the central bank. This information is extremely useful and may be used to guide bank policy, to enhance the public service function entrusted to the Banco de España as the bank of issue. The Surveys have also provided information on the degree of success of specific



measures taken, and on occasions have led to the reorientation of cash strategy, in all cases as part of the Banco de España’s aim to continue to improve the service it provides to the public.

Updating the Survey

The Banco de España updates the contents of the Survey as and when appropriate. Accordingly, to ensure that the Survey data are significant over time, the most important core questions remain the same, but some of the other questions vary from one year to the next. Every year the questionnaires contain a number of set questions, included for purposes of comparison, and that are re-viewed: a) to eliminate any questions that are no longer relevant at the time of the Survey; and b) to include different questions designed to obtain information on new topics of interest.

How to design a web page on banknotes

■ **Wolfgang Söffner** *Former Chief Cashier of the Deutsche Bundesbank*

Contrary to some predictions, cash remains extremely popular in Germany: almost two-thirds of all retail purchases are settled using banknotes and coins. Cash will undoubtedly maintain its appeal in the age of plastic money, similarly to books and newspapers in the internet era. The “stable currency” offered by central banks and their status as independent, neutral institutions of common good provide a unique opportunity to communicate with the public via the internet. Confidence in a currency starts with cash. Confidence is boosted by a high level of quality, that is, by the security (preventing and combating counterfeits) and fitness of cash.



There are three main approaches to communicating these **basic messages** on the Bundesbank’s cash-related web pages:

- The first objective is to appeal to citizens and, by enhancing awareness of security features, to improve the acceptance of and confidence in euro banknotes. To this end, pictures of banknotes are shown in a prominent position and their security features published. Information material on the euro can also be downloaded or ordered by submitting an online form.
- The website is also used as an information platform for the range of cash management services offered by the Bundesbank. The main focus is on “Depositing banknotes at the Bundesbank” as multi-denomination deposits and “CashEDI” for professional cash handlers. By gradually introducing modern multi-denomination processing machines, the Bundesbank is making the most of technological advances and thus affording the necessary contribution to efficient cash supply. The introduction of “CashEDI” - electronic access to cash operations - has also improved efficiency.
- For consumers, banknotes are like the central bank’s business card which they can hold in their hands. For this reason, the Bundesbank aims to meet high quality standards, not only at the time of issue but also throughout the entire circulation period. It should therefore be possible to distinguish between genuine and counterfeit banknotes at any time. With this in mind, the Bundesbank has published comprehensive information on the Eurosystem’s Banknote Recycling Framework and its implementation in Germany.

Departments responsible for the website:

- The Communications Department, as an intermediary between the Bundesbank and the public, is responsible for the bank’s public image. With regard to communication, it deals with all design, monitoring and steering issues in order to ensure a consistent public image.
- The Cash Department is responsible for technical descriptions and for updating cash-related content.

The website consists primarily of short summaries of several topics and visual elements, especially with regard to euro banknotes. Clear groupings, with boxes and links, and the well-structured presentation allow users to navigate the site quickly. Popular topics, such as “Free Exchange DM-Euro”, are placed in a prominent position and can be accessed directly from the “Cash Management” homepage.

The above-mentioned popularity of cash is also reflected in the interest shown by visitors to the website. An online survey conducted in 2005 showed that 45% of all first-time visitors to the site clicked on “Cash Management”. The number of people visiting the site for the first time will undoubtedly soar prior to the introduction of the new series of euro banknotes and the site will be a focal point for Bundesbank communication.

Why not simply visit the “Cash Management” pages of the Bundesbank’s website at:

<http://www.bundesbank.de/bargeld/bargeld.en.php>

Cuban banknotes

■ **Raquel Cabrera** *Banco Central de Cuba*

The Banco Central de Cuba is the current bank of issue in Cuba, created in May 1997 to succeed the Banco Nacional de Cuba which was founded by virtue of an Act of December 1948. The Banco Central de Cuba has the exclusive right to issue Cuban currency. It is responsible for printing banknotes and minting coins and for other means of payment, in accordance with the national interest; it is also responsible for supervising all these activities.

The unit of currency of the Republic of Cuba is the Cuban peso which is divided into 100 cents. The peso dates back to the dawn of the XXth century.

One characteristic feature of the Cuban economy is the coexistence of two currencies: the Cuban peso (CUP) and the Cuban convertible peso (CUC). Both means of payment have their specific area of use: there is one market for the Cuban peso and another for the convertible peso.

The Cuban convertible peso was first issued in 1994 and is used in commercial transactions made in establishments that are authorised to sell products and provide services in freely convertible currency. The general characteristics and principal security features of the Cuban convertible peso are similar to those of the Cuban peso.

For cash transactions the public can exchange the two currencies at the country's currency-exchange bureaux. The present rate of exchange is approximately 1 CUC for 25 CUPs.

The Banco Central de Cuba began to issue Cuban peso banknotes on a gradual basis in 1997, its first year of operation; the present family of banknotes was not completed until 2004. The first series of Cuban convertible peso banknotes was issued in 2006, with new and improved security features.

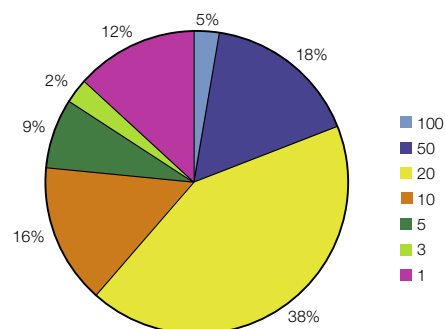
- Face value: 1, 3, 5, 10, 20, 50 and 100 Cuban pesos.
- All banknotes are the same size: 150 x 70 mm.
- The banknotes bear effigies of important figures in Cuba's struggles for freedom, or images of monuments erected in their honour, on the front, while on the back they depict historic and other important events for the Cuban people.
- High quality paper with effective security features as required in accordance with the country's situation, including, inter alia, localised watermarks and security threads with printed text.
- Banknote numbering: two letters followed by two digits and a 6-digit number. All banknotes bear the signature of the President of the Banco Central de Cuba.

To date, the Banco Central de Cuba has made three commemorative issues:

- In 2000 a 100 peso note was issued to mark the 50th anniversary of the Banco Central de Cuba.
- In 2003 a 1 peso note was issued to mark the 150th anniversary of the birth of José Martí, a Cuban national hero, and a 20 peso note to

mark the 50th anniversary of the assault on the Moncada barracks on 26 July 1953.

Structure of banknotes in circulation



Data as at end-June 2008

The number of banknotes in circulation in Cuba has increased considerably in recent years, primarily as a consequence of the country's economic growth.

The banknote in most use is the 20 peso note which accounts for 38% of all banknotes in circulation. The highest denominations (the 50 and 100 peso notes) account for 23% of the total and the intermediate denominations (the 5 and 10 peso notes) for approximately 25%. The lowest denominations (the 1 and 3 peso notes) account for 14% of all banknotes in circulation and coexist with coins of the same denominations.

The 20 peso note is included, by virtue of its face value, in the group of high-denomination banknotes together with the 50 and 100 peso notes.

Features of the 20 peso banknote

Design and printing substrate

The banknote was designed by Andrés Iser Alfonso and is printed in Cuba by Impresos de Seguridad.

It is printed on high-quality paper with a weight of $88 \text{ g/m}^2 \pm 5 \text{ g}$.

The front of the banknote depicts the legendary figure of Camilo Cienfuegos Gorriarán (1932-1959) who was born in Havana on 6 February 1932. He was an expeditionary who set sail on the Granma and was, in 1958, together with Commander Ernesto Che Guevara, another national hero, a Commander of the Rebel Army that headed west, aiming to extend the armed struggle for national liberation to the west of the country. On 28 October 1959, the year of triumph of the Cuban revolution, he was killed in an air crash, an event that caused great consternation among the Cuban people.

The back of the banknote bears a vignette depicting a scene representing Cuba's agricultural development, which has been strengthened in recent years to increase food production.

Printing techniques

- **Intaglio.** This technique is used to print the key features on the front

of the banknote, which bears a white border on all four edges. The characteristic tactile relief affords the banknote greater security and greater durability. The note is blue in colour on both sides.

- **Offset.** Used in the printing of the features on the back of the banknote and in the security backgrounds on both sides.
- **Letterpress.** Used in red in the two letters and two digits and the 6-digit banknote number, all of which appear twice on the front of the note.

Security features

Front and back

- **Intaglio printing.** This technique is used for the images of the main elements on the front of the banknote, making them perceptible to the touch and giving them fine lines and well-defined outlines. Intaglio printing is also used for the face value of the banknote and for the tactile marks that incorporate the Braille system, of great assistance to the visually impaired.
- **Watermark.** Located to the left of centre on the front of the banknote and visible when it is held against the light. The watermark depicts the figure of the national heroine Celia Sánchez Manduley.
- **Security thread.** A continued thread, visible when the banknote is held against the light. It is embedded into the paper and runs vertically down the left half of the banknote, close to its central axis. It bears a microtext with the words "PATRIA O MUERTE".
- **Latent image.** The logo of the Banco Central de Cuba, on the front of the banknote, includes a hidden image with the number "20"; this is only visible when the note is viewed at a certain angle.

- **Microprinting.** The edging that runs the full length of the bottom of the banknote on both sides bears a continuous microtext in which the number "20" appears repeatedly. This microtext is also included in the initials "BCC" that appear on the front of the banknote, to the right of the main image of the national hero.

- **Coloured fibres.** Very fine red and blue fibres, visible to the naked eye, across the entire surface of the banknote.

- **Ultraviolet properties.** Yellow-green fibres embedded in the paper which are not visible to the naked eye but are visible under ultraviolet light.

Information on substrate, dimensions and colours

Substrate	Paper
Substrate weight	88 g/m ² ± 5g
Dimensions	150 x 70 mm
Dominant colour	Blue

Counterfeit Cuban banknotes

There is no history of large-scale counterfeiting of Cuban peso banknotes. The counterfeit notes that have been seized to date have been of poor quality and easily detectable.

In its fight against counterfeits, the Banco Central de Cuba is developing a programme to raise the public's awareness of the security features of the banknotes in circulation.

It is the job of cashiers to improve the procedures used to check the authenticity of banknotes, based on mastering their technical characteristics rather than on the use of machines designed to detect counterfeit notes.



Treasury and Issue Department of the Banco de Portugal

■ Hélder Rosalino *Banco de Portugal*

The Banco de Portugal was set up 162 years ago and is one of the country's most well-known and respected institutions. The Banco de Portugal, which now forms an integral part of the European System of Central Banks (ESCB), operates in an international, and in particular in a European, context following the creation of Economic and Monetary Union (EMU) whose final stage (Stage Three) started on 1 January 1999. EMU implies a single monetary policy whose key features are the single currency, the euro, the existence of a European Central Bank (ECB) and the creation and functioning of the Eurosystem. This latter comprises the ECB and the national central banks of the 15 European Union Member States that share the euro as their common currency.

The Banco de Portugal, which employs around 1,700 staff members, has its head office in Lisbon, with the central departments split between two main buildings. Currency issue-related tasks, which are the responsibility of the Treasury and Issue Department (DET), are performed at the Carregado Complex, located approximately 40km outside Lisbon. The Banco de Portugal is also widely represented in the country, with a main branch in Oporto, two regional delegations in Madeira and the Azores and six branches across mainland Portugal.

Mission and organisation

Under the procedural rules defined for the Eurosystem's national central banks, the DET, whose existence and history is closely linked to that of the Banco de Portugal itself, is mainly responsible for ensuring currency issuance and putting into circulation the legal tender deemed necessary for the national economy. The Department is also responsible for managing the central bank's main branch in Oporto and the regional network.

Carregado Complex

In 1992 the Board of Directors of the Banco de Portugal decided to build the Carregado Complex; the construction process took 21 months, it involved 19 different firms and used 54,000 m³ of concrete, 7,000 tons of steel and 300 km of electric cable.

Since October 1995 the Carregado Complex has housed the industrial facilities necessary for banknote production, the areas for safekeeping and sorting of banknotes received from credit institutions and a distribution centre for banknotes and coins capable of meeting the needs of the Portuguese banking system.

The Carregado Complex was built on a large (67,000 m²) and safe area of land, close to Lisbon and to the country's principal motorway network; this location permits fast fund transfers between the DET's centres and provision of a top-quality logistics service to credit institutions and cash-in-transit companies. It is a highly functional and extremely secure building, endowed with the most sophisticated intrusion prevention and detection systems. Even today, the Carregado Complex is considered at ESCB level to be one of the most modern, functional and secure facilities designed for central banking treasury and issue activities and it is often visited by delegations from other central banks intending to build new cash centres with similar features.



Carregado Complex.

In order to ensure the production of euro banknotes within the Eurosystem, the Banco de Portugal has set up its own 100%-owned company, Valora SA, which also operates at the Carregado Complex, in close collaboration with the Treasury and Issue Department. Valora SA's production activities are currently exclusively focused on meeting the banknote production requirements allocated to the Banco de Portugal within the framework of a decentralised production scenario with pooling. Under this system, each central bank is responsible, on an annual basis, for the production of between one and three denominations to meet their own needs and those of other central banks. This production represents a part of the Eurosystem's total needs.

Functional responsibilities

In recent years, in parallel with the traditional activities entrusted to it in the field of treasury and issue, the Department's functions and responsibilities have been increased and/or reinforced, notably in the following

Statistical data ¹	2005	2006	2007
Banknotes in circulation			
By value	5,024	4,516	3,041
By volume	342	371	370
Banknotes sent out by the central bank			
By value	12,367	12,821	13,154
By volume	709	754	784
Banknotes deposited with the central bank			
By value	12,349	13,329	14,625
By volume	677	725	784
Banknotes processed by the central bank			
By value	13,194	13,190	14,524
By volume	728	712	771
Destruction rate²	40%	42%	35%

1. Value expressed in million euros and volume in million banknotes, at each year-end.

2. Number of unfit banknotes / number of banknotes processed.

areas: i) issue and processing of coins, by virtue of the implementation of new Community frameworks; ii) regulation and control of the business activity of credit institutions and cash-in-transit companies within the scope of external recycling, based on the frameworks defined by the Eurosystem; and iii) handling of cash-related complaints filed by individuals against the banking system.

Overall, the Department is responsible for:

- Promoting regulation and control of the national cash system, in cooperation with all other national authorities with competence in this area.

Plans for the future – 2008 / 2011

- **Adaptation of the operational model for provision of services in the treasury and issue area**, which translates into monitoring of the process of convergence of practices and provision of services in the cash-cycle field between the Eurosystem central banks, together with enhanced internal and external operational efficiency, based on modernisation of procedures and technological means.
- **Monitoring of external recycling of banknotes**, with special emphasis on the development of monitoring powers, within the scope of the existing regulatory framework.
- **Reinforcement of cooperation with the banking system**, aimed at optimising cash management on a national level, while improving the process of handling of banking customer complaints.
- **Communication and training**, with the underlying purpose of developing the Department's public service role, gearing action towards the different population segments, aimed at instilling confidence in the use of banknotes and coins.
- **Qualification/readjustment of the activities of the Banco de Portugal's regional network**, which includes defining a common image for all delegations and branches, improving staff profiles and matching staff profiles to functional requirements.
- **Consolidation of the DET's powers**, which includes ongoing human resources development, aiming for a greater capacity to intervene, specifically within the scope of the Department's international representation.

- Ensuring the levels of production, sorting and issue of legal tender, so as to ensure the holding of reserves and meet circulation needs, given the economic environment, the national banking structure and the Banco de Portugal's regional network.

- Guaranteeing full implementation of the legal systems for recycling of euro banknotes and coins by credit institutions and other professional cash handlers.

- Promoting interbank cooperation targeted at developing solutions to optimise management of the different stages of the cash cycle.

- Ensuring the development of specific communication and training policies with regard to banknotes and coins.

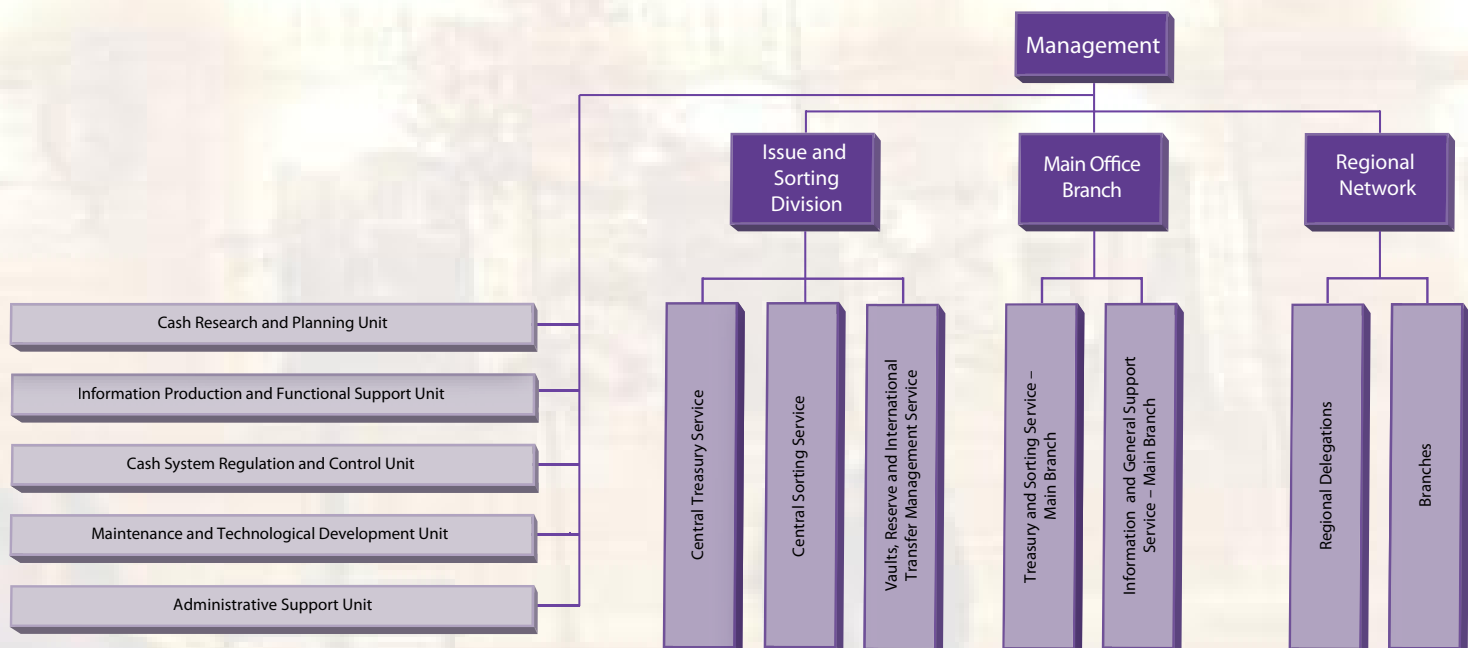
Organisation

The DET's organisational structure comprises 22 functional units, all with different and complementary powers. It is based on a functional model, characterised by low vertical differentiation and the promotion of dynamic interaction between decision-makers and technical officers. It is a flexible structure and is thus able to accommodate changes in the Department's activities.

The DET currently has a staff of 295 employees, of whom 190 are men and 105 are women, with an average age of 51 and 48, respectively.

The services performed by the Issue and Sorting Division are essentially the Department's operational activities, i.e. those which can be considered "traditional" treasury and issue functions, namely storage, issue and sorting of cash. These activities are also performed at the Oporto branch and across the regional network.

In parallel, the Department also includes a series of technical units that provide support to the business functions, notably at the level of maintenance and technological development, information systems, research and planning, cash system regulation and control, and general administrative support.



Holograms

■ Eduardo Kropnick and Fernando León *Banco de España*

Introduction

Diffractive elements today represent one of the most well-known and most easily recognised security features in the fight against counterfeits, used in banknotes and in other security documents such as passports, ID cards, driving licences, credit cards, etc. They are also used to protect brand name consumer goods, such as compact disks, computer software, cosmetics, clothing, etc.

The Hungarian Dennis Gabor discovered the principles of holography in 1947 and was awarded the Nobel Prize for Physics for his work in this field in 1971. Holography enables a three-dimensional image to be reproduced on a flat surface. The term hologram comes from the Greek *holos* (whole) and *grama* (message), as holograms show a whole image and not just its perspective.

By means of holography, a three-dimensional image of an object is recorded on the surface of a special sensitive emulsion. The image is rebuilt in three dimensions and appears to be moving into or out of the surface. One unique feature of the hologram is the parallax, which enables an observer to see how the position of the holographic object shifts against the background as the angle of observation shifts. This effect is achieved by means of microstructures of the hologram which diffract the light when it falls on them.

Light is diffracted when light waves are diverted off course when they meet an obstacle in their path. When these obstacles are tiny regular structures, called diffraction gratings, the regular patterns of the gratings act as secondary light sources. These secondary light sources interact in accordance with the laws on interference of light: the light waves that are in phase are reinforced (constructive interference) and those that are in opposite phase are cancelled out (destructive interference). Diffractive elements contain diffraction gratings in the order of 1,000 lines per millimetre; they may be transmission holograms (visible when lit from the back) or reflection holograms (visible when lit from the front, that is, from the side of the observer). Reflection holograms are embossed onto a very fine layer of aluminium to give them a shiny appearance. The layer of aluminium is applied with pressure to a polymer (embossed). A layer of lacquer is applied to the upper side to protect them from the effect of chemical agents and they are attached to the banknote by means of a layer of glue applied to the underside.

Typology

There are many different kinds of diffractive elements: they may be classified by the effect they produce, by the type of light required for them to be seen or by other features. Below we describe those in most frequent use.

Holograms were the first diffractive element to be created and gave their name, by extension, to all other such elements. The term hologram is used to designate the recording of a three-dimensional image on a two-dimensional surface, enabling the object to be seen in relief. More-



Application of holographic patches.

over, when the angle of observation changes, the perspective of the image represented in the hologram also changes.

The first holograms could only be seen correctly using monochromatic light sources, such as laser beams, which hindered their use. However this difficulty was removed in 1969 when the Ameri-

can physicist Stephen Benton invented the *rainbow* hologram which was visible under white light. When a rainbow hologram is observed from top to bottom, changing the angle of observation, the image provided by the hologram does not change its position against the background but it changes colour, shifting from red to yellow to green to blue to purple. The holograms used in security applications are almost exclusively rainbow holograms; they are typically used in credit cards.

Stereograms reproduce a fragment of a moving object in three dimensions, as the angle of observation shifts. This effect is achieved by placing the object on a rotating platform during recording. Stereograms may be considered to be a series of rainbow holograms placed together, each containing one sequence of the movement.







Kinegrams, which are computer-generated, were developed for use in security documents. When tilted, they reveal very marked changes in colour, as well as translation, rotation, contraction or expansion of the corresponding image. Unlike holograms which are three-dimensional, kinegrams present a two-dimensional image; they do not appear cloudy when lit with diffuse light sources and they change colour as the angle of observation changes.

The diffractive element used in euro banknotes is the kinegram. In the low-denomination banknotes (€5, €10 and €20) it appears on the right-hand side of the front of the banknote in the form of a stripe parallel to the short edge of the banknote. In the high-denomination banknotes (€50, €100, €200 and €500) the kinegram appears in the form of a patch, also on the right-hand side of the front of the banknote.



Pixelgrams, like kinegrams, are also computer-generated and show two-dimensional images. The characteristic feature of pixelgrams is that they show greyscale images which, when tilted, shift from positive to negative. The pixelgram was first used in 1988 in the Australian 10 dollar note that was issued to commemorate the second centenary of the founding of the colony of New South Wales, and depicted Captain Cook. In 1990 a pixelgram was also incorporated into the Singaporean 50 dollar note. In both cases, the banknotes were printed on a polymer substrate.

Examples of holograms

Type	Application	Illustration
Metallized	Former Dutch 100 guilder note	
Diffractive	50 euro note	
Overprinted	Canadian 10 dollar note	
Embossed	Swiss 20 franc note	
With transparent window	Bulgarian 20 lev note	
Applied to polymer	Australian 10 dollar note	

In addition, the use of holographic stripes allows other security features to be included in banknotes: invisible features readable only by machines may be incorporated into the stripes, facilitating mechanized authentication of the banknotes. Recently, banknotes have been issued that include a transparent window in the holographic stripe with optical security features visible to the naked eye.

Advantages and disadvantages

From the point of view of banknote security, diffractive elements offer the following advantages:

- They are visible to the naked eye and thus easily recognisable by the general public.
- They cannot be reproduced using photocopiers or traditional reproduction techniques.
- Complex technical resources are needed to create them; this represents a barrier to counterfeiting.

- They may be applied in various different ways to the product to be protected.

However, there are also a number of disadvantages:

- Holograms are complex elements with a laborious production process. Applying holograms to banknotes implies adding an extra stage to the production chain. It also means that the additional quality control systems and machinery required must be more technologically advanced.
- Holograms attract the attention of counterfeiters.
- They may come to eclipse all the other security features, with the risk that the general public may tend to check the authenticity of their banknotes purely on the basis of the holograms.
- They do not form an integral part of the substrate of the banknote, but are simply attached to it. Accordingly there is a risk that holograms may be removed from original banknotes and applied to counterfeit notes.

Conclusion

Holograms are diffractive elements which are highly advanced security features, easily recognisable by the general public. The difficulties they present insofar as the raw material and the process of application to banknotes are concerned make them difficult for counterfeiters to reproduce. Nevertheless, despite this indisputable advantage, holograms are currently one of the most expensive security features to be used on banknotes. Accordingly, when deciding whether or not to incorporate these features, a series of factors, in addition to cost, should be taken into account, such as the risk of counterfeiting of the country's banknotes, the quality of other security features and the attitude of the general public towards verification of the features included in the banknotes.

Application of holograms

Holograms may be incorporated into banknotes as patches or stripes. Patches are individual elements, applied in almost all cases in register with the banknote printing; stripes are vertical, parallel to the short edge of the banknote, and are generally applied in register with the horizontal printing.

Carriers or plastic supports are used to incorporate holograms into banknotes. In some cases the holograms are hot-stamped onto the notes: this implies transferring them from the carriers to the banknotes and applying pressure and heat. In other cases the holograms are laminated on the banknotes: in this case both the carriers and the holograms are applied to the notes.

Holographic stripes are applied to banknotes in the paper mill, when the paper is still in the form of a large bobbin. These bobbins are then cut into sheets of paper which are subsequently printed.

Holographic patches are applied at the banknote printing stage when the paper has been cut into sheets, generally after the security backgrounds have been printed in offset and before the intaglio printing.

Holograms may be applied to paper substrates and to plastic substrates such as polymer.

Holograms combined with other security features

The security provided by holograms may be incremented by partially demetallizing the diffractive aluminium layer, making it more difficult to reproduce. Or the holograms may be overprinted with the offset and intaglio printing. Features in relief may also be added, using the embossing technique whereby pressure is applied to the holograms thus deforming them. All these features when combined with holograms make it much more difficult for banknotes to be reproduced and thus hinder counterfeiting activities.

Toshiba's banknote processing

■ Masahiro Takagi *Toshiba Europe GmbH*

Toshiba, a world-class leading manufacturer of electrical and electronic goods, with annual sales of over 40 billion euro, was founded in Japan in 1875. Toshiba has a proud tradition of supplying banknote processing machines to central banks and commercial banks around the world. While this is common knowledge in the industry, it may not be general knowledge; this article describes the technology developed by Toshiba in the banknote processing machine market.

Beginnings

The economic growth seen in Japan in the 1960s and the increasing number of banknotes in circulation meant that it became vital for the Bank of Japan to make the growing volume of banknote processing operations more efficient and less labour-intensive. In 1967 the Bank of Japan decided to mechanize sorting operations, which had previously been carried out by hand, and asked Japan's major manufacturing companies to develop banknote processing machines.

Toshiba began to develop banknote processing machines immediately, having already acquired some "paper-handling technologies" in the form of peripheral equipment technologies for computers (card readers, card punches, high-speed tape punches, etc.). Moreover, at almost the same time, Japan Post asked the country's major manufacturing companies to develop mail sorting machines. The technologies involved were very similar and Toshiba decided to tackle both markets with company-wide development.

Toshiba currently has over 1,000 banknote processing machines for central banks and currency sorters for the commercial market in operation in countries around the world.

Design policy

Due to continuing product improvement in response to customer requests, Toshiba has evolved from designing low- to high-speed machines, based on a series of consistent design policies: reliability, accuracy, and user-friendly and ergonomic operation.

Toshiba's banknote processing machines, designed on the basis of these policies, have the following features:

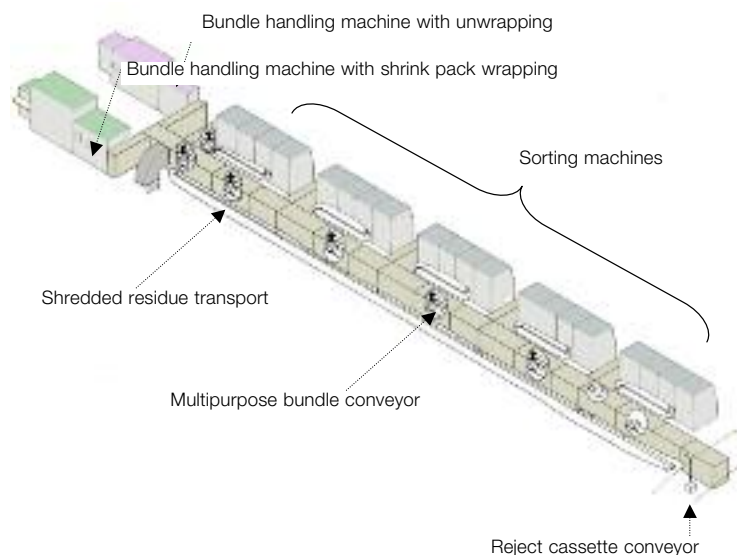
- High accuracy on the basis of elimination of human error.
- Security, high-processing efficiency and alleviation of operator workload due to sophisticated operation.

- A human interface that is intuitively usable by all, including outstanding ergonomic design, sophisticated operating monitors and jam recovery operation that eliminates operating errors.
- High-performing banknote handling technology that can process even poor quality banknotes.
- An open maintenance detector system.
- A combined system formation of multiple sorting machines and peripheral equipment (automatic packaging machines).
- Open architecture information processing (connection to other suppliers' systems).

Automated processing for central banks

Nowadays central banks require fully automated banknote processing systems. There are three main reasons that justify a more sophisticated level for banknote sorting: improved processing efficiency, alleviation of operator workload and improved security. Toshiba has put products meeting these requirements to practical use.

In particular, the Bank of Japan has installed a fully automatic Toshiba system that inputs a shrink pack consisting of 1,000 notes bundled x 10 bundles packed. The system automatically undoes the pack and subsequently outputs another shrink pack of 1,000 notes bundled x 10 bundles packed after all the banknotes have been processed by a high-speed sorter. This system reduces the manual element of the sorting process to a minimum, helping to achieve significant improvements in both security and processing efficiency.



Fully automatic sorting system (five interconnected high-speed machines).

ng machines

Importance of handling poor quality banknotes

Recent trends in the banknote processing market worldwide include the growth in the cash recycling process and automation in the commercial sector. This trend increases the percentage of unfit notes being returned to central banks, leading to a drop in the average quality of banknotes sorted by the central banks.

In addition, the quality of lower-denomination banknotes is generally very poor in comparison with the higher denominations, due to their long-term exposure to harsh conditions of use. Conventional-design sorting machines found it difficult to process seriously deteriorated banknotes continuously for extended periods, prompting many users to request sorting machines that were more tolerant of poor quality banknotes.

Conclusions

Until recently, central banks and the private sector each had their own clearly differentiated role in the banknote processing market and each selected equipment accordingly, but customer needs are now diversifying due, inter alia, to the start of cash recycling in the commercial sector. Toshiba intends to enhance its line-up in future to respond to these new needs and plans to develop new machines such as high-speed machines for the central banks and large-scale currency sorters for the commercial sector.

Toshiba is committed to improving the global environment, and banknote sorting machines are no exception. Thus Toshiba will continue to make the greatest possible effort in this respect, developing energy-saving and operator-friendly solutions for the global environment.

Improvements in processing of poor quality banknotes

■ Dual-reject process

Conventional sorting machines had a transport path for rejected banknotes after various sensors, meaning that all banknotes passed through the sensor section. This was one of the problems that caused jams of poor quality banknotes in particular, as the sensor section transport mechanism transported only one side of the banknote to monitor the entire note, or the path was narrow to prevent banknotes from fluttering. Moreover, if hard materials such as pins or clips were put on the banknotes, the resulting problems could lead to potential sensor failure.

To resolve these problems, Toshiba's latest sorter has a sensor placed immediately after the feeder to detect the thickness and position of banknotes and a transport path for rejected banknotes immediately after this sensor. This means that banknotes that are double-fed, skewed or displaced during feeding may be rejected before moving on to the sensor section. This dual-reject process reduces problems caused by jams.

■ Multiple-pair flat belt transport system

As poor quality banknotes tend to be less durable, they must be gripped firmly to ensure normal transport at high speed. Toshiba's latest sorter uses a multiple-pair flat belt system that transports notes by gripping them on each side from both sides, thus reducing problems such as jams caused by notes becoming entangled in their surroundings.

■ Dual processing speeds

Banknote quality varies according to banknote denomination and circulation area and there are cases in which extremely poor quality banknotes must be processed in bulk. In these cases, even raising the machine's tolerance for poor quality banknotes using the measures described above may be insufficient.

Accordingly, Toshiba's latest sorter has a function that enables banknotes to be processed at half the normal feed speed. Processing efficiency can be improved by reducing transport speed. The change in speed can be made by the operating monitor alone, as part of the overall operation and with no intervention required from maintenance personnel.



GB-5600 sorting machine.

Vth Course: Lisbon



The fifth edition of the International Course on Cash Management, organised by the Banco de Portugal, was held in Lisbon during the week of 26 to 30 May 2008. The sessions were held in the hotel chosen as the site for the Course and for accommodation of the participants from abroad and in the Banco de Portugal's Carregado Complex and Valora banknote printing works.

On the eve of the Course, on Sunday 25 May, Dr. Manuel Castelhana, Director of the Treasury and Issue Department of the Banco de Portugal, hosted a welcome dinner for all the participants. The inaugural session, on Monday 26 May, was attended by both the Administrator of the Banco de Portugal, Dr. Vítor Pessoa, and the General Director of the Banco de España, Mr. Javier Alonso

and the Banco de España, included a singular and inspired lecture given by the General Director of Currency Issue at the Banco de México, Dr. Manuel Galán, on "Banknote printing substrates. Paper, polymer and others.

The course was given in Spanish and Portuguese. Similarly to previous editions, it attracted a wide range of international participants, with 22 attendees from 11 different countries and 20 highly-qualified lecturers and speakers of eight different nationalities. In this case the Course gained from the participation of private sector professionals who presented their approaches and points of view on the different topics discussed. Thus the Course provided an opportunity for cash in transit companies and the banking industry to make presentations on matters

Ruiz-Ojeda. The academic programme began with a video entitled "A brief history of money" and the first lectures on the creation and destruction of money and monetary income.

The first day, which was devoted to technical aspects of banknote production, with the participation of experts from Valora

of interest to them. Representatives from various departments of the Banco de Portugal also participated in the Course, as did representatives from the Portuguese Criminal Investigation Department. The CEMLA was represented by Mr. Fernando Sánchez, Central Bank Meetings and Programmes Manager.

Two further aspects deserve special mention. First, the efficient job done in preparing and printing the Course documentation, which with the support of videos and electronic files made handling and filing the lectures so much easier. And second, the excellent job done by the Banco de Portugal, and particularly by the representatives of the Treasury and Issue Department, who created an optimum working environment, making it possible to meet the planned schedule in a unique atmosphere of friendliness and comradeship. For some of the participants, the memories of the week of the Vth CIGE in Lisbon will probably remain with them for ever.

The Course ended on Friday 30 May with the corresponding diploma ceremony. The diplomas were presented by the directors of the cash departments of the central banks of Portugal, Mexico and Spain, Mr. Manuel Castelhana, Mr. Manuel Galán and Mr. J. Darío Negueruela, respectively.



VIth Course: Madrid

At the close of the Vth CIGE held in Lisbon, it was announced that the VIth International Course on Cash Management, to be organised by the Banco de España, will be held in Madrid during the week of 1 to 7 June 2009.

In accordance with the pedagogic methodology established when the CIGE was founded, the first three days of the Course are devoted to the academic programme. This is followed, on the Thursday, by a programme organised by the host central bank, with discussions of topics of interest in the morning and an excursion to sites of historic-artistic interest for

Course participants in the afternoon. On the Friday, highly-qualified guest lecturers have the opportunity to present their views on the latest topics affecting cash management, with a special session devoted to appraisal of the Course and its development. This is followed by the official close, with presentation of diplomas.

For further information or clarification or for registration for the VIth CIGE, please contact cige@bde.es.

Central banking news

Monetary reform in Venezuela

On 1 January 2008 the Bolivarian Republic of Venezuela introduced a new series of banknotes and coins. This monetary reform was the result of a political decision, designed to simplify calculations and the use of the currency but with no change in name. Three zeros were taken off the face value of the previous bolivar, adapting the new currency to all amounts expressed in bolivares. However, it was decided to call the new currency the “strong bolivar” during a transition period, the aim being to help the public easily identify the two currencies and facilitate better comprehension and effective and quick familiarisation with the new currency. The characteristics of the new series of banknotes and coins make them easily distinguishable from the old series. The two currencies, the bolivar and the strong bolivar, will coexist at least until year-end.



The new currency comprises seven coins and six banknotes. The seven coin denominations are 1 strong bolivar, 50 cents, 25 cents, 12.5 cents, 10 cents, 5 cents and 1 cent. The banknote denominations are 2, 5, 10, 20, 50 and 100 strong bolivares, this latter a new denomination and the highest in the series.

The Banco Central de Venezuela has dedicated an internet portal exclusively to the currency conversion (<http://www.reconversionbcv.org.ve/>), with information on general and specific aspects. Enquiries may also be addressed to biblio@bcv.org.ve.

New banknote sorting centres in Spain

The Banco de España website has been extended to include a new section where it lists the new **banknote sorting centres**, facilities belonging to organisations that handle and distribute banknotes professionally. The list comprises those centres which have successfully passed inspection by the Banco de España, to ensure that they meet the common Eurosystem regulations on detection of counterfeit banknotes and verification of banknote quality. The list is valid for one year and has been published at the request of the corresponding organisations. This procedure, which is in accordance with the responsibility deriving from implementation of the Eurosystem Banknote Recycling Framework, was set up by virtue of the «General Rules Applicable to the Ordinary Cash Service of the Banco de España for Euro Banknotes», published in the Official State Gazette of 23 November 2006.

Banknote processing and automatic sorting must comply with the following conditions:

1. Verification of banknote authenticity and fitness. All suspected counterfeit notes and all banknotes that fail to meet minimum quality standards must be sent to the Banco de España, on behalf of the corresponding credit institution.
2. All such verifications must be made using recycling machinery approved by the Banco de España or other Eurosystem national central banks. Both the Banco de España and the European Central Bank (ECB) websites contain details of the machinery deemed appropriate for these purposes.



To date there are a total of nine banknote sorting centres subject to the new regulations: two in each of Spain's three big cities (Madrid, Barcelona and Valencia), one in Seville, one in the Balearic Islands and one in the Canary Islands. Two or three more centres are expected to be opened by year-end but no further new openings are foreseen in 2009, given the extent of the existing banknote distribution network.

International events

IXth Meeting of Central Bank Treasurers



The 9th Meeting of Central Bank Treasurers of Latin America and associated countries was held in Bogota during the week of 2 to 5 September 2008, organised by the Banco de la República in collaboration with the Centre for Latin American Monetary Studies (CEMLA). The meeting, which was attended by 68 representatives from 24 central banks, was opened by the General Manager of the Colombian central bank, Mr. José Darío Uribe, and closed by Mr. Néstor Plazas, Deputy General Manager. It was a great success, thanks to the excellent presentations made by the central banks and the programme of events and visits organised by the Banco de la República which proved to be a perfect host.

The meeting was devoted in particular to two main topics: communication as a cash management tool and coin. In the field of communication, the discussions focused on central banks' strategies and objectives and on the results of surveys and campaigns conducted, with papers from Austria, Brazil, Canada, Colombia, the European Central Bank, Mexico and Spain. In the case of coin, aspects relating to production, distribution, circulation, stocks and demand forecasting models were all analysed, with papers from the central banks of Brazil, Colombia and Mexico.

2008 European Banknote Conference

During the week of 15 to 19 September, the Bulgarian National Bank played host in Sofia to the European Banknote Conference held once every two years. The Conference was attended by a large number of European central banks that are Association members and by guests from other institutions such as the European Central Bank. Over the three days, papers and documents were presented from the dual viewpoint of banknote printing works and central bank treasury depart-



From left to right: J. Darío Negueruela, Bernardo Calvo and Néstor Plazas, in Bogotá.

Two research topics were also addressed, relating to contingency schemes for treasury operations, with the participation of the Bundesbank and the Banco Central de Costa Rica, and optimum levels of cash reserves that should be held by central banks, developed by the Banco de Guatemala. In addition, the Banco de España presented a paper on the current challenges facing treasury management.

The meeting also included two round table discussions: the first, on coin collection strategies, with the participation of Guatemala, Peru, Spain and Venezuela; and the second on communication campaigns targeting specific segments of the population, with the participation of Brazil, Canada, Colombia, Mexico and Peru.

In addition, Mr. Bernardo Calvo of the Banco de la República and Mr. J. Darío Negueruela of the Banco de España presented a joint paper on cash statistics in Latin America. This initiative is of paramount importance, developing a body of statistics that was previously nonexistent. These new statistics will facilitate international comparison of the volume of cash in circulation in the countries of Latin America and constitute a vital decision-making tool for the monetary authorities in the field of cash management.

The programme also included an extremely interesting visit to the Cash Centre Facilities of the Banco de la República, providing an opportunity for the participants to verify the high-efficiency profile of the new complex that was opened in 2007 and that boasts the most up-to-date technology for simultaneous and coordinated production, storage and issue of cash.

ments, with noteworthy technical and industrial contributions and logistical and strategic contributions, respectively. The Conference also reviewed the work of the Association's specialist groups over the last two years and ended with a *tour de table* that offered a broad and detailed view of the present situation and concerns of the European central banks.

(cont. over)

Publications devoted to cash

Developments in Banknotes

A book on banknote production published in 2006 by Pira International of the UK. The work presents an overview of the technologies currently used for banknote production worldwide, with information on banknote printing works, manufacturers of specialist machinery and suppliers of raw materials for banknote production. The book includes descriptions of the latest technological developments in the preparation of intaglio printing plates, printing

substrates, coatings, types of printing, holograms and variable optical devices, and of the latest developments in raw materials for banknote production. It also contains a series of general considerations on regulations and legislation governing security printing, control of waste and health and safety issues and, lastly, a set of tables with information on the cost of banknote production. To request a copy, please contact:

publications@pira-international.com



Arte en el dinero Dinero en el arte

A book published by Caja Duero at the end of 2006 to commemorate the 125th anniversary of Caja de Ahorros de Salamanca. *Art in money* presents a historic-artistic overview of banknotes and coins since their early beginnings in primitive cultures,

whilst *Money in art* presents works of art depicting money and related items. The book was made possible thanks to the participation of 21 Museums and Foundations and 12 private collectors. Ten scientific advisors and 32 art historians were involved in the project. To request a copy, please contact: coordinacioncultural.obs@cajaduero.es



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2008 Currency Conference

The 2008 Currency Conference, held in Prague on 11 to 15 October, was attended by more than 400 delegates from a wide range of countries. Over the three days, papers were presented on a variety of topics connected with the currency world. The Conference provided an opportunity for central banks and public-sector printing works to mix with private-sector printing firms and technology suppliers, to discuss matters of mutual interest from their respective points of view. At the close of the Conference it was announced that the next edition will be held in Buenos Aires in May 2010.



Polymer Symposium in Bucharest

The One-day Polymer Banknote Symposium jointly organised by the National Bank of Romania and Innovia Security was held on 10 October 2008 in Bucharest.

The Symposium was opened by the Governor of the National Bank of Romania, Mr. Mugur Isarescu, and was attended by experts from the central banks of Australia, Austria, Canada, England, Mexico and Spain, as well as the host country Romania, and by industry and polymer banknote printing works representatives. The European

Central Bank also sent a representative. It is now twenty years since polymer first appeared in the world of banknotes and some of the main banknote issuers and printing works gave presentations and presented papers on their experiences with polymer, notably Mr. Bob Rankin from the Reserve Bank of Australia, Mr. Enrique Guarner from the Banco de Mexico's printing works and Mr. Brian Lang from Polyteq. There was also an interesting discussion on the challenges facing polymer banknotes.

Banknote security features

■ Banco de España *Cash and Issue Department*

This section presents a catalogue of the main banknote security features recognisable by the public and currently in use worldwide. The features have been grouped according to their common functional properties for detection by the general public and retailers. The picture of each feature is accompanied by a brief explanatory text. The list will be subject to constant review, adding new security features resulting from technological advances and discarding those that are no longer relevant for the industry.

WATERMARKS



1. Multitone watermark

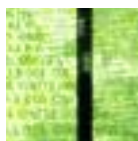
Image incorporated into the paper which is visible when the banknote is held against the light. It is created during the paper making process by varying the thickness of the paper. The resulting variations in opacity give rise to an image with bright and dark areas.



2. Electrotype watermark

It is a filigree visible when held against the light. It is created during the paper making process using a filament which takes the form of numbers or different types of characters.

SECURITY THREADS



3. Embedded security thread

A thin band of plastic inserted into the paper. It is usually made of 1-2mm wide and 30-40 microns of thickness. It often bears microtext and fluorescence. It can also contain electric and magnetic properties readable by banknote processing machines.



4. Window thread

This band is made of a thread wider than the abovementioned, 3-4 mm, that weaves in and out of the paper. The uncovered sections are visible and could contain an optically variable element like an ink that changes colour when the banknote is tilted.



5. Thread with floating images

A window thread inserted into the paper using a standard window embedding technique. The floating image effect is produced by embedding microlenses into the thread. When the thread is tilted, the microlenses move producing floating images.

INTAGLIO FEATURES

Tactile



6. Intaglio printing

The printing with relief is detectable by the sense of touch. It is a printing technique in which the ink is transferred directly from the plate to the substrate under high pressure and temperature conditions. The printing produces a relief effect due to the thick layer of ink deposited and the embossing of the substrate. The main motif of a banknote is usually printed in intaglio.



7. Tactile marks for the visually impaired

These tactile marks are detectable by touch. They are printed in intaglio and are usually located near the borders of a banknote to facilitate its recognition by the visually impaired.

Visual



8. Colour gradation in intaglio

Gradual superimposition of colours printed in intaglio that are very difficult to reproduce by copiers.



9. Latent image

A hidden image that becomes visible when the banknote is viewed at a certain angle. It is made by intaglio printing using a particular structure of lines.



10. Blind embossing

An embossed colourless image that becomes visible when the banknote is viewed from an oblique angle. It is created by deforming the substrate by the high pressure of the intaglio printing without ink.

OPTICALLY VARIABLE FEATURES

**11. Iridescent ink**

A brilliant ink that changes colour when the banknote is tilted. The ink can be applied in a stripe and displaying an image.

**12. OVI ink**

Printing with optically variable ink (OVI), implies it will change colour when the banknote is tilted. Its effect is increased when the whole surface is covered by a layer of this ink applied in silkscreen printing.

**13. SPARK ink**

A particular type of OVI ink which changes colour, containing magnetic particles which can be oriented in such way as to produce a dynamic colour effect when the banknote is tilted. The effect is increased when the whole surface is covered by a layer of this ink applied in silkscreen printing.

**14. Optically variable devices (OVDs)**

Images produced onto holographic elements which change form and colour when the banknote is tilted. These are anti-copying devices based on the light diffraction principle, such as kinograms. OVDs can be stamped onto the substrate in the form of a patch or stripe.

**15. Moiré variable colour**

Feature that uses the latent image principle. It produces a rainbow effect which appears when the banknote is tilted. It is performed by means of an offset printing combined with an intaglio printing.

VISIBLE BY MEANS OF A MAGNIFYING GLASS

**16. Microprinting**

Printing of small characters that are not visible to the naked eye but can be seen through a magnifying glass. When printed onto a banknote, it usually combines characters in positive and negative.

ULTRAVIOLET AND INFRARED PROPERTIES

**17. Ultraviolet properties (UV)**

These properties are incorporated into the fluorescent pigments of the printing inks which are not visible in daylight but are visible under UV light. Ultraviolet properties in banknote printing turn out really notorious as the substrate used is non-fluorescent under UV light.

**18. Fluorescent fibres**

Fibres made of synthetic material and differently coloured embedded into the paper that are not visible in daylight but are visible under UV light. Their length is usually 3-6 mm. There are certain fluorescent fibres in which each fibre has several colours. The fibres are incorporated onto the banknote in a random way while elaborating the paper mass.

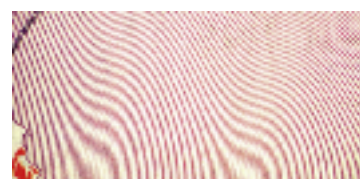
**19. IR properties (IR)**

These are incorporated into the pigments of the inks. These are inks with different infrared performance due to different absorptions in that spectrum. The IR characteristics are usually applied combining transparent inks with inks opaque to IR.

OTHER FEATURES

**20. See-through register**

Some elements of an image are printed in offset on the front side of the banknote and the remaining elements of the image are printed on the back. The whole image with perfect coincidence is visible when the banknote is held against the light. This feature is also known as 'perfect register' as it is printed simultaneously on front and back sides in register.

**21. Structure of fine lines (moiré effect)**

Set of fine and narrowly printed lines which produce an optical confusion, named moiré effect, when reproduced by copiers.

**22. Rainbow printing**

Offset printing that creates in the banknote an area with different colours that are gradually mixed together to create a rainbow effect.

**23. Numbering**

The serial number on each banknote, which enables it to be identified. It is usually printed in letterpress, naked eye readable and may also be machine readable if mechanically readable characters are used. The ink usually incorporates magnetic properties.

**24. Transparent window**

Transparent area on a banknote on which optical effects are incorporated by applying various elements, such as a blind-embossed image or an optical device. It is used in polymer banknotes and is beginning to be used in paper banknotes too. In these, the window is placed on a holographic band.

**25. Microperforations**

An image made up of a large number of microholes in the paper, which becomes visible when viewed against the light. The microholes are drilled by means of laser.



Juan de la Cosa's map, 1500. Madrid Naval Museum.

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