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Designing Banknote Identity

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Central bank and prudential supervisor of financial institutions

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Abstract

Confidence in banknotes is entirely based on trust in the currency, the organisation behind it and the authenticity of the note. The authenticity may be verified by an authenticity check, one of the four main user functions of a banknote; the others are value recognition, handling and (communication) message. Central banks may follow different banknote design policies, like putting ‘authenticity check’ first. In all combinations the final banknote identity is made by the ‘design sum’ of all functions. Scientific literature to support these decisions is not available and banknote identity issues are rarely discussed at conferences on banknotes. This study addresses this lack by looking into development metrics and contributing to a better understanding of identity subjects. Once the desired identity of the banknote has been described, the banknote may be designed. These two concepts, banknote identity and banknote design, are brought together in this study.

Several design methods are introduced to support the development of an identity policy, like positioning and balance diagrams, familiarity and design freedom. To be perceived as a banknote, a new design has to carry several prototypical banknote design elements; the study describes 37 of such elements, divided in currency and banknote elements. Although general principles are described, the focus of the study is on the former guilder banknotes and on the euro bank notes.

In 2011 De Nederlandsche Bank researched which of these design elements are contributing most to the European identity of the euro cash money. The main conclusion of the study is that euro banknotes are designed according to the status quo of national banknotes based on trust. Supranational banknotes require an appropriate, different design policy, since they are a next development stage of tangible money.

Keywords

Design methodology, banknote design, banknote identity, banknote communication.

I Introduction

‘When bankers get together for dinner, they discuss art. When artists get together for dinner, they discuss money.’

Words written down by the Irish poet Oscar Wilde (1854-1900) and still valid today. Instead of talking about art in general, central bankers could discuss more often their own banknotes as a form of art. What kind of emotions should banknotes evoke? Should they exude happiness or create a warm feeling? Which story should be told? In other words, what is the identity of the banknotes issued?

The following three items are reported in the introduction of this study on banknote identity:

- Aims of this study,
- Topics discussed,
- Contribution to existing literature.

The four aims of this study

Bringing the subject of banknote identity on the radar of central banks is the first aim of this study. Without an identity policy, the banknote’s message remains open and communication on the banknote may even become target of unwanted interpretations. Preparing a design instruction is the second aim of this study. How to brief the graphic designer? Reporting the achievements of the guilder banknotes in the field of banknote design policy is aim number three. Finally this study reports on research done in 2011 by DNB on the identity of the euro coins and banknotes as perceived by the Dutch.

Topics discussed

This study is about banknote design, which is a specific form of graphic design. Graphic design is a creative process undertaken in order to convey a specific message or messages to a targeted audience. The field as a whole is often referred to as ‘visual communication’ or ‘communication design’. Graphic design often refers to both the process by which the communication (designing) is created and the products which are generated (designs). Common uses of graphic design include identity (logos and branding), publications (magazines, newspapers and books), advertisements and product packaging. Usually the process of graphic design involves a client and a designer. And usually the design process is completed in

conjunction with producers of form, i.e. printers or sign-makers. In the case of banknotes the central bank is the client and the banknote designer is either an independent graphic designer or is working for the banknote printer.

The study starts with a historic overview of paper money design. Over time cash money developed from original money, tokens like shells, to the first supranational banknotes, the euro. Information on banknote identity is collected from a graphic designer's point of view and analysed. New user requirements created a demand for new types of money, keeping several carry-on elements from the previous type. The study continues with a description of banknote identity, one of the two concepts, the other is banknote design, introduced in this study. Both concepts are closely related and are often mixed up with each other and should be explained.

Product identity

Looking for a product to full fill their needs, consumers may choose from many different offers, created by competition between manufacturers. Consumers may select their favourite product by using preferences like functions, aesthetics, cost and sustainability. The manufacturer formulates such consumer preferences usually in advance in a design policy prepared by the marketing division. A business with a known design policy is the Body Shop, selling cosmetics but at the same time supporting the protection of the planet. Another example is Volvo Car Corporation, whose design policy was and still is to make safe and sustainable cars. Part of the design policy is the product identity; the safe and sustainable Volvo should also look strong and solid, but should not be a tank. The products of the Body Shop should not only consist of natural ingredients, they should also not be tested on animals. This desired identity is translated into the Body Shop's design of their packaging and shop interior. Reasoning along similar lines, first a banknote identity description should be provided before the banknote design process may take off.

Banknote design

One may argue, why boulder about banknote identity, people will use the banknote anyway. However, since 1974 a banknote became 'just a piece of paper', as it could no longer be exchanged for silver, gold (up to 1971) or US dollars (1974). How to preserve trust in a piece of paper that commands a purchasing power many times larger than the few cents for its production costs? Confidence in banknotes is based entirely on trust in the authenticity of the note and in the organisation behind it, the reason why central banks see it as one of their main tasks to maintain this trust in the paper money, genteel phrased as preserving the integrity of the currency [e.g. 250]. Banknotes issued in this era of 'trust' ultimately rely on the trustworthiness of the state and community that issue and accept them. A proper banknote design will support confidence, so is the presumption, the reason why portraits of respected citizens were first introduced during the financial turmoil of the 1920s. Between 1974 and 1995 the trust in the banknote as a piece of paper increased and historical

portraits were no longer a necessary means to enforce the public’s confidence in paper money.

This study invites central banks to follow a user-oriented design approach. Positive emotions should be addressed, which will be discussed in the last chapter on designing a banknote identity. The study concludes with an outlook on future banknote design, including the competition faced from other means of payments.

Contributing to existing literature

The banknote’s identity function is the theme of this study; a banknote is the ambassador of the country and the culture it represents. The banknote is the front or show piece of a nation, often referred to as the calling card or business card function. In 2003, president Duisenberg of the European Central Bank (ECB) referred to this identity function when he wrote that ‘banknotes are not only a means of payment, they are also pieces of craftsmanship, reflecting the soul of the nations issuing them.’[86].

Unlike security features and durability, banknote identity is rarely discussed at conferences on banknotes, and if it is, this usually occurs by incident. There is, surprisingly, hardly any literature available. The studies done by Jacques Hymans [97, 108, 196] seem to be the most relevant to banknote identity. Central banks may think that they have created an unique banknote identity, but one of Hymans conclusions is that the nations rather express a trans-national spirit of the times than unique national identities. Using the Albert Pick catalogue on world paper money [10, 153], Hymans studied in 2004 a database of 1,368 notes from all 15 member states of the European Union. He found that the period in which a banknote is issued is more decisive than the nation issuing the note. Hymans distinguished five different

Table 1.1

Design period Europe	Actor			
	State	Society	Individual	Mainly
Pre-1920	80 %	9 %	11 %	State symbols, mythical
1920 - 1949	53 %	36 %	11 %	Society, allegorical imagery, scenery
1950 - 1979	45 %	15 %	29 %	State actors, portraits
1980 - 2000	35 %	7 %	58 %	Scientists, artists, famous women
2000 - ...	-	-	-	Post-modern, trend to leave portraits

Overview prepared by Hymans of 5 different design periods (or currency issue epochs) of European banknotes as used by the 15 countries forming the European Union in 2004 [97].

State = state symbols (e.g. classical gods, statesmen, royalty),

Society = classical imagery (e.g. allegorical figures, pastoral scenes, kids playing basketball),

Individual = historical non-state actors (e.g. Aristotle, Henry Ford, Albert Einstein).

design periods as reproduced in table 1.1. To illustrate his statement figure 1.1 shows four examples of the pre 1920 period, clearly similar in their design. In two other studies Hymans applied the same methodology on Japanese and East European banknotes.

Post-modern banknote design is defined by a currency offering something rather abstract, open to multiple interpretations, phrased by Hymans as ‘abandon the past practice of transmitting any literal, unmistakable message; abandon the “celebratory” banknote altogether’. Since DNB replaced the portrait on the 100 guilder banknote in 1981 by a bird, a snipe, this banknote is one of the first post-modern banknote designs (figure 1.2). Several countries followed suit, as will be discussed at some length in chapter 2, subsection 2.2.8.2. According to Hymans the euro is also a post-modern banknote design as the euro reflects ‘the highly egalitarian idea that ‘Europe’ is all around us - but is nowhere in particular’ [97].

Figure 1.1



The vertical symmetry axes in these banknote designs give the notes a similar appearance. Illustrating prosperity, these European designs were issued by the national banks of different countries.

a) NLG 10/Labour and Prosperity, designed by Nicolaas van der Waay and issued in 1904. Labour and Prosperity reach out to each other.

b) Germany, 1,000 mark, reverse, 1908.

c) Russia, 500 roubles, 1912.

d) France, 100 francs, first issued in 1923.

Figure 1.2



In 1981 a Dutch 100 guilder note was issued with a bird, a snipe, as its main image, which was clearly a large design change. Being unique in the world, this image enhanced the identity of the Dutch banknote series. Such a large bird on the note was unfamiliar to the Dutch, although several design parameters were kept similar (colour, size, lay-out). The note became very popular.

- a) NLG 100/De Ruyter (1972),
- b) NLG 100/Snipe (1981).

Most literature on coins and banknotes is fragmented, one must conclude. Publications focus on a certain period, country, area or banknote printer and provide no useful information on banknote identity on the other hand. The present study on banknote identity made good use of the many coin and banknote collectors active on the internet. They contributed numismatic descriptions and several of the images used are copied from their websites. Also other information provided by museums, auctions and blogs on the internet was also helpful. All such bits and pieces from many, many different sources were brought together and used in this study. It presents a helicopter view of the major trends in paper money design, with a keen eye for identity aspects. The author invites the reader to inform him on any inconsistencies; your feedback will be appreciated.

Input from young designers and researchers

Apart from keeping track of literature and attending conferences, DNB is open to public feedback on banknotes and especially to comments coming from students and young designers. Such feedback was provided on banknote design in 2008 by Tom van Enckevort, see figure 4.19b and figure 5.41 and can also relate to subjects such as a European coat of arms, as provided in 2011 by Joost van Dorst as shown in figure A1.29f or on digital money by Jaap de Vries as mentioned in subsection 5.10.1 on the future of cash. Sometimes such feedback comes from outside the Netherlands, like in 2011 by Katja Müller from Germany who focussed on banknote design for elderly people, the subject of her master thesis (see subsection 5.3.1 on series design).

2 History of banknote design

Since the 1980s several publications became available on banknote design, some touching also the subject of banknote identity. Banknotes carry several historical design elements, such as a currency unit, a number and a signature. These historic design elements are still carrying elements of today's banknotes and it seems that new banknote designs should have one foot in the past and one foot in the future. Such carrying elements that characterises the product are prototypical elements. In case such an element is left out of the product this will be noticed by the (frequent) user [192].

The following three topics are discussed in this chapter:

- 2.1 Studies on banknote design and identity: an overview
- 2.2 History of paper money design
- 2.3 Conclusions on banknote design from a historical point of view

2.1 Studies on banknote design and identity: an overview

One of the first publications on banknote design was made by C.W. Dickinson in 1895. In this rather technical study Dickenson explained the gravure technique [2]. Eighty years later, in 1975, the German numismatist Albert Pick compiled for the first time the 'Standard Catalog of World Paper Money' [10]. This catalogue presents the paper currency of all nations, from Afghanistan to Zimbabwe. This three-volume publication is mainly used by collectors and banknote designers. Each entry contains photographs of the front and reverse of the note, identifying information and current market value.

Since the 1980s several publications became available on banknote design. In 1983 Martin Monestier was one of the first. He takes the reader in 'Art of Paper Currency' all over the globe showing the banknotes of every country [20]. In the same category are popular books that explain the many facets of money as, for example, 'Money' published in 2005 [110]. Besides rather broad reviews there are several monographs such as 'Collecting Paper Money and Bonds' published in 1979 [12].

In the Netherlands, Hans Jacobi and Bert van Beek published a book in 1988 on all the money ever issued in the Netherlands [36].

Anticipating its third centenary in 1994, the Bank of England published in 1987. 'As Good as Gold: 300 years of British banknote design' by Victoria Hewitt and John

Keyworth [33], followed in 1994 by ‘Beauty and the Banknote Images of Women on Paper Money’ [48]. A design study of all Dutch banknotes was commissioned to Jaap Bolten and a first summary was published in 1986 [24], followed by a book edition in 1987 [31]. Twelve years later this study was updated marking the end of the era of the Dutch guilder [66]. Bolten described the relation between central bank, printer and designer in detail, but made only limited reference to banknote design outside the Netherlands. Because banknotes world-wide are produced by similar machines, the introduction of new banknote production tools usually triggers a wave of new banknote designs as well - a line of approach mentioned only incidentally by Bolten. Another dominant factor in banknote design that is hardly touched upon by Bolten is the prevailing time spirit, creating similar note designs across nations as reported by Hymans.

A third book published by the Bank of England, in 1987, was written from the perspective of the central bank: ‘Inside the Bank of England’ [32]. Other central banks followed. Willibald Kranister, employee of the National Bank of Austria wrote ‘Moneymakers’, a rather kaleidoscopic overview of the various aspects of banknote design in 1991 [39]. In the same year, DNB’s Jan Grolle published a detailed historic overview of the Dutch banknotes including many details on design aspects [40]. Several other central banks, too, came up with historical overviews of their banknotes: Switzerland in 1997 [58], Finland in 2003 and one more in 2012 [88, 253], Spain and (former) Yugoslavia in 2004 [respectively 103, 104] and Turkey in 2005 [113]. The banknote printers in their turn published overviews of their own historic productions: Polish printing works PWPW in 2006 [122], the Russian Goznak in 2008 [158] and the German Giesecke & DeVrient in 2009 [173]. However, these overviews are primarily descriptive and do not provide relevant background information on the banknote design process or the design policies of the central banks involved. In their 2001 book ‘A Flutter of Banknotes’, René Brion and Jean-Louis Moreau survey the history of motif in European paper money. Banknotes, their overall conclusion runs, tend to reflect core values of the issuing societies: faith in progress, the virtue of work, social harmony and the greatness of a nation. Portraits in realistic style came to prevail only after 1945 and national figureheads from art, philosophy and science became prominent features from the 1960s [77].

So far an overview of studies on banknote design. Unfortunately, also on the subject of banknote identity there is not much literature available as reported by Johan Förmås: ‘Surprisingly few have seriously studied money as mediated texts in wider cultural contexts. Numismatic studies are remarkably absent from the field of media and cultural studies’ [138]. However, apart from the studies by Hymans, there are some other studies available on the subject, like the publication by Richard Zeid named ‘Money. The branding of a country through the design of its currency’ [99]. Zeid describes banknotes as ‘amazing public relation tools’. Recently two papers by N. Krishnaswamy published two papers providing some views of the

Table 2.1

When	Type of money	Remark	Example
Feudal	Original (primitive)	Trade by barter. Unit of account: salt, cattle, tea, cod.	
> 700 BC	Coins (gold, silver)	Electrum (Lydia). Greek coins. Roman coins. Circa 800 - first Chinese banknote.	
> 1200	Bills of exchange	Development of coin transfers: Italy: lettera di cambia. England: running cash notes. Bills of exchange (time, place, amount).	
> 1661	Private banknotes	Commodity money. Goldsmiths became moneylenders. Notes were convertible to gold.	
> 1750	State money	National banknotes 'monometallic standard'. The nation guaranteed the value of the banknote. Notes became legal tender.	
> 1865	Currency of monetary unions	Currencies used by different monetary unions, like the Latin Monetary Union.	
> 1920	National banknotes 'pegged to dollar'	Turbulent period because of crises. Other currencies linked to the US dollar.	
> 1973	National banknotes 'trust'	Pure fiduciary money. Portraits of famous national figureheads, that people trust like scientists, artists, writers.	
> 1980	Small scale private currencies	Coins, paper money, electronic. Lets, regional money.	
> 2002	Supranational banknotes	The euro is the first banknote called a supranational banknote	
Future	Global money	Currency substitution by global markets.	
	Print on demand	Home-printed notes, banknotes printed with machine-readable codes, app banknotes, ...	

Overview of the development history of different types of paper money.

central bank of India on 'branding through banknotes' (2007) and 'philozophising banknote design' (2011) [133, 211]. The first to discuss 'banknote identity' from a banknote design perspective seems to be DNB, when De Heij presented the subject to a meeting of European central banks in 2009 [163], on the basis of research performed in the field of banknote identity for the Central Bank of Aruba in 2007. This presentation was elaborated and presented twice at international seminars in 2010 [181, 190] and is used for this study.

2.2 History of paper money design

Sweeping changes in paper money design are driven both by new user requirements and by technological innovations. For a better understanding of these changes in the design, this study elaborates occasionally on the altered financial function of paper money. This chapter determines 11 different periods of the development of tangible money, of which 9 are related to paper money (table 2.1), the first two periods, original money and coins, are precursors of paper money. The future is also included in table 2.1, but this outlook will be reported in chapter 5, subsection 5.10. Not included in this overview are paper money used for special purposes like military money (e.g. figure A1.30), play money (e.g. Monopoly money, figure A1.47), church money or prison money.

The design characteristics of the different currency periods are briefly reviewed as follows:

- 2.2.1 Original money
- 2.2.2 Coins
- 2.2.3 Bills of exchange
- 2.2.4 Private banknotes
- 2.2.5 State money
- 2.2.6 Currency of monetary unions
- 2.2.7 National banknotes 'pegged to the dollar'
- 2.2.8 National banknotes 'trust'
- 2.2.9 Small scale private currencies
- 2.2.10 Supranational banknotes
- 2.2.11 Global currencies

2.2.1 Original money

In early societies people bartered, exchanged goods and services with each other without using any form of money. Primitive money, also referred to as original money, is the first stage of the development of money like for example the famous cowries. There are numerous examples of original money from various cultures, all based on an agreement on a unit of account. For example, the cod was the common means of payment in the trade between England and Iceland in the 14th century. The price of 48 yards of textile was 120 pieces of cod, as we know from a preserved

official price list of those days. The cod itself was not a medium of exchange. Other commodities could also serve as a unit of account, like livestock (sheep, goat, cow), shells, salt, sugar, rice, cocoa beans or tea; see figure 2.1a, b and c for examples [7, 46, 62, 84, 194, 208].

Special forms of original money are dowries and famous are the impractical Yap stones. The effort and peril involved in obtaining Yap stones made this stone money scarce and valuable (see appendix A1, section A1.5 on size).

A transitional stage between original money and metal coins is the copper-based Katanga cross shown in figure 2.1d. While the civilizations of Mesopotamia and Egypt still used silver rings and other precious metal items for payment, the Lydians introduced the world's first monetary system using coins around 700 BC.

Figure 2.1



Some examples of original money.

- Livestock was a regular unit of account, which, consequently, was seldom actually exchanged. A price agreed could for example be 1/8 goat.
- Cowry shells are the white glossy, translucent shells of sea snails living in the Indian Ocean. Their Latin (taxonomical) name is 'Monetaria moneta'. This original money circulated around 2000 BC in China and later also spread to India, Thailand and East and West Africa. Their world-wide popularity had two reasons. First, their uniform shape and size make the cowries easy to count. Secondly, the cowries are also a symbol of virility. As late as the 20th century, cowry shells were still used in some parts of Africa, New Guinea and some islands in the Pacific Ocean.
- Tea bricks were used as a form of currency throughout East and Central Asia up until the mid-20th century. The bricks were produced by mixing tea and blood. They were available in different qualities, which were valued accordingly.
- Katanga cross, used in south-east Congo since the early 16th century onwards into the 20th century. A single Shaba Cross would buy some 10 kilos of local manioc flour or 5 chickens. A cross was moulded in dry sand and filled with native copper, each cross weighing approximately 0.6 kilogram and measuring about 0.2 metres.

2.2.2 Coins

Lydia was a kingdom in what is today western Turkey. A natural alloy of gold and silver, named electrum, was found on the banks of the Pactolos River. These lumps became the first coins and their value was based on their weight (figure 2.2a). By making standardised pieces of fixed sizes and weights, the weighing process was simplified. The value of these coins was guaranteed by the authorities who marked these standard pieces of electrum with a die (figure 2.2b). These coins had no official name and were available in one denomination (weight) only. While used by ordinary people, this money was not intended for daily payments by the general public but chiefly for use by merchants. They could cut the electrum unit into smaller pieces reflecting the exact amount required for a given payment, but they did so only incidentally.

Around 550 BC, the Lydian were able to split electrum into gold and silver, the cradle of gold and silver coins (figure 2.2c and d). From Lydia, the minting of gold and silver coins found its way to Greece.

Figure 2.2



- The first coins were minted in Lydia; initially in electrum, later in gold and silver.
- a) Electrum coin made in Lydia around 600 BC. The lion head symbolizes the King of Lydia.
 - b) Reverse of electrum coin made in Lydia around 600 BC, as shown in a).
 - c) Lydian gold coin issued under the reign of King Croesus (561-547 BC), who introduced gold coins to the masses. The coin shows the roaring head of a lion attacking a bull.
 - d) Lydian silver coin with a similar image.

Main image

Images of animals were already used on the very first Lydian coins (figure 2.2) and also on the first Greek coins (figure 2.3). The city-state or polis characterised the ancient Greek world and there were several hundred of such independent and autonomous poleis. From about 700 BC until the arrival of the Romans in Greece in 146 BC, each Greek polis had its own form of government, patron deities and economy. The polis issued its own coins, designed to protect and enhance the identity of the polis, which is why coins from different city states differed widely from each other. Greek coins crossed borders regularly and circulated well beyond the limits of the city which had minted them. The shape of the first coins was not important as long as its weight in electrum was correct (about 14 g or one 'stater'). A personal stamp or seal on the coins identified the person who guaranteed the coin's weight. portraits were not yet used on these early Greek coins.

First portrait on currency

The first effigy ever to appear on coinage was that of Alexander the Great (356-323 BC). After the conquest of Egypt, he allowed himself to be depicted as a god-

Figure 2.3



Four ancient Greek silver coins issued by different city states (polis).

- a) Aegina. The turtle symbolises Aegina as a major sea power.
- b) Santorini. Two dolphins swimming in opposite directions. The coins were used for only a short period, since the island's currency needs were met by 'turtles' from Aegina.
- c) Samos. The lion symbolises Hera, the goddess of women and marriage.
- d) Thassos. Abduction of a nymph by Silenos, the old rustic god of the dance of the wine-press. He was also the god of drunkenness and taught Dionysus such tricks as balancing a wine glass on your nose.

king on the front of the coins, by analogy with the Egyptian pharaohs, who were considered to be divine. After Alexander died, coins were issued showing idealised portraits of him (figure 2.5a). As far as known, no coin was ever minted with a realistic portrait of this historic figure.

Imagery on both sides of a coin

The Lydian used one side of a coin for an image and the other side for a mark (figure 2.2b). After 500 BC, the Greek started to use both sides of the coin for imagery. The Athenian four drachma coin (in Greek ‘tetradrachm’) was one of the first with also an image on the reverse (see figure 2.4a and b). The design was kept essentially unchanged for over two centuries and returned on the Greek euro coins issued in 2002 (see figure 2.4c and d).

The first coin issuing authority to make use of the coin edge was probably the Royal Mint at the Tower of London in 1662. An engraved, decorated and milled edge was considered to prevent counterfeiting with the aid of counterfeit moulds or by die

Figure 2.4



An old and a contemporary Greek coin.

- a) The head of Athena on the front or obverse of this ancient Greek coin.
- b) On the reverse the image of an owl, the iconographic symbol of the Athenian polis, with a sprig of olive and a crescent for the moon. The owl symbolises Athena, the goddess of wisdom.
- c) National side of the Greek 1 euro coin issued in 2002. The image of the owl is cited from the tetradrachm circulated more than 2,000 years before the euro was introduced.
- d) Common side of the 1 euro coin (2002).

stamping. Later, when he became Warden of the Royal Mint in 1696, Isaac Newton (1643-1727) invented a tool to protect edge milling against forgery.

Heads or tails?

Coins have an edge, but basically a coin is a two-sided object with a front or obverse and a back or reverse. Equivalent terms for front and back are respectively recto and verso. The joint term recto-verso is used to indicate a double sided print. The terms obverse and reverse - and recto and verso - are also used for other kinds of two-sided objects such as flags, medals, drawings and paper currency. Reverse is more commonly used than the term obverse, which is why front and reverse are the terms most frequently used to indicate the front and back of a coin or banknote. Since the front of a coin often bears the effigy of a monarch, this side is also called head or face. With coin tossing, the opposite side, the reverse, is called tail or flipside.

The euro coins have a national side and a common side. The national side is officially referred to as the obverse and the common European side is the reverse. See also figures 2.4c and d.

Self-promoting imagery

The first Roman coins were minted around 200 BC, showing the bust of Roma on the obverse and a deity driving a chariot on the reverse. Another early Roman coin depicted Janus, a two-headed Roman god, on the obverse, and the prow of a galley on the reverse.

After adding their names, the Roman coin issuers introduced images related to the history of their family. Self-promoting imagery on coins was part of the increasing competition amongst the ruling classes in the Roman Republic. Fostulus watching Romulus and Remus suckling from a mother wolf on the coins issued by a descendant of Fostulus, is an example of such self-promoting imagery. The imagery on Republican coins introduced by the elite was there first of all to impress other members of the upper class and was not meant to influence the populace. Such behaviour can still be observed today in coin and banknote designs; often the elite of the issuing authority decides on design themes and images of the cash currency [65].

Portraits of living persons appeared

In 27 BC, the Roman Republic became an Empire. Admired emperors of the Roman Empire were remembered on the coins, but only after they had passed away. Caesar was the first Roman emperor to be portrayed on a coin when still alive (figure 2.5c). Before Caesar, coins had been issued portraying living royalty of lower status (see figure 2.5b). The Romans were also the first to mint coins depicting portraits of women (see figure 2.5d). Ladies of the Roman Empire were associated with Venus (goddess of love) or Ceres (goddess of fertility) and on the coins they received the accompanying symbols like the cornucopia or horn of plenty. The

Figure 2.5



Four examples of ancient coins with royal portraits.

- a) Coins with the effigy of Alexander the Great (356-323 BC) were issued after his death. The portraits were idealised.
- b) Antimachos I was (one of) the first royal whose effigy appeared on a coin in his own lifetime. He wears a flat Macedonian kausia hat. On his coinage, Antimachus called himself *Theos*, The God.
- c) Caesar (100-44 BC) was the first living ruler portrayed on a coin.
- d) Faustina the Younger (125/130-175) was a Roman Empress who was married to the famous Roman Emperor Marcus Aurelius.

cornucopia is a design element frequently used on banknotes issued between 1860 and 1920 and even up to 1968, when the cornucopia was used for the watermark of the Dutch banknote NLG 10/Frans Hals.

2.2.3 Bills of exchange

In the 13th century gold coins started their spread across Europe. However, merchants would rather not take large quantities of such coins with them on their journeys; the coins were heavy and the road unsafe. Italian moneychangers therefore offered deposit services at major trade centres. With a 'lettera di cambio' merchants had access to these deposits. This was the earliest form of 'bank giro' deposits!

In the 16th century, the English goldsmiths took coins and other valuables into their custody at a fee. And like in Italy, they also began to accept deposits. For the deposited gold coins they gave out receipts in the name of the depositor, promising

to pay her or him on demand. These receipts became known as running cash notes. This paper money usually bore two signatures, one of the depositor (payer) and one of the receiver (payee).

Many also read 'or bearer' after the name of the depositor, which allowed them to circulate in a limited way, from one merchant to another while the coins represented remained in secure storage, in Italian called 'cassa'. These running cash notes are therefore the predecessor of the first banknotes. 'Kassa' is still the Dutch word for cash register.

First bank in Italy

In daily practice the owners of the deposited money, the account holders, never reclaimed all of their deposited money at once. The next step for the moneychangers was therefore to start lending money to others, at which point they became banks in the modern sense. The oldest bank in the world is the Banca Monte dei Paschi, which started in 1472 in the Italian town of Siena. As its banking operations initially consisted of issuing loans to the poor out of charity, its name was Monte di Pietà; ('monte' means heap or pile and 'pietà' means compassion).

Twenty years later, in 1492, Columbus discovered the Americas, which gave a boost to commerce and, consequently, banking and the use of running cash notes.

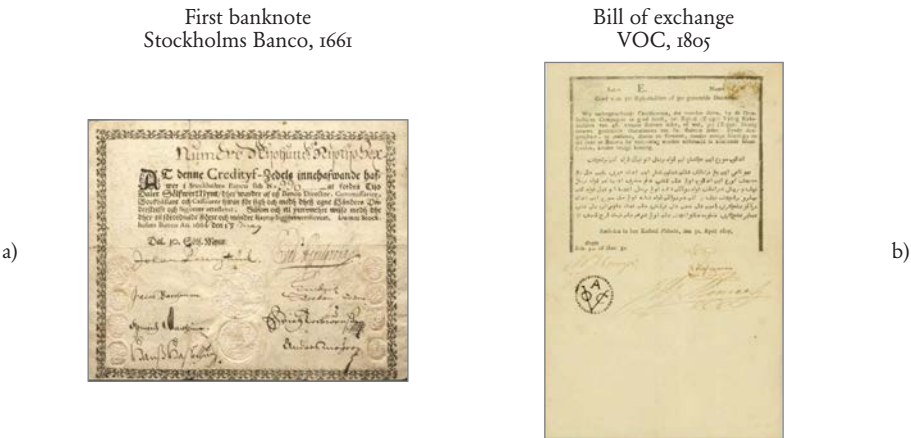
Bills of exchange

Instead of securing the running cash notes by coins, the agreement could also specify another collateral commodity. For several centuries, such documents, known as bills of exchange, were the most important form of credit in European trade. An example from the 17th century will make this clear. If a trading house in London had to pay for commodities *bought* in Amsterdam, it would normally not export coins to pay the debt. To settle the debt it would seek to buy a bill of exchange from another London trading house that had *sold* goods in Amsterdam. A fine example of a bill of exchange is shown in figure 2.6b. This Dutch bill, issued in 1805 by the Dutch East Indies Company or VOC, has a conspicuously large blank space for subsequent signatures, as a bill could be transferred several times over, ending up with as many as 20 or 30 different signatures. The payee would transfer the bill and the debt it represented by endorsing it. In turn, the receiver (or 'payor') could use this bill as payment for another transaction. If the last acceptor could not pay, the debt would fall on its original drawer. If the drawer could not pay, it would fall in turn on each of the bill's endorers. The debt represented by the bill thus became progressively more secure as it circulated, since with each successive transaction in which it changed hands it acquired another guarantor [65].

Amsterdam Exchange Bank (Amsterdamse Wisselbank)

The Amsterdam Exchange Bank (AEB) was founded in the Netherlands in 1609. One of the objectives of the AEB was to provide the area with high-grade silver and gold coins: the silver and gold 'dukaat' and the silver 'rijder', together known

Figure 2.6



- Two documents with many signatures.
- a) An example of the first private banknotes in Europe, a 10 taler banknote, dated 18 May 1666 and issued by Stockholms Banco. The banknote bears 10 different embossed stamps. In today's banknote industry 'dry embossing' is still used as a security feature!
 - b) Bill of exchange as used by the Dutch VOC, dated 30 April 1805, worth 50 dollars or 30 mill-edged dukaten. Probably accepted four times, judging by the four signatures on the right side of the bill; the document left space for several more signatures. Besides the signature, there is a seal type stamp representing the VOC logo.

in Dutch as 'negotiepenningen'. The AEB verified, weighed and exchanged coins besides allowing merchants to deposit their gold and silver coins into an account. Just as the Italian banks, the AEB was a giro bank and accountholders could transfer money from their account to the account of another AEB client. In 1794, the AEB collapsed after it was revealed to have distributed millions worth of illegal, unsecured bills of exchange to the VOC.

2.2.4 Private banknotes

A bill of exchange payable at a future date, say thirty days, is worth less than its face value. In other words, a bill of exchange sets a price on money. Secondly, the value promised on the bill of exchange was collectable at a different place than that where the transaction was effected. These two inconveniences triggered the next step in the development of paper money. Instead of certificates for dedicated purposes, why not issue bills with rounded amounts to be paid to the bearer? This is what the Swede John Palmstruch had in mind when he introduced the idea of a new form of currency, the credit paper, in Swedish 'kreditivsedlar', which could be transferred to any third party and at any time, without the receiver needing to sign for acceptance (figure 2.6a). Stockholms Banco, established by Palmstruch in 1657, started issuing the first European banknotes in 1661. These first European

banknotes were commonly redeemable in silver coins. (The first paper-like money was invented in China, around 120 BC, see appendix A1, section A1.4.2 on paper). Then something happened which would recur several times in the history of banknotes: the bank issued so many banknotes that the notes were no longer backed up by silver coins. The banknotes became almost worthless and thus this first banknote project became a major disaster. The bank was nationalised in 1668 and became Sveriges Riksbank, the present central bank of Sweden. Johan Palmstruch was dragged to court, convicted and thrown in jail.

Figure 2.7 displays two early examples of banknotes where handwriting contributes strongly to the design.

Pay to bearer

The Dutch equivalent for ‘promise to pay to the bearer’ is printed on the first banknotes issued by the DNB in 1814 as shown in figure 2.8a. In 1860 this text was shortened to just three words, ‘Betaalt aan toonder’ (‘will pay to bearer’). This text

Figure 2.7



Two examples of largely handwritten banknotes.

- Banknote of the Bank of Scotland issued in 1716. The handwriting reads: ‘No. 35450 Edinburgh. 16 April. 1716. The GOVERNOR & COMPANY of the BANK of SCOTLAND constituted by Act of Parliament Do hereby oblige themselves to pay to David Spence or the Bearer Twelve pounds Scots on demand. By Order of the Court of Directors (followed by three signatures)’.
- Banknote of the James River Bank in Virginia. Value 3 pound and issued in 1773. A transcription of the writing is: ‘Virginia (James River Bank) No. 59-5817. I Robert Carter Nicholas Esq. as Treasurer of the Colony and Dominion of (and Company Bankers in) Virginia, promise to pay to the Bearer on (demand) Three Pounds. Current money witness my Hand this first Day of April one thousand seven hundred and seventy three. 1773. (Our cashier), followed by three signatures: Payton Randolph, Robert Carter Nicholas and John Blair. On the left side: 3 Pounds Currency. On the right side: Three Pounds £ 3. The signatures of Payton Randolph and Robert Carter Nicholas are difficult to distinguish.

Figure 2.8



- From partly handwritten to fully printed banknotes.
- a) The Netherlands 1847. This banknote bears the text, ‘Received from bearer the amount of FORTY guilders to be returned to bearer upon presentation’ (in Dutch: ‘Ontvangen van toonder de somma van VEERTIG guldens om aan toonder op vertooning te restituëren.’). The banknote also indicated the opening hours: ‘Payments are carried out all working days from ten o’clock in the morning until two o’clock in the afternoon’ (in Dutch: ‘Tot de betaling wordt gevaceerd alle werkdagen, van des voormiddags tien - tot des namiddags twee uren.’)
 - b) Banknote of The British Linen Company, issued in Edinburgh on 1 June 1868. This banknote bears the printed text, ‘Promise to pay on demand to Mr. William Spence or bearer one hundred pounds sterling.’

disappeared from the notes in 1949, since it was no longer meaningful, as banknotes were no longer fully exchangeable for silver or gold. The fixed relation between the gold price and a gold (or silver) coin was abandoned as explained in appendix A1, section A1.4.1 on precious metals.

Banknote design for merchants

Up to the 19th century the British Pound Sterling was the world currency and banknotes were not used by the general public but intended for use by merchants and business people, as the denominations were too large for ordinary people. The lowest denomination issued by the Bank of England was 50 pound, whereas the average annual income was about 20 pound; most people went through life without ever coming close to a banknote. In the Netherlands the lowest denomination issued in 1814 was 25 guilders and the highest 1,000 guilders, at a time when wages averaged about 10 guilders a week.

This is why banknotes of this era of private banknotes reflected the trust merchants put in them. Custom-made designs ranged from highly specific, such as local coats of arms, a town view or an important local building, to broadly relevant images such as pastoral scenes of cattle or ploughing for an agricultural area. Local features were used as images designed after the contemporary fashion. Later, banknote designs came to reflect economic prosperity. Symbols of flourishing commerce like smoking factory chimneys and ships under sail or steam or world globes were

favourite metaphors (figure 2.9a). Illustrations for banknotes were also frequently found in various permutations of Fortuna and Plenty, representing commercial and financial prosperity. Other figures drawn from classical mythology, appearing singly or in combination, include Fortuna with her rudder, Mercury and his attributes of winged cap and staff and Neptune on a sea-shell chariot. The cornucopia or horn of plenty may also be found regularly as a design element. However, most popular were female allegorical figures in classical style, representing human virtues (figure 2.9b).

Social critique on money

At the same time that people became familiar with banknotes as a means of payment, the social implications of money were criticised by scholars in sociology. The most famous among these is Karl Marx (1818-1883). Money will change traditional social relations, is a radical leveller that does away with all distinctions of traditional social relations, Marx explained in 'Das Kapital', first published in 1867 [1]. Georg Simmel (1858-1918) followed up on Marx' critique and in his 'Philosophy of Money' issued in 1907 focussed even more sharply on money itself [4]. As money and transactions increase, Simmel's opinion was that the value of the individual decreases and everything that matters will be about what the individual can do rather than who the individual is. People create value by making objects and - when finished - would be separated from those objects. All nuances are replaced by the quantitative logic that asks only how much but not what or how. Everything boils down to financial instead of emotional value. Money repainted the world into an 'evenly flat and grey tone' making the world 'colourless'.

Figure 2.9

Private banknote, Canada, 1880



a)

Private banknote, Germany, 1907



b)

Two examples of private banknotes issued around 1900.

- a) Banknote of The Merchants Bank of Halifax, 1880. In the centre: ship under sail.
- b) 100 mark banknote with female allegorical figures issued in 1907 by Die Badische Bank in Germany'

Simmel also introduced the ‘teleological sequence’ of money and its ability to characterise people by gain (greedy persons), possession (misers), spending (spendthrifts) and enjoyment (ascetics, cynics and relativists).

Over 5,000 private banknote issuers in the US

In pre-industrial economies (1800-1860) banknotes circulated locally and were subject to very little regulation. By 1810 there were many hundreds of banks operating in towns throughout Britain, issuing a myriad of different notes. Banknotes were not yet a state monopoly and starting a bank was a profitable enterprise; every goldsmith, bank or other private organisation could issue banknotes, resulting in many different forms of domestically issued paper currency. Poor and illiterate people had difficulty in telling good from bad private notes.

The first monetary union was created in the early years of the United States, when in 1789 the sole power to coin money and regulate its value was assigned to the US Congress. This monetary union lasted until 1792 when the United States became one political entity, one nation. Two attempts to establish a central bank failed, with the result that many banks issued their own banknotes without any oversight. It is estimated that at the end of the 19th century there were around 8,000 institutions, issuing over 5,000 distinct banknotes. Banknote denominations, sizes and designs differed (figure 2.7b). Merchants and bankers had to rely on banknote directories or catalogues to keep track of the dizzying multitude of paper currencies, just as they had to in the past regarding coins. It was common to specify in advance what type of money deposits were to be made and in what form promissory notes were to be repaid. In Maryland and Virginia, for instance, taxes and other debts were settled in pounds of tobacco. Insolvent banks in the United States were called ‘Wildcat banks’ and usually went bankrupt when too many of their notes issued returned. In 1909 the US government banned private currency issues, creating confusion with US coins. Further legal restrictions against private currencies followed and in 1913 a system of central banks was established named ‘Board of Governors of the Federal Reserve System of Central Banks in the USA’ On the notes is written ‘Federal Reserve Note’; the ‘Federal Reserve System’ is often shortened to ‘Federal Reserve’, ‘Fed’ or ‘FRS’ (figure 3.15).

2.2.5 State money

Banknotes are a debt the bank owes to the public and refunding should be guaranteed; at any time a bank should be able to convert all banknotes issued back into silver or gold. However, private banks too often followed the example of Stockholms Banco in 1668 and went bankrupt. In general, backing by gold or silver remained the regular bane of privately issued banknotes. By the end of the 17th century King William III of Orange (1650-1702) needed money to finance the war against France. This brought William Paterson, a Scottish goldsmith, in 1691 to the idea of a bank that would issue paper money whose value was guaranteed by

the government. The king agreed to Paterson's proposal and founded the Bank of England in 1694. Like goldsmiths' notes, the earliest state-backed banknotes carried both the name of the depositor and the signatures of the directors. An example is the banknote shown in figure 2.7a, issued by the Bank of Scotland established in 1695, one year after the Bank of England. Despite the implication of their names and certain privileges these institutions were not national or central banks nor did they hold an exclusive right to issue banknotes.

Coins became legal tender long before banknotes did, as explained in appendix A1, section A1.17 on legal tender (coins). The history of the process by which banknotes became legal tender repeats the history of coins, except that this time national authorities were closely involved. Although the USA with its 5,000 different private notes was never surpassed, people everywhere lost their way in the plethora of privately issued banknotes. Just as before with the coins, the state had to act. The introduction of legal tender banknotes during the American Civil War (1861-1865) marked the start of the evolution from commodity money to state money.

First legal tender notes in the US

Nearly 90 years after the War of Independence from Great Britain, in 1861, the American Civil War broke out, in which the Confederate States in the South sought independence from the United States. And again both parties financed the struggle by printing banknotes. The banknotes of the South were called 'confederates' and the banknotes of the Union were named 'unions' (figure 2.10) [157].

The banknotes of the Union introduced an innovation, the Legal Tender Notes. Rather than guaranteeing the right to be exchanged for gold, these notes proclaimed they could be used to settle all 'taxes and other public dues'.

Figure 2.10



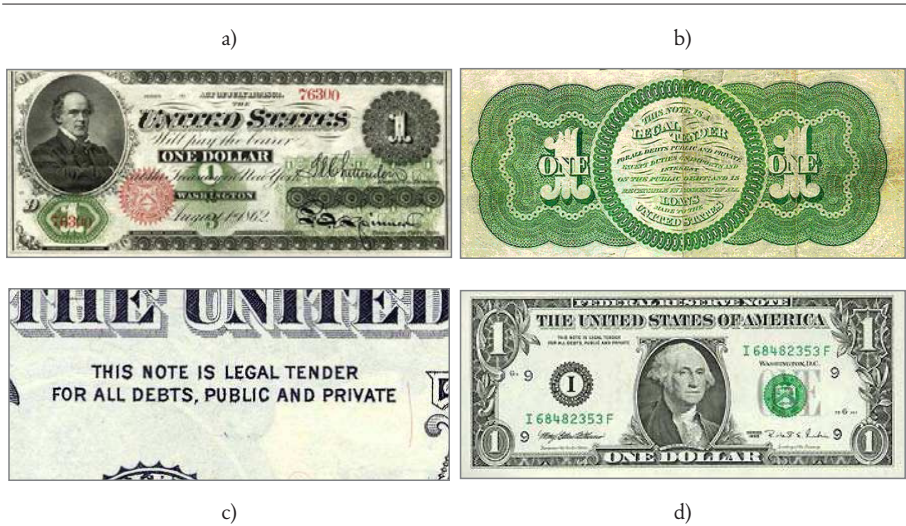
Banknotes issued during the Civil War in the United States (1861-1865).

- a) Confederate 1 dollar banknote issued by the Bank of the State of Georgia, 1861
- b) Union 100 dollar banknote issued by the Virginia Treasury, 1861. In red print in the upper right corner: Receivable in Payment of Taxes & other Public Dues.

After the American Civil War the confederate notes were declared illegal and a new monetary era arrived. The US did not establish a central bank with a lender of last resort function, but instead a system of state banks was created. This also implied that once issued, US dollar banknotes remain legal tender, whereas in Europe banknotes lose their value when the model is withdrawn by the central bank. Today US banknotes are not only legal tender in the US, but also in several other countries such as El Salvador, Ecuador and Panama. In 2010 the US dollar became legal tender on three islands of the (former) Dutch Antilles: Bonaire, Sint Eustatius en Saba (also known as BES-islands).

In 1862 the legal tender notice became more obvious on the Union banknotes when they were given a green back showing a large, clear legal tender text, as presented in figure 2.11b. The green colour for the US banknotes was proposed by the printer as one that was difficult to counterfeit. Soon these notes were called ‘greenbacks’. The colour of the reverse of the confederate dollar notes was yellow, making reference to the followed gold standard. Although the Civil War ended in 1865, it took until

Figure 2.11



- First and current US dollar banknotes.
- a) First banknote of the United States, a one dollar bill, issued under the Legal Tender Act of 1862. This Union money was recognisable by its red seal, green back and standard size.
 - b) Reverse of a), the first greenback.
 - c) Legal tender notice on the USD 1: ‘This note is legal tender for all debts, public and private’ (enlargement of figure 2.11d). It meant that all United States money as identified above constituted a valid and legal offer of payment for debts when tendered to a creditor in the United States. In the Coinage Act of 1965 all US currencies became legal tender.
 - d) USD 1/Washington, first issued in 1929.

1879 before the US returned to one currency, the US dollar, with a green back. The colour green that lent its name to the US dollar has never been changed because Americans associate it with reliable and stable government. However, this was not yet the case around 1900, when the greenbacks became the topic of intense public debate: Were greenbacks real money, or could only hard metallic money serve as authentic currency? Were national banknotes legitimate? Or, as 'greenbackers' insisted, was government-issued money the only acceptable type of money? See also appendix A1, subsection A1.4.1 on precious metal and appendix A1, subsection A2.5 on colours, for some more information on this matter.

Georg Knapp

Important for the identity of banknotes, private or state, are the thoughts of Georg Friedrich Knapp (1842-1926). Probably influenced by the invalidation of the confederate banknotes at the end of the American Civil War, Knapp supported the case for legal tender, declaring that the soul of money is not economic, but legal and political. Money is that which is accepted at government pay offices. In Knapp's own words: In effect, paper or token money is a territorially defined form of credit, and must therefore be treated as a legal guarantee. Only the state can provide the necessary backing for such a guarantee [3]. However, the state does not select the thing in which it wants to be paid in total disregard of market usage, countered Max Weber (1852-1937), contending that money is also a creature of the market; apart from administrative, regulated money there is free or market money [5].

Design of state money

Typical for this period are the symmetrical banknotes designs building further on the allegorical designs of the era of private banknotes. Economic prosperity is again the main motive, illustrated with allegorical women. Symbols of permanence or vigilance were meant to inspire confidence: anchors, hives, towers, open eyes, lamps or roosters. Printed landscapes invited people to learn of distant zones of their country, which they had no other way to see. Policymakers recognized that images on notes were particularly effective tools of propaganda, more so than flags or anthems. Monarchs were rarely depicted. Other banknotes depicted national symbols: coats of arms, heraldic beasts or more indirectly motifs relating to folklore, local landscapes or place-bound mythology.

2.2.6 Currency of monetary unions

Where two or more states share the same currency there is a currency union. If further common economic and monetary policy is implemented the currency union becomes a monetary union. According to the International Monetary Fund there are about 155 currencies in the world, while there are about 200 nations, indicating that some 45 nations do not have their own currency. A large part of these 45 nations are the 17 countries in the euro zone. Another 17 countries have their currency guaranteed by the French treasury, the 14 CFA and 3 CFP franc

countries (See Appendix 4). The remaining 10 nations are - with some exceptions - either using the dollar or the euro and are examples of currency unions.

Monetary unions and global currencies are political and/or economical concepts and central banks - once decided - have to organise them. Studies on monetary unions often also refer to the Greek and Roman empires. However, a union based on military force is not a voluntary union but more like an occupation. Still, within the Greek and Roman empires limited currencies were used and in some periods just one.

An overview of moneterary unions is provided in Appendix A4, two of them will be introduced in the following.

Latin Monetary Union

One of the first monetary unions with several members is the Latin Monetary Union (LMU). The LMU story started when Belgium adopted the French franc in 1830 (see figure 2.12b and c). The basic idea was that member countries would have

Figure 2.12



Currencies of the Latin Monetary Union. Foreign coins circulated domestically only under the terms of international agreements which regulated their production and acceptance in each participating countries.

- a) Overview of coins which could be accepted in France in the 1880s in the context of the LMU
- b) France: 5 franc coin, 1827.
- c) Belgium: 5 franc, 1873. Motto: 'L'Union fait la force' (in English: 'The Union creates the power').
- d) Bulgaria: 100 leva, 1921. The silver 100 leva coin had to be reduced to a banknote because of inflation. The banknote was printed by Waterlow and Sons in London in 1921. Reflecting the usage of French in Bulgaria as the international language the printer's imprint displays Londres instead of London.

identical coinages by using the same amount of silver or gold for the coins minted in their own national currencies. The monetary union was based on a bimetallic standard, with a fixed gold to silver price ratio. Switzerland harmonised its currency to the franc in 1848 and Italy did the same in 1861, both retaining the names of their national currencies, but adjusting their silver or gold grammage to match the franc. In this manner a French trader could accept Italian liras for his goods with confidence that it could be converted back to a comparable amount of francs. Currencies would be freely interchangeable, facilitating trade.

This system continued until 1864, when all silver coins except the 5 franc piece were debased from 90% to 83.5% silver without the weights changing. In 1865, this arrangement was formalised as the Latin Monetary Union; the gold to silver price ratio was fixed at 1 gram of gold equals 15.5 grams of silver. Fluctuations in the values of gold and silver forced the LMU to convert to a gold standard for its currency in 1878.

Through the LMU, the French emperor Napoleon III wanted to promote the French franc to a world currency, trying to break the economic hegemony of Great Britain. Greece and Spain joined the LMU in 1869 and Finland in 1877. Greece was formally expelled from the Latin Monetary Union in 1908, because their gold coins did not carry the agreed amount of gold. It was readmitted in 1910, however.

A number of states issued currency following the conventions without officially joining the Union (e.g. Austria, Bulgaria, Montenegro, Papal State (Vatican), Romania, San Marino, Serbia and Venezuela). The LMU was disbanded in 1927.

In the end the LMU failed for a number of reasons:

- The fixed LMU exchange rate eventually overvalued silver relative to gold. German traders, in particular, were known to bring silver to LMU countries, have it minted into coinage then exchanged those for gold coins at the discounted exchange rate (this situation ended in 1878).
- Some members, Papal State and Greece, minted their coins with respectively less silver or gold than agreed; these coins were exchanged for coins from other countries that had been minted correctly.
- Some members, France and Italy, printed banknotes using the LMU currency. The monetary income on these banknotes was kept by these countries and was not shared with the other members.

Scandinavian Monetary Union: joint currency unit

After the monetary union in the US (1789) and the LMU in Europe (1865), several monetary unions followed with a bias towards Europe (see table A4.1 in Appendix A4). A further development of a joint currency of a monetary union was first made by the Scandinavian Monetary Union (SMU), established in 1873. The innovation here was the introduction of a joint currency unit named 'crown'. Both the Swedish 'riksdaler' and the Danish 'rigsdaler' coalesced into the new crown, spelled slightly

differently in Swedish ('krona') and Danish ('krone'). Norway entered the union with its krone two years later, in 1875. A Swedish and Danish banknote used within the SMU are shown in figure 2.13.

Today, all three countries still use the same name for their currencies as during their monetary union, but they have lost their one-to-one peg. The currency of Iceland, until 1944 part of Denmark, is also krona. Finland did not participate in the SMU, but did join EMU as the first of the Nordic countries.

Some unions involved only two countries as was the case with Belgium and Luxemburg. Monetary unions also occurred when states were unified, like the German and Italian unifications in the 19th century and recently in 1990 the German reunification.

In most cases a political union preceded a monetary union. Critics of the European Monetary Union often use this argument: a political union is a requirement for a (stable) monetary union.

Future supranational currencies?

There are some old and new plans for other supranational currencies besides the euro. Brazil, Argentina, Uruguay and Paraguay had plans for a South American monetary union in the 1990s. Today four regions have active programs to build new currency unions:

- East African Community (EAC),
- Gulf Cooperation Council (GCC),
- Southern African Development Community (SADC),
- West African Monetary Zone (WAMZ).

Figure 2.13



The currency unit of the banknotes of the Scandinavian Monetary Union was similar: krona in Sweden and krone in Denmark and Norway. The design and sizes of the notes were different. Also private krone/krona banknotes circulated.

- a) Sweden 1,000 kronor, 1873
b) Denmark, 10 kroner, 1888.

Once these four currency unions are realised, the currencies of 30 countries will disappear and will be replaced by four new union currencies. However, launches will be in 2016 at the earliest. Most advanced in the establishment of a new monetary union seems to be the EAC with 5 member states (Burundi, Kenya, Rwanda, Tanzania and Uganda).

In South-East Asia there are plans for an Asian Monetary Union (AMU) lining up the currencies of the so-called ASEAN10+3. Prospective members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, Japan, South Korea, and the People's Republic of China.

Currency boards

A country may not be strong enough to pursue their own monetary policy, but wishes to keep their own coins and banknotes. In such a case the nation may opt for a currency board or a currency union. The monetary authorities peg their currency to a strong, foreign currency. A currency board maintains unlimited convertibility between its notes and coins and the foreign, anchor currency, at a fixed rate of exchange, with no restrictions on account transactions. There are several examples of currency boards, like Aruba and the East Caribbean Currency Union with members like Antigua, Bermuda and Granada. Currency boards are further elaborated on in appendix A4.

2.2.7 National banknotes 'pegged to another currency'

The optimistic banknote designs issued during the period of 1860-1930 came to an end in the 1930s. The British pound lost importance and the US dollar became the dominant world currency. The First World War (1914-1918) eroded the prosperity that had marked the first years of the 20th century and was followed by the Great Depression (1929-1933), which would cause the collapse of the world economy. Some economists blamed the monetary authorities for continuing the gold standard too long instead of expanding the money supply rapidly enough to revive economic activity.

When one currency is strong, like the US dollar in the 1930s, others might want to link their currency to this strong friend. One of the first 'currency pegs' was established in 1940 when the British pound was fixed to the US dollar at a rate of GBP 1 = USD 4.03. Later, forerunners of the euro were also pegged to the US dollar and, again later, became free floating.

1 euro = 1 US Dollar (in 1962)

To the identity of the euro currency the US dollar was and still is important, since the value of the euro is based on the US currency. The roots of the value of the euro go back to 1962, to the unit of account used in the agricultural policy of the European Coal and Steel Community (ECSC), the forerunner of the European Economic Community (EEC). This unit of account was used as the monetary intermediary to express common levels of farm prices. Its original value was the

same as that of the budget unit of account. Council Regulation No. 129 of 1962 fixed the value of the unit of account at 0.88867088 gram of fine gold, which at that time was the value of one US dollar. When, in 1971, the US dollar ceased to be convertible into gold, this figure became a purely abstract measure of the worth of the unit of account. When the European Community (EC) introduced the European Unit of Account (EUA) on 1 January 1975, the value of the EUA was made equal to the basket of the IMF Special Drawing Rights, worth USD 1 [11] (see also appendix A5 on European organisations). In 1979 it was replaced at parity by the European Currency Unit (ECU), in turn replaced at parity in 1999 by the euro. So 1 euro was equal to 1 USD in 1962. Table 2.2 provides an overview of the historic decisions on the exchange rate of the US dollar and the euro and figure 2.14 for the development of the exchange rate between eua/ecu/euro and US dollar.

When nations peg their currency to world currencies like the dollar and the euro, rises and falls of these world currencies are usually followed within a certain range. Doing so they control the value of their currency, allowing them to export their goods relatively cheap. Several countries have this policy, such as China, Hong Kong, Malaysia and Singapore.

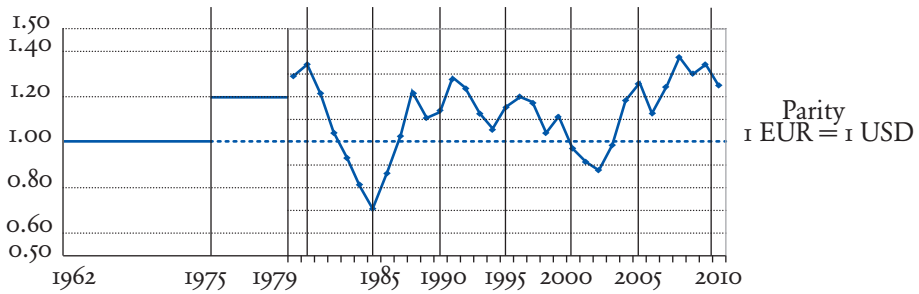
To date over 20 countries not belonging to the EU have currencies that are directly pegged to the euro. Many of these countries had a peg to the French franc, like the 14 countries of the CFA franc. Another country pegging their currency to the euro is Morocco.

Table 2.2

Period	Code	Full name	European Community	Exchange rate to USD
1962 -1975	-	unit of account (ua) of EMA (European Monetary Authority)	ECSC	1 ua = 1 USD = 0.88867088 gram gold
1975 -1979	EUA	European Unit of Account	EEC	1 EUA = 1 UA = 1.20635 USD
1979 -1999	ECU	European Currency Unit	EC	1 EUA = 1 ECU = 0.9742616 USD
1999 -	EUR	Euro	EMU	1 ECU = 1 EUR = 1.18 USD

Overview of the development of the value of the euro since 1962. In 1962 the euro was at parity with the US dollar: 1 euro = 1 US dollar (1962).

Figure 2.14



Development of the exchange rate USD/EUR (ECU) since 1962.

European Exchange Rate Mechanism

EU countries, not yet part of the Eurosystem also have a peg to the euro, usually by European Exchange Rate Mechanism Two or ERM II. They try to limit the exchange rate of their currencies to the euro within a bandwidth. A currency in ERM II is allowed to float within a range of $\pm 15\%$ with respect to a central rate against the euro. In the case of the Danish krone, the exchange rate is within the narrower range of $\pm 2.25\%$. Countries within ERM II are Bosnia and Herzegovina, Bulgaria, Denmark, Latvia and Lithuania. Other European countries have plans to enter the ERM II, which is a necessary step before the euro can be adopted.

2.2.8 National banknotes 'trust'

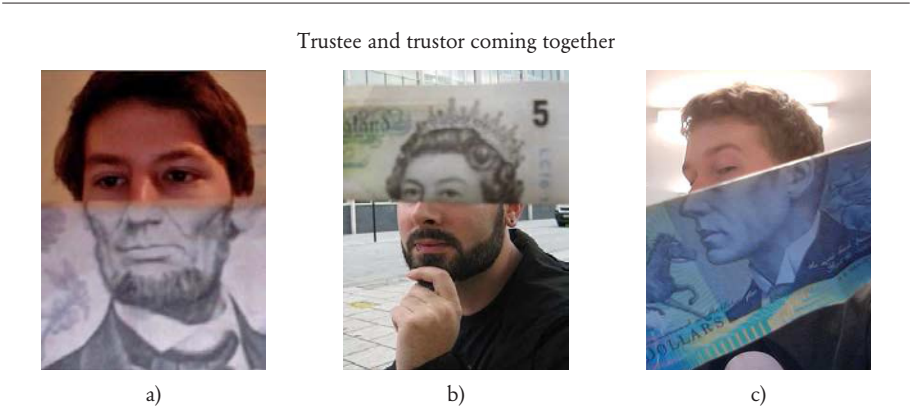
Today's banknotes are characterised by 'state issue' and 'trust'. People will only use banknotes they trust and which, fundamentally, are a measure of social trust, a mortgage on society itself, as George Simmel already stated in 1907 [4]. And Matthias Kaelberer, a monetary expert at the University of Memphis, phrased trust in banknotes as follows: 'It's not a question of how strongly people identify with how a currency looks that is so important, but how much *trust* they have in its value' [90].

These statements of Simmel and Kaelberer on trust brings us to the question what is trust? In a social context trust is characterised by two parties: a *trustor* willing to rely on the actions of another party. The trustor is uncertain about the outcome of the other's actions and becomes dependent and may be harmed. Voluntarily or forcedly, the trustor abandons control over the actions performed by the other party, the *trustee*. The degree to which one party trusts another is a measure of belief in the honesty, fairness, or benevolence of another party.

Trust can also be attributed to relationships between people and technology, like is in the case of banknotes. The public, the trustor, has confidence in the banknotes issued by the central bank, the trustee. Since 1974 a banknote is 'just a piece of

paper', since it could no longer be exchanged for silver, gold or US dollars. Between 1974 and about 1995, this piece of paper grew into a trusted piece of paper. People's trust in banknotes is today entirely based on trust in the authenticity of the note and in the organisation behind it. For most people it is an unrealistic effort to deal with all the complexities of trust in the currency and the authenticity of the banknote. People's trust in banknotes is a heuristic decision, based on 'it feels good', here defined as confidence in banknotes. To support the heuristic process of creating confidence, most central banks have a banknote design policy focused on easy to use and secure. The US Federal Reserve System (FRS) and European Central Bank (ECB) formulate their policy even more abstract, their main aim is 'to preserve the integrity of the currency' [e.g. 250]. Some others have a different design policy and give priority to sustainability or accessibility (see chapter 5, subsection 5.1). The banknote may be perceived as very secure, if the currency loses value, trust will leave on horseback. From paper money's history it is clear that, in line with Kaelberer, trust in banknotes is lost because of inflation and not because of (large scale) counterfeiting. There are several examples of citizens losing trust in the state's ability to manage the national currency effectively, especially in the aftermath of experiences with soaring inflation: Germany (1923), Hungary (1946), Israel (1984), Argentina (1994) and Zimbabwe (2009). There is a personal component in people's confidence in banknotes. A person may be naïve, credulous or critical towards banknotes. With a portrait on a banknote people may have more confidence in the banknote, since the banknote shows a human face. The two, trustee and trustor, come together in the images of figure 2.15!

Figure 2.15



People holding a folded banknote for a camera and positioning themselves in such a way that their face completes the (missing) part of the banknote's portrait. Images a) and b) by Solent News & Photo Agency, 2011.
a) USD 5.
b) GBP 5.
c) ASD 10.

Given the fact that banknotes are part of the currency, the question is how may design play a role to support confidence? Most central banks issue banknotes bearing portraits for traditional reasons, started somewhere in the 1920s to support confidence as will be explained in the following. Some central banks argue that the public would be triggered on reproductions by the ‘different look’ of counterfeited portraits, especially the eyes of a gravure portrait would contribute to this effect. This is a debatable argument as discussed in ‘Banknote design for retailers and public’ [192]. Besides this doubtful security aspect, placing portraits on banknotes is no longer necessary. However, confidence in banknotes may be defined best by asking the public, as done first by the Bank of Canada in 2004. DNB followed in 2005 by including confidence as one of the parameters measured within the biannual opinion poll, as will be reported on in the second subsection:

2.2.8.1 Confidence in banknotes by portraits (1920-1995)

2.2.8.2 Confidence in banknotes after 1995

Figure 2.16



Example of changing from portraits of unknown persons to portraits of well-known historical persons.

- 1000/Relief border with in the medallion a helmeted female head (Dutch virgin). Issued in 1859.
- 100/Grietje Seel, first issued in 1921 (the note shown dates from 1929). Grietje Seel was a model at the Amsterdam Academy of Art. The burst of sun-rays is a traditional symbol of glory, power and enlightenment and is often used on banknotes. Designer: Nicolaas van der Waay.
- 10/Zeland woman, issued in 1924. The woman is the assistant at DNB's branch in Middelburg, Geertrui Walraven from Goes.
- 40/Prince Maurice (1923). Small portrait of Prince Maurice (1567-1625) in the upper centre.

2.2.8.1 *Confidence in banknotes by portraits (1920-1995)*

Animals were the first images on currency; portraits appeared later, as has been described at the beginning of this chapter. Many banknotes issued before 1900 depicted imaginary, allegoric, women (figure 1.2) and after 1900 portraits of real but unknown persons were used. Three examples of the Dutch banknote history are provided. In 1859 a small portrait of a helmeted female head appeared on the new issued guilder notes (figure 2.16a). In 1921 a model working for the Amsterdam Academy of Art was used on Dutch banknotes (figure 2.16b) and in 1924 the assistant at one of the branches of DNB was portrayed (figure 2.16c). The first small portraits of historical statesmen appeared in the Netherlands in 1921, the Mercury series (figure 2.16d) [66, 192].

Portraits 1920-1950

The 1920s were a turbulent time with first the German hyperinflation in 1923 and the stock market crash in 1929, followed by the Great Depression of the 1930s. The turbulence was reflected in a rapid succession of new banknote designs, including many solitary issues. Increasingly, banknote design made use of portraits, which were intended to reinforce public trust in the economy. In the Netherlands a 20 guilder note issued in 1926 displayed a helmsman steering a boat in rough weather (figure 2.17a). In the years that followed the portraits of anonymous persons were superseded by portraits of prominent compatriots. In Poland a national hero appeared on the 100 zloty banknote (figure 2.17b) and the portrait of a Nobel laureate was used for the Spanish 50 peseta note issued in 1935 (figure 2.17d). In 1934 former DNB president Mees was depicted on the 25 guilder note issued in 1934 (figure 2.17c). The front of the US dollar notes was not changed in this hectic period, probably also because the dollar served as the anchor for most other currencies. A creative solution to use a portrait to create confidence in the banknote is the French example provided in figure 2.18. The (unknown) lady depicted on this 100 franc banknote looks into the mirror, the watermark area.

Portraits 1950-1975

A new era began for portrait designs when the crisis and the Second World War were over. After this rather chaotic period of banknote issuance, central banks longed to introduce organised series designs to tell the nation that its currency was under control. Portrait sizes increased and subjects were selected from the realm of science (especially physics, mathematics and chemistry), but also from the arts (mainly composers and writers). Confidence in a piece of paper would be supported, it was thought, by portraits of persons whom people trusted. Four examples are provided in figure 2.19, two of them are looking at the beholder; the eyes on the banknote meet the eyes of the banknote user (figure 2.19a and d). Presumably, eye contact inspires trust in the note, although there is no scientific evidence to support this

Figure 2.17



Portraits appeared on banknotes to support confidence in paper money. The size of the portraits creates a similarity between the notes.

- Netherlands gulden, NLG 20/Helmsman (1926). Design: J. Visser.
- Polish zloty, PLZ 100 /Tadeusz Kościuszko (1934). Tadeusz Kościuszko (1746-1817) was Supreme Commander of the Polish National Armed Force.
- Netherlands gulden, NLG 25/Mees, issued in 1934. W.C. Mees (1813-1884) was President of DNB from 1863 to 1884; the only Dutch banknote issued with the portrait of DNB's president. Design: C.A. Lion Cachet.
- Spanish peseta, ESP 50/Santiago Ramón y Cajal (1935). Santiago Ramón y Cajal (1852-1934) was awarded the Nobel Prize in 1906 for his work on the structure of the nervous system.

Figure 2.18



French FFR 100 banknote, issued in 1939. A fine example of combining a main image (unknown lady) and security feature (watermark).

Figure 2.19



Portraits 1950-1975. Trust is supported by depicting famous persons, or portraits made by famous painters, on banknotes.

- a) Netherlands gulden, NLG 25/Christiaan Huygens (1956). The portrait is Christiaan Huygens (1625-1695), mathematician and physicist. Designer: Eppo Doeve.
- b) Deutsche Mark, DEM 20/Young man (1960). The portrait was taken from a painting by Albrecht Dürer (1471-1528). Designer: Max Bittrof.
- c) French franc, FFR 10/Voltaire (first issued in 1963). Voltaire (François-Marie Arouet, 1694-1778) was a writer, historian and philosopher famous for his wit and for his advocacy of civil liberties, including freedom of religion, and free trade (Enlightenment).
- d) East German Mark, DDM 100/Karl Marx (1975). The portrait is Karl Heinrich Marx (1818-1883), German philosopher, economist, sociologist, historian, journalist and revolutionary socialist.

view. Rather than the result of a conscious design policy, this development is seen as a trend typical for the time spirit of these decades.

Portraits after 1975

All links to the gold standard or the US dollar were severed in 1974 and all currencies became free floating. Central banks responded with larger portraits of independent great countrymen, coming from the same categories as in the previous period: science and arts. It seems that there was just one main task for these great countrymen portrayed: support confidence in banknotes, which had become ‘just a piece of paper’.

Clara Schumann, portrayed on the DEM 100 issued in 1994, not only makes eye contact, she is also showing a little smile (figure 2.20b). Bright colours in this banknote added to its perception as an open, transparent and happy note, befitting a trustworthy German D-mark currency. This banknote is also an example of

Figure 2.20



Introduction of female portraits by four central banks.

- a) Danish krone, DKK 500/Franziska Genoveva von Qualen (1972). The portrait is of Franziska Genoveva von Qualen (1776-1841), a noblewoman from Germany, drawn by Ib Andersen.
- b) German mark, DEM 100/Clara Schumann (1994). The portrait is of Clara Schumann (1819 -1896), pianist and composer.
- c) Japanese yen, JPY 5,000/ Higuchi Ichiyō (2004). The portrait is Higuchi Ichiyō (1872-1896), writer.
- d) South-Korean won, KRW 50,000/Shin Saimdang (2009). The portrait is Shin Saimdang (1504-1551), calligraphist.

solving the imbalance between female and male portraits. Women's liberation and emancipation in the 1970s was a driver for central banks to adapt their portraying policies. Denmark alternated the sexes equally in its 1972 banknote series (figure 2.20a). Other European countries followed: Sweden in 1992 and Germany in 1994. In Asia the first woman appeared on banknotes in Japan in 2004 (figure 2.20c) and the Republic of Korea - known as South Korea - in 2009 (figure 2.20d).

Remarkably absent are Canada and the USA; also on their recent portrait issues women are absent, except for Queen Elizabeth II of the United Kingdom on the CAD 20.

Portraits development from small to large

The development of unknown people to portraits of famous fellow countryman went parallel to the size of the portrait. The portrait size in the 1920s was on average not more than 10 % of the banknote surface, while the size of many the portraits around the year 2000 may take over 40 % of the front of the banknote. Today this trend seems to come to an end with 'off running' portraits; the height of the portrait exceeds the height of the banknote. The portrait on the US dollar is a fine

Figure 2.21



Development of the portrait of Benjamin Franklin on the USD 100.

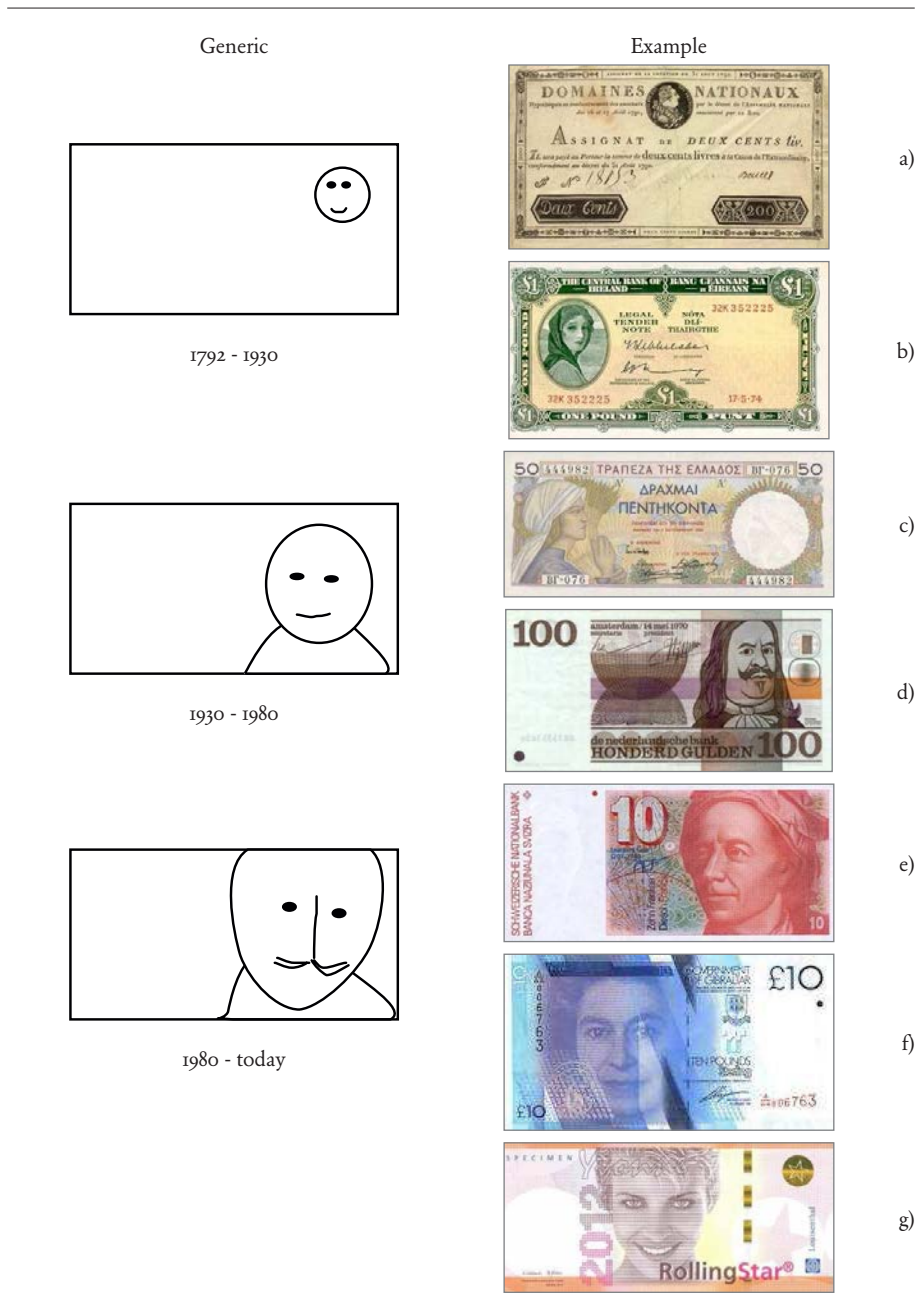
- a) USD 100, first issued in 1929.
- b) USD 100, first issued in 1994.
- c) USD 100, to be issued.

example of the development of the portrait size on banknotes. Dollar notes with a small oval portrait area date back to 1929 (figure 2.21a). In 1990 the portrait size was enlarged (figure 2.21b) and since 2004 the oval shape disappeared from the notes and some colour was added (figure 2.21c). All portrayed persons were kept and the three series are often typed by:

- a) Small portrait (1929),
- b) Large portrait, no colour (1990),
- c) Large portrait, with colour (2004).

Off running portraits suggest that the person is approaching the viewer, after size and eye-contact a third parameter to create a positive feeling about the portrayed person. The development towards larger portraits is a world-wide trend and is illustrated by figure 2.22; eye contact, a little smile and off running portraits, what else may banknote designers do to enforce a positive feeling? Forward lean and show some teeth, if we look at the promotional banknote with the portrait of Yvonne (figure 2.22g)

Figure 2.22



Development of the size of portraits on banknotes.

- | | |
|---|---|
| a) French livre, 200 (1792, 1813) | b) Irish punt, IEP 1 (1928, 1974). |
| c) Greek drachma, GRD 50 (1935) | d) Netherlands guilder, NLG 100 (1972). |
| e) Swiss franc, CHF 10 (1979) | f) Gibraltar pound, GIP 10 (2011). |
| g) Promotional banknote Yvonne, Papierfabrik Louisenthal (2012) | |

Islamic world: no or small portraits

The Islamic culture differs from the Western world in several ways, including banknote design. For a long time, coins and banknotes used in Islamic cultures did not feature portraits for traditional and cultural reasons (see figures 2.23a and b). However, the use of portraits on these banknotes is gradually adopted (figure 2.23c and d). Some banknotes issued feature large portrait areas, like the notes of Indonesia's and Pakistan's currencies, fading the differences between the banknote identities of respectively Western and Islamic banknotes.

2.2.8.2 Confidence in banknotes after 1995

One of the objectives of the new euro was to gain a similar level of trust in the euro as was enjoyed by the US dollar (although this level was not measurable). Since the euro banknote designs could, because of a national bias, not be supported by great musicians or scientists, architecture was selected as a metaphor for trust and élan in building Europe. This policy was successful since the euro did create confidence and is now also evidence that the public no longer needs - if ever it did - portraits on banknotes to trust the value of pieces of paper.

The Bank of Canada was in 2004 the first to measure the public's confidence in banknotes (index composed on the answers on 4 attitudinal questions: is

Figure 2.23



Four examples of banknotes from Islamic cultures.

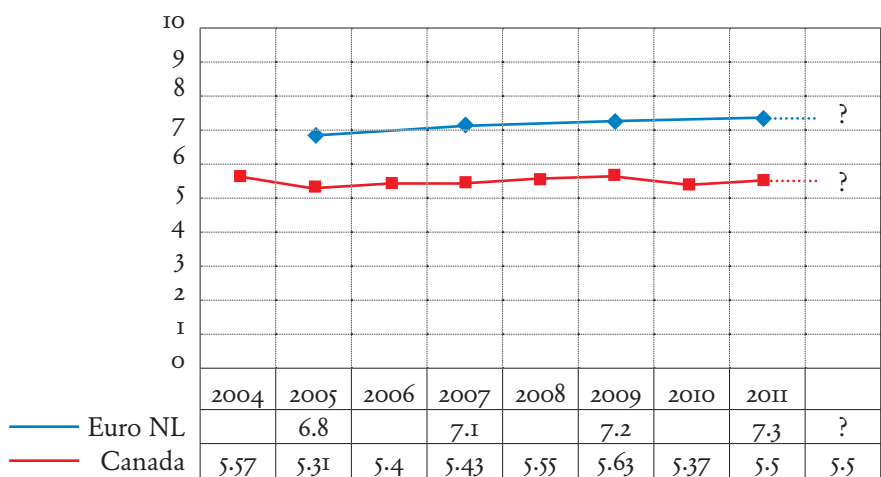
- a) Egyptian pound, EGP 200 (2007).
- b) Sudanese pound, SDP 10 (2005).
- c) Tunisian dinar, TND 10 (2005).
- d) Saudi riyal, SAR 50 (2007).

counterfeiting a problem?, how likely is it to receive a counterfeit?, likelihood of experiencing fraud when using cash?, confidence in systems to remove counterfeits?). In the Netherlands, confidence is determined simply on the basis of the answer given by the public to one question, which came out on 7.3 score in 2011 [115, 126, 192, 204].

The confidence scores of Canada and the Netherlands are compared in figure 2.24. The confidence graphs are rather flat, while the counterfeit situation in both Canada and the euro zone is volatile for the same period of time. Using this information De Heij concluded in 2010 that the public trusts their banknotes blind and is not bothered by the counterfeits in circulation, neither when the counterfeit trend is going up nor when it is going down [192].

In general, people have a conservative attitude when it comes to changes to their cash money. When offered a choice, people will opt for the existing situation. In case of the replacement of a banknote by a coin people will opt for the note, as experienced several times in the US (figure 2.25a and b). The opposite leads to a similar conclusion; if a new banknote denomination is offered in addition to an existing coin of that same domination, as was the case in Germany with the 5 D-mark since the 1950s, people will opt for the coin (figure 2.25c and d). There was a good reason for this preference; the coins were used in vending machines and parking meters.

Figure 2.24



Public confidence score (scale 0-10) for the euro banknotes (in NL) and for the Canadian dollar banknotes in Canada. The original Canadian score is reported on a scale of 0-100 %, while the Dutch score is reported on a scale of 0-10; to make both comparable in one graph, the Canadian score is brought to the scale of 0-10).

Figure 2.25



- People like to stick to the coin or banknote they are used to. Up to four times (in 1971, 1979, 2000 and 2007) the US Treasury tried to introduce a one dollar coin with the intention to push up the note coin boundary to the 5 USD, each time to no avail (see also appendix 1, figure A1.43 on note-coin boundary). In the Germany it is the other way around. The DEM 5 has been the note coin boundary in Germany since the 1950s. People rather used the existing coin than the new banknote denomination.
- a) USD 1/Washington, banknote issued in 1929.
 - b) USD 1 coin, presidential dollar, reverse view (2007-present). Several different design variants on presidential themes are used on the front, Design by Don Everhart. The US coins are produced since 2007 in large quantities - under a Congressional mandate - by the US Mint, resulting in large stocks.
 - c) DEM 5 coin since 1951; first issue in this design in 1975.
 - d) DEM 5/Bettina von Arnim, issued 1 August 1991. Design by Reinhold Gerstetter.

US one dollar bills are frequently used in vending machines and this could also be the reason why the Americans would like to keep the one dollar banknote. Furthermore, coins are heavy and lead to thick purses. Perhaps also the following reason is of influence. The dollar has kept its value since 1929; ‘a dollar is still a dollar and has not been downgraded to a coin’ is what people may think. Two more examples of currency changes met by a conservative response from the general public have been reported by central banks. In 1997, the Thai people would not accept polymer notes, asking for the familiar ones, made of cotton. A similar reaction came from the Brazilian public in 2000, when a BZL 10 polymer note was offered next to the traditional note of this value.

When people do not chose for the optimal, but are satisfied with limited changes which will make them happy enough, is described by the term *satisfice*, a contraction of *suffice* and *satisfy*, as introduced by Nobel Prize winner Herbert Simon (1916-

2001). Simon studied behaviour which limits a fully rational decision based on 'bounded rationality'. This tendency to minor changes, to satisfice, seems to be true for banknote design. Further proof for the satisfice statement comes from two opinion polls on new banknotes. Researching the design of Japanese banknotes, Hymans unveiled that 70 % or more of the Japanese public consistently replied between 1995 and 2001 that the Japanese banknotes do not need to be redesigned, while fewer than 7% felt that it did [108]. DNB asked the Dutch in 2009 a similar question and the outcome confirms the statements made above; ask the people, and the majority will tell that there are no changes needed in the banknotes. Half of the consumers (49 %) does not find it time for a new series of euro banknotes, and one out of three does not care (36%). Only 15 % consider it time for a new series of euro banknotes [162]. These figures might be influenced by the positive attitude of the Dutch towards the introduction of new NLG-notes, which usually created a positive emotion among the Dutch (happiness), characterised by designer Oxenaar as 'Santa Claus feeling' (in Dutch 'Sinterklaasgevoel').

Lots of unknowns in this field and central banks should therefore be reluctant with issuing new banknote designs if no real argument can be provided to the retailers and the public for a design change. On the other hand, a striking new banknote design may conquer the hearts of the people.

Trend to abandon portraits?

Although portrait series are still popular, several central banks looked for different reasons for other subjects. In case of the euro banknotes it was not possible to find a series of portraits without a bias to one of the members of the European Union, as will be explained in section 4.2 which analysis the identity of the euro banknotes. According to Hymans central banks want to abandon the celebratory banknote, since it is no longer seen as appropriate for the present time spirit, marked by the introduction of a banknote featuring a bird in the Netherlands in 1981 (see chapter 1 introduction). Recently Bermuda (2009), Denmark (2009) and Switzerland (new series) moved away from portraiture and introduced, respectively, animals, bridges and Swiss 'scenery'. Figure 2.26 provides an overview. On the other hand, the central bank may return to a portrait series. The banknotes issued since 1994 by the Central Bank of South Africa display the Big Five, five different wild life animals. Early 2012 they announced that Nelson Mandela will be honoured on their future banknote series.

Two central banks, Israel and Sweden, started in 2011 the development of a new series of banknotes and both decided it will be (again) a portrait series. Both central banks do not explain why, but focussed on the lists of persons to be portrayed. Besides the persons to be portrayed, the Swedish design policy also requires that the nature and environmental motifs are used for the reverse. The central bank's press release explains that in the selection of motifs, the General Council of the Riksbank decided that 'the persons concerned should have lived and worked during

Figure 2.26



Trend to abandon portraits on banknotes.

- a) Netherlands gulden, NLG 100 (1981). Bird, a snipe.
- b) South African rand, ZAF 10 (1993). Rhinoceros.
- c) Russian rouble, RUR 100 (1995). Sculptural group near the Bolshoi Theatre.
- d) Euro, EUR 100 (2002). Arch in baroque and rococo style.
- e) Danish krone, DKK 50 (2009). Bridge, Sallingsund Bridge.
- f) Bermudian dollar, BMD 100 (100). Bird, red cardinal.
- g) Swiss franc, CHF 10 (2013). Skiing (design stage, design by Manuela Pfunder).

the 20th century, should be popular with the general public and, preferably, should also be well-known internationally. They should also represent different parts of Sweden.' An equal balance between women and men is also important and the selected persons include Astrid Lindgren, Greta Garbo and Ingmar Bergman. Emotional attachments of the Swedes to this new series are almost guaranteed by the requirement that the persons should be popular with the general public. Of course, the quality of the design itself also contributes to the final public judgement.

Concluding, there is no longer a need to portray great historical countrymen for reasons of adding confidence to the banknotes. Adding human figures to banknotes would provide life and diversity to the new banknote design. For this aim, the person to be portrayed could be again anonymous like in the 19th century and could be a fantasy character created by using image software or could be displayed as a silhouette. Furthermore it is advised to provide a positive emotion to portrait. Emotions are cultural biased and should be selected with care. For the western world the advice is to apply a portrait with an open face, looking at the banknote user, showing a little smile.

2.2.9 Small scale private currencies

Special phenomena in today's banknote design are small private currencies. Such small-scale private currencies can be perceived as a kind of back to the future. Just as in the 19th century private organisations issued their own banknotes, marking a return to a world that existed before states began to monopolize the creation of money. There are regional currencies issued in Great Britain, the USA, the euro zone and elsewhere. In most cases, the local currencies are denominated in the national currency but are not convertible; the regional money is not legal tender. Are the designs of such private banknotes different from state issues? Which parameters do they use to provide these notes identity? Before this question can be answered, the phenomenon of small scale private currencies is explained.

Local communities feel that the national currency does not bring that many local benefits, which is to be the main driver for the introduction of small scale private currencies. Such currencies are also known as complementary currencies, sub-national currencies, local money or regional currencies. They serve as a means of exchange within a local community network. Support for local currencies is often linked to the changing conceptions of economic space, frequently inspired by green political ideas that emphasise the various benefits of small-scale economic life. The issuers of local currencies advocate, for example, community involvement and an enhanced sensitivity to environmental issues.

There are two manifestations of small scale private currencies: visible and invisible. The visible local currencies usually appear in the form of paper money looking like banknotes. The invisible variant exists primarily as an electronic bookkeeping system, like 'lets' (Local Exchange Trading Systems), usable only by the local network of local currency members.

The variety of small scale private currencies is reported in the following Subsections:

2.2.9.1 Electronic book-keeping system

2.2.9.2 Currency unit time

2.2.9.3 Idealistic money

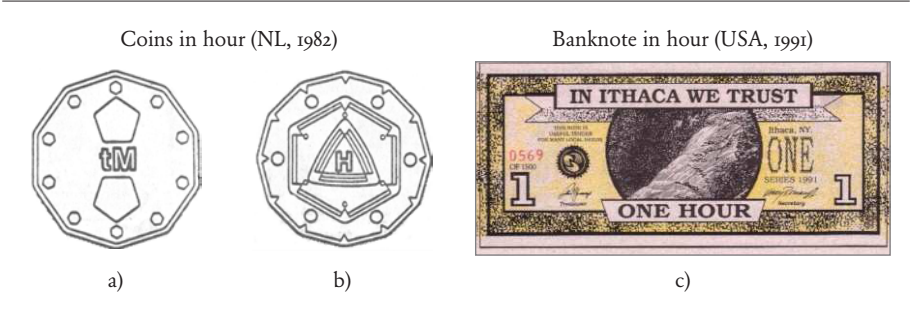
2.2.9.4 Regional money

2.2.9.1 *Electronic book-keeping system*

Michael Linton introduced the idea of lets in Canada in 1983. Linton wanted to help his neighbour residents, who had been hit by an economic slump. The basic principle underlying lets is that no money changes hands, but instead a system of multilateral exchange is created expressed in terms of products or labour power. Membership is open to all against a membership fee. Transactions are recorded on cheques forwarded to and logged by an accountant or treasurer to the system. Details of all transactions are published on a regular basis so that all members of the system have knowledge of the full transactional activity and trading balance, debit or credit, of all other members.

From Canada, Linton’s idea has spread to the United States, Australia, New Zealand, and European countries such as the United Kingdom (1985) and the Netherlands (e.g ‘Noppes’ in 1993 in Amsterdam and ‘Nobels’ in Doetinchem). Noppes started in 1993 on the initiative of STRO (Strohalm) in Utrecht, which is committed to a sustainable and fair economy. Together with partner organisations STRO provides an interest-free payment system named ‘Cyclos’, which provides settlements in several local currencies as used in developing countries. STRO also provides micro-credit at low interest costs. Micro-credit is not a regional currency but a movement which started in 1983 in Bangladesh with the setup of the Grameen Bank. For poor people who have no collateral to pledge, bank loans were unavailable. The average micro-credit loan size was about USD 75.

Figure 2.27



- Two examples of regional money based on a currency unit time.
- a) ‘Green money’ proposed in 1982 by Dutch organisation De Kleine Aarde (‘Little Earth’) . This coin has a value of ten minutes (tM) . Designed by David Douwes, drawn by Studio Hans Barvelink.
 - b) A coin with a value of one hour (H), belonging to the same issue as the coin shown under a). Other denominations were 1 and 5 seconds and 1 and 5 minutes.
 - c) A banknote with a value of ‘one hour’, issued by Ithaca in New York in 1991. Issued denominations are 1/10, 1/8, 1/4, 1/2, 1 hour and 2 hours. Over 500 local businesses and over 1,500 other local entities have agreed to either pay or redeem the currency.

2.2.9.2 Currency unit: time

Time, Benjamin Franklin (1706-1790) famously said, is money. Following this adage, an obvious implementation of a local currency is to use time as unit of account. One of the first to propose hour as currency unit, in 1982, was an idealistic community in the Netherlands [17]. They did not propose any paper money but only coins (figure 2.27a and b).

A more successful initiative was the ‘Ithaca hour’ introduced in the US 1991 as shown in figure 2.27c. The authorities have decided that hours are legally used as long as the paper forms of these local currencies do not resemble US dollars and are regarded as taxable income. Since 1991 others have copied the time model, steadily gaining acceptance among local entities.

2.2.9.3 Idealistic money

The Maharishi movement introduced ‘Raam’ banknotes in the Netherlands in 2001 (figure 2.28). The Raam currency should support the ideal of ‘a country without borders for peace-loving people everywhere’. An exchange guarantee was provided by a local branch of a Dutch bank. One Raam is approximately USD 10 and is exchangeable in 35 US states and the Netherlands. The notes clearly exude a peaceful oriental atmosphere.

Figure 2.28



An example of an idealistic currency is the Raam issued by the Global Country of World Peace (GCWP). GCWP is an initiative of Maharishi Mahesh Yogi, the founder and guru of the Transcendental Meditation movement. This non-profit organisation has its headquarters in Iowa and has subsidiaries at various locations, one of them being Vlodrop in the Netherlands. The Raam-series has 3 denominations: 1, 5 and 10 Raam. The notes bear the portrait of Vijayadshami, and were issued on 7 October 2001, being Victory Day. The notes were printed by the Dutch banknote printer Joh. Enschedé.

2.2.9.4 *Regional money*

The focus of this subsection is on local currencies, which are of interest to this study on banknote identity. The founders of local currencies often criticise the formal currency and this criticism may be reflected in an innovative, contrasting design vision. However, this does not seem to be the case. Local currencies or regional moneys are emblazoned with imagery and slogans that reflect local values and are usually intended to be used alongside the national currency. Regional currencies are driven by three main considerations: economic, environment and social. Money spent locally stays within the community and is re-used many times, multiplying wealth and increasing local economic resilience. The money thus spent, supporters say, will stay in the region, since once a regional banknote has been accepted it can only be spent locally and all profits will once again be inserted in the region. ‘Buy products from regional producers instead of goods from big supermarket chains who import their goods’ is a typical motto for regional currencies.

Secondly regional currencies support local businesses and reduce the need for transport. Therefore it would decrease emission of carbon oxides and/or other emissions and reduce the ecological footprint.

The third argument is that regional currencies will strengthen relationships between local shopkeepers and the community.

Although technically illegal, regional currencies are not classified as unlawful. Authorities recognise that regional currencies may supplement the state’s role of social services like combating unemployment. They are found comparable to financial schemes, like loyalty systems operated by hotels or airline companies, which also pose a challenge to the status quo. As long as they do not look like the national currency, regional paper money is tolerated and no suggestion should be made that it is a lawful means of payment.

As said, local electronic bookkeeping systems exist since 1983. The first regional cash money were coins, banknotes followed later. An example is the ‘Tesselaar’,

Figure 2.29



Regional money on the island of Texel in the Netherlands, 1995. Currency unit: Tesselaar.

first issued in 1995 on the Dutch island of Texel (figure 2.29). Such coins are seen as barter by the Dutch Ministry of Finance and are therefore allowed. Regional coins remain popular in the Netherlands; in 2010 a new coin ‘ZeeCu’ was issued on Schouwen-Duiveland within the province of Zeeland. And retailers in the Noordoostpolder region have plans to introduce the ‘Schokker’ in 2012.

The first regional banknotes were introduced in both the USA and Europe around 2005. The first in the USA are probably the ‘BerkShares’, the regional currency of the town of Berkshire, Massachusetts. One of the first European regional banknotes is probably ‘Rheingold’, issued in 2007 in Düsseldorf, Germany. One of the most successful in 2007, with 70.000 notes in circulation, is the ‘Chiemgauer’ circulating in Bavaria. From a design point of view, there is a large variety of regional banknotes around, as shown by the examples presented in figure 2.30.

Promoters of regional money argue that it takes on average over 40 days before a payment in euro has been settled, which is too long for small businesses. To

Figure 2.30



Four examples of regional European currencies, issued between 2007 and 2009.

- The main objective of the Remstaler is to support foundations. The 10 Remstaler note depicted here donates to the Björn-Steiger Stiftung. Remstalers were introduced in Germany in 2007 and are a special form of German regional money. The notes can be exchanged one-to-one for euros.
- Banknote of 20 Rheingold, issued in the Düsseldorf region in 2007.
- Lewes pound, 2008. 10,000 pieces are printed and is accepted in over 60 stores. The town Lewes also had its own currency between 1789 and 1895.
- Brixton pound, 2009. Equal to 1 GBP. Denominations 1, 3, 10 and 20. The banknotes feature people well known to the Brixton residents.

speed up the settlement, regional banknotes often lose value after a certain date. This type of 'depreciative money' will encourage people to spend their money quickly. However, usually regional banknotes are issued at a rate of one-to-one to the national currency (or parity). For example, the 'Urstromtaler', the regional currency of the city of Magdeburg in Germany, has an exchange rate of 1 to 1 to the euro. Local issuers, just like national issuers, have to maintain the value of the local currency.

It is frequently suggested in articles on the subject that these initiatives also lean on sentiment to the disappeared national currencies as the guilder or D-Mark and the need for a regional identity in a global world. However, there does not seem to be evidence for this statement.

German study to regional currencies

The Bundesbank commissioned Gerhard Rösl to prepare a study on regional currencies in Germany. Rösl in 2006: 'There are now 16 regions in Germany where "regional currencies" are currently in circulation as a cash substitute for the euro. At present, the German regional currencies are conceived almost exclusively as depreciative currency (in German 'Schwundgeld'), which loses value on a predetermined timescale. (...) However, given that the overall volume of regional currencies in circulation in Germany amounts only to roughly 200.000 euro, the current economic welfare losses resulting from the issuance of Schwundgeld are negligibly small.'

Rösl concludes: The regional currencies are not a threat to the Bundesbank, although technically they are illegal and could pose a problem. The Bundesbank tolerates the local currencies, which are regarded as a kind of 'social money' [120]. Although one might have a different opinion, the design of the 2007 Remstaler series (figure 2.30a) was judged by the German central bank as being too close to the euro banknotes. People might be fooled and the next 2008 series was changed in consultation.

Regional money in the Netherlands

A Dutch example of regional money is the 'Gelre', first issued in 2007 and is a form of depreciative money. The issuer provides a discount of 5 % to the euro; 105 Gelre are sold for 100 euro, so their value in the shop is 105 euro. When the Gelre is exchanged again to euro, a financial penalty of 5 % is paid (95 euro for 100 Gelre). Gelre currency is offered both in electronic form (account) and in paper money form. It is the aim of the issuer Gelre Beheer to become an alternative bank for complementary currencies [129, 161, 180].

Another example of regional money in the Netherlands was the so called 'Bijlmer euro'. Issued in 2010 in the Bijlmer, a district of the city of Amsterdam. These Bijlmer euro banknotes are regular euro banknotes of 5, 10 or 20 euro with a yellow adhesive RFID-sticker on it (figure 2.31). This sticker is used for tracking the

Figure 2.31



An example of a 'Bijlmer euro' issued in 2010 in the region of the Bijlmer, a district of Amsterdam.

banknote's circulation in the region of the Bijlmer with the aim to increase the awareness of local citizens. DNB tolerated this version of regional money under the restriction that the stickers should all be removed before the notes are returned to the bank.

Summarizing, small-scale private currencies are tolerated by the authorities. If such private currencies would were to become current on a larger scale and would affect the national legal tender currency, feasible with today's support of electronic means, this would be different.

2.2.10 Supranational banknotes

The euro is not the currency of a country or a nation and is therefore called a supranational currency. The euro is the currency of the European Monetary Union (EMU) and precedes the creation of a political European Union. As discussed in subsection 2.2.6 on currencies of monetary unions, former monetary unions did not have one type of coins or banknotes, neither did they have a common central bank like the European Central Bank. Analysing the design of the euro banknotes leads to the conclusion that the euro banknotes are a reflection of the legacy banknotes, the notes the euro replaced. Although the theme 'Ages and styles of Europe' could suit a supranational design concept, the outcome of the design contest was from a design point of view a 'national' design rather than a new, innovative supranational design concept. Banknote design for supranational banknotes seems to be in its embryonic stage.

The views of Jürgen Habermas on supranational money

The German sociologist and philosopher Jürgen Habermas (1929-....) analysed advanced capitalistic societies such as the European Union (EU). His theoretical system is devoted to revealing the possibility of reason, emancipation, and he criticises modern institutions which grow beyond control of human beings. According to Habermas money is the medium by which the economic system colonises the life

world. Once money enters the realm of personal relations it inevitably bends those relations in the direction of instrumental rationality.

Habermas distinguishes two types of sovereignty: state sovereignty (legislator) and people sovereignty (parliament). Applied to a supranational organization like the EU, Habermas proposes the following construction. The state sovereignty of the member states can be combined with the right to legislation at the supranational level. However, the latter still derives its legitimacy from the sovereignty of the member states.

Habermas has also doubts about the increasing scale of the EU and what it does to a person's identity. In reply EU President Van Rompuy said in 2010 that a person's identity is a layered identity. 'Your home, street, city and country. And every Dutchman is also European. I think we should not be so difficult on this point, the way Habermas is.' [189]. This topic is further discussed in chapter 3, section 3.2 on identity of currency users.

2.2.II Global currencies

Up until the 19th century payments in Austria were made with French 'écus', in France with Spanish 'pistoles', in Spain with British 'guineas', in England with Venetian 'zucchini', and in Venice with Turkish 'piastres'. In fact, there was only one kind of money: gold! It was the weight and name of the gold that varied over Europe. All these gold coins were different and the two basic questions were: are the weight and the purity correct? In the Low Countries, the majority of the currency in circulation was of foreign origin. In 1626, the Dutch authorities allowed 388 different currencies to circulate, as illustrated by (a part of) the placard provided in figure A1.1b. The concept of currency frontiers was introduced in the 19th century, when the idea of nation states took root.

The gold standard created the first global currency: gold; currencies were for a long time just names for different weights of gold. In 1582 the Italian merchant and banker Gasparo Scaruffi (1519-1584) published a proposal for the establishment of universal coin with the same shape, weight and name in every country: 'as if the world were one city and one monarchy.' [109]. Various economic liberals called for the creation of a truly global or universal currency at different times during the 19th and early 20th century. Even though countries enjoyed stability of exchange rates under the gold standard, they wanted to go further and eliminate unnecessary information and transaction costs associated with international trade.

Second proposal for world currency (1860)

In the 1860s at the time of the Latin Monetary Union, a universal currency was proposed that could co-circulate in all nations. Not only would such a currency reduce transaction costs associated with the handling of various distinct national currencies, but it would also help people to transcend national identities by making them think about themselves as being of one blood.

Table 2.3

	Year	Who	Type
1.	1582	Gasparo Scaruffi	Universal coin with the same shape, weight and name
2.	1860	Latin Monetary Union	Co-circulating universal currency
3.	1944	John Maynard Keynes/UK	Global currency named 'Bancor'
4.	1976	Friedrich Hayek	Competing currencies by co-circulation (denationalisation)
5.	2005	Robert Mundell	G-3 Monetary Union (dollar, yen, euro), stabilising exchange rates and a global co-circulating currency named 'Incor'

Five proposals for a global currency.

Most major countries were willing to alter slightly their monetary units in order to make 1 pound = 5 dollars = 25 francs as the common monetary unit. Britain rejected the plan because the pound sterling would lose influence.

After four hundred years Scaruffi's thoughts were still alive when Paul Volcker, Chairman of the Federal Reserve Board between 1979 and 1987, stated: 'A global economy needs a global currency. Why not make one?'.

Over the centuries there have been at least five proposals to introduce a global currency, in co-circulation with national currencies. Table 2.3 provides an overview and more detail may be found in appendix A4 on monetary unions, currency boards and global currencies.

2.3 Conclusions on history of banknote design

- 2.3.1 Most literature on coins and banknotes is fragmented. Publications focus on a certain period, country, area or banknote printer and provide no useful information on banknote identity. Therefore, answering questions on currency and banknote identity has to borrow from general literature on product identity and branding.
- 2.3.2 Over time cash money developed from original money, tokens like shells, private banknotes and other forms of paper money to the first supranational banknotes, the euro. The design of the paper money was several times adapted to its new function. Looking at it the development of money, a total of 11 periods are recognised of which 9 periods relate to paper money.
- 2.3.3 Banknote designs are driven by their function and by the time spirit. Since the first paper money appeared in Europe in the 13th century, the paper money has kept several prototypical elements, like e.g. a signature, date and a watermark. A total of 19 *currency design* elements are recognised and

another 19 elements are identified *as banknote design* elements. Thus a total of 38 design elements may contribute to the identity of a banknote and are listed in table 2.4.

- 2.3.4 Although the euro banknotes are the first form of supranational banknotes, its design and identity is not adapted to the new user requirements. The design concept of the euro is similar to the (previous) period of national banknotes based on trust.
- 2.3.5 Portraits to support confidence in banknotes were first introduced during the uncertain economic period of the 1920s. Since 1995 historic portraits of great countrymen are no longer necessary to support people's trust in banknotes. Based on the current findings, it seems that central banks should develop banknotes based on contemporary public feelings, positive emotions.

Table 2.4

Banknote identity	
Currency design element (see also appendix A1)	Paper money design elements (see also appendix A2)
1. Currency unit (name)	1. Promise to pay
2. Language(s)	2. Security features
3. Currency symbol	3. Legal tender (banknotes)
4. Material	4. Warning text
5. Size	5. Colours
6. Shape	6. Gravures, guilloches and rainbow printing
7. Main image	7. Symmetry
8. Issuing authority	8. Series design
9. National symbol(s) (seal coat of arms, flag)	9. Portraits (trust)
10. Motto	10. Unprinted area on edge
11. Denominations	11. Name of the note
12. Value indication	12. Name of printing house and designer
13. Signature	13. Personal remarks by designer
14. Date (incl. copyright notice of later date)	14. Geographical maps
15. Place	15. Register marks
16. Typography	16. CDS features
17. Legal tender (coins)	17. Wayfinding features
18. Number	18. Marks for feeding direction
19. QR-code	

Banknote design elements split in currency design elements and banknote design elements. Listed in order of appearance; historical order.

3 Banknote identity

Identity is a broad term, the reason why there is usually an adjective used as in case of a cultural identity, gender identity, national identity, online identity and a document identity. The specific uniqueness of a product is called ‘product identity’. There are many examples of product design with a clear product identity, like e.g. almost all products made by Apple, B&O, Braun, IBM, BMW or Swatch.

Today the identity of a product is seen as part of a larger whole, the corporate identity. Corporate identity became popular in the 1950s and refers to what people perceive, feel and think about the corporation [e.g. 171]. But what if the corporation is not a commercial organisation but a central bank and the product is a banknote? The answer is that similar methods may be applied as to consumer goods, as will be reported on in this chapter.

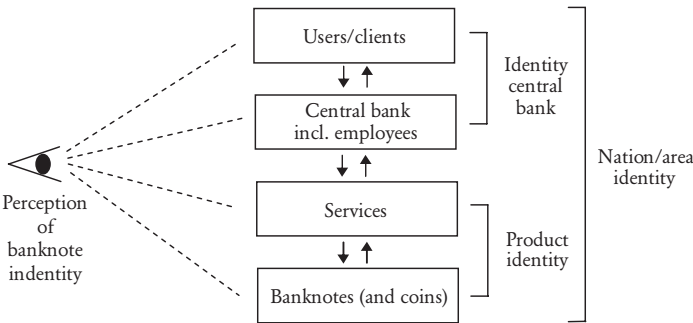
Corporate identity is composed of four different perception categories: people, organisations, services and products. All four categories contribute to the ‘overall identity’, the identity as perceived by an individual person, also known as ‘brand experience’. A currency includes both product (coins and banknotes) and services (on cash money, but also on other payment instruments). Specialising in several tasks, products and services, e.g. ensuring financial stability, statistics and payment services, central banks are no monolithic brands.

The focus of this study is on the product banknote of the central bank as provided in figure 3.1.

Since the identity of a banknote is first of all the perceived identity, an analysis is provided of the different currency users. All citizens are included; the identity function of a banknote design is meant for everybody and nobody in particular. In other words, the identity of a banknote doesn’t have specific, identified users groups like retailers in case of an authenticity check or visually impaired in case of value recognition. This chapter is broken down in the following sections:

- 3.1 Banknotes are part of a currency
- 3.2 Identity of currency users
- 3.3 Identity of currency issuing organisations
- 3.4 Currency design elements
- 3.5 Conclusions on banknote identity

Figure 3.1



Four basic perceptions of the identity of a banknote: users, central bank, services and products. The identity of the central bank and the banknotes (as one of its products) contribute to the nation/area identity.

3.1 Banknotes are part of a currency

A product may be described in objective technical specifications, drawings and photos, but research is needed to tell how people perceive the product. A study on banknote identity should therefore start with the public's perception of a banknote, which is - together with coins - seen as cash money. On its turn cash money is part of all the money available of the local currency. Together, all the national currencies are perceived as all the money in the world. Using the euro as an example, this situation is explained in figure 3.2. The national currency is expressed by both coins and banknotes, but also by other means of payment like electronic money.

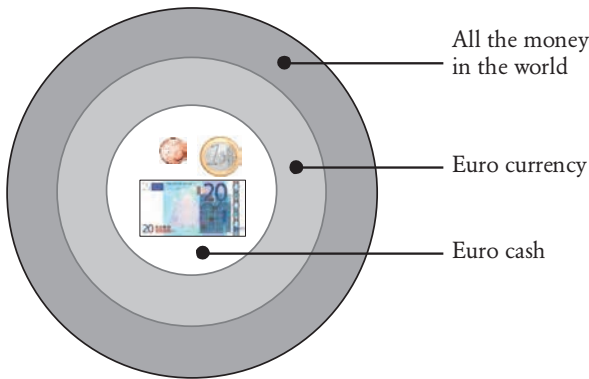
While in its original form, money could be understood by everyone, today money has become one of the abstractions of our world. Economists usually define money according to its three functions:

- Unit of account,
- Medium of exchange (to settle a debt),
- Store of value.

The banknote provides for all three functions, all contributing to its 'money identity'. However, the concept of money is mystique. Where does money come from? How much money is there? Although outside the scope of this study, a short answer is provided.

In its original form, money is anything that settles a debt, anything that makes a payment. A century ago people lived in a cash society, meaning that most payments were settled in coins and banknotes. Today the role of tangible money has been reduced; only a few percentage of the money used in a modern economy is cash.

Figure 3.2



Three perception levels of money: 1) money in general, all the money in world, 2) euro currency (all money labelled euro) and 3) euro cash money (euro coins and euro banknotes).

Money supply statistics observe different types of M (for Money), ranging from the narrowly defined M_0 to a broadly defined M_3 . Which M is actually used depends on the policy of a country's central bank. The answer to the question of how much money there is, is the value called M_1 , also known as narrow money, which represents all cash currency, the face value of all coins and banknotes in circulation, plus deposit money, being all balances in payment and savings accounts. Because it is unlikely that all accountholders will convert their full bank deposit into cash, only a small percentage of the deposit volume, for example 20 %, has to be available in cash. Earmarked to cover overnight deposits of the public, this part is excluded from M_1 . The ratio between cash currency in circulation and deposit money is the cash currency ratio. In a 100 % cash society, this cash currency ratio will be 1 or 100 %. As noted, since it accounts for just a fraction of the overall money supply, cash currency has lost its importance for money supply statistics.

A commercial bank will multiply the money entrusted to it - in cash or electronic form - up to 10 times and in some cases even up to 35 times. In other words: one euro deposited by a private person on his savings account may be lent up to 35 times over to other parties (on equity of e.g. 3,5 %). To prevent new financial crises, the united central banks, by way of the Bank for International Settlements (BIS), stipulated in the 'Basel III Capital Accord' (2011) that banks must hold more and higher-grade capital reserves and should increase their liquidity ratios. Indeed, money is one of the greatest abstractions of our world and this vague feeling influences the perception of money, including banknotes.

3.2 Identity of currency users

The uniqueness of an industrial product such as a chair, mobile phone or a banknote may be codified in several ways. One of the earliest is the character of a product. The word character derives from ancient Greek meaning engraved or stamped mark. 'Characterisation' covered anything involving grinding, scratching, engraving or stamping, including the minting of coins. The result, a scratch, notch, mark, stamp, engraving or printing was called the 'character' of the product. Character was also used for the style of an artwork or the typical shape of a thing. The word character initially penetrated the Germanic languages as a term denoting an alphabetic character, a letter of the alphabet. Foreign scripts are still described in terms of characters, like e.g. Chinese characters. The uniqueness of a product can also be described in terms of a personality, e.g. 'solid' and 'safe'. Personality, character and identity have a similar meaning and the one preferred in this study is identity.

This section makes a start with the description of a product identity from the user point of view. The central bank should be knowledgeable on their currency users and the basic question for the bank is: who do we want to achieve? Once the users are identified a meaningful banknote's message may be developed. The banknote users are split in two: the individual user and the collective, the nation. The individual user generally has multiple identities, e.g. both national and European, rather than a single one. Domestic and non-domestic use of banknotes are outside the scope of this discussion. With the collective, the nation as a user, the central bank will also have to deal with prejudices or xenophobia, the reason why caricatures of identities are discussed in the last subsection:

3.2.1 Individual identity

3.2.2 Collective identity

3.2.3 Multiple identities

3.2.4 Caricatures of identities

3.2.1 Individual identity

Every person has characteristic qualities that make her or him unique, providing a personal or individual identity. As it changes over time, this identity is more like a film than like a photo, more dynamic than static. A personal identity is understood to include both a physical identity - female or male, tall or short, young or old - and psychological identity. Key to the psychological identity is the capacity for self-reflection. The habit of people to reflect on their own behaviour provides the basis for self-identification. Self-reflection is an on-going process of subjective construction and reconstruction by which a person's identity is developed, maintained and transformed in the course of her or his life. An individual identity has many layers and is often represented by concentric circles around a person as advocated by Anthony D. Smith in 1992:

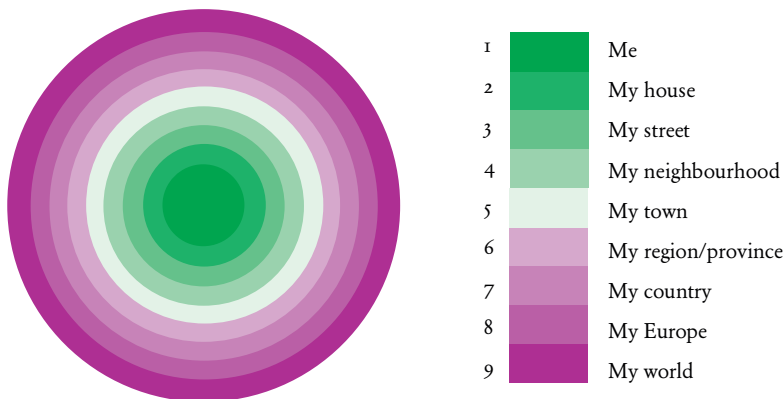
‘There is plenty of historical evidence for the coexistence of concentric circles of allegiance. In the ancient world it was possible to be Athenian, Ionian and Greek all at the same time; in the medieval world, to be Bernese, Swiss and Protestant; in the modern Third World to be Ibo, Nigerian and African simultaneously. Similarly, one could feel simultaneously Catalan, Spanish and European; even - dare one say it? - Scottish or English, British and European. (...) Under normal circumstances, most human beings can live happily with multiple identifications and enjoy moving between them as the situation requires.’ [43].

Following this view on personal identity represented by concentric circles and to clarify this view for Europeans, figure 3.3 was constructed by De Heij. This figure is divided into 9 grades changing colour from green to purple; ‘proximity’ being represented by green and ‘distance’ by purple. As for most people the national identity (‘My country’) already feels far remote, that identity is positioned in the purple area. A European identity is even one gradation further removed in the purple area.

Document identity

A special form of a person’s identity is her or his ‘document identity’. To authorities we are nobody without an Identification Document (ID). In that light, a person’s identity is established at birth and laid down in birth certificates and, later, in driving licences and passports. Besides a signature, there are other identifiers by which a person’s identity can be verified, like a photograph, or biometric features

Figure 3.3



Schematic representation of the identity of one person in terms of self-identification by geographic position. The individual identity is represented here in 9 gradations (or attachments): from saturated green (grade 1: ‘Me’) to saturated purple (grade 9: ‘My world’).

Figure 3.4 Two examples of banknotes issued after a unification process.



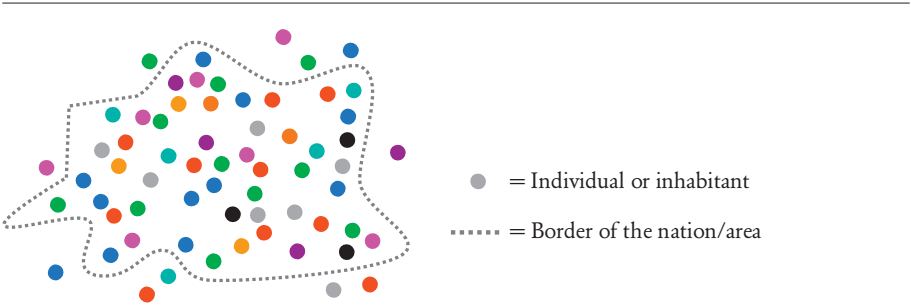
- a) First Italian 5 Lire banknote issued in 1882. In clear writing ‘Biglietto di Stato’.
- b) A 5 Mark banknote issued in 1882 in Bismarck’s united Germany (Deutsche Reich), clearly stating ‘Reichskassenschein’ in the upper section.

(a finger print, and iris scan etc.). Banknotes still carry some rudimentary elements, like a signature and a number, dating back to the times that banknotes had a strong document identity, as has been introduced in chapter 2.

3.2.2 Collective identity

Coins and banknotes are often used to fortify a collective identity, as in the case of the euro. There are several other historical examples, like in Italy around 1870, when the designer of the first Italian banknotes followed the adage of the Italian statesman Massimo d’Azeglio (1798-1866): ‘We have made Italy, now we have to make Italians’ (figure 3.4a). To foster awareness of the existence of a united Italy, the first Italian banknotes clearly stated ‘Biglietto di Stato’ (‘note of the state’). Until unification in 1871 Germany was a patchwork of different currencies and just as in

Figure 3.5



Schematic representation of a collective identity within a nation or area. The identity of a group is built by the individuals making up the group. Also group members (temporarily) living outside the group contribute to the collective identity.

Italy the first German banknotes issued featured also a ‘note of the state’ text, in this case ‘Reichskassenschein’ (figure 3.4b)

A collective identity is defined by all individuals belonging to a group or organisation, together they constitute their collective identity, as illustrated in figure 3.5. Residents (temporarily) living outside the area also contribute to the collective identity.

3.2.3 Multiple identities

A multiple identity is an identity with two or more identity components. In the case of two components it is called a hybrid identity. Both, euro and US dollar coins are designed with a hybrid identity. The collective organisation uses one side for the common identity and the other side is filled in by the member organisation. The hybrid identity is featured by all euro coin denominations (figure 3.6a). In the case of the US-dollar coins a hybrid identity may only be found on the quarter dollars as part of the ‘Quarter Dollar Programme’ started in 1999 (figure 3.6b). In addition to the hybrid quarters, fully common quarter dollar coins are circulating. Such a hybrid identity reflects the hybrid identity of both European and American citizens, having two identities, respectively a national or state identity (e.g. the Netherlands and Texas) and a collective identity, respectively the European Union (or eurozone) and USA. However, in case of the EU the national or local organisation is stronger (feels closer) than the collective organisation (feels more remote), shown on the left-hand side of figure 3.7. Illustrative here is the response ‘Yes, I feel European’ by 37 % of the Dutch in 2011 to the question ‘Do you feel European?’ [204]. The opposite seems to be the case in the United States of America, where many people see themselves first of all as US citizens and secondly as inhabitants of one of the States. This principle is shown on the right-hand side of figure 3.7.

Statements on national or continental feelings have to be analysed with reluctance; using Chinese products, does not make a Dutchman Chinese [e.g 134].

Figure 3.6

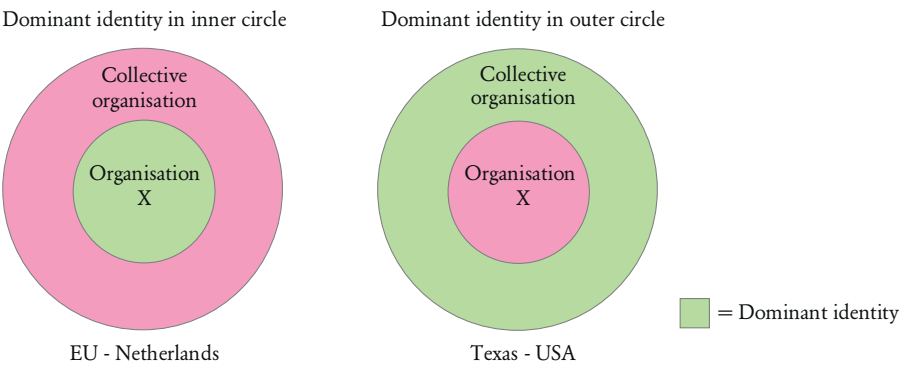


Two examples of coins with a hybrid identity: these coins have a collective and a national side.

a) Euro 1999, Finland.

b) US quarter dollar 2009, Puerto Rico.

Figure 3.7

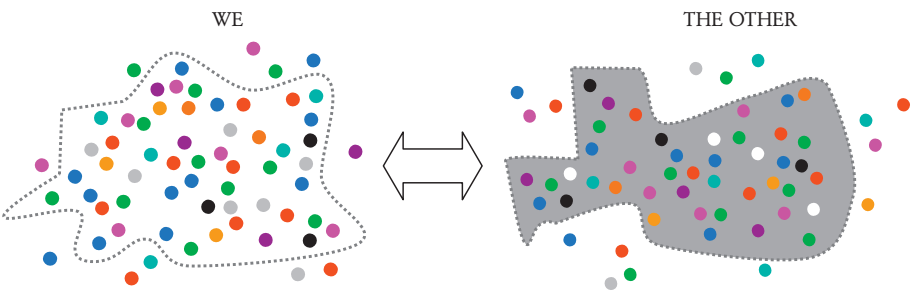


Schematic representation of the two forms of a hybrid identity. On the left, the identity of organisation X dominates the collective organisations. On the right, the identity of the collective organisation is dominant.

In versus out-group effects: us and them

In 1940 Evans-Pritchard was the first to introduce identity formation as categories of ‘us’ and ‘them’, also known as in-versus-out-group (figure 3.8). He analysed the identity formation as a dualistic process involving fission and fusion creating boundaries between different groups [6]. It is an important aspect of identity to define oneself in contrast to ‘others’, either by stressing the cultural differences or, more intensely, by excluding the strangers from the ‘we’-community. Gerard Delanty: ‘In order to define itself, Europe needed the Other against whom it could construct an identity of its own.’(...) It was in the encounter with other civilisations that the identity of Europe was shaped. Europe did not derive its identity from itself but from the formation of a set of global contrasts. In the discourse that sustained this dichotomy of Self and Other, Europe and the Orient were opposite poles.’ [50].

Figure 3.8



Schematic representation of ‘we’ and ‘the other’

Figure 3.9



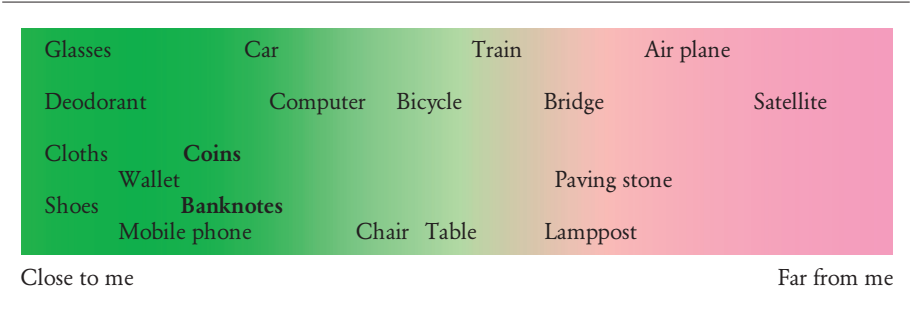
Logos used for the introduction of the euro in 2002 based on ‘We and the Others’. Every country could use its own language *The Euro. Our Money*.

An example of building a ‘We and the Others’ identity is the motto used for the introduction of the euro in 2001 and 2002: ‘The euro. Our money’ (figure 3.9). The ‘our’ is emphasized in the graphic design of this logo. In this case, the motto can be interpreted in two ways; it can be seen as exclusive: referring to the eurozone countries, which share one currency; or as inclusive: inviting European countries outside the eurozone to join the eurozone.

Close to me -far from me

The inventors of the introduction campaign of the euro banknotes might also have based their concept on the fact that the euro banknotes are carried on our bodies, which is directly relevant for a person’s identity. This might have resulted in a stronger emotional attachment to the euro than the in-versus-out-group strategy. Somehow similar to the gradations of self-identification as presented in figure 3.3, products can be positioned on a scale using the product’s proximity to or distance

Figure 3.10



Examples of ‘close to me’ and ‘far from me’ products. The green colour again represents strong, nearby attachments, while the purple gradations denote weaker attachments and could be described as outer circles or non-attachment. Banknotes are products that are carried on the human body and therefore positioned in the green area. A satellite, for example, is a ‘far from me’ product and therefore positioned in the purple area on the right-hand side.

from the human body as a criterion as presented in figure 3.10. In general, people will feel more strongly attached to ‘close to me’ products. This is positive for a banknote, a clear advantage over other products and central banks could exploit this position further. Carried in people’s wallets the coins and banknotes often even take the temperature of the body something that cannot be said of most close to me products [19]. Another psychological phenomenon works also in the advantage of the banknotes of the central bank. People have to use the available banknotes, there is no choice. The public will tend to be positive on any banknote design issued by their central bank, since otherwise they will be discomforted each time when they use the (ugly) note, following the principle as explained by the cognitive dissonance theory [69]. Indeed, as often said in speeches by ECB representatives: over 300 million people are carrying the euro in their pockets and this will bring Europe closer to them.

3.2.4 Caricatures of identities

When ‘we and the others’ is replaced by ‘similar or different’, the resulting identities will express xenophobia and become controversial. Contrasting ‘we and the others’ often results in caricatures of identities, like the ‘Yellow Peril’ and the ‘Red Peril’, two well-known stereotypes prevailing in the second half of the 20th century, indicating the Chinese and the (Soviet) communists, respectively. This is probably the reason why politicians try to limit voices proposing politics based on in- and out-grouping [e.g. 170]. An answer to reduce the tension between different communities is to introduce some self-reflection by making jokes about each other, including yourself (see figure 3.11). Some humour could therefore be considered as an ingredient of a banknote identity and is especially advised in case of the euro banknotes.

3.3 Identity of currency issuing organisations

The identity of the users of the currency, the receivers, has been discussed in the previous section and this subsection will focus on the senders, the central banks. Worldwide there are about 155 currencies and so there are at least 155 different banknote designs. If a central bank would like to create its own banknote identity, how should it be designed? What should the central bank do to make their banknote different from others? And what if a central bank would like to go even further and would like to have a competitive currency identity?

People perceive coins and banknotes as one type of money, being cash. Two different organisations are usually responsible; the coins being the responsibility of the Treasury (Ministry of Finance), while banknotes are issued by the national central bank (figure 3.12). As a result, coins and banknotes may reflect opposite design philosophies and, in some cases, even conflicting identities. In 2007, De Heij reported two such examples from euro coins and banknotes: the coins have no currency indication in Greek, and Norway and Iceland are included on the banknotes, but not on the (first) coins [126].

Figure 3.11

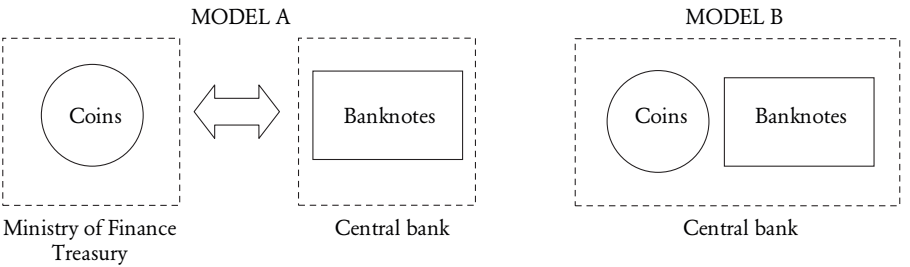


Postcard 'The Perfect European', by J.N. Hughes-Wilson (1988), for sale in Amsterdam in the early 1990ths.

The texts below the cartoons read:

Cooking like a Brit	Talkative as a Fin	Humorous as a German	Driving like the French
Available as a Belgian	Famous as a Luxembourger	Patient as an Austrian	Technical as a Portuguese
Flexible as a Swede	Humble as a Spaniard	Organised as a Greek	Controlled as an Italian
Sober as the Irish	Generous as a Dutchman		Discreet as a Dane

Figure 3.12



Two models to manage the design and issue of cash money. In Model A two organisations are involved, the Ministry of Finance or Treasury and the central bank. In Model B one organisation is responsible for both the coins and the banknotes. Most countries follow model A. Examples of model B are Chili, Denmark, Ireland and Morocco.

Figure 3.13 is a rare example of a self-reinforcing identity: the effigy on the coin is identical to the image on the banknote.

Organisational identity perception of central banks

As introduced, a product cannot be seen apart from the company bringing this product to the market. This is also true for banknotes (figure 3.1). From a corporate identity point of view, ideally people feel part of the central bank and its policy. If such is the case, corporate identity achieves its ultimate goal: the customers feel that they have ownership of the organisational philosophy. Indeed, from this point of view the motto of the euro introduction ‘The euro. Our money’ is well chosen, since it contributes to public ownership. Some commercial examples also approach the goal of ‘philosophical ownership by the customers’, like the Body Shop which sells cosmetic products which are not tested on animals [171].

Building a corporate identity central banks should answer such questions as: who are we, how do we see ourselves, what do we believe in and what kind of employees are working for us? This last question refers to the in- and outside world. This is important in the case of banknotes, since the central bank is a monopolist with a tendency to be inward looking, and the people outside usually have no say in the new banknote design. This is one more reason for a central bank to invest in consumer research and to be open to public input. The inside and outside world are clarified for the euro banknotes in figure 3.14.

Visual and verbal identity of currencies

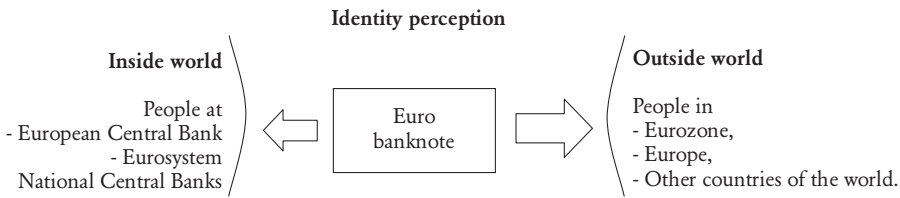
Humans have five senses: hearing, sight, touch, smell and taste. In principle all five senses may contribute to the perceived identity of a corporation. In daily life the verbal and visual stimuli of most companies are addressed about equally, while the other stimuli seldom play a role. Cases in point are Shell, the Red Cross, Apple and

Figure 3.13



Similar image on Brazilian coin and banknote. The image is a national symbol of Brazil - Effigie da República - and represents a young woman wearing a crown of bay leaves in Roman style. After the proclamation of the Brazilian Republic in 1889, this image became an important national symbol.

Figure 3.14



Identity perception of euro banknotes by the inside and outside world. The outside world is much larger.

Penguin Books. Hearing the name of one of these entities or seeing their symbol has the same effect, as the visual and verbal identities of these companies are about equally strong. There are also examples of companies where there is a bias towards the verbal (e.g. Google) or the visual identity (e.g. BMW and IBM) [171].

Banknotes are also experienced by multisensory input; it is not only the feel and look, but sometimes smell plays a role too. The smell of fresh banknotes is often listed in the top 10 of pleasant smells, together with newly baked bread and just mowed grass. Also hearing may play a role, like in case of rustling banknotes. To varify if a silver dollar was made of silver, which is a relatively soft metal, people used to put their teeth in such coins. If the coin showed a bite it would be a genuine silver one! However, the two most important design parameters for a currency are its name (hearing, verbal) and its symbol (sight, visual). No study is available on the verbal versus the visual use of a currency, but it would not be surprising if the verbal use outperforms the visual one. A currency's name seems to be the dominant parameter of currency branding and the verbal identity of a currency is of major importance, since the currency's name is frequently used in daily life. The three existing world currencies, dollar, yen and euro are strong verbal brands. Usually, currency symbols are - at least outside the country or area - better known than the banknotes. Currency name and symbol will be discussed in the coming section 3.4.

3.4 Currency design elements

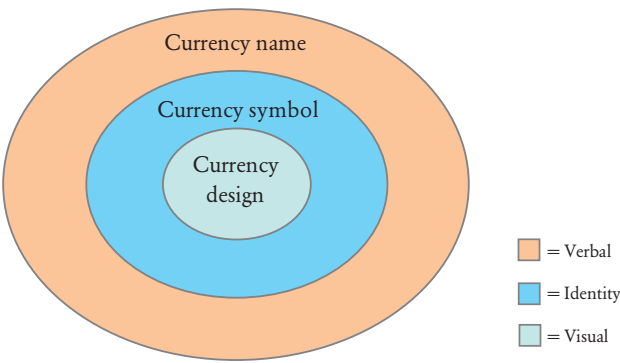
Figure 3.2 made clear that people will perceive a banknote as part of cash, as part of the currency and as part of money in general. The currency - is it a dollar or a euro? - seems to be the most dominant property of a banknote. Currency design elements are presented in table 2.4 and the two most important are name and symbol as shown in figure 3.15. These two topics are discussed in more detail in the following and in a third subsection the name of the central bank is analysed:

3.4.1 Currency name

3.4.2 Currency symbol

3.4.3 Name of the central bank

Figure 3.15



A currency derives its identity first from its name, then from its symbol and thirdly from its appearance (design).

3.4.1 Currency name

Currency names often connote:

- Food, like cod or grain (e.g. spoon of grain in old China),
- Precious metals like gold (e.g. gulden, zloty) or silver (rupiah),
- Weight (e.g. pound, peso, and mark),
- Shapes, e.g. circular (yen),
- Symbols, e.g. a shield (escudo), kingdom (crown) or lion (e.g. lev, leu),
- National heroes like colón in Costa Rica (to Christopher Columbus or Cristoforo Colombo (Italian) or Cristóbal Colón (Spanish)) or boliviano in Bolivia (to Simon Bolivar),
- A town, country or region (e.g. afghani , referring to Afghanistan; rand referring to the gold vein in Witwatersrand, South Africa; leone, referring to Sierra Leone; and euro, referring to Europe).

Dollar, yen and euro have a strong verbal identity. The dollar is, next to the United States, used in 27 countries like Australia (ASD), Canada (CAD), Hong Kong (HKD) and Surinam (SRD). The Japanese yen comes verbally close to - at least to Western ears - the Chinese yuan, the South Korean won and the North Korean won. The currencies dollar, yen and euro are often referred to as the DYE-currencies, while the BRICS-currencies refer to respectively Brazil, Russia, India, China, South Africa. Also the currencies of these countries have a strong verbal identity and again there is some competition with others. Next to the India rupee (INR), there is the rupian of Indonesian (IDR), Sri Lanka (LKR), Pakistan (PKR) and Nepal (NPR). The peso is another currency unit that is used in more than one country (e.g. Mexico (MXN) and the Philippines (PHP)) and more information on currency names is provided in appendix A1, section A1.1 on currency names.

A currency is a country's means of payment and a currency unit is its unit of account or monetary unit. The currency unit points in particular to coins and banknotes, but does have wider meanings like circulation of money and payment instruments. In most cases, currency and currency unit are one. For example, the US dollar is both a currency (USD) and a unit of account, and the same holds for the euro. However, in some cases the name of the currency differs from that of the unit of account. The currency of the United Kingdom, for example, is the Great Britain Pound (GBP), while the currency unit is 'pound sterling' or 'sterling'. The difference is made clear by the following: a payment is accepted in sterling and the costs are two pounds. The currency of China is the yuan (CNY) and the currency unit is the renminbi. This explains why the Chinese call the US dollar also the 'American yuan', the money of America.

The European Currency Unit (ECU) is a case on its own, since it only ever existed as a currency unit and not as a currency, even though the ISO code XEU was reserved for the ECU. The ECU represented a 'basket' of the nine currencies of the countries forming the European Economic Community (EEC) from 1979 to 1999. Its purpose was to minimize exchange rate fluctuations between EEC member states within the European Exchange Rate Mechanism. The ECU was also used in international financial transactions, providing investors with a foreign diversification option, without needing to rely on the currency of a single European country.

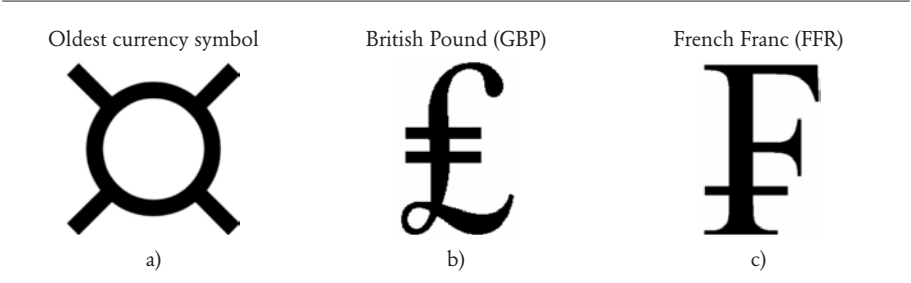
From a branding point of view it is an advantage to give a currency and the corresponding currency unit identical names (like is the case for dollar, yen and euro).

A modern variant on currency units are 'mobile phone units' or call-minutes, as used in several countries in Africa, like the M-Pesa in Kenya.

3.4.2 Currency symbol

Once the currency has a name, a currency symbol may be developed. The currency symbol is seen as major element of currency design. The oldest currency sign known is shown in figure 3.16a. It is not known when it was first launched. The currency logo £ is another well-known symbol (figure 3.16b) and may seem elaborate at first sight. However, it is only a stylized letter L derived from the Latin word 'libra', meaning pound. Libra was the basic unit of weight in the Roman Empire, which in turn is derived from the Latin name for scales or a balance. The pound became an English unit of weight and originally had the value of about 334 grams of pure silver. Again, it is unknown when £ first appeared, but it was used on the British banknotes at the start of the 19th century. Also the French livre, the Italian lira and Turkish lira find their roots in this Latin word for pound. The currency symbol for the French franc is F and was probably first used around 1800. With the introduction of the euro the French currency sign disappeared (figure 3.16c).

Figure 3.16

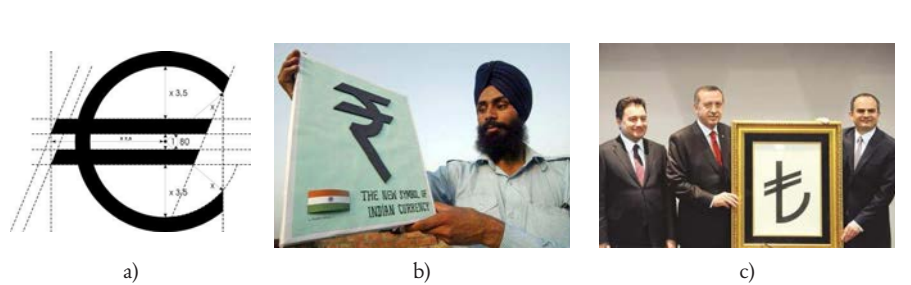


Three older currency symbols.

- a) First currency symbol.
- b) Currency symbol of the British pound, probably first used in the 17th century.
- c) French currency symbol dating back to the beginning of the 19th century.

The development of the currency symbols for the dollar and yen are described in appendix A1, subsection A1.3 on currency symbols. Shortening of the name dollar led to the dollar symbol \$. In the case of the euro it was the other way around; the European currency symbol was designed in 1974 (3.17a) and the name euro was given later, in 1997 as is explained in more detail in appendix A1, section A1.1 on name of currency unit. Recently, India developed a currency symbol using a design contest (see figure 3.17b). With this currency symbol, India adopted the design philosophy of the Japanese and the Europeans. The chosen symbol features two horizontal lines, as is used in other currency symbols like the ¥ and the €. They signal stability.

Figure 3.17



Two currency symbols which were designed from scratch.

- a) Specifications of € symbol. The symbol was created in 1974 by Arthur Eisenmenger, the former chief graphic designer of the European Community.
- b) Design of currency symbol for India, by D. Udaya Kumar of the Indian Institute of Technology, 2010.
- c) Presentation of the design of the currency symbol for Turkey, 2012. The symbol is a double-crossed 'L' shaped like an anchor. The shape is intended to convey that the currency is a 'safe harbour', while the upward-facing lines represent its rising prestige.

In 2012 Turkey introduced a currency symbol for the Turkish lira also using two horizontal lines (figure 3.17c). Probably the Russian Federation and South Africa will follow with symbols for their currencies. Table 3.1 provides an overview of the currency indications of today's eight major world currencies.

Central banks are monopolists

Central banks are no commercial companies and their currencies, including coins and banknotes, are no commercial products. Further, larger central bank organisations like the Eurosystem and the Federal Reserve System in the USA are no multinationals. In branding terms, central banks are identified as Governmental Organisations (GOs). Together with the Non-Governmental Organisations (NGOs) they are not-for-profit organisations. Central banks are monopolistic and have no meaningful competitors. In this light, central banks are comparable to railway and airport organisations, since they serve all people. The interest for the identity of Governmental Organisations is of later date than the interest in the identity of profit organisations, although there are some exceptions, like the 'GO identity' of the Dutch Post (PTT) in the 1930s. In 2009, Simon Anholt proposed the term 'nation brand' for governmental organisations 'when the product just happens to be a country, a city or a region rather than a bank or a running shoe' [171].

Table 3.2 provides an overview providing an indication of GO's with a similar monopolistic position. Two examples of respectively a nation brand and a city brand are provided in figure 3.18.

Table 3.1

Currency symbol	\$	¥	¥	€	₹	R\$		
Country/area	United States of America	Japan	China	Eurozone	India	Brazil	Russian Federation	South Africa
Currency name	US dollar	Japanese Yen	Chinese Yuan Renminbi	Euro	Indian Rupee	Brazilian Real	Russian Rouble	South African Rand
ISO code	USD	JPY	CNY	EUR	IDR	BRL	RUB	SAR
Design year	< 1785	> 1871	> 1871	1974/1997	2010	> 1880	-	-

Overview of currency indications of eight major currencies.

Table 3.2

Organisation	Category	Example
Profit	Fast Moving Consumer Goods	Coca Cola, Nescafé
	Durable goods	Toyota, Philips, Apple
Non-profit	Non-Governmental Organisations (NGO)	Greenpeace, Oxfam, Red Cross, Solidaridad
	Governmental Organisations (GO)	Central banks, railroads, airports, UN forces, tax offices tourism, municipality

Organisations classified to profit and non-profit. Central banks are non-profit, governmental organisations. In this category there are several other organisations with a rather monopolistic position.

Currency is part of nation brand

The identity of a central bank and its currency corresponds to a nation brand rather than to a product brand. Products contributing to a nation brand are, among others, a flag, a geographical map, a coat of arms, (the portrait of) the head of state and the national coins and banknotes. Banknotes are often referred to as the country’s calling or business card. However, often people are not able to tell from which country a banknote is coming, especially not when the texts are written in unfamiliar characters. What currency units do they represent and what is the value? Not only for foreigners, but also for citizens future banknote designs may be improved on its (international) communication by the use of branding and marketing.

According to the first president of the European Council, Herman van Rompuy, there are at least two aspects of an identity to be taken into account. If people want to contribute to an organisation, this organisation has a positive identity. If people

Figure 3.18



An example of nation and city branding.
a) Spanish tourism logo expressing the national identity of Spain. Based on the sun by the Spanish painter Miró. Around 2000.
b) Identity logo of the city of Amsterdam, reading I Amsterdam. Around 2005.

just want to profit from it, the organisation has a negative identity [189]. How to achieve a positive banknote identity? This is the question which will be answered in this section. Therefore the central bank is seen as the sender, issuing the banknotes, and the public is the receiver.

The identity of a currency may develop along similar lines as followed for the development of commercial consumer products like Coca Cola or Benetton. President Nout Wellink provided, shortly before he retired as president of DNB in 2011, an example: ‘For most people a central bank is an abstraction. People search for a face and arrive at the president. The result is a strong identification of the outward world with the president of the institution.’ [221]. What Wellink describes is that the face of the president of a central bank is an aspect of central bank branding. Reasoning along similar lines will the president of the ECB be ‘the face of the euro’. However, also other elements contribute to the ‘euro brand’ as illustrated in figure 3.19.

Not many central banks are able to provide a description of their banknote identity. A central bank publishing its banknote design policy on their website is the Bank of Thailand. Their design policy is defined by the following keywords [245]:

Figure 3.19



An impression of the ‘euro’ brand. From left to right: the name euro, euro coins, euro currency symbol, euro banknotes, the logo of the European Central Bank (ECB), the President of the ECB (since 2011 Mario Draghi), annual/monthly reports and the (new) building of the ECB.

- Gracefulness,
- Convenience,
- Cultural identity,
- Technical limits,
- Counterfeit deterrence feature.

Unfortunately it does not describe the cultural identity in more specific terms. Central banks seem to struggle with banknote identity as illustrated by the policies of two major banknote printers. Printer Giesecke & DeVrient (G&D) helps their clients to resolve identity issues [257]:

‘If the customer is using G&D’s own designers, they will start by researching the country’s cultural background, and possibly even visit it before drafting the digital layout of the banknote. On the one hand, this ensures that the country’s specific cultural characteristics are included in the design, and on the other, the G&D designers’ mastery of the various technologies ensures that the banknotes are given the maximum degree of counterfeit protection.’

Competitor De La Rue has a similar approach. They help their clients to formulate ideas for their banknote designs by carrying out research into a country and its culture [245]. Customers are offered three basic styles: traditional, modern and progressive. These three classes are subdivided into a total of nine different design variations, explained as follows [176]:

‘Among other issues, you need to consider whether you want a modern geometric or classical border design. Whether you want vibrant colour, or something more subtle. Whether you would prefer a portrait or landscape format, or a combination. And what is your theme: classical portraits, building, nature or something quite different?’

Once a ‘design style’ has been selected, banknote printers may show their clients also catalogues filled with banknote design elements, leaving the client to compose their own design. The banknote designer of the firm will combine the selected elements, avoiding a cut-and-paste look.

Instead of consulting the printer, central banks may consult other central banks with some more experience on banknote identity policies. Recently two European central banks invited DNB for internal sessions on defining banknote identity [167, 168, 184, 185, 186].

Besides the identity issue there is a second issue to be solved. The banknote shown in figure 3.20a may have a strong identity, clearly coming from Antarctica, but is it a banknote? The answer has to be sought in the prototypical design elements.

To design a banknote and not a voucher, a designer would like to know which of the 37 design elements listed in table 2.4 are dominant? What is the top 5? For the euro coins and banknotes DNB researched this matter in 2011 and the top 5 for this currency (as perceived by the Dutch) is presented in subsection 4.3.2. Unlike a coupon or voucher (figure 3.20b), the banknote is therefore also a carrier of the currency's identity. In other words: banknotes have a double identity: they represent the currency and they have to look like a banknote.

3.4.3 Name of the central bank

In branding it is important that people remember a company's name and core business at the right time. For Governmental Organisations like central banks and their banknotes this goal is often not attained, since the issuing authority is seldom clearly displayed on the banknotes and is usually absent on the coins. An example is the cryptic text on the euro banknotes as shown in figure 3.21a. Who will recognise their own language in these cryptic abbreviations of BCE ECB EZB EKT EKP? Only 15 % of the Dutch consider these abbreviations 'European', and no spontaneous comments about these texts were recorded [204]. The abbreviations are explained in table A1.3 of appendix A1. Earlier DNB research also reported a poor spontaneous response to these text elements, see e.g. table 4.3 [114, 115, 126].

Figure 3.20



Voucher or banknote?

- a) One Antarctica dollar, issued in 2007. The notes have such an individual design that they can't be confused with any other currency. The Antarctic dollar does not have the status of real money as Antarctica is not a part of the territory of any country and is not allowed to issue its own currency. The Antarctica dollar is the initiative of a group of enthusiastic US citizens, who established in 1996 the Antarctica Overseas Exchange Office which issued a series of Antarctic dollars. 80 % of profits on sales of Antarctic banknotes are used to fund the research on the sixth continent and 20 % is used for the reimbursement of expenses. Besides commercial profit the aim of the designs is also education, to extend people's knowledge about the Antarctic climate, history and fauna.
- b) The marble background is borrowed from a design of Tim Mine, made in 2009 for the Dollar ReDesign Project'. The typographic smiley :) dates back to 1953. The authorship of the Smiley as a sign or button is credited to Harvey Ball, who drew it in the 1960s. The Quick Response code (QR code) on the note will, when scanned with a mobile telephone, activate the website of the central bank and, for example, inform the public on security features. Design by De Heij in 2011 [213].

Figure 3.21



Indications of the issuing authorities of euro and USD banknotes, respectively.

- a) The full name of the banknote issuing authority of the euro banknotes, i.e. 'European Central Bank', cannot be found on the euro banknotes. Instead, five different abbreviations are given, representing the languages of the countries forming the Eurosystem in 2002.
- b) The full name of the banknote issuing authority of the United States is 'Board of Governors of the Federal Reserve System of Central Banks in the USA' and can also not be found on the dollar banknotes. On the notes is written 'Federal Reserve Note'.

Although no relevant research is available, it would seem that on USD banknotes the issuing authority is more clearly indicated (see figure 3.21b).

The word 'bank' is confusing

Absence of the word 'bank' from the indication of a banknote's issuing authority is, from a corporate identity view, an advantage. The word 'bank' in 'De Nederlandsche Bank' creates confusion in the Dutch public, as established by a recent DNB survey of the perception of the role of DNB in payment systems [223]. Indeed, the words 'central' and 'national' are often used by commercial banks in their name like e.g. National Irish Bank. And the central bank of Germany is not Deutsche Bank, but the Bundesbank. Some illustrative examples are provided in figure 3.22.

Reversed identity

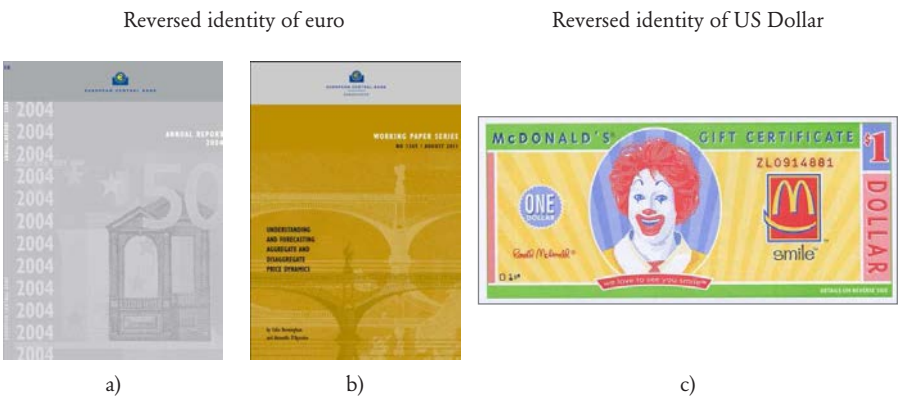
To the general public the banknotes are the best known product of the central bank (although there is no research known to support this statement). This explains why the ECB uses euro banknotes to adorn their annual and other reports (see figure 3.23a and 3.23b). Several bridge elements from the euro banknotes also serve as identity markers on the ECB's website. Such a 'borrowed identity' is called a 'reversed identity'. The US dollar banknotes, and especially the unchanged one dollar banknote, are another example. Having been in circulation for over 80 years, this banknote has become an icon of the USA. This icon is so indestructible, that even after undergoing radical alterations, it will always still be perceived as basically a dollar banknote (figure 3.23c).

Figure 3.22



Some examples of commercial banks whose names suggest they are national or central banks.

Figure 3.23



- Examples of reversed identity using banknotes.
- a) ECB Annual Report 2004, using EUR 50 banknote.
 - b) ECB Working Paper 2011, using EUR 100 banknote.
 - c) McDonald's gift certificate (2005).

3.5 Conclusions on banknote identity

- 3.5.1 A banknote is often an isolated design, not part of the central bank's corporate identity. The banknote however is a strong identity tool and it could be made part of an integrated design policy, including both corporate identity and banknote design.
- 3.5.2 The identity of cash money - coins and banknotes - should be similar, since the public perceives these products as one category of money.
- 3.5.3 The word bank in the name of the central bank often leads to confusion by the general public; Eurosystem is better name than European Central Bank.
- 3.5.4 Identity should be defined not only for the benefit of 'us', but also for that of 'the others'. Therefore banknotes should demonstrate some positive emotions as a sign of self-reflection and being open to others (e.g. humour).

4 Analysing banknote identity

The previous chapter 3 introduced the banknote identity as part of a currency. How may banknote designers use these identity components within a banknote design? To arrive at a theory on designing a banknote identity, this chapter first makes an analysis of two well-known banknote designs:

- 4.1 Identity of Netherlands guilder banknotes
- 4.2 Identity of euro banknotes
- 4.3 Conclusions on banknote identity

4.1 Identity of Netherlands guilder banknotes

Banknote design in the Netherlands developed from the traditional portrait gravure in the 1950s to the slightly caricatural portrait gravure in the 1970s (figure 4.1a). The next step in this development was to abandon using portraits altogether, with the introduction of a bird, a sunflower (figure 4.1b) and a lighthouse (figure 4.1c) [40, 66, 69, 192]. How was such a unique banknote design possible? What were the preconditions and catalysts? These questions will be answered in the first of two subsections:

- 4.1.1 Dutch banknote design
- 4.1.2 Correlation between appreciation and knowledge

4.1.1 Dutch banknote design

When Robert Oxenaar (1929) began to design his first Dutch banknotes in 1965 there was no identity description or a start of a theory on banknote identity available. Oxenaar's later comment in 1987: 'What I did first when I was introduced to the world of banknotes? Well, I tried to get to see all the banknotes in the world. That was easy because the Central Bank of the Netherlands has all the banknotes of the world in its archives.' [30]. Taking existing banknotes as a starting point is a logical start for a new banknote design although often not done. An important year for the development of Dutch banknotes was 1976, with the introduction of a new design policy by DNB to leave the theme for a new banknote to the graphic designer. The reason was the development of an emergency banknote, as will be elaborated on in

Figure 4.1



Three designs by Oxenaar focussing on colour, main image and lay-out.

- a) NLG 10/Frans Hals, issued in 1971. Design: Robert Oxenaar.
- b) NLG 50/Sunflower, issued in 1982. Design: Robert Oxenaar and Hans Kruit
- c) NLG 250/Lighthouse, issued in 1986. Design: Robert Oxenaar and Hans Kruit.

chapter 5, section 5.2 on new or upgrade? This policy of leaving the theme selection and its design to the graphic designer is a policy of high design freedom (level 9) as will be explained in chapter 5, section 5.9 on design freedom. The banknote designs made by Robert Oxenaar for DNB became world famous and were judged as outstanding.

Oxenaar was inspired by Monopoly money, as their value is so easy to recognise [e.g. 23, 29, 66, 218]. The three most characteristic design elements of monopoly money are colour, lay-out and typography (see appendix A1, figure A1.47) . Oxenaar used these design elements and later added a fourth, the main image, to his innovative banknote designs. With the help of Oxenaar DNB formulated a banknote identity description, which read in its last version of 1995 as follows [53, 60, 69, 100]:

‘Banknotes are seen by DNB as an important mirror of Dutch culture. Therefore their design should:

- Reflect a Dutch, or at least not an un-Dutch character,
- Exude some happiness and a degree of humour,
- Express the time we live in (without being trendy or over-progressive),
- Be contemporary,
- Not show living individuals,

- No bias to religion,
- Be dignified,
- Be dynamic (as opposed to static),
- Be representative of its value.'

The Dutch people highly appreciated the guilder note designs, giving the highest credits in 1991 to the NLG 250/Lighthouse (91 % beautiful) [e.g. 156]. The notes were also celebrated in museums of modern art, for example the exhibition 'Holland in Vorm' in the Amsterdam Stedelijk Museum in 1987 [29]. Patrick Gramsie selected the Oxenaar designs in 2010 to be included in his compendium entitled 'The Story of Graphic Design' [195].

Value recognition as a design driver

Inspired by the success of Oxenaar's banknote designs, new Dutch designers looked in the 1980s for innovative approaches to both coin and banknote design. The designer Bruno Ninaber van Eyben (1950) used the Dutch guilder coin denomination structure for his winning proposal for a new guilder coin design in 1982 (figure 4.2a). Discussions in the Dutch parliament on the design of the coins were concluded with 'no plebiscite on design' [15].

Jaap Drupsteen (1942) also participated in this design contest for new guilder banknotes in the early 1980s [18] and in 1986 he was invited to join the contest for a banknote design. Believing that Oxenaar's designs could not be improved upon, Drupsteen searched for a new concept and opted, just as Ninaber van Eyben, for the currency denomination structure as motive, adding the main colour of the denominations as a second theme (figure 4.2b). Peaking at 85 % beautiful in 1997 for the NLG 1,000/Lapwing the innovative Drupsteen banknotes won high appreciation scores from the Dutch public too, although not as high as the Oxenaar notes [79, 150, 151, 152].

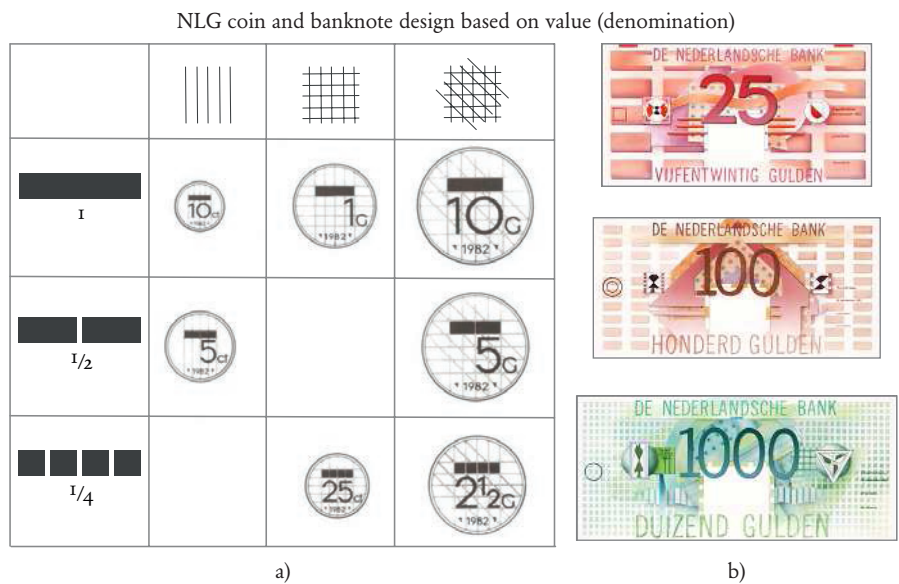
To conclude, both new Dutch currency designers, Ninaber van Eyben and Drupsteen, found 'value recognition' as driver for their new designs.

According to Drupsteen a banknote does not need a main image such as a portrait, lighthouse or sunflower. Instead of searching for identity images such as statues, bridges or portraits, banknotes may receive their identity from their functionality: value recognition, portability and a security check [e.g. 72]. These topics will be reported on in chapter 5, section 5.1 on a user-oriented banknote design policy. A (small) image though may contribute to the main functions and may strengthen the emotional attachment. An example of this philosophy is the watermark of the NLG 100/Little Owl as shown in figure 4.3 providing the note both security and identity.

4.1.2 Correlation between appreciation and knowledge

One may say, fine such highly appreciated banknotes, but what matters more is the banknote's authenticity. However, there is some evidence that banknotes with a higher aesthetic quality will contribute more to the public knowledge of authenticity

Figure 4.2



- Dutch cash money designed in the 1980s is based on the theme ‘value recognition’.
- a) Design proposal by Bruno Ninaber van Eyben for a new series of guilder coins. The unit of account, one guilder, is represented by one full bar. Referring to the traditional Dutch system of halving and redoubling, this bar is divided by two for the half unit and by four for the quarter unit. A second graphic design principle was added to support the distinction between lower and higher denominations: a square formed by five vertical parallel lines of equal length marked the low denominations; a similar square crossed at right angles by five horizontal parallel lines of equal length marked the medium denominations, and the latter square diagonally crossed by another set of five parallel lines of equal length marked the high denominations. Finally, true to tradition, Ninaber used ‘2½’ on the ‘Rijksdaalder’ instead of ‘2.5’ following the Dutch tradition of dividing and multiplying currency units [18, 35, 240].
 - b) Design proposal by Jaap Drupsteen for a new series of guilder banknotes (1987). The unit of account is represented by a grid of 25, 100 or 1,000 units, representing respectively 25, 100 or 1,000 guilders.

Figure 4.3

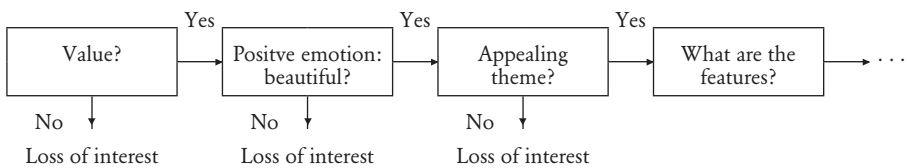


Innovative ‘little owl’ watermark as used in NLG 100 /Little Owl, issued by DNB in 1992. Its development was based on detailed watermark requirements in the Programme of Requirements. Design by Jaap Drupsteen.

or security features. In general people will only be interested in information on the security features of banknotes when this is useful for them. Since there are usually no counterfeits of the new note, people will not beforehand be interested in the security features. Central banks however would like to get attention for the new banknote and especially for the public security features. When seeing a new banknote for the first time, people usually instantly comment on its aesthetic qualities, they find the note beautiful or ugly. In fact this is a (passive) emotional reaction formed in less than a few seconds. Instead central banks would like to come to a more active attitude and would like to arouse people's interest in the new note's security features. To get public interest - without any probability of receiving a counterfeited note - takes at least four distinctive steps as provided in figure 4.4. When the security features are part of an appealing theme and well designed, people may become interested in these features. However, in most cases the public security features do not fulfil the user requirements. Public security features are in general hard to find, rather small, unclear in their use and show a boring design [192]. Banknotes that engage people's interest will most likely trigger attention to the security features. Some proof for this statement is the correlation found between appreciation and knowledge, as first established in 1983 by DNB. In short: the more people appreciate a banknote, the more image and text elements they recall, including security features (see figure 4.5).

There are a number of statistical methods to test whether correlations are statistically significant. Three tests were selected and applied on the NLG 100/Snipe: the chi square test, Kendall's tau c test and regression analysis. The outcome of course applies only to this banknote and its security features and the prior knowledge the public had of these features. The three tests were applied to six different combinations of 'knowledge and appreciation' data from the 1983 DNB poll, yielding a total of 18 test results (6 combinations x 3 test methods). In 16 tests a significant correlation was found; in only two tests was the correlation found non-significant. In 1985 the same tests were repeated using the 1985 survey. This time the correlation between

Figure 4.4



Typical decision diagram of people's first interest in a banknote's security features. The first reactions to a new banknote will be is it valuable, is it a banknote? Secondly the new design instantly has to trigger a positive emotion be perceived, e.g. judged as beautiful, or otherwise people lose interest.

Figure 4.5

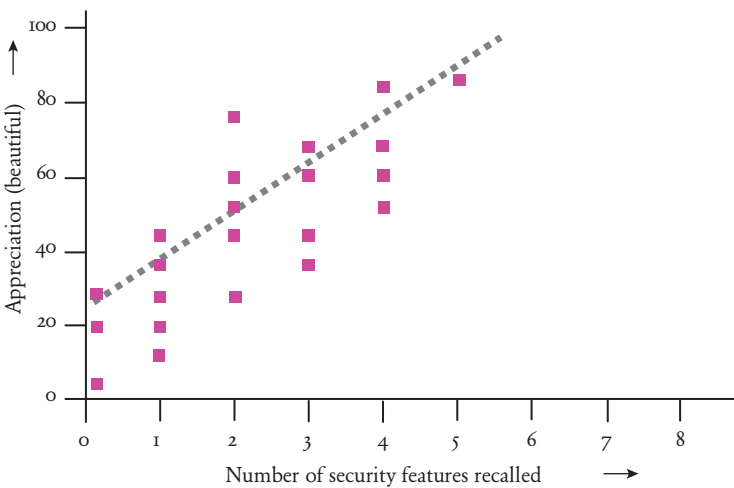


Illustration of the correlation between the appreciation of a banknote and the number of security features recalled. The more people like the look of a banknote, the more they remember about it. No real data.

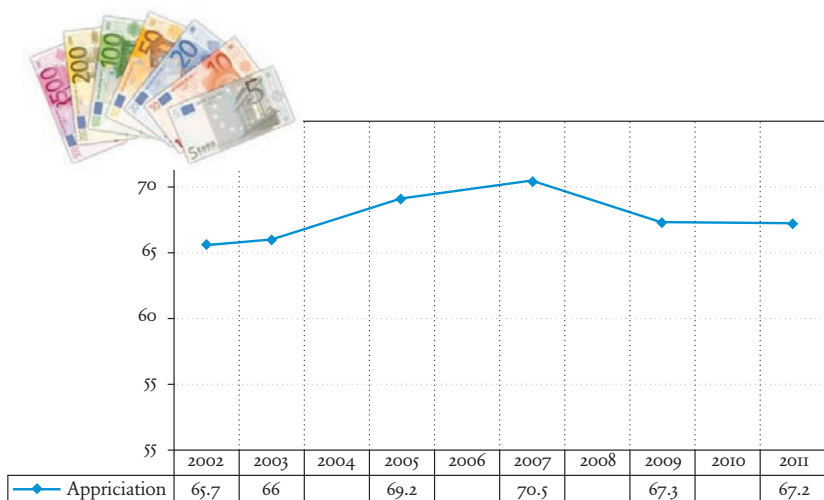
knowledge and appreciation was less clear; only seven out of 18 test conducted failed to show a significant correlation [21, 22].

This research made it clear that the public appreciation for the banknotes is relevant for the public knowledge of security features.

Collecting feedback on previous banknote designs is seen as essential input for future designs. Every other year since 1983, DNB has commissioned an opinion poll on banknotes, first on the guilder notes (NLG) and from 2002 and onwards on the euro notes. DNB has reported frequently on these biennial surveys [e.g. 69, 79, 143, 163, 179, 192, 255]. The correlation between knowledge and appreciation as found for the guilder banknotes seems to be also true for the euro banknotes. Both, appreciation and knowledge turned out to be quite stable since their introduction in 2002. While the Dutch appreciation for euro banknotes has gone up somewhat it seems to stabilise at around 70% ‘beautiful’ for the complete series (figure 4.6). In 2002 the Dutch recalled on average 2.3 security feature and in 2011 this turned out to be the same figure of 2.3. Inbetween 2002 and 2011 this score showed some deviations with a lowest score of 1.9 in 2007 and a highest score of 2.5 features in 2009, providing some more evidence for the statements made above on a correlation between appreciation and knowledge [192].

To conclude, central banks are recommended to develop appealing banknotes, since such designs will increase the public’s awareness of banknote security features.

Figure 4.6



Appreciation for the euro banknote series in the Netherlands over the years 2002-2011.

Apart from this useful feedback on the banknote designs issued, such time series demonstrate that a central bank respects its customers and is interested in their opinions. Furthermore, it also makes banknote management as part of a central bank's remit transparent to the public. The biennial opinion polls provided DNB with unique time series on the public's [143, 204]:

- Knowledge of security features (average 2.3 in 2011),
- Inability to recall a single security feature (11 % in 2011),
- Trust in banknotes (7.3 in 2011, see also subsection 1.2.2 on confidence),
- Perception of the quality of the notes in circulation (85 % 'clean' for the whole series, 2011).

By providing this kind of marketing figures in addition to figures on counterfeit notes, a central bank may enhance its reputation as a banknote circulation guardian.

Are all banknotes equally beautiful or ugly?

The previous item has discussed the correlation between banknote appreciation and knowledge of security features. Next question is, does the public perceive any differences between the aesthetic qualities of banknotes? Are banknotes not equally beautiful or ugly? The answer to this question is clearly that the public does discriminate between ugly and nice notes. Over the measuring period 1981-2011 DNB has found the following extremes:

- The highest score is 91 % beautiful for the NLG 250/Lighthouse, measured in 1999,
- The lowest score is 41 % beautiful for the EUR 5/Classic period, measured in 2011.

There has also been some research to compare these scores with other currencies, like the US and Canadian dollar. Figure 4.7 presents an overview.

4.2 Analysing European identity

The identity of the euro banknotes is reported in this section, including the effect it had on the Dutch. Research by DNB in 2011 measured the perceived identity of both the euro coins and the euro banknotes. These two topics are part of this section, but first, to have a better understanding of the identity policy of the euro banknotes, an introduction on the overlaying European identity is provided:

4.2.1 European identity

4.2.2 Identity of euro banknotes

4.2.3 Measuring European identity in the Netherlands (DNB research 2011)

4.2.1 European identity

Nations express their collective identity in their own unique way, demonstrating allegiance to national symbols and historical myths. Totem poles among others are

Figure 4.7



Graph showing the 'beautiful score' of four banknotes. The lowest score ever is found in 2011 for the EUR 5 (41 % 'beautiful' and 59 % 'ugly') and the highest score ever was recorded in 1999 for the NLG 250/ Lighthouse (91 % 'beautiful') [143, 204].

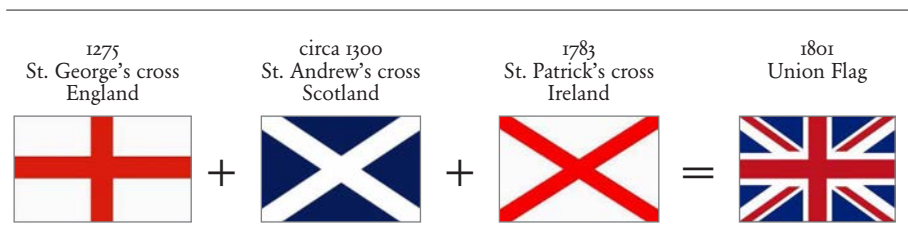
the first examples expressing people's need to belong to a group, something that pervades all times and cultures. There are many examples of religious totems, like the crucifix and the Star of David. The European medieval banners and shields of knights are other early expressions of a collective identity. Flags became national symbols towards the end of the 18th century; one of the first was the flag of the French revolution which became the national flag of France in 1789. Before, flags were used on battlefields, including ships under sail, to distinguish between battling forces and to impress. Until the Napoleonic era (1804-1815), conquering banners was of more importance than capturing guns.

A fine example of a national flag from an identity point of view is the national flag of the United Kingdom, which combines the national colours of three former kingdoms to form the Union Jack (see figure 4.8).

Personification of the nation

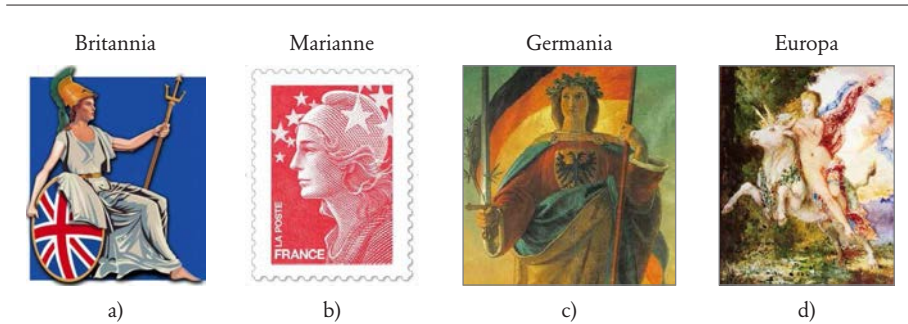
The development of the identity of nation states in the 18th century was further supported with symbols of fictitious persons like Britannia (England), Marianne (France) or Germania (Germany) as shown in figure 4.9. Like many proto-national figures, Europa was the name of a woman. The idea of Europe or Europa had little meaning for the Ancients. Long before it became even a geographical expression the idea of Europe belonged more to the realm of myth than of science and politics. It were the Romanticists of the 19th century who displayed the myth Europa so often as symbol of Europa (figure 4.9d). The Romanticists advocated the purified ancient Greece as the cultural roots of Europe that bore no recognition of its roots in the Orient. Many sculptures and paintings of Europa made in the 19th century found inspiration in the Greek myths and it is from these days that people believe that Europe's name is coming from the Greek myth Europa [50] (see also appendix A10 on visual identity of Europe).

Figure 4.8



The national flag of the United Kingdom is the Union Flag or Union Jack. From 1606 to 1801 there was a compound flag based on the flags of England and Scotland. In 1801, the Irish flag was added. The flag is an inventive design; it is made up of the individual flags of three of the kingdom's countries: England, Scotland and Ireland. Since 1921, only Northern Ireland has been part of the United Kingdom. Not being a kingdom but a principality, Wales could not be included on the flag.

Figure 4.9



Personification of the nation by a woman.

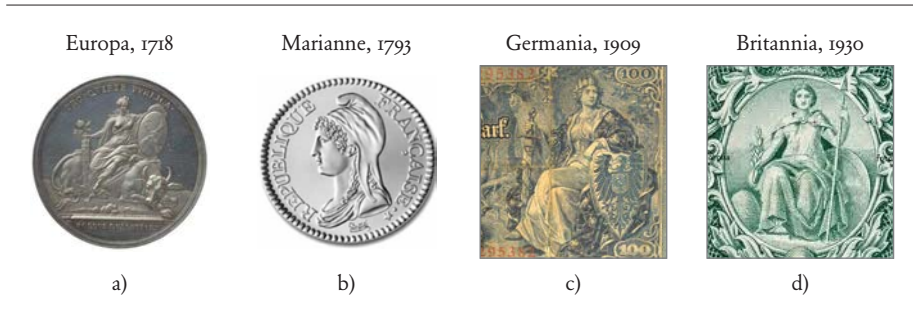
- a) Britannia first appears on copper coins minted under the Roman Emperor Hadrian (reign AD 117-138), who visited Britain in AD 122 and ordered the building of the famous Hadrian wall. Britannia, the personification of the island of Britain, wears a Roman classic tunica and a plumed helmet. In her left hand she holds a trident to symbolize Britain's hegemony over three oceans, and in her right hand she holds a shield (or, on some images, an olive branch).
- b) Marianne first appears in 1793, on a coin of the French republic. Marianne is a young woman symbolizing the French revolution and its values: liberty, equality and fraternity. Her face changes over the years. The stamp shown is known as 'Marianne and Europe' (design by Yves Beaujard).
- c) Germania was created during the German turbulences of 1848. To mark the first meeting of the German National Assembly in St. Paul's Church in Frankfurt, Germania was painted by Philipp Veit (1793-1877).
- d) Painting 'Europa and the Bull' (1869) by Gustav Moreau (1826 -1898).

The first national hymns were also composed in the 18th century, the very first one probably being the British hymn 'Land of Hope and Glory' (1740).

The symbol of Europa is used on a medallion issued by Austria in 1718 (figure 4.10a) and could be the first sample of depicting Europa on an artefact like a medallion or coin. The symbols of Britannia, Marianne and Germania have all been used on both coins and banknotes. The United Kingdom and France have a long tradition in showing these symbols on their coins; Britannia has featured on British coins since 1672 and on banknotes since 1694, while Marianne has graced French coins since 1793 (figure 4.10b). Germania, the equivalent German national symbol, is used on a German banknote in 1909 (figure 4.10c). Uncle Sam is a well-known national symbol for the USA and belongs also to this family, although never used on banknotes.

Animals are also used as symbols for nation states, like the Russian bear and the American eagle. Plants and building are national symbols too, like the cherry blossom in Japan, the Eiffel tower in France and both the Statue of Liberty and the White House in the USA.

Figure 4.10



Examples of the use of female symbols on British, French and German coins and banknotes.

- a) Austrian silver medallion dated 1718 with Europa. Europa sits on bull (Jupiter) holding a sword and a shield on which four shaking hands. The head text reads 'PRO QVIETE PUBLICA', or 'Peace in Public Interest'. The reverse shows emperor Carolus VI of Austria (1685-1740). The medallion was made on the occasion of the Quadruple Alliance formed in 1718-1719 between Great Britain, France, the Dutch Republic and Austria. The engraver is Richter or Routtiers.
- b) Marianne has continuously adorned French coins since 1793. Marianne also appears on the national side of the French euro coins.
- c) Germania on a 100 Reichsmark banknote issued in 1909.
- d) The image of Britannia has featured on several British banknotes. Shown is a detail of a GBP 1 banknote issued in 1930. Britannia has continuously marked British coins since 1672, such as on the reverse of this one penny coin issued in 1806. In her right hand Britannia holds an olive branch. The shield shows the crosses of Saint George and Saint Andrew.

European identity after 1945

Since their beginning in 1949 the Council of Europe (CoE) has been building on European identity, which should start with turning a new page, with the European cooperation. European identity should therefore not have any bias to any of the European countries. These discussions in the early 1950s also touched upon the Greek myth about Europa. However, the Council's aim for a clean sheet excluded any reference to imperial eras like the Roman, Carolingian or Ottomans Empire and also excluded ancient myths (see also appendix A10 on visual identity of Europe). For a similar reason it was discussed in 2011, that the idea for a European Historical Museum should start its story in 1945.

European nations have national symbols, but unlike the USA, Europe does not have such strong supranational symbols. The European Union (EU) is not a state and has no government. Instead of the latter, the European Council is the EU's supreme decision-making body. It is confusing, the European Council and the Council of Europe are two different gremia as explained in appendix A9 on the Eurosystem within European organisations. It was believed that a European identity did not exist and had to be created. Predecessors of the European Council have worked on forging one since 1949 and made the desired identity public in 1973 [9]. Although its membership numbered no more than 6 out of the approximately

50 European countries at the time, the EU claimed the European identity. Today, this European identity may be summarised as follows [226]:

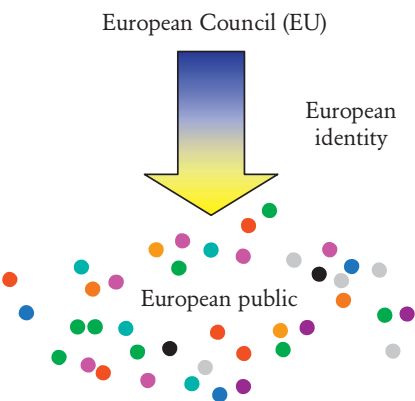
- Forward-looking, without referring to Greek mythology, Charles V or wars.
- Based on humanism as embodied by freedom, equality, legal security and respect.
- Solidarity between the Member States,
- Cultural diversity.

Top-down approach

The building of a European identity is criticised by many authors as an idea of the European elite. Further criticism concerns the top-down approach (see figure 4.11). The basic idea behind it is assimilation; listening and watching for decades to European messages will automatically create a European feel to citizens of the EU. At least two authors noticed and criticised the top-down approach. Gerard Delanty in his publication ‘Inventing Europe’ formulates it as follows: ‘The idea of Europe was mostly derived from ‘above’ and not from ‘below’ in concrete forms of life and political struggles.’ [50]. The other author is Cris Shore, writing on the cover of his ‘Building Europe’ [70]:

‘Building Europe details the attempts of EU elites to use culture as a tool for forging a sense of cohesion and belonging among Europeans - from invented Euro-symbols and statistics to European citizenship and the single currency. (...) The author asks whether, in the absence of a popular European consciousness, the EU's supranational ideal can ever lead to a ‘people’s Europe’.’

Figure 4.11



Top-down approach to European identity.

First European products

One of the first European products was an international signposting system, an E-roadwork using the typical green signs, e.g. E 233 (see figure 4.12). This roadwork was developed in 1950 by the United Nations and not by a European organisation. One of the first totems developed for Europe was a European flag; a Council of Europe initiative adopted in 1955 (see appendix A10, section A10.1 for the design history of the flag) [8]. One year later, in 1956, all 6 countries of the European Coal and Steel Community (ECSC), a forerunner of the EU, issued a similar stamp. The stamp shows a tower composed of the 6 letters forming the word EUROPA. Europe is clearly under construction, representing the letters in scaffolding (figure 4.13). One may ask, which design elements do all these European products have in common? The blue and yellow colours and the ring of star seems to two of such elements, but as far as known, no study has been done on this subject.

Figure 4.12



A limited overview of products issued by the European Union.

From left to right, row by row:

- European flag (1955), international E-roadwork (1950, by United Nations), EU border sign France (2004),
- European passport (NL, model 2007), Romanian driving licence (2007), euro coin (2002),
- Vehicle license plate in the Netherlands (2010), euro currency logo (1974), euro banknote (2002).

Figure 4.13



First Europe-themed stamp series issued simultaneously in all six countries of the ECSC in 1956 (designer Daniel Gonzague, France). Until 1973, the annual Europe-themed stamp series design was the same for all countries. In 1974, a new theme of the year was proposed and each country was free to choose its own design provided that it reflected the new theme.

Building a European identity: top-down approach

In general the policy of building a European identity is indeed a top-down approach, but as far as known there have not been any attempts to force a European identity. The opposite seems to be the case, since the European Union makes quite an effort to find out how Europeans adapt to a European identity. Such in-depth research is subject of the ‘EuroIdentities’ project. This project runs over the years 2007-2013 and will report on how Europeans ‘process European identity’. The aim is to gain insights into the evolution and meanings of a European identity or identities from the bottom up perspective. The project aims for a holistic understanding of people’s own perspective on ‘Europe’ and the process of identity formation and transformation over their life course. Factors that promote or retard a positive identification with ‘Europe’ and the European Community are included [199].

The results of building a European identity by all these European products like a passport (1995), driver’s license (1998) and euro banknotes (2002) is limited. The European Commission was of course interested in this (top down) effect, especially concerning the introduction of the euro. In 2009 they raised the following question: Has the euro contributed to a stronger European identity? The answer to this question is ‘no’; the euro has not made consumers feel as European as had been hoped. About 22 % of the people living in the eurozone feel more European with the euro; for the vast majority (77 %), however, nothing has changed. Over the years 2007-2010 these figures are remarkably stable as shown in table 4.1 [193]. Although the euro currency is seen as utterly European, to the Dutch, the Eiffel tower is still the most European object, according to the results of DNB’s 2011 study as will be reported on in the coming subsection 4.3.2. Remarkable, since this tower has nothing to do with the EU.

Table 4.1

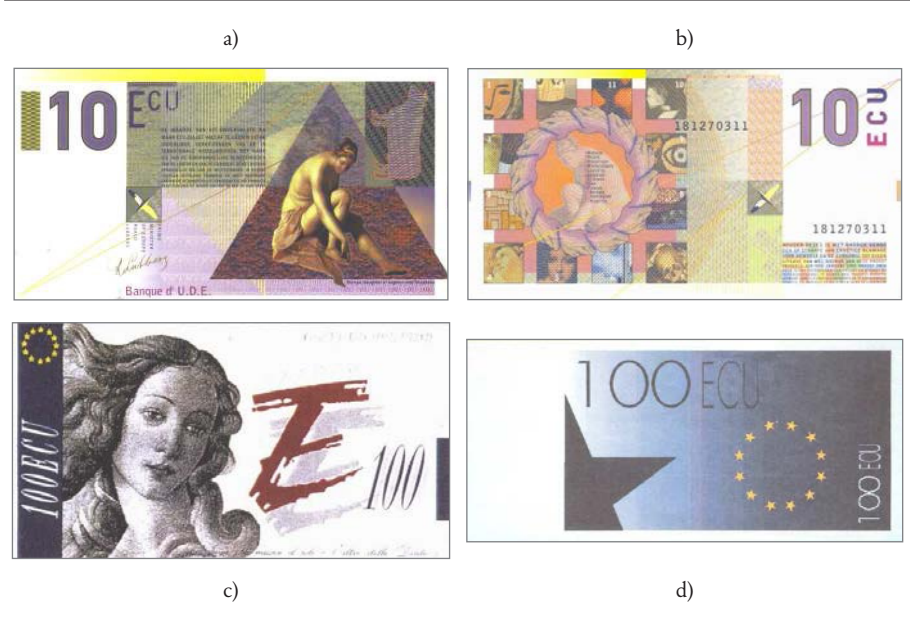
	■ Yes, more European	■ Nothing has changed	□ DK/NA
09/2010 (EU16)	22	77	1
09/2009 (EU16)	23	76	1
09/2008 (EU 15)	22	77	1
09/2007 (EU 13)	22	77	1

Outcome of answers to the question: Does the euro make you personally feel more European than before or would you say that your feeling of being European has not changed?

Euro banknote designs: bottom-up approach

When in 1992 the Maastricht Treaty was signed and it was decided to introduce the single currency, designers all over Europe presented proposals. An example in the Netherlands was the euro banknote proposed by Proost and Brand as shown in figure 4.14a. Several other Dutch private initiatives were reported in 1996 in DNB’s

Figure 4.14



- Future ecu banknote designs made by private persons around the year 1993.
- a) 10 ecu banknote, ordered by the Dutch Proost & Brand and used for promotional reasons. The banknote displays Europa and the bull (1993).
 - b) Reverse of a), showing 12 details of well-known paintings from 12 different countries.
 - c) Selected design for 100 ecu, The Graphic ECU Competition, designer unknown (1993).
 - d) Winning design of The Graphic ECU Competition, designed by Codina & Fontanals (1993).

magazine 'De Florijn' [51]. See also the first euro coin minted in 1971 in figure A1.1 in appendix A1.

In France, gallery manager Sylvia Bourdon started already in 1985 with the organisation of a coin and banknote design competition open to professional designers, named 'The Graphic ECU Competition'. French politicians supported the project and granted it modestly. Bourdon collected over 1,000 proposals and in 1993 a jury, including well-known designers like Wally Ollins and Philippe Starck, made a selection of 10 coins and 10 banknotes (figure 4.14c). The European Parliament supported the proposals and the designs were published in magazines and also a placard was made. About 27 million magazine readers could vote for their favourite coin and banknote. By December 1993, about 60,000 respondents had cast their vote. The winner was the Spanish agency Codina & Fontanals with a rather abstract design, including not much more than a part of a five-pointed star and the ring of stars (figure 4.14d). However, once the outcome was there, these designs were ignored by the authorities, including the European Monetary Institute (EMI), forerunner of the ECB.

4.2.2 Identity of euro banknotes

The previous section has outlined the ideas on a European identity at the time when the euro currency design process took off in 1996. Before, two themes were developed to provide the new euro banknotes with a European identity:

- 1) Use known European identity symbols,
- 2) Brand new, original creation which would become the new symbol of (the new) Europe.

As will be elaborated on in this subsection, the outcome of the euro banknote design process is a mixture of both concepts, with a bias to known European symbols.

Theme selection and design euro banknotes (1994-1996)

The EMI installed in 1994 the 'Theme Selection Advisory Group', which reported in 1995 on 'The Selection of a Theme for the European Banknote Series'. In all, the Group considered 18 themes, of which the following 3 were selected:

- 1) Ages and Styles of Europe (portraits of ordinary men and women on one side and architectural styles on the other side),
- 2) Heritage of Europe (portraits of famous men and women from the past on one side and a mix of related achievements (e.g. music, painting, science, architecture, literature, medicine, education) on the other side of the note),
- 3) Abstract and Security (high degree of design flexibility in order to facilitate the harmonious incorporation of authenticity features).

The Advisory Group also suggested incorporating the European flag as a universally accepted symbol of Europe. However, the Group did not report on the available views on a European identity as developed by the European Union and its forerunners. If this would have been part of their study, they would have found

that the proposed European identity should be to look to the future and not to look back, like the proposed theme Heritage of Europe does. However, because of its (possible) bias to one or the other nation, this theme was not approved by the EMI-council and the two other themes became both part of the 1996 Design Brief. The design project of the euro banknotes started in 1996 with an identity description [86, 140] that stipulated that the euro banknotes should:

- Be visually attractive,
- Be clearly identifiable as European,
- Embody a cultural and political message acceptable to all Europeans.

This description does not say what should be understood by European. The basic idea was to create a euro banknote by organising a large design contest with public input, following the adage: Design for Europeans, by Europeans. Proposals were prepared by 29 designers, divided into the two categories proposed by the Advisory Group: 'Ages and Styles of Europe' and 'Abstract/modern'. Several designers competed in both categories, which resulted in a total of 44 entries. Of these, 10 were selected and presented to the European public, who were requested to make a selection. The outcome was that the preference of the general public differed from that of the professional jury. Both professionals and the public however ranked the designs of the Austrian banknote designer Robert Kalina (1955) in second place. Based on this outcome, the Governing Council of the EMI selected the design proposal of Kalina [86, 126]. Kalina on his design approach in 2011 [248]:

'The ideas to my designs are based on an intuitive mix of intellectual and emotional processes. I draw from mental images that arise in response to a variety of influences and experiences. Reading, photography and artistic work constitute an important source of inspiration. I live with my eyes open in a world of visual stimuli and perceive everything as images.'

The bridges on the reverse sides of the notes are recalled more often as being the theme of the euro banknotes than the windows and gates on the front. However, the recall of these two main images on the euro banknotes is low for both, less than 10 % since their issue in 2002. Over the years both scores are on the decline, in 2009 the bridge on the euro 50 is only recalled by 5 % of the Dutch (2002: 9 %) [143, 162]. In another DNB study it was proven that the main images on the front may be switched between denominations without being noticed, as illustrated in figure 4.15 [192]. The main images on the euro are therefore not seen as prototypical design elements of the euro banknotes [e.g. 126].

Kalina understands why the bridges may be perceived as symbolically significant: 'The idea of 'building bridges' between nations and cultures is a common metaphor in many languages and cultures so it works well.' [248].

Figure 4.15



One of these four euro banknotes is correct, three are non-existing. Can you point out the right one? Images on the euro banknotes may be switched without being noticed by consumers.

Architectural themes on euro scores

The conclusion is that it was left to the graphic designers and the public to make proposals for the European identity. The ECB was satisfied with the outcome of the 1996 design contest, as phrased in 2004 by president Trichet [93]:

‘It is no coincidence that the Governing Council of the European Central Bank chose the theme of European architectural styles to illustrate the banknotes of our single currency, the euro. (...) These architectural styles were born in very different areas of Europe, and demonstrate Europe’s cultural richness. They also provide a powerful illustration of this unique concept of unity within diversity, which is the central trait of our continent. (...) We embrace this enriching diversity, which forms an integral part of our identity.’

In 1996, the European motto ‘united in diversity’ as mentioned by Trichet had not yet been adapted; it was approved in the year 2000 (see appendix A10, section A10.3 on European motto). Coincidence or not, this slogan closely resembles the South Africans motto: ‘diverse people unite’, which was also adopted in the year 2000. The Dutch were also satisfied with the euro banknotes, given the 65.7% who ranked the series as ‘beautiful’ (figure 4.6), according to the method applied by DNB since

1981 [143]. As reported, the former Dutch guilders received significantly higher scores, with a peak at 79.8% 'beautiful' in 1999 [63], although not every Dutchman was content [e.g. 56].

Early decision on euro upgrade policy

Let us have a closer look to the upgrade design policy of the European Central Bank. The first concern of the ECB after the issuance of the euro banknotes in 2002 was to develop an emergency note response and no time was spent on a design and communication analysis of the first series. While for the first euro banknote series (ES1) a theme advisory group was established, for the second series (ES2) not much preparatory work was done from a design and communication point of view. One of the analysis done concerns the message of a 'European banknote', according to the information leaflets of the ECB delivered by four typical European design elements:

- 1) The 12-star flag of the European Union,
- 2) Name of the currency EURO in both the Latin and Greek alphabets,
- 3) Initials of the European Central Bank in five linguistic variants,
- 4) Map of Europe.

As said, the ECB was content with the first series of euro banknotes and decided already in 2003, one year after the issuance of the first euro banknotes to '... base the artistic design for the euro second series banknotes (ES2) on the current design concept, using the main design features, but allowing changes to ensure proper integration of new security features ...'. In its Annual Report for 2003, this was announced as follows: 'The design of the second series will be based on the 'ages and styles' theme of the current series in order to signal continuity.' In subsequent years the ECB reconfirmed several times that the ES2 will remain close to that of the current series, stating in its 2009 Annual Report, for example: 'The design (...) will retain the most important design elements from the first series of banknotes. Thus, although certain design elements will be adjusted, the second series of euro banknotes will still be closely related to the first series.'

The ECB did not invest in a thorough design and communication analysis and DNB tried to fill this gap as far as the Dutch are involved. The study on the recollection and switching of the main images has been reported on, just as on the periodic research to the appreciation and knowledge of the euro banknotes. Main criticism on the euro banknotes is that there is no sign of life on the notes, giving people the illusion that Europe is not about people, but about money (the word euro is written frequently on the note). No living beings will also affect the emotinol perception of the notes, which was subject of research by DNB in 2005. The outcome was that the euro notes do not evoke strong emotions, neither negative nor positive ; the notes are found emotionally flat. To improve TNS NIPO recommended alterations

in future designs to avoid boredom. If future euro banknotes should have a higher emotional appeal, desire, boredom and contempt are the emotional aspects most in need of improvement. Appealing colours and pictures can make the euro banknotes more attractive and less dull. DNB also researched other design aspects of the ES1, like the optimal banknote sizes, the split between low and high denominations, communication theme and others [115, 126, 169, 192]. This study continues the design analysis of the euro banknotes on aspects of banknote identity.

Questions on identity of euro banknotes

For the development of a second series of euro banknotes there are two relevant questions to be answered before the design process may start:

- 1) Which elements of the euro banknotes contribute to a European identity?
- 2) Which design elements of the euro banknotes are prototypical and should return in the second series to signal the desired continuity?

Do the Dutch agree with these four typical European design elements? The following subsection will answer this question.

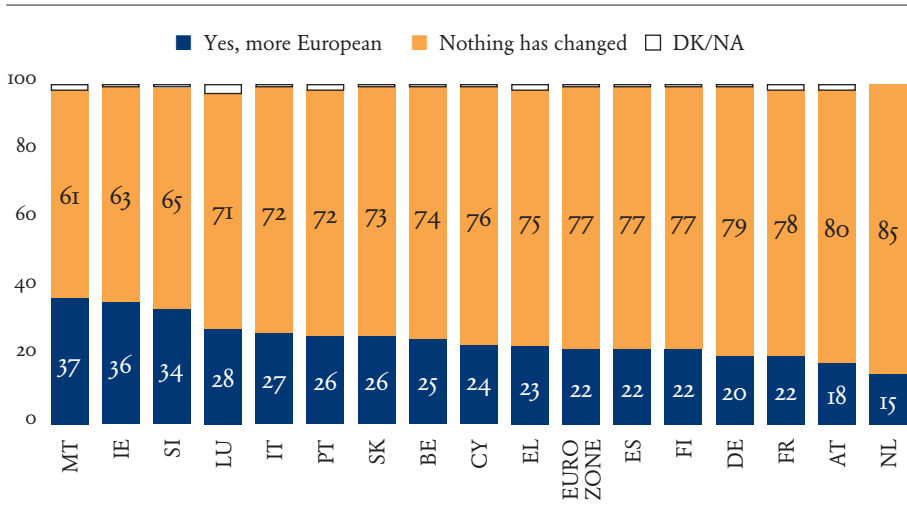
4.2.3 Measuring European identity in the Netherlands (DNB research 2011)

Although the Dutch were satisfied with the design of the euro banknotes, they are hardly influenced by the introduction of the euro as measured in 2009: only about 15% of the Dutch people feel more European with the euro. This is the lowest score in the Eurozone as shown by table 4.2. According to this survey the introduction of the euro on Malta in 2008 made 37 % of the Maltese feel more European, the highest reported score [204]. The extreme score for the Netherlands prompted DNB to find out more about the Dutch sense of European identity by way of a survey conducted in February 2011 [204, 213, 226, 227, 258]. The basic questions were: What is actually typically European about euro cash money and what could be improved? The results are reported in the following and the questions asked are listed in appendix A8.

First, the research done confirms the above-mentioned research by the EU Commission. About 70 % of the Dutch respondents gave no positive answer to the question regarding their European feeling. A negative answer - no, I do not feel European - was given by 17 %, while many of the respondents below age 55 indicated they were indifferent (47%).

Before coming to questions on euro coins and banknotes, the respondents were asked with which countries Europe has the strongest ties. According to respondents Europe has the strongest ties to the USA (69 %), with respectively Turkey (8 %) and Russia (6 %) following in a very distant second position. One in five people are unable to answer. Respondents who feel (almost) completely European are more likely to mention Turkey (13 %), Russia (10 %) and Morocco (4 %) than respondents who feel less European.

Table 4.2



DK/NA = Don't Know/No Answer

Outcome of answers to the question: Does the euro make you personally feel more European than before or would you say that your feeling of being European has not changed? This question was asked in September 2009 in the 16 countries forming the Eurozone.

Before the outcome of the 2011 research was reported by the research institute, DNB already had an idea from the biannual public opinion polls of what would be - according to the Dutch - the prototypical design elements of the euro. The most likely prototypical design elements to bet on, following the results of DNB's biennial 2009 poll on banknotes as presented in table 4.3, would be the banknote colours and the word euro.

Currency name euro well chosen

The outcome is not the colour, but the word euro. The word euro is with a score of respectively 86 % and 85 % seen as the prototypical design element of both the euro coins and banknotes (table 4.4, columns with coin/banknote). With one remark though, spontaneously the word euro is not often mentioned - respectively 7 % for the coins and 4 % for the notes - and are the banknote colours better recalled (11 %, table 4.4, column spontaneous). Using table 4.4 a top 5 of prototypical design elements of both the euro coins and euro banknotes is constructed in table 4.6 and now the reported opinion of the ECB on typical European elements of the euro banknotes may be compared with the perception of the Dutch. There is agreement on two of these four elements; the map of Europe and the name of the currency. For the Dutch, the two other elements, i.e. the name of the currency in the Greek alphabet and the initials of the European Central Bank (ECB BCE EZB EKT EKP), do not contribute to a European identity.

Table 4.3

Picture elements euro 50 recalled by the public by heart	2009	Text elements euro 50 recalled by the public by heart	2009
1. Orange, orange shades	41 %	1. Figure 50/the number 50	86 %
2. Other colours	38 %	2. Word EURO	35 %
3. Brown, brown shades	29 %	3. Banknote number(s)	19 %
4. (part of) building/historical building	11 %	4. Euro in Greek, ΕΥΡΩ	7 %
5. Hologram/foil	10 %	5. BCE ECB EZB EKT EKP	6 %
6. Watermark/gate in watermark	7 %	6. Signature	5 %
7. Bridge	5 %	7. Currency symbol €	4 %

Overview of picture and text elements of the EUR 50 banknote as mentioned most frequently from memory collection by Dutch respondents in 2009. The numerals and the colours are by far the features best recalled, useful information to both central bank and designer for future banknote designs [162].

Table 4.4

Prototypical elements euro cash money	Euro coins		Euro banknotes	
	Spontaneous	With 1 euro coin	Spontaneous	With euro 50 banknote
Map of Europe	24 %	85 %	13 %	85 %
Image of buildings, church, window	-	-	13 %	30 %
National side	19 %	63 %	-	-
Images within Europe (e.g. buildings)	13 %	-	13 %	-
Colour	-	-	11 %	30 %
European flag	13 %	-	7 %	69 %
Famous Europeans	9 %	-	-	-
European symbols (e.g. ring of stars)	8 %	-	4 %	47 %
Currency symbol €	8 %	74 %	-	73 %
Word euro	7 %	86 %	4 %	85 %
Common side	4 %	78 %	-	-
God be with us (God Zij Met Ons)	-	24 %	-	-
Euro in Greek	-	15 %	-	17 %
BCE ECB EZB EKT EKP	-	-	-	12 %

Overview of the prototypical elements of euro cash money according to Dutch respondents in 2011. Prototypical elements of the one euro coin and the euro 50 banknote, as mentioned spontaneously and when prompted.

Spontaneous: Which elements in the appearance of euro banknotes contribute to a European identity? Prompted with image of euro 20 or euro 50 note: To what extent do elements of the euro 20 note contribute to the European identity of the euro banknotes?

Research results that do not match the coin and banknote properties are marked in orange; most remarkable is the reported 74 % for the currency symbol on the one euro coin (there is no such symbol on the euro coins, except for a special 2 euro coin issued in 2009; also the image offered did not show any currency symbol).

Table 4.5 combines the 2009 research results (table 4.3) and the 2011 results in one (table 4.4). Indeed, the word euro is the most significant prototypical design element (35 %); all other elements mentioned in the 2011 research received in 2009 a score below 10 %. The word euro on the euro banknotes is not that dominantly present

Table 4.5

Euro coins	Euro banknotes
1. Map of Europe	1. Map of Europe
2. Word 'euro'	2. Word 'euro'
3. National/common side	3. Currency symbol
4. Currency symbol	4. European flag
5. European flag	5. Ring of stars

Top 5 of prototypical design elements of the euro coins and the euro banknotes as perceived by the Dutch.

Table 4.6

Design element	2009		2011	
	By heart euro 50		European identity	
			Spontaneous all euro denominations	Prompted euro 50
Map of Europe	P	4 %	13 %	85 %
Word euro	T	35 %	4 %	80 %
Currency symbol	P, T	2, 4 %	nil	73 %
Flag	P	3 %	7 %	69 %
Stars	P	4 %	4 %	47 %
Gates and windows (buildings)	P	3 %	13 %	28 %
Bridge	P	5 %		27 %
...
Euro in Greek, ΕΥΡΩ	T	7 %	nil	17 %
BCE ECB EZB EKT EKP	T	6 %	nil	15 %
Signature	T	5 %	nil	12 %

Ad lib and prompted answers to the 2011 Identity Survey questions 'Which elements in the appearance of euro banknotes contribute to a European identity' and 'To what extent do elements of the 50 euro banknote contribute to the European identity of the euro banknotes?' The results are compared with the spontaneous recollection scores regarding picture (P) and text elements (T) on the euro 50 note (collected in a biennial survey held in 2009 [162]). The 2011 survey did not cover awareness of design elements.

and this could be the explanation for the large difference between the response on the word euro in 2009 (by heart: 35 %) and 2011 (spontaneous reaction on euro 50 note: 4 %).

The two main images of the euro banknotes, the gates/windows and the bridges, are no carrying elements of the euro banknotes, as stated before [126, 179, 192]. The conclusion for future euro banknote designs should be to eliminate both themes and to follow the top 5 of prototypical European design elements as listed in table 4.6. However, buildings and especially towers, like the Eiffel tower and the tower of Pisa, are perceived by the Dutch as European and as such may be used as design elements for euro banknotes (table 4.7). Also when explicitly asked for 'What typically European symbols would you advise the European Central Bank (ECB) to include in a new euro banknote series' towers of Europe are responded (table 4.8).

What is typically European?

In 2007 DNB asked the Dutch what themes should preferably feature on a new euro banknote series [125, 126]. While the survey conducted in 2011 differs both in questions and method from the previous one, the outcome is pointing in the same direction (see table 4.10). Although most people in the Netherlands do not have strong European feelings, they do seem to have a European mind-set. As in

Table 4.7

Typically European is ...	2011 Spontaneous
Euro	25 %
Eiffel tower	16 %
No borders, no passport	11 %
Brussels, offices in Brussels	10 %
Single currency	8 %
European Union, EU, EEC	8 %
Cooperation among European countries	7 %
Diversity, variety	7 %
European flag	6 %
(...)	
Tower of Pisa	4 %
Big Ben (in London)	3 %

Recorded answers to the question: 'When you think about Europe, what would you consider to be typically European?' Spontaneously, the euro was regarded as the most typically European symbol (25 %), followed by the Eiffel tower (16 %), absence of borders (11 %) and Brussels (10 %). Youngsters are more likely than people older than 35 years to see the euro, Brussels and the European flag as typically European.

Table 4.8

Suggestions	2007	2011	
	Prompted	Prompted	Spontaneous
Pictures of well-known European buildings: Eiffel Tower, Acropolis etcetera.	37 %	60 %	
- National characteristics, attractions			8 %
- Building, monument, cathedral, bridge			8 %
- Eiffel Tower			6 %
- Tower of Pisa			1 %
Unity	-	40 %	1 %
Peace	-	36 %	-
Democracy	-	34 %	-
Diversity, cultural differences	-	30 %	-
Pictures of animals	17 %	-	2 %
Pictures of plants and flowers	12 %		-
Portraits of famous Europeans	11 %	-	3 %
Pictures of bridges, windows and gates	7 %	2 %	4 %
Something abstract, no representation	7 %	-	1 %
Football	-	6 %	-
Musical instruments	5 %	-	-
More lively colours	-	-	5 %
Map of Europe	-	-	3 %
Names of (euro) countries	-	-	2 %
Eurovision song contest	-	1 %	-
Other	-	4 %	12 %
Don't know	3 %	2 %	52 %

Suggestions for typically European characteristics provided by the Dutch in 2007 and 2011, respectively. The 2007 answers are provided on prompted themes preferred by the Dutch for a new series of euro banknotes [126]. The 2011 answers are spontaneous answers to the question: 'What typically European symbols would you advise the European Central Bank (ECB) to include in a new euro banknote series (other than the ones already featured on the banknotes and coins currently in circulation)?'

2007, the Dutch came up with the Eiffel tower and the tower of Pisa for new euro banknote design. Rather than signifying that the Dutch really want to see the Eiffel Tower on banknotes, this outcome suggests that the Dutch have no strong national feelings when choosing an image for a new euro note. In other words, the Dutch do not necessarily require euro notes with Dutch national symbols like clogs, tulips, windmills or Rembrandt.

Table 4.9

	Coins	Banknotes
European	66 %	53 %
Not European	33 %	47 %

Recorded answers to the question: ‘To what extent do you think euro banknotes and euro coins have a European identity?’ Netherlands only, 2011.

Euro coins are more European than euro banknotes

Which of the two is more European, the euro coins or the euro banknotes? To arrive at an answer, a question was included to what extent the Dutch would perceive respectively the euro coins and banknotes as European and the result is presented in table 4.9. Clearly the Dutch perceive the coins as more European than the banknotes. The fact that the euro coins have a common and a national side is probably the main reason, symbolising the motto ‘unity by diversity’ very effectively. In contrast to the coins, the euro banknotes have several themes, like ‘Ages and Styles of Europe’, ‘openness to others’, ‘bridges linking people’ and ‘Europe’. These four themes do not impress the Dutch public, as first reported by De Heij in 2007 [126].

A second success factor of euro coins compared to euro banknotes, whose message is of a more historical nature, is that coins communicate a modern message: the common use of euro coins, unlike the euro banknotes. In other words, for the Dutch it is more appealing to find a Portuguese and German euro coin in their wallet than the Renaissance theme on the euro 50 banknote (see figure 4.16).

It seems that the EU Commission’s policy on European identity for the coins is well chosen, at least where ‘unity by diversity’ and ‘forward-looking’ are concerned. The concept of a common and a national side as for the euro coins was considered and rejected for the euro banknotes. The reasoning was that the diversity created by national sides would encourage counterfeiting. The euro’s identity seems to be built more on its mere existence than on the physical appearance of the euro coins

Table 4.10

	Coins	Banknotes
Important	61 %	45 %
Indifferent	30 %	35 %
Not important	9 %	19 %

Recorded answers to the question: ‘How important do you think it is for the appearance of euro banknotes and euro coins to reflect a European identity?’ Netherlands only, 2011.

Figure 4.16



Left: The motto 'unity by diversity' is expressed by the euro coins. The bottom row shows, from left to right: the national side of the one-euro coins of Italy, the Netherlands, Ireland and Germany.

A second theme is Europe, expressed by the map of Europe (front), the ring of stars (both front and reverse) and the word euro (front).

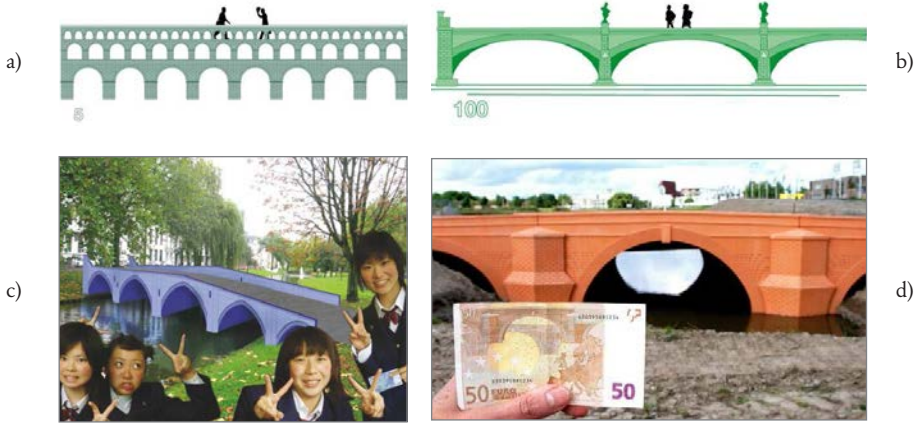
Right: The euro banknotes carry four communication themes. On the euro banknotes, the theme of 'Europe' is expressed by the flag (front), the ring of stars (front and a part of the ring on the reverse), the map of Europe (reverse) and the word euro (front and reverse). 'Openness to others' on the front and 'bridges linking people' on the reverse are two other mottos expressed on all euro banknote denominations. The theme of the euro 50 note is the Renaissance, part of the fourth theme of the euro banknote series: Ages and Styles of Europe.

and banknotes. However, future euro banknote designs could adopt these two communication policies, thereby creating more consistency within the messages communicated by euro cash money as well.

Expressing self-reflection in banknote design

The messages of the euro banknotes (Ages & Styles of Europe, openness to others, bridges linking people and Europe) do not come across to the Dutch public and may have triggered some humorous responses in the Netherlands. If the bridges on the euro banknotes do not exist, why not built them in our town? The 'euro bridges' have been built (figure 4.17), copying the - non-existing - bridges as depicted on the euro banknotes, in a new Dutch suburb (Spijkenisse, near Rotterdam). The idea and the designs are by Robin Stam, who asked both DNB and the ECB for permission to realise his plans. Having no problem with the bridges concerned being 'retro-constructed', both central banks were enthusiastic. Usually there is hardly any self-reflection expressed in a banknote design, triggering people to draw a moustache or replace the portrait by a crook. Probably the same lack of self-reflection triggered the idea to rebuilt the euro bridges.

Figure 4.17



Euro banknote bridges in 'reality' as seen by designer Robin Stam of Agency Vijf890 . Images a, b and c are taken from www.robinstam.nl.

- a) Euro 5 bridge. An earlier suggestion to add a human factor to the banknote bridges came from designer Jaap Drupsteen in 2006.
- b) Euro 100 bridge.
- c) Impression/teaser of euro 20 bridge.
- d) The Renaissance bridge as depicted on the euro 50 banknote as replicated in Spijkenisse, June 2011. The euro 10 and 50 and bridges were also realised in 2011; the other four will follow later [e.g. 220, 246, 254].

The example of rebuilding the bridges is also seen as a form of reversed identity as introduced in section 3.3. This suburb now owes part of its identity to these bridges. Two more Dutch examples of reversed identity are provided in figure 4.18: a graffiti banknote near the premises of the Dutch banknote printer Enschedé and two DNB employees dressed up like 100 euro banknotes!

Unity on front, diversity on reverse?

Let us return to the results of DNB's 2011 research on European identity, which showed that the currency indication in Greek does not contribute to the European identity. Only 17 % of the Dutch respondents are of the opinion that the ΕΥΡΩ text is a European element (table 4.4). The rest probably sees it as a national element contributing more to diversity and, therefore, not typically European. A similar finding is that the 'God Be With Us' circumscription on the Dutch euro coins does not contribute to a European identity [204]. Adding further spelling variants for the word euro to future euro banknotes should therefore be driven by 'unity' rather than 'diversity' (e.g. use the word euro on the front and spelling variants on the reverse). It is indeed striking that the symbols that people use daily (euro, currency symbol, map of Europe) received a high score, while symbols which are used only occasionally, like the Greek lettering (17 %) and the ECB abbreviations

Figure 4.18



Two Dutch examples of reversed banknote identity.

- a) The Spaarnwoude railway station in Haarlem was decorated with a 'graffiti style' image of a well-known Dutch banknote depicting a portrait of the famous Dutch painter Frans Hals (1580-1666). The station is also close to the Dutch banknote printing works, Joh. Enschedé. The date on the graffiti banknote ('7 Juli 1972') differs from the date on the original banknote (25 April 1968). Photo by De Heij, November 2010.
- b) Two employees of DNB (Hans de Heij and Peter Balke) became 'Billy Banknote' during the 'Sustainable Amsterdam' manifestation (in Dutch: 'Amsterdam Duurzaam'). Photo by Jan Binnekamp, 6 June 2009.

(15 %), receive a lower score. Is this typically Dutch or would the same results be obtained in other eurozone countries?

To suggest a design solution for future euro banknotes: use diversity elements like other lettering and abbreviations on the reverse and create a 'unity' front. Such a policy would also create more similarity to the euro coins with a common (unity) and a national side (diversity).

Different thoughts on euro coins and banknotes

Is it important to have a European identity on the euro coins and banknotes? This question received more positive answers from the Dutch. To them the European identity is of greater importance for coins than for banknotes (see table 4.10). This is remarkable. Given that the Dutch are rather indifferent about Europe, an explanation is that the outcome is probably a reflection of the existing situation. Such a *laissez faire* attitude is also provided by Müller as an explanation for the rather passive attitude of the elderly Germans when they were asked to come with suggestions for future euro design motives, as will be reported on in chapter 5, subsection 5.3.1 on series design [241, 256].

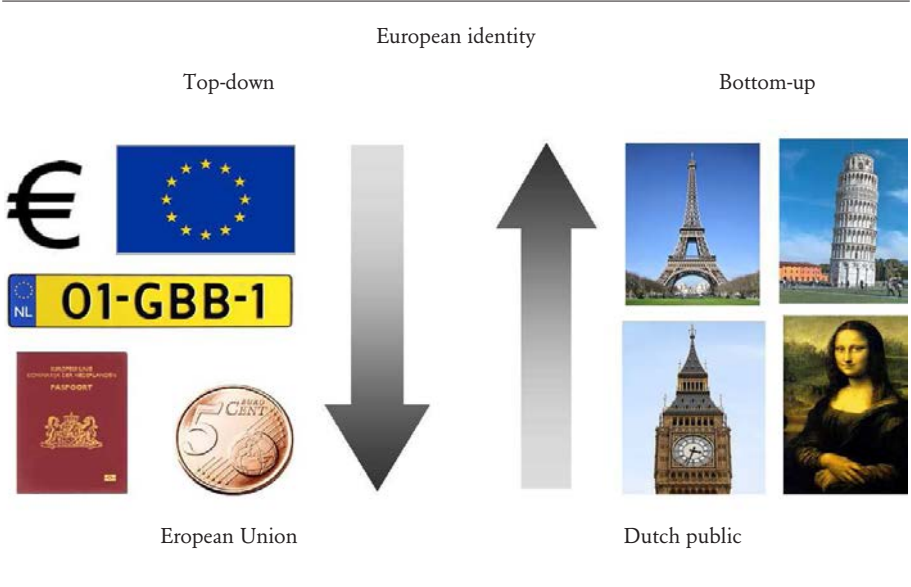
Public input

A banknote identity can be developed in either of two directions: top-down or bottom-up (see figure 4.19). The key to creating more appealing and identifiable banknote designs is to incorporate more input from the users, i.e. the public. In 2007 and 2011, the Dutch public suggested introducing European symbols, supplementing the current top-down approach by a bottom-up approach. The question is where the two will meet.

Popular persons on banknotes?

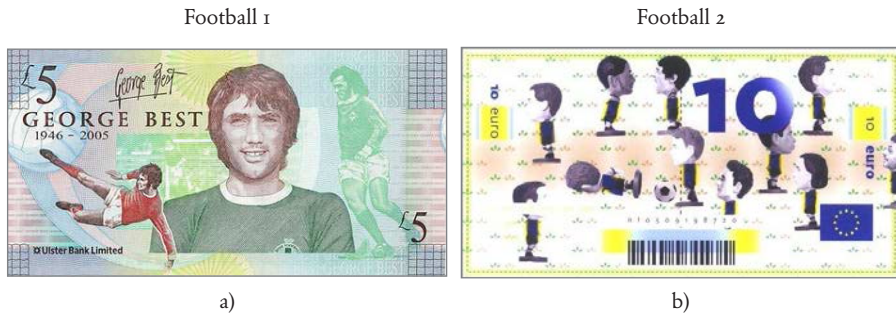
Public input is a means to come to more appealing banknote designs. The Bank of England found in 2006 a specific way to receive bottom up input from their banknote users, by inviting the public to respond on their website with proposals for persons or subjects for new banknote designs. The Bank of England has kept track of these suggestions to be depicted on (the reverse) of future British banknote designs. To limit too popular suggestions, the central bank of the Republic of Korea asked in 2007 the public to choose one among a shortlist of 10 historic figures. However, when central banks would leave it to the public, popular persons will be proposed. The first of such banknotes are already issued in 2005 by private British banks, like a football player (figure 4.20a)) and a golf player (respectively George Best and Jack Nicklaus). Probably more of such banknotes will be issued in the

Figure 4.19



The imposed identities of European products in the European Union are not (yet) very similar to the Dutch public's suggestions for euro banknotes with a stronger European identity. Where will the two meet?

Figure 4.20



The theme 'football' can be designed in a realistic (a) or in a more abstract way (b).

- a) Football player George Best on the reverse of a GBP 5 banknote of the Ulster Bank Limited (2005).
- b) Design for a 'banknote part' for a 10 euro 'print your own banknote' with theme football (see also figure 5.41). At first sight, people talking to each other and even yelling. Players are looking in different directions. You have to look twice to see the football. Concept and design by Tom van Enckevort (2008).

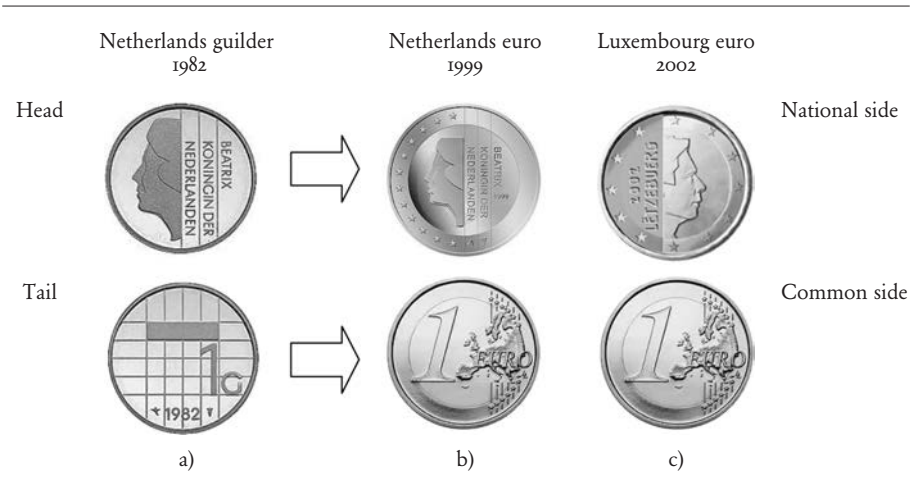
future, for example by the central bank of Sweden. In 2011 they decided to print popular Swedes on their new banknote series, as noted in chapter 2, subsection 2.2.8.2 on confidence in banknotes after 1995. These developments were food for thought for DNB's researchers that football might be favoured by the respondents as a theme for banknotes. Indeed, football was a marked answer to the prompted question, but only by a small 6 % (see table 4.8). Themes may be suggested by the public, the design can be rather different (figure 4.20b) and is the reason why a central bank should only show designs to receive public feedback [126].

Familiarity from guilder to euro coins

In 1991, during the negotiations of the Maastricht Treaty, Queen Beatrix told the European leaders that she had no problem if her image would have to disappear from the Dutch coins were the euro to replace the guilder. However, four of the eleven nations planning the euro in 1992 were kingdoms and together they agreed to use the royal heads for the national sides of the euro coins (Belgium, Luxembourg, Netherlands and Spain). Following this advice, the effigy of Queen Beatrix on the Dutch side of the euro coins received a similar design as on the former guilder coins, creating familiarity with the guilder. Most probably this helped to smoothen the changeover from guilder to euro in 2002. The national side of the euro coins of Luxembourg received a similar design as the Dutch (see figure 4.21).

A second example of familiarity from guilder to euro is the circumscription on the coins. When it was decided to give the euro coins a common and a national side, no decision was made regarding the edge. Gerrit Zalm, the then Dutch Minister of Finance, in 1996 successfully claimed the edge of the 2-euro coins as belonging to the national side. This claim was made on behalf of a small Dutch confessional political party in return for political support. The text on the Dutch 2-euro coins is

Figure 4.21



- Familiarity with coin designs.
- a) Dutch guilder coins issued in 1982. The diametrical division allows the effigy of Queen Beatrix - a side profile - to be turned slightly upward, suggesting an optimistic outlook. Design: Bruno Ninaber van Eyben.
 - b) Euro coins issued by the Netherlands. The national side of the Dutch euro coins is similar to the head side of the former guilder coins. Twelve stars and the year have been added. Design of national side: Bruno Ninaber van Eyben. Design of common side: Luc Luycx.
 - c) Euro coins issued by Luxemburg. The effigy of Grand Duke Henri on the EUR 1 and 2 coins is similar to the Dutch design. Design of national side: Yvette Gastauer Clair. Design of common side: Luc Luycx.

similar to the circumscription on the former guilder coins: GOD*ZIJ*MET*ONS (God be with us). As reported, only 24 % of the Dutch think this circumscription contributes to the European identity of the coins (table 4.4) [204]. There are some more examples of familiarity from the guilder banknote to the euro banknote which have been reported on before. First there is the non-portrait euro series and the Dutch were the only people using banknotes without portraits. Second, just as the buildings on the euro banknotes, the building on the 250 guilder, a lighthouse, differs in reality also from the printed version (figure 4.1c). Furthermore the colour-scheme refers to the Dutch banknotes and the signature on the first euro notes was taken from the NLG 50/Sunflower [80, 126].

White border is European

DNB's 2011 identity research did not report on what probably is the most important prototypical design element of the euro banknotes, the unprinted margin on the left side of the note. This white margin was introduced in earlier European banknotes to see the watermark without disruption. The first multi-tone watermarks were issued by the French central bank in 1829, followed in 1855 by the first shaded watermark in the banknotes of the Bank of England. This invention created the possibility of

image watermarks, like a portrait or a bunch of grapes. The origin of such a white border or strip is traced back to for example Austrian, Belgium, German and Polish banknotes as shown in figure 4.22.

Up to the 1990s US dollar banknotes did not carry any watermarks and so there was no need for an unprinted watermark lane, which is the main reason why the dollar banknotes look different. Banknotes following such a prototypical format of a vertical unprinted lane became therefore associated with European banknotes [192]. This ‘unprinted lane’ became a generic design element for several European banknotes, including the euro notes (figure 4.23). The similarity between the euro and its national predecessors is also recognised by the illustrator who created the hybrid banknote shown in figure 4.24, where the 50 guilder note transforms into a 50 euro banknote. The ‘white band on the left’ and the colours contribute more to a European identity of the euro banknotes than the images of gates and windows. The banknotes shown in figure 4.25 are issued in Asia and Africa have a European look, just as the notes shown in figure 4.26 are associated with US dollar banknotes. This observation is basically true for most banknotes in the world. The conclusions of

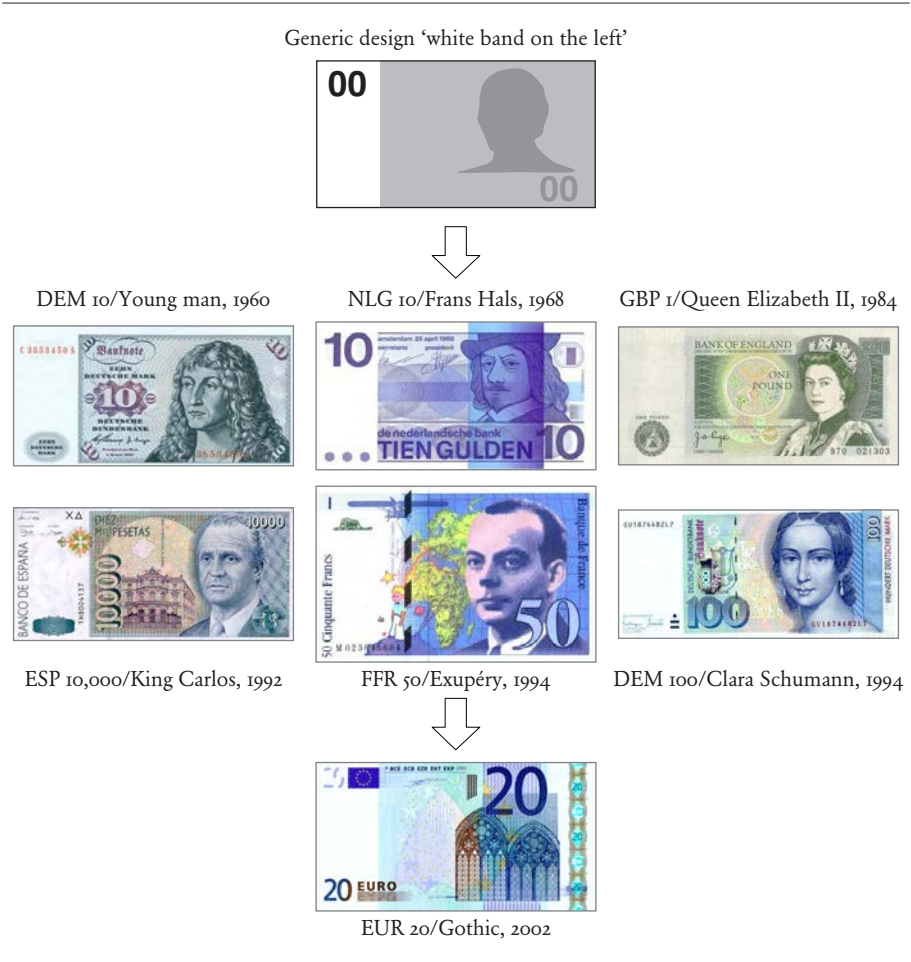
Figure 4.22



Early examples of banknote design with an unprinted area on the edge of the banknote.

- a) Austria, 50 crowns, issued in 1919.
- b) Belgium, 20 franc, issued in 1919.
- c) Poland, 50 zlotys, issued in 1925.
- d) Germany, 10 reichsmarks, issued in 1929.

Figure 4.23

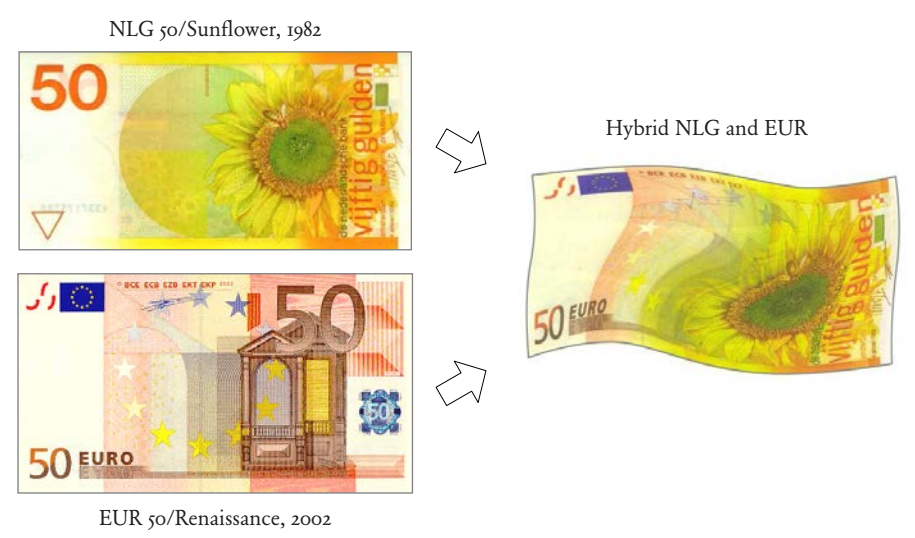


The euro banknotes are derived from the generic design of European banknotes (top) as first used in 1960 in Germany and followed by several others. The similarity is due to 1) landscape orientation, 2) basic lay-out (white area), 3) colour and 4) main image, a portrait.

this subsection is that is that there are worldwide two major banknote families. One type of banknotes shows familiarity to the US dollar and another shows familiarity to European banknotes.

The unprinted lane is usually positioned at the left side of the notes, but may also be found on the other, right side, as illustrated by figure 4.27 displaying the so-called legacy notes, former European banknotes of 12 national banks which were replaced by the euro in 2002. A watermark area on the right or left clearly creates a resemblance between these European notes (9 out of 12). In case of the Belgian

Figure 4.24



The illustration made for an article on the euro crises 2010-2011. A hybrid construction using Photoshop was made by Elsevier in early 2011 [198] and visually illustrates that the guilder and the euro share similar prototypical design elements.

Figure 4.25



- Similarity to European banknotes.
- a) Chinese Yuan renminbi, CNY 5 (2005).
 - b) South African rand, SAR 100 (2005).
 - c) Indonesian rupiah, IDR 10,000 (2005).
 - d) South-Korean won, KRW 10,000 (2007).

Figure 4.26



Similarity to US dollar banknotes.
a) Liberian dollar, LRD 100 (1999).
b) Barbados dollar, BBD 10 (2000).
c) Cuban peso, CUP 20 (2001).
d) Cayman Islands dollar, KYD 5 (2005).

banknotes the white lane is positioned near the middle of the note. The Austrian and Dutch banknotes shown do not carry an unprinted lane, but their predecessors did. Figure 4.27 also suggests that a portrait (11 out of 12) contributes to a European banknote identity. Although the 1996 design contest allowed portrait entries, this idea was dropped during the selection process, since portraits would also suggest a bias towards one nation. And more importantly, a historical portrait would be looking backwards instead of forwards; an architectural motive, symbolising the building of Europe, was an attractive alternative.

4.3 Conclusions on banknote identity

4.3.1 Worldwide there are two major banknote families. One type of banknotes shows familiarity to the US dollar and another shows familiarity to European banknotes.

The white margin on the left of the euro banknotes goes back to the 1920s when it was used first for European banknotes. This unprinted margin discriminates the euro notes effectively from the US dollar and Japanese yen.

4.3.2 A banknote identity policy is often specified in very general terms and in case of upgrades often omitted. Banknote identity issues are usually overlooked. Without an identity policy, the message conveyed by the banknote remains

Figure 4.27



Overview of legacy banknotes; one from each of the 12 countries that introduced the euro in 2002.

open and may become target of unwanted interpretations. Upgraded banknotes may be experienced as boring and outdated.

- 4.3.3 A hybrid identity, a common and a national or domestic side, is favoured for coins and banknotes of monetary unions. Proof is delivered by the euro coins, which are perceived as more European than the euro banknotes.
- 4.3.4 Historic banknote themes are at odds with a futures oriented message. The desired European identity avoids any reference to the one of the member states or bias to historical periods of Europe before 1945. The theme of the euro banknotes, Ages & Styles of Europe, is historic and as such not in line with a forward looking European identity as intended by the Council of Europe.
- 4.3.5 Currency indication is (probably) the most typical design element to support a banknote's identity. The word euro is recognised as the most European element of the euro banknotes. Other design elements contributing to a European message are the map of Europe, the currency symbol (€), the European flag and images of buildings. The representation of the issuing authority in abbreviations of all languages (BCE ECB EZB EKT EKP) and the presence of the Greek lettering of the word euro are not contributing to a European identity and could be positioned on the reverse side to be used for national design elements.
- 4.3.6 Characteristic architecture is an appropriated theme for (one of the banknotes of) a series of banknotes. The main images of the euro banknotes, gates/windows and bridges, are not perceived as prototypical and are not in the top 5 of design elements contributing to a European identity. However, buildings and especially towers are perceived as European and as such may be used as design elements for euro banknotes. Although the research method used in 2011 is quite different from the 2007 research, the outcome is partly similar: the Dutch public proposes again the Eiffel tower and the tower of Pisa for new euro banknote design.
- 4.3.7 Banknotes not showing any life like plants, animals and also human figures make them emotionally flat. There is no life on the euro banknotes. Human figures should not be searched in the category of portraits of famous or popular Europeans, but could be silhouettes, 'constructed people' by using imaging software or anonymous models.

5 How to create identity in new banknote designs?

Financial stability issues and oversight are two tasks of a central bank requiring daily attention of the central bank's management. Designing new banknotes is a relative small task and central bank governors are usually not particularly knowledgeable on the subject of banknote design. Coming back to Oscar Wilde's quote at the start of chapter 1, the most important role of the governor is to have interest in design and to encourage a high design quality.

The two concepts introduced in this study, banknote identity and banknote design, are brought together in this last chapter. Central banks should be an 'expert client' for banknote design, which is a key factor here. First the central bank should prepare itself and invest in the development of a design policy. 'Think before you print!' should be the motto. Over the years DNB has developed several design management tools for a better understanding of the banknote design process. This chapter outlines the most important methods relevant for the development of a banknote design policy, including an identity policy, and are in order of settlement:

- 5.1 Basic banknote design policy: prioritise functions
- 5.2 New or upgrade?
- 5.3 Development of a series of banknotes
- 5.4 Familiarity in banknote designs
- 5.5 Positioning diagrams for banknote design
- 5.6 Balance diagrams for banknote design
- 5.7 Competitive banknote design
- 5.8 Selection of banknote designer
- 5.9 Design freedom
- 5.10 Future banknote design
- 5.11 Conclusions on how to create banknote identity

5.1 Basic banknote design policy: prioritise functions

To prevent unauthorised reproductions is usually the first concern of a central banks, since such plagiarism would undermine the confidence in banknotes. To achieve this objective central banks usually target the general public, *the man in the street*, as their 'first level' of defence to stop large scale circulation of counterfeits. As a consequence central banks see it as their main task to develop features to verify the genuineness of

a banknote, known as security features for public use. Reproductions of a banknote should be clearly different from the original. Such a banknote design policy is a ‘authenticity design policy’. Other design policies followed may have other priorities like ‘confidence based’ as phrased by the motto ‘Maintain the look and feel of the dollar’ for the US dollar, or ‘durability based’ like central banks introducing polymer banknotes. However, for the public it is of more importance that banknotes are clearly distinguishable from each other and that they fit properly in their wallets. A user-oriented design policy sets the main users - retailers and public - in front and provides priorities which will guide the banknote process. The following four basic user functions of any banknote are determined: value recognition, handling, authenticity check and message, together creating the banknote’s identity, the subject of this study. Two of the four functions mentioned, value recognition and authenticity check, are described by De Heij in two separate issues of DNB’s Occasional Studies, respectively ‘Banknote design for the visually impaired’ in 2009 [169] and ‘Banknote design for retailers and public’ in 2010 [192]. The banknote’s function handling or ‘fit for purpose’ was an earlier object of study and includes durability [82, 228, 230], sizes and orientation [118]. Also a ‘green banknote policy’ is seen as part of the handling function, since the general public expects that the central bank takes care of such subjects. Green banknotes should be environmentally friendly, should be free of child labour, should have a low ecological footprint and shouldn’t pose a health risk. Such a policy may be part of the Corporate Social Responsibilities (CRS) of the central bank and includes also sustainability aspects of the banknote, defined as managing social, environmental and economic impacts of the supply chain and encouragement of good governance [259].

Banknote identity is defined by how the banknote communicates through all its elements of design such as images, colours, typography and by the values of a nation, the feelings and emotions the banknotes evoke. Identity design parameters may be contributed to each of the four main banknote functions, as done in table 5.1. This overview illustrates that the message design parameters are not the only elements contributing to the banknote’s identity, the other three basic functions are contributing too.

To come to a banknote design policy, the four main design functions are prioritised. For a user oriented banknote design the main design functions are put in the following order:

- | | | |
|--|---|-------------------|
| <ul style="list-style-type: none"> 1) Value recognition, 2) Authenticity check, 3) Handling, 4) Receiving message. | } | Banknote identity |
|--|---|-------------------|

These four functions are seen as ‘design layers’ as illustrated in figure 5.1. Central banks may follow different banknote design policies to come to a new banknote

Table 5.1

Banknote	
Main design functions	Design parameters
<div> <div>↑</div> <div>Banknote identity</div> <div>↓</div> </div>	Value recognition Expression of value Discriminating colours Optimal readable denomination figures, clear typography Discriminating theme (e.g. images from different classes)
	Handling Accessible for all people Size, orientation Clean, fit Sustainable
	Authenticity check Security features easy to find and to use Innovative expression (Perceived as) difficult to counterfeit
	Receiving message Positive emotions: e.g. pleasant surprise, amusement; creates a little smile Symbolism, cultural identity Associated with, familiarity to (iconography) Time orientation: e.g. forward looking, future-oriented Theme and motto: free

The column on the left represents the four main design functions of a banknote. The column on the right lists their identity parameters.

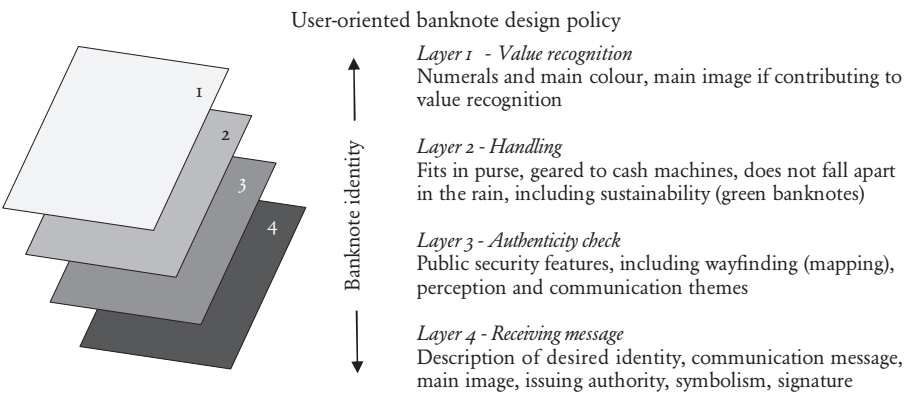
design, like putting the ‘authenticity check’ or the ‘message’ first. In all combinations the final banknote identity is made by the ‘design sum’ of all layers.

The formulation of a design policy, including a message description, is the very start of the banknote design process. Such a message description requires a study by the central bank. Two tools are described, respectively positioning and balance diagrams, which are helpful to define the required message. The outcome of such a study is an identity policy description, which does not need to be longer than half a page and should be approved by the central bank’s board.

5.2 New or upgrade?

Once the central bank has prioritised the four main banknote functions as described in the previous section, further steps towards a complete banknote design policy

Figure 5.1



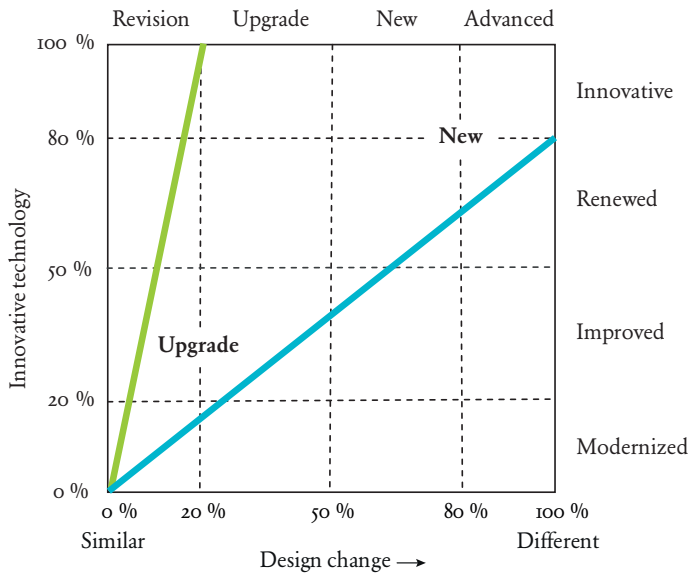
A user-oriented banknote design policy, based on the principle of ‘functional layers’ of a banknote design. The example shown gives priority to the value function of the banknote, which should be the first message to the public when looking at the banknote. The second design layer represents the handling functions (e.g. single note height). Thirdly the public should be able to find the public security features with ease, this should become layer 3 and the fourth layer is reserved for message parameters. The (overall) banknote identity is the result of how the designer has composed these four layers [126].

should be made. One of the first following questions to be answered is: should the banknote design be new or should it be an upgrade? Basically, there are two drivers to answer this question:

- 1) Graphic design (including communication and perception),
- 2) Innovative technologies (including technological improvements).

The major design policy is to determine the ratio between new technologies and new graphic design. For this purpose figure 5.2 is useful, presenting these two variables respectively on the x and y axis. Two different design policies are drawn, represented by a green and a blue line. For both policies the existing banknote is the starting point, positioned in the x,y coordinates 0,0. When a central bank allows only small changes in its existing banknote design and would like to introduce one or two new innovative features, the design policy represented by the green line is followed. The maximum design change allowed is about 20 %, while the level of innovation may reach as high as 100 % (the figure of 20 % is arbitrary and chosen because it refers to the 80/20 rule). Banknotes using innovative technologies are by definition the first of their kind; they are the pioneers. Central banks taking such technologies on board for their next banknote design, are followers, relative innovators, and cannot be positioned at the top of the innovation axis. If the central bank would like to develop a completely new design (x = 100 %) including new technologies (y = 80%), the blue design policy is their guide.

Figure 5.2



Banknote design policies based on two variables: design change (x-axis) and innovative technology (y-axis). Two design policies are represented by respectively a green and blue line. Both design policy lines start with the note to be replaced positioned in coordinate $x,y = 0,0$. The green line ends in $x,y = 20, 100\%$ and the blue line ends in $x,y = 100, 80\%$.

Using the graph in figure 5.1 an upgrade banknote design policy is roughly defined by the area around the lower left quadrant and a new banknote design policy is defined by the upper right quadrant.

Of course, the outcome of the banknote design process will be different from these two theoretical approaches represented by the green or blue line, but the central bank will find the end result close to the line they took as reference for their new-or-upgrade design policy.

The design policy of new dollar banknotes from the United States Federal Reserve System (FRS) is clearly an upgrade policy, as said captured by the phrase ‘Maintain the look and feel of the dollar’. People like consistency, is the driving policy of the FRS as indeed may be concluded from the dollar designs shown in figure 2.21. Other central banks follow a different design policy. To illustrate this, four different banknotes are introduced in figure 5.3, selected as representatives of four different design policies. What would have been the design policy of these four banknotes? The first example is the Australian ASD 10, issued in 1988, by far the most innovative banknote of the last decades (figure 5.3b). It is the first banknote printed on polymer, including a transparent window and a holographic element. However, its design change was not large enough to be judged as advanced. Therefore this Australian

Figure 5.3



Four examples of banknotes as a result of four different design policies.

- a + b) Australian dollar, ASD 10 (1974) and ASD 10 (1988). From cotton to polymer banknote. Including an innovative security feature, being a transparent window and a new type of hologram (pixelgram), viewable from both sides. The front of the note shows the Supply, a ship from the fleet which landed at Botany Bay in January 1788, with a line of immigrants and the site of the first settlement at Sydney Cove in the background. The reverse celebrated Aboriginal culture with designs based on work commissioned from Aboriginal artists; the main features were an Aboriginal youth, an ancient rock painting, hand stencils, and a ceremonial morning star pole.
- c + d) Netherlands guilder, NLG 1,000/Spinoza (1973) and NLG 1,000/Lapwing (1994). From portrait to abstract, including several technological improvements.
- e + f) Uganda shilling UGS 50,000 (2003) and UGS 50,000 (2010). From standard design to a new design, using existing, modern technologies.
- g +h) Canadian dollar, CAD 100/ Robert L. Bordon (2004) and CAD 100/Robert L. Bordon (2011). From cotton based paper to a polymer substrate.

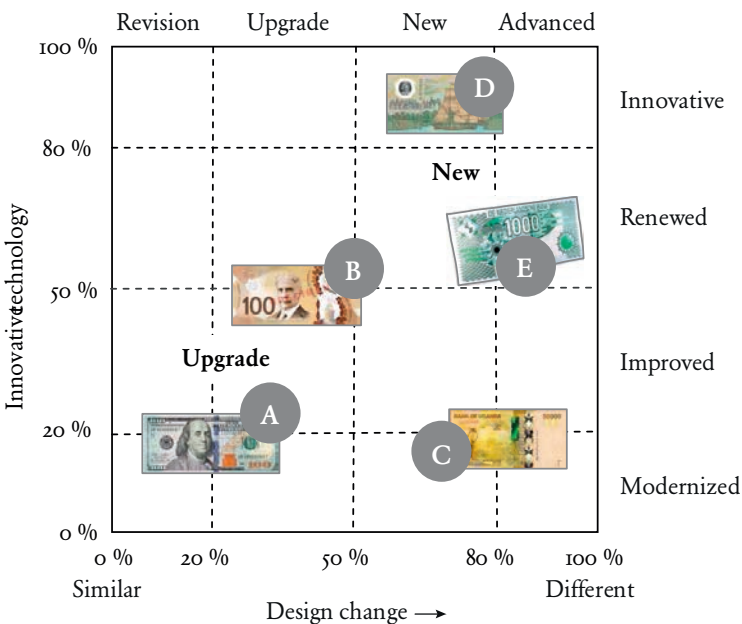
banknote is marked by position D in figure 5.4. The strategy of DNB in case of the former Dutch guilder notes was not to develop completely new innovative technologies as done by the central bank of Australia, but instead to apply existing technologies from other industries. The Dutch banknote designs however did aim for advanced designs (figure 5.3d), bringing 'borrowed' technologies and design together in position E of figure 5.4. The third type of banknote represents banknotes ordered from a commercial banknote manufacturer that was equipped with the latest, modern production machines. This situation applies to central banks commissioning their banknotes as turnkey projects from banknote printing works. In this case the central bank will not be innovative on the technologies used, unless they are the first to order. However, the central bank may aim for large design changes, as is the case with the new 50,000 shilling design from Uganda, issued in 2010 (figure 5.3f). In figure 5.4, this development strategy is marked by position C. The new Canadian polymer banknote issued in 2011 (figure 5.3h) is the fourth example. This note differs from the former cotton-based version (figure 5.3g) and can be seen as innovative for the Bank of Canada. However, the technical concept on which the new Canadian banknotes are based is quite similar to the one used for the Australian ASD 10 note issued in 1988 and the previous design may still be recognised in this banknote. The large transparent area with a holographic area is a new approach, and upgrade and new come together in this new Canadian banknote, marked by position B in figure 5.4.

Several large central banks, like the FRS in the United States, the Bank of Japan and the ECB, follow the development line of upgrades, introducing new technologies compared to the previous issue. These three world currencies, dollar-yen-euro (DYE), are all ranked around position A in figure 5.4. Although these central banks may speak about a 'quantum leap' or a 'paradigm change', their new features are usually no innovations, because they have already been applied in other banknotes.

Commemorative banknotes

A separate subject of a banknote design policy is the commemorative banknote. Other terms used are occasional or memorial banknote. Most central banks, like the FRS or the ECB do not issue commemorative banknotes. Bringing unnecessary diversity in banknote design will distract the public from discovering counterfeits so is their policy. However, commemorative banknotes are not for daily public use, but are made for promotional purposes. Such banknotes often aim for a financial profit, mainly coming from banknote collectors. To a central bank such occasional banknotes may be helpful to try out new technologies and designs. Central banks that want to try out innovations and do not want to issue commemorative notes have to opt for other policies like DNB's 'roof tile strategy', as will be explained in section 5.3 on development of series. In contradiction to this uniform banknote policy for the DYE-currencies, many commemorative coins are brought into circulation, both in the United States and the eurozone, which indeed often lead to confusion by retailers, public and commercial banks.

Figure 5.4



The design policy of 5 different banknotes, positioned as a result of both design change and innovative technology.
Position A = US Federal Reserve System, Bank of Japan and ECB.
Position B = Bank of Canada: new polymer series (2011).
Position C = central banks commissioning their banknotes from banknote printer.
Position D = Australian 10 dollar banknote, issued in 1988.
Position E = DNB at the time of NLG banknotes.

It is unknown which central bank came first with an occasional banknote. One of the first is the central bank of Chili in 1971 with a 500 escudos banknote dedicated to the nationalisation of materials like copper, nitrate and iron. The central bank of Thailand issued a commemorative banknote in 1987 on the occasion of the 60th birthday of King Bhumibol. The note has a square format, unusual for modern paper money. Another innovation of this note is the first application of an Optically Variable Ink (OVI), an ink changing colour when it is tilted (figure 5.5a). Today several central banks issue occasional banknotes and the central bank of Kazakhstan seems to be today's champion. Established in 1992 this central bank has built a reputation as being the first to apply new security features (figure 5.5b).

Advanced and new designs

The four basic design changes introduced at the beginning of this chapter are revision, modernising, new and advanced. Table 5.2 provides an overview of the

Figure 5.5



Two examples of commemorative banknotes.

- a) THB 60 (1987). Banknote issued to celebrate the 60th birthday of King Bhumibol Adulyadej (or King Rama IX) and the first banknote introducing an Optically Variable Ink (OVI) in the gravure print (intaglio).
- b) KZT 1,000 (2011). Banknote issued on the occasion of Kazakhstan's chairmanship in the Organization of the Islamic Conference and the first banknote to feature the 6 mm wide security thread, a foil type thread with images (Picture thread by paper mill Arjowiggins Security).

characteristics of these four policies a central bank may consider and includes a fifth, the development of an 'emergency banknote'.

Where new banknotes have to be introduced, as in case of the euro in 2002 or the South Sudanese pound in 2011, a revision or upgrade policy is not possible and the bank has to formulate an identity description. However, upgrade policies are clearly the trend and relatively few central banks introduce completely new designs. Examples of new banknote design are coming from Bermuda, Denmark, Israel, Philippines, Sweden and Switzerland. Building familiarity with a new banknote design may take some time, but on the other hand a new note can become a national symbol as experienced by DNB. The Dutch banknotes were known and appreciated for their innovative design policy and once issued Snipe (1981), Sunflower (1982) and Lighthouse (1986) became icons to the Dutch. When the Dutch central bank announced a new guilder banknote design, many wondered what new beauty the central bank has in mind for us this time? The Dutch liked these radical changes although in the beginning there was often some public debate. The new designs looked like Monopoly money and a sunflower was not considered to be Dutch. Also in other European countries it was a tradition to launch new and advanced banknote designs. There was even some competition between central banks for delivering the most advanced designs, like for example between France, the Netherlands and Switzerland. The Dutch will lose this feeling in the future, since an upgraded euro banknote will most probably not bring such emotions.

Table 5.2

Design policy new banknote	Characteristics	Example
1. Advanced	Innovative design, iconic banknote, ‘avant garde’.	Invite outstanding, independent, contemporary designer and provide high design freedom.
2. New	New design of a denomination, usually the start of new series	Bermuda (2009), Denmark (2009), Switzerland (2013), Venezuela (2007).
3. Upgrade	Redesign of an existing banknote with one or two new security features for the public and/or other changes in e.g. portraiture.	Major upgrade (e.g. GBP 20, 50 in 2007 and 2011). Medium upgrade (e.g. USD 5, 10, 20, 50, 100 in 1994-1999). Minor upgrade (e.g. DEM 50, 100, 200 in 1997-1998).
4. Revision	Small changes to the design.	Signature, dates, details (euro 2003, 2011), USD.
5. Emergency banknote	Minor adaptations of the existing design, only to embed one or two new features. To be issued within one year.	Introduction of a security thread, planchettes, fluorescent fibres, silk screen, multi luminescent inks etc.

Overview of five basic design policies for a new banknote.

Revised and upgraded banknotes

In the early 1980s the first colour copy machines became available and the central banks were not really prepared to this new threat. The banknote security industry reacted by offering authenticity features which could be ‘easily’ added to an existing banknote. Examples of such features are OVI, iridescent stripes, holograms and security threads. Such ‘add-on features’ triggered a stream of revised and upgraded banknotes. Upgrading banknotes is still the trend; central banks are clearly following each other, encouraged by the security industry.

Several central banks, like in United Kingdom, Malaysia and Peru, combine an upgrade policy with a new design policy, by keeping the front of the note quite similar and introducing new themes on the reverse. Such a policy is perceived as an upgrade policy, since the front of the note is dominant over the reverse. It is therefore called a ‘hybrid upgrade’. The most recent Malaysia series, started in 2007, serves as an example. The reverse reflects Malaysia’s traditional handicraft and embroidery, while the front of all denominations displays the same portrait of the first head of state, Tuanku Abdul Rahman.

Emergency banknote

The last design policy introduced in table 5.2 concerns an emergency banknote or fall back banknote. Such a banknote can be issued in case an existing banknote is not functioning well, for example because there are too many reproductions in circulation and people avoid this banknote. Over the decades DNB developed several emergency notes (in Dutch ‘reservebiljetten’). The last emergency note, the NLG 100/Snipe, was issued in 1981. From then on priority was given to a controlled design process. The new policy stipulated that from start to finish a new banknote should be realised within two years, including new features. The main reason was the above mentioned rapid technological development of the graphic reproduction industry at the end of the 20th century. The applied security technology in a new note would age quickly and would probably not be ahead of new technologies used by counterfeiters. A second argument to relinquish the emergency note policy was the high cost. DNB’s new policy was to have new features ready on the shelf and to control the planning of a new banknote [69].

Different upgrade policies

Within an upgrade policy there are several choices to be made, such as the number of new features to be added. People do easily accept minor adaptations, though, as they understand these are necessary to remain one step ahead of counterfeiters. However, in-depth arguments for an upgrade policy are usually not provided. The public is not asked for their opinion about this kind of policy, which is mostly (patronizingly) decided by the central bank management. Such decisions seem to be prompted by intuition and indeed, by following each other. The upgrade policies of three major currencies are compared to each other in table 5.3 (US dollar, German mark and Japanese yen) [94].

An upgrade policy may be disappointing news for banknote designers who do not like ‘facelifts’ and would rather create something new. A redesign seems at first sight less honourable than the assignment for a completely new design, but this does not have to be the case. The situation of a banknote’s redesign is similar to asking an architect to add a new wing (a new feature) to an existing building. In fact, upgrading is more difficult than starting from scratch, since the degree of design freedom is restricted. If the central bank would, for instance, prescribe retention of a subject or motif rather than preservation of the image and if the designer is given enough freedom, an upgraded banknote could become successful, including a forward-looking image. A challenge for central banks opting for an upgrade policy! However, a redesign of an existing banknote is by definition looking back and thus historically oriented. Since an upgrade and a future oriented design exclude each other, no example was found combining these two parameters (figure 5.6).

Table 5.3

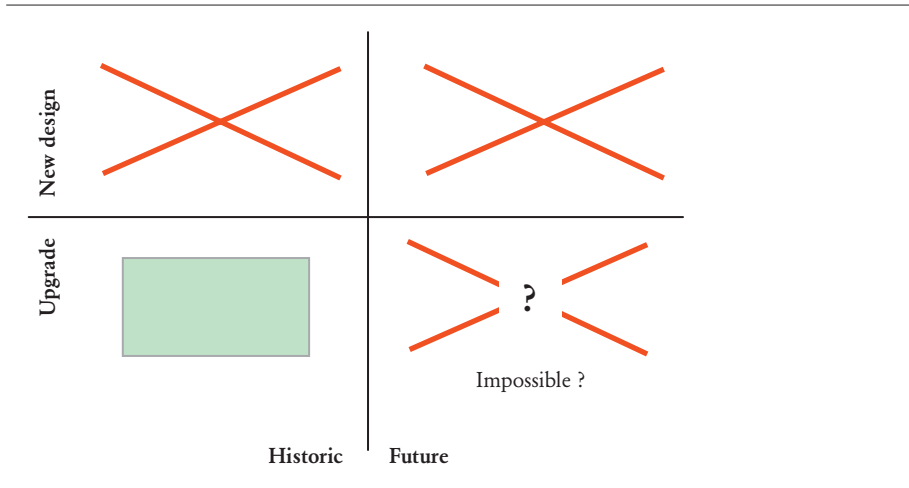
	DEM	USD	JPY
1. Year	1997	1996	2005
2. Time between old and upgrade	7 years	6 years	20 ears
3. Number of denominations modernised	3 of 8	6 of 7	3 (+ 1 new)
4. Number of features added	3	2	4
5. Which features	1. Foil patch	1. Watermark	1. Foil patch (on 2 high denominations)
	2. Iridescent stripe	2. OVI	1. Low denominations OVI
	3. Latent image	(3. Improved: fine line printing)	2. Iridescent stripe
			3. Latent image
			4. Paper based barcode
6. Co-circulation old and upgrade	6 months	18 months	24 months
7. Decrease of counterfeits after one year	Yes (~ 30 %)	Yes (~ 35 %)	Yes (~ 45 %)
8. Increase of counterfeits 'old model'	No	No	No
9. Old and upgrade too similar to public?	No	No	No
10. Preference for old or upgrade?	Upgrade	No	No, shopkeeper hesitates sometimes with old note

Overview of three different modernising policies: German mark (DEM), US dollar (USD) and Japanese yen (JPY).

Limits to upgrading

Figure 5.7 explains the principle of upgrading and shows the example of the Hungarian 1,000 Forint banknote. This banknote was adapted 4 times within a period of 11 years, an average modernise frequency of more than once every three years. How many times can a banknote be face-lifted? The generic US dollar (1929) has been adapted five times, an average upgrade frequency of once every 15 years (excluding changes of signatures). When the central bank presents such a modernised banknote as new, the general experience is that people's reaction will be: New? We already have this banknote! Or people will say: It looks as if something was forgotten and had to be added. There are a lot of unknowns and central banks follow different

Figure 5.6



With an upgrade policy the central bank limits itself as regards the identity of the new banknote. An upgrade is by definition looking back and thus historical [205].

policies as may be concluded from table 5.3. Looking at other products like cars, food or cosmetics packaging it seems that many modernisations may be done. One of the unknowns in the case of banknote design is how many iterations may be made? It seems that after three iterations changes remain unnoticed, because they are too close to earlier versions and a completely new design has to be made. This leads to the hypothesis that a banknote may be upgraded twice.

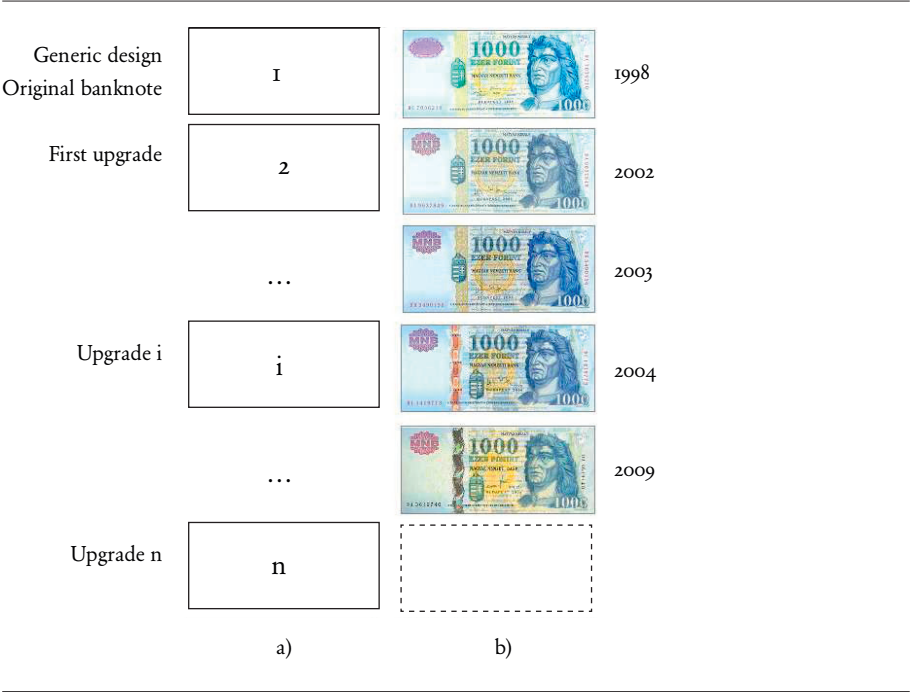
Design cannibalism

An upgrade policy may also be criticised from a banknote designer's point of view. The designer who made the first, original design is usually not consulted by the central bank about upgrade adaptations. Although the central bank usually has the ownership of the copyrights, it is ethically questionable to adapt a designer's work. Revised and modernised banknotes are therefore seen by designers as 'design cannibalism'. And in many cases they are right, as the design of upgraded banknotes is often qualified by critics as patchwork or cut-and-paste jobs. However, if the central bank would, as said before, prescribe retention of a subject or motif, rather than preservation of the image and if the designer receives enough freedom, an upgraded banknote does not have to be a dead-end street.

5.3 Development of series

Once the central bank has decided on a functional design policy (5.1) and new or upgrade (5.2), the next item of the bank's design policy to be decided upon is the

Figure 5.7



Upgrading banknotes.
a) Basic principle of upgrading banknotes. The generic design is used for the first upgrade, which is the second issue.
b) Original and four upgrades of the Hungarian 1,000 forint over the period 1998-2009.

series design. Should the new banknote design be part of a series or is it a solitary issue? Series designs are advised as will be explained.
The components of a series S are identified by a, b, c, ... i, .., k and each individual banknote of a series S, the denominations, may be marked by S(a), S(b), ... S(i), ...S(n). Banknote model S(i) will receive higher public appraisal than a solitary note, so is the hypothesis. Supporting evidence was provided in 2002 by De Heij; each newly issued guilder model - by the same designer - received a higher appreciation than its predecessor [79]. However, this could also be caused by the learning curve of the designer.

Any graphic series, e.g. postal stamps, coins or banknotes, can be defined by the number of components (n) - sibling designs - that make up the series. For the euro series, n = 7, since the euro series consists of 7 denominations. The number of components of a series design appears to have a lower and an upper limit:
 $3 \leq n \leq 8$

The lower limit for a series may be set at 3 denominations, since two banknotes with serial elements are perceived as a set rather than a series. The upper limit is put at 8, since there are no contemporary banknote series composed of 9 or more denominations. So a banknote series consists of minimum 3 and maximum 8 denominations, but what is the optimum number? Payne and Morgan reported in their study published in 1981, that 6 coins and 6 banknotes are an ideal sequence [13] (see also appendix A1, chapter A1.11 Denominations). The number of notes in a series of banknotes seems to average around 5. Series with $n < 4$ could be perceived as emergency series - to be issued in a crisis situation - or as suggesting less than average wealth, while series with $n > 6$ suggest inefficiency and could be perceived as anticipating on inflation.

On average, European central banks issue 0.7 banknote per year [108]. In case of a series of 5 banknotes it will take on average 3.5 years to issue the full series.

Table 5.4

Country	Original	Upgraded version					
		1	2	3	4	5	6
USA	1929	1935	1957	1990	1996	2010	
Great Britain*	1960	1970	1990	1999	2007		
Japan	1984	2007					
South Africa	1992	2005					
Brazil	1994	2003	2010				
India	1996	2005					
Russia	1997	2000	2004	2010			
Hungary	1998	2002	2003	2004	2009		
China	1999	2005					
Canada	2001	2004	2011				
Euro area	2002	20??					

Overview of the issue of generic banknotes and their upgrade versions for several currencies (excluding signature changes). In 1935 the reverse of the dollar was redesigned. In 1957 'In God We Trust' was added and in 1990 several security features. The 1996 upgrade included new security features and an enlarged, off-centred portrait.

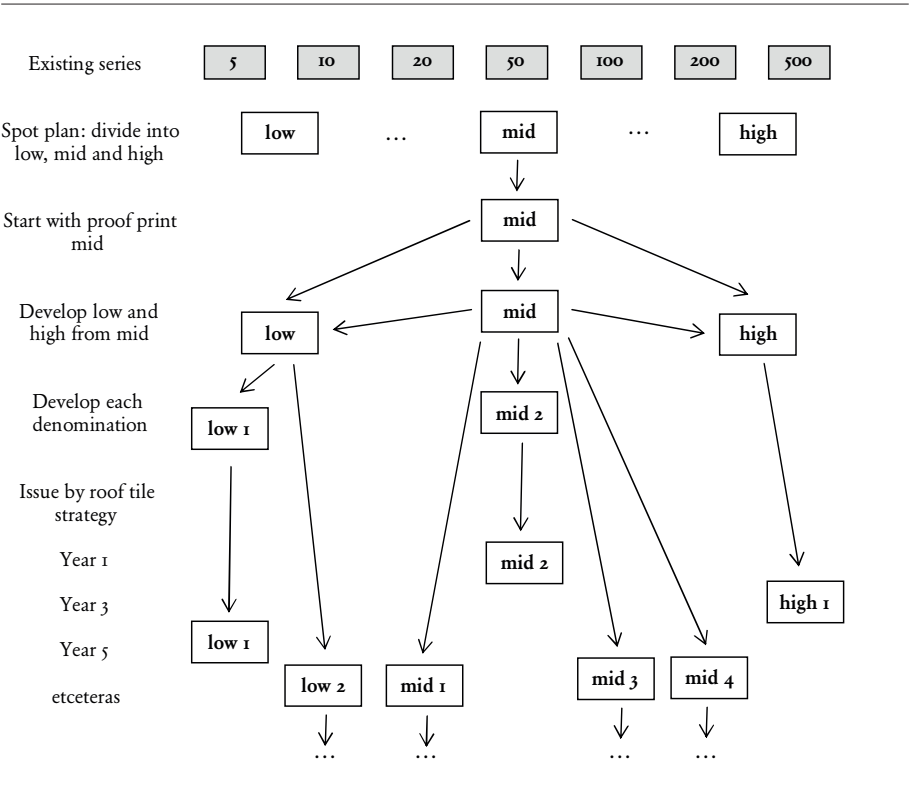
*) The Bank of England sees these upgraded versions as different series, referred to as Series C (1960), Series D (1970), Series E (1990), Revision Series E (1999) and Series F (2007). However, all series feature portraits of Queen Elisabeth II.

Spot plan and roof tile strategy for banknote series

Design policies for new series are elaborated in ‘Banknote design for retailers and public’ [192], which compared the planning of a new series to town planning and architecture and introduced a ‘spot plan’ (figure 5.8). Such a spot plan was used by DNB in the development of the Abstract series, issued from 1989, which Bolten described as follows [66]:

‘A so-called spot plan guarantees the consistent structure of a series of banknotes not issued simultaneously (but instead in ‘roof tile’ fashion). The plan outlines the general impression to be conveyed by each model in the series without a detailed elaboration of that model. As well as involving directives for the design and position of characteristics recognized by users and machines, a spot plan also applies to design specifications. These include the type of paper, sizes, colour schemes, typography, print techniques and general suggestions for subjects.’

Figure 5.8



Basic principle of series development according to the ‘spot plan’ principle. Issue in roof tile fashion: one new note every two years. In this example the first note to be issued is the mid 2, followed by high 1 and low 1. Of course, other sequences are possible.

Roof tile strategy

DNB's 'roof tile' strategy was to issue successive banknotes $S(i)$ at 2-year intervals, since the total development time from start of the design process to the first day of issue is 2 years [69]. This means that, with 6 denominations, an NLG banknote series' life cycle would be around 12 years. The basic idea was that if the technical realisation of new developments for banknote $S(i)$ took too long, the planned new technology would have to serve for banknote $S(i+1)$, so that $S(i)$ would not be delayed and $S(i+1)$ could eventually be produced without further ado. This theory was put in practice for the Abstract series 1989-1997 and worked well, judging by the relative speed at which the last series of Dutch banknotes was produced (4 new notes in 8 years). The roof tile strategy also provided an answer to one of the challenges of a central bank's management of keeping design knowledge up to date and alive is. Furthermore, the roof tile strategy ensured a constant work load for the central bank designers and printing works.

People will become familiar with the first denominations of the new 'roof tile series' and after one or two new models, people will see the next new design as familiar. However, a disadvantage of this policy is that the public usually carry banknotes from different series in their wallets [66, 192].

Now that the components of a series are defined, the next step is to identify the individual design elements that create the serial effect. There are no studies available on this subject; a first orientation was made in 'Banknote design for retailers and public' [192]. The following subsections shed some more light on the subject:

5.3.1 Series design

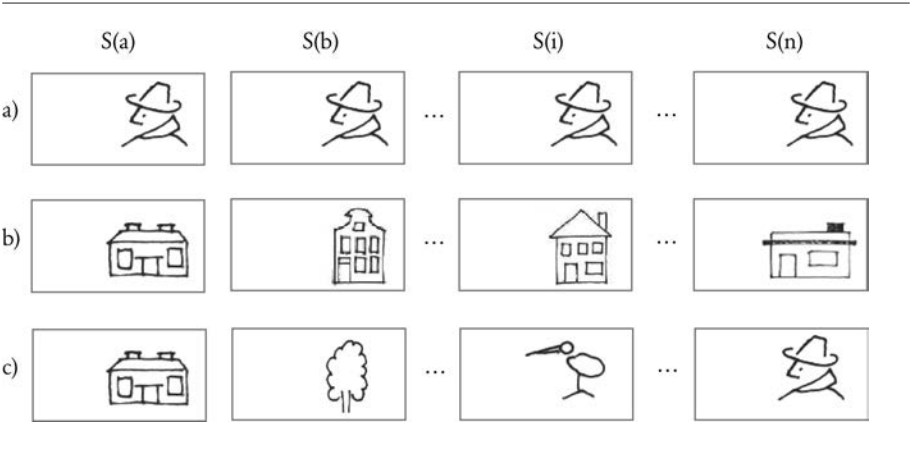
5.3.2 Banknote designs as part of a larger whole

5.3.3 Generic series design elements in private banknote series

5.3.1 **Series designs**

The denominations of the first series of guilder notes issued in 1814, the Robins, were all similar. As explained in section 2.2 on the history of paper money, the very first banknotes had no main images and were merely typographic designs without much variation. Since the appearance of the first, small, images in banknotes around 1850, this feature has become increasingly prominent, also in terms of size, and since the 1950s, large main images have been a traditional element of banknote design. Today a concept for a series design may be selected from one of three different concepts as shown in figure 5.9. When all denominations have identical images, like in the case of the pound banknotes issued by the Bank of England, the bank follows the concept shown in figure 5.9a. Central banks opting for these policies of identical images usually use the reverse side to introduce some variety within their series, the concept of hybrid banknote design as explained in section 5.2. The most frequently used policy seems to be to vary the images within one 'image class', like for example different portraits or different animals like in the case of South Africa (figure 5.9b).

Figure 5.9



Three basic series concepts using main images.

- a) Same main image, usually a portrait. Examples: United Kingdom (portrait), Malaysia (portrait), Pakistan (portrait) and Surinam (building).
- b) Variations of the main image within one image category, in this case houses. Examples: United States (variation of portraits), South Africa (variation of animals) and euro (variations of gates and windows on the front and bridges on the reverse).
- c) Main images taken from different image categories, like people, animals, plants and buildings. Examples: Cabo Verde, Latvia, Netherlands guilder.

The euro notes are an example of varying the main images on the front within the architectural theme of ‘gates and windows’.

To achieve optimal variation images should be selected from different categories as listed in table 5.5 [69, 115]. This series design concept as displayed in figure 5.9c was used for the (second) Dutch guilder banknotes designed by Oxenaar (see figure 4.1). A variation on this concept was applied in 2007, in a proposal for a new series of banknotes in Aruba [178, 192].

Avoid images coming from one image category

There is some evidence that the public does not discriminate between images coming from one image category as reported on in subsection 4.3.2 on the identity of the euro banknotes. All main images used on the euro are architectural elements and are perceived as belonging to one category, namely buildings. In the eyes of the Dutch, the images on the euro banknotes are just old buildings, one much like another. When for a survey, the images of the euro banknotes were switched, very few respondents noticed this [169, 175, 192].

Supporting evidence is delivered by Katja Müller in 2011 in her Master thesis ‘Directions for improving the Euro banknotes for the elderly people’ [241, 256]. The main images on the front of the euro banknotes were offered in respectively greyscale and in colour. Most people could not tell from which denomination the

Table 5.5

Denomination	Image category
1 - High	Woman
2	Man
3	Animal
4	Plant
5	Building
6	Product
7 - Low	Abstract picture

A concept for a banknote series, specific main images for each denomination. The dominant colours for each denomination could be added to this table.

images were taken. For both situations the best score was delivered by the euro 20, respectively 12 % correct answers in case of greyscale stimuli and 76 % correct answers for the coloured images. Müller concluded that the elderly people do not use the motifs of the euro banknotes and confirmed the earlier DNB conclusion that the colour of the euro banknotes contributes more to value recognition than the images [e.g. 169].

As said in subsection 3.1 the three series of US dollar notes are discriminated by the size of the portrait (small, large) and the presence of colour and not by the person portrayed (figure 3.5), which is some more proof for the use of different image categories in a series of banknotes.

The 17th century painter Frans Hals, whose portrait figured on the NLG 10 note issued in 1970, delivers also some evidence here (figure 4.1a). Frans Hals figured in a series according to the concept of variation of the main image within one image category (figure 5.9b). Although many people within the banknote industry believe that people remember portraits best, only 14 % of the Dutch public was able to recall who was on this note. More than half (53 %) did not know and 9 % gave a wrong answer. The remaining 24 % gave answers that were only partly right: historical person (16 %) or painter (7 %) or a man (1 %). These are disappointing results for advocates of portraits, especially considering the fact that the ten guilder note was daily used by the Dutch over a period spanning 25 years. Furthermore, the name Frans Hals was clearly written on this note.

Concluding, the advice is to avoid main images within a serial banknote concept coming from one image category.

What is the best subject?

If a central bank persists in images of a banknote series coming from one category, one may ask which subjects are better, (similar) portraits as on the US dollar or

(similar) buildings as on the euro banknotes? To find an answer, the Bank of Canada experimented with alternative subjects within a note (figure 5.10). One of their conclusions in 2008 was that the portrait used was least conducive to authentication and the building the most. The test was performed with new notes and also with two degrees of soiling [147]. The outcome of this test is of course influenced by the designs of the subjects.

Müller also researched images coming from different image categories. One of the sample cards used showed four different images copied from existing banknotes. When asked for their preference for a main image on a euro banknote, the German elderly citizens selected the building (56 %), second the sunflower (20 %), portrait was ranked third (16 %) and the rhinoceros was the least preferred (8 %). The images taken were the portrait of King Bhumibol of Thailand as displayed on the 50 bath banknotes, the white rhinoceros as displayed on the South African 10 rand, the sunflower from the Dutch 50 guilder note and the amphitheatre as shown on the Croatian 10 kuna banknote. According to Müller the building was most probably preferred because the respondents have become accustomed to buildings on the euro.

The conclusion of both studies is that instead of questioning what the best subject would be for a single banknote, one may ask what are the best subjects for a series design? In terms of value recognition, main images for a banknote series should be selected from different categories, including human figures. Like Jaap Drupsteen, one may put the question on an even higher abstraction level and question the

Figure 5.10



Same banknote, different main image. Test notes prepared by the Bank of Canada in 2007.

Table 5.6

MAIN IMAGE ON A BANKNOTE

+ PROS	– CONS
+ Provides emotional content	– Distracts from security features
+ May support instant value recognition (in case of different images on different denominations)	– May distract instant value recognition (in case of similar images on different denominations)
+ Contributes to identity	– Contains a clue, e.g. the watermark (encourages guessing and discourages ‘pleasant surprise’)
	– Takes up space
	– Can be seen as patronizing

Overview of the pros and cons of a main image on a banknote.

application of any main image. There are clearly some pros and cons to applying a main image on a banknote as provided by the overview given in table 5.6.

5.3.2. Banknote designs as parts of a larger whole

In the 1970s several Dutch graphic designers used the principle of ‘continuation’ for their stamp designs (se-tenant stamps). Jaap Drupsteen’s 1974 design became a collector’s item (figure 5.11a).

Recently two cash currency designs applied the principle ‘design as parts of a larger whole’. Together the British coins introduced in 2008 show the Royal Shield (figure 5.11b). Michael Ross used a similar concept for his contribution to the private US Dollar Redesign Project, a reaction of American designers to the ‘change’ motto of President Obama (figure 5.11c and d).

The advice is to link individual banknotes S(i) to one or more other banknote of the series (S(a), S(b) etc.). This ‘connection’ effect is experienced as a positive emotion, as a surprise and will most probably render a little smile. If the bridges on the different euro banknotes could be connected to each other, they would also fit within this category and would literally support the motto ‘bridges linking people’ [126].

5.3.3 Generic series design elements in private banknote series

A special class of series designs are the banknote series issued by Scotland and Hong Kong. In both areas three private banks are still permitted to issue banknotes - a relic from the time banknote issuance was not the privilege of a single central bank, but left to the free market. However, these individual series do have joint design elements such as size, lay-out and security features (figure 5.12). The issue of Scottish

Figure 5.11



Designs as part of a larger whole.

- a) Postage stamps designed by Jaap Drupsteen (1974). The cows were only partly displayed on the stamp, allowing continuation on the next stamp.
- b) New British pound coins, introduced in 2008. Design: Matthew Dent.
- c) Six US dollar denominations tile to show the Statue of Liberty. Design by Michael Ross for the US dollar Redesign Project (2009).
- d) One dollar design of series design as shown in 3.12c).

banknotes is regulated by the Bank of England. Apart from the three Scottish private banks, there are four private banks in North Ireland allowed to issue banknotes. The iconography of Scottish banknotes has been studied by Jan Penrose [234]. Although such private banknotes may provide identity to the Scots, the situation is far from ideal. First of all, the co-circulation of Scottish variants and the British pound notes led to a variety of banknotes in people's wallets as shown (figure 5.13). Secondly, the Scottish banknotes are not legal tender anywhere else in the United Kingdom.

5.4 Familiarity in banknote designs

When several design parameters are similar, banknotes appear as a kind of family. A reason for keeping some elements similar is to avoid the impression of a coupon or voucher. The introduction of a bird on a Dutch banknote was probably also accepted because several design parameters of this innovative 100 guilder note were

kept similar, like colour, size, lay-out (figure 1.2). This 1981 design was unique in the world and enhanced the identity of the Dutch banknote series.

When planning a new series, most central banks will seek to strike a balance between familiarity with the banknote to be replaced and the new design, as indicated by the following three central bank policies:

- Should look like money (DNB),
- Signal continuity (ECB),
- Maintain look and feel of the dollar (FRS).

Banknote printers recognise this issue and like to offer two proposals, a familiar and a progressive one. In the words of Steve Pond of a well-known banknote printing works: 'If we are given the time, we like to give the customer two designs: one that

Figure 5.12



Both Scotland and Hong Kong have three private note-issuing banks. Three designs issued in 2007:

- a) Royal Bank of Scotland (RBS), designed by De La Rue.
- b) Bank of Scotland (BS), designed by De La Rue.
- c) Clydesdale Bank (CB), designed by De La Rue.

Three designs coordinated by the Hong Kong Monetary Authority (HKMA), issued in 2010:

- d) Standard Chartered Bank (Hong Kong) Limited (HSBC), designer Jennings Ku.
- e) The Hongkong and Shanghai Banking Corporation Limited (SCB), designer Henry Steiner.
- f) Bank of China (Hong Kong) Limited (BoCHK), designer Guowei Shao.

Figure 5.13



Banknote confusion in Scotland in 2010. (photo by De Heij, 2009)

they are probably going to be comfortable with because it's within expectations; and one that pushes the development and sets a new level for the bank or series.' [165].

A new banknote may show - desired or undesired - familiarity with foreign banknotes, like the examples shown in figure 5.14 using similar blue colours. The unprinted border lane also contributes to the perceived familiarity. Sometimes the designs are very similar, like in the case of the Brazilian coins, clearly inspired by the euro coins as shown in figure 5.15 (colour, italic lettertype, lay-out, parallel lines).

Prototypical for US dollar type banknotes are the length/width ratio, the horizontal bars and the numerals in all four corners (figure 2.21). When other banknote designs follow these carrying elements, such banknotes look familiar to US dollars, as illustrated by the four examples shown in figure 4.26. Several other examples of this phenomenon of banknote design familiarity are provided in appendix A5 and include:

- Look-a-likes old (figure A5.1),
- Look-a-likes modern times (figure A5.2),
- Iconic layout (figure A5.3),
- Typical main image like bridges (figure A5.4) or elephants (figure A5.5),
- Political leaders or head of states (figure A5.6),
- Portrait of one person over the decades (figure A5.7),
- Group portraits (figure A5.8).

Familiarity may also be used by a central bank to reassure people in case of (large) currency changes, as in case of the Dutch transition from guilder to euro coins (described in chapter 4, subsection 4.2.3 on measuring European identity in the Netherlands (DNB research 2011)).

Figure 5.14

Blue is the colour of ...

a)



d)



b)



e)



c)



f)



Banknote familiarity of colours and border lane.

a) Netherlands guilder, NLG 10 (1968).

b) French franc, FFR 50 (1994).

c) Deutsch mark, DEM 100 (1994).

d) Euro, EUR 20 (2002).

e) Indonesian rupiah, IDR 50,000 (2005).

f) South Korean won, KRW 1,000 (2007).

Figure 5.15.



Euro coins, published 1997,
issued 2002.



Brazilian real coins,
issued 1998.

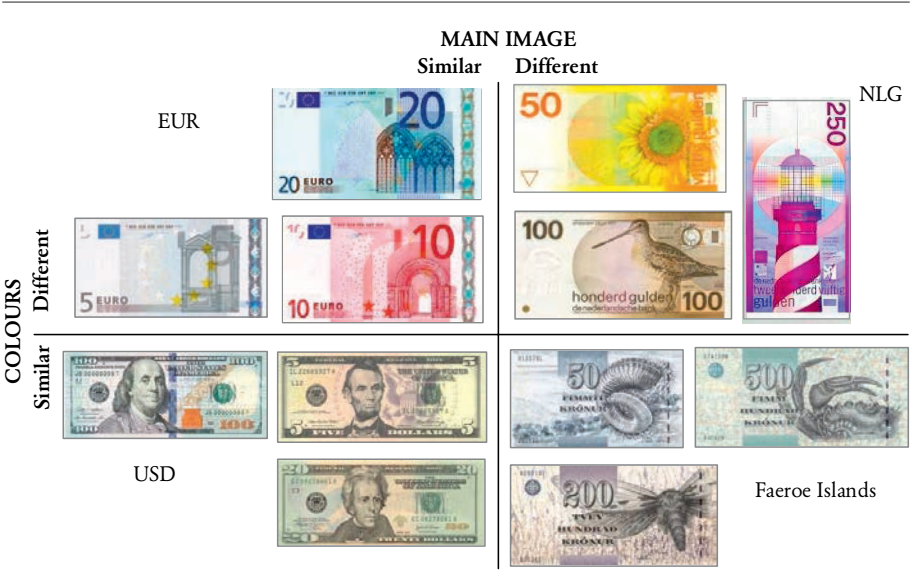
Brazilian coins show strong familiarity with euro coins.

The remaining question is: how to incorporate familiarity aspects into a design policy? The two following sections will provide an answer, reporting on respectively positioning diagrams and balance diagrams.

5.5 Positioning diagrams for banknote design

In this section several important design parameters will be introduced using positioning diagrams with the aim to build further on design parameters like colour, main images, juncture and emotion. A positioning diagram is similar to a usability quadrant, an analytical tool often used in branding, displaying two qualitative variables in a Cartesian plot. The usability quadrant was invented by Bruce Henderson in 1968 for the Boston Consulting Group and is also known as the Boston matrix, 2×2 diagram or product quadrant. The product quadrant model was applied for the first time to a banknote design by De Heij in 2007 [126]. He renamed it to positioning diagram since its purpose is to assist the central bank in adopting a position on design parameters of future banknote design. An example of a positioning diagram is provided in figure 5.16, applying two dominant qualitative parameters of a series design: colour and main image. Most current banknote designs should be positioned on the left side in this diagram, because the images used are taken from one category, for example all animals.

Figure 5.16



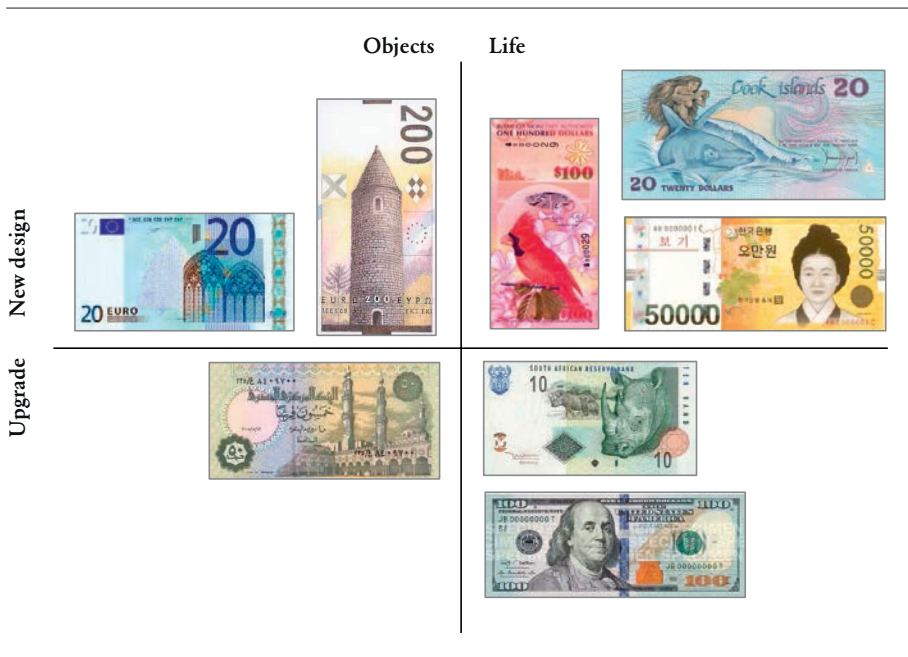
Banknotes’ main images and colours displayed in a usability quadrant. The notes of the Faeroe Island were first issued in the 2001-2009 period.

Doing such an exercise will provide insight into unexplored areas, useful for an alternative identity policy. A quadrant rarely used is similar colours/different images; except for the banknotes of the Faeroe Islands a quadrant difficult to find examples for (figure 5.16).

After colours and images, one of the most important parameters is life, like people, animals and plants (figure 5.17). Illustrative here is the promotional banknote Yvonne, full of life and produced by Papierfabrik Louisenthal in 2007. This note was reproduced from DNB's publication 'Public feedback for better banknote design 2' [126] and made it in 2007 to the front page of the Dutch financial daily 'Het Financieele Dagblad'. Many newspaper readers thought for a moment that this would be the new euro banknote! (figure 5.18).

Some more examples of positioning diagrams are provided in appendix A6 and will clarify several parameters a central bank may apply as part of its identity policy:

Figure 5.17



Example of a positioning diagram with parameters 'design' (upgrade or new design) and 'objects - life'. From left to right and clockwise the following notes are displayed: euro 20 (2002), euro 200 design by Oxenaar (1996), Bermuda (2009), Cook Islands (1987), South-Korea (2009), South Africa (1993), USA (2010) and Egypt (several upgrades since 1976, displayed 2005 revision).

Figure 5.18



New euro banknote?

- a) Front page of Dutch Financial Daily Newspaper (28 August 2007) with headline 'New euro banknote should bring citizens together'.
- b) The banknote with Yvonne was used to illustrate life on the future euro banknotes. Many newspaper readers thought for a moment that this would be the new euro banknote!

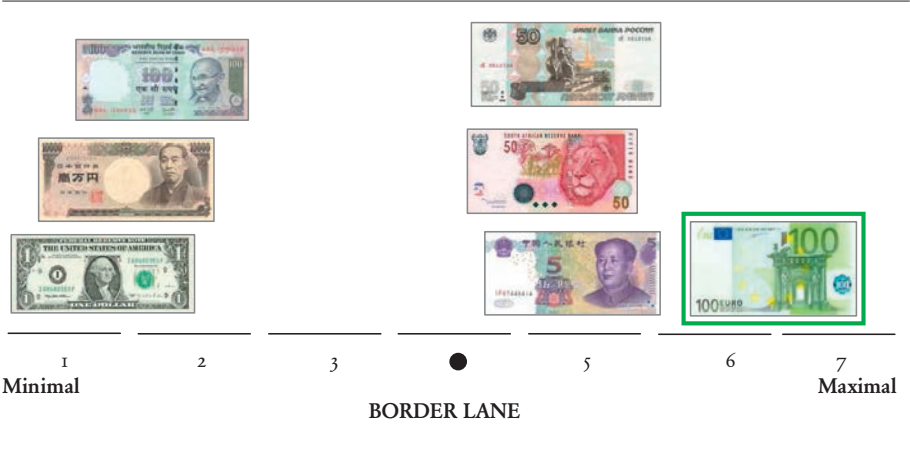
- Serious - Happy (figure A6.1),
- Local orientation - Open to others (figure A6.2),
- Directive, institutional - Neutral, non-institutional (figure A6.3),
- Historic - Future (figure A6.4).

These parameters are examples and may be replaced by others or adapted, according to the policy of the central bank.

5.6 Balance diagrams for banknote design

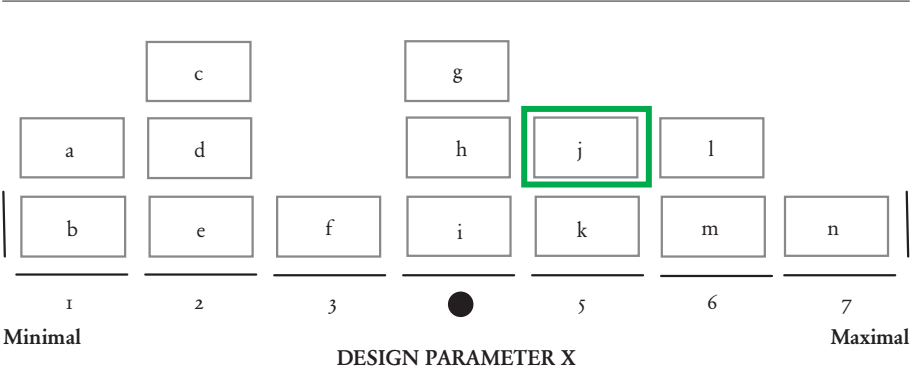
Positioning diagrams were subject of section 5.5 and this section continues with a second methodological tool assisting the central bank to define details of their design policy for a future banknote. Existing national banknotes may be compared to other banknote designs in a balance diagram on a number of design parameters, like colour and format parameters. For each parameter the central bank may decide to keep new banknote designs as it is or to fine-tune such a parameter in detail, by moving the design instruction on a 'balance' to the left or to the right. Figure 5.19 shows an example; the border lane of the euro could be moved from position 6 to position 7. The general principle is provided in figure 5.20 [163, 181].

Figure 5.19



Balance diagram of the banknotes of the 8 world currencies (DYE and BRIC) scored on ‘border lane’. From left to right: USD 1/George Washington, 1929, JPY 10,000/Fukuzawa Yukichij, 1984, INR 100/Indira Ghandi, 2005, RUR 50/ 2004, ZAR 50/Lion, 2005, CNY 5/Mao Zedong, 2005, EUR 100/Baroque and Rococo, 2002, BRL 100/National symbol, 2010.

Figure 5.20











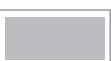





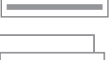



Basic principle of a balance diagram for banknotes. Select several different banknotes or banknote series (a, b, c, ..., i, ... n) and conclude for each banknote or a series of banknotes a position on the design parameter scale, in this example a 7-point interval scale. The banknote identified with the letter j is the banknote to be researched; it is marked with a green rectangle.

Balance diagrams may be prepared for 9 different design parameters as listed in table 5.7. Once a set of balance diagrams has been prepared, the central bank management, could - guided by public feedback - manage the design of a next series by giving instructions for each individual design parameter. This set may be extended or altered, according to the wishes of the central bank. In appendix A7 several examples of balance diagrams are provided for the euro banknotes, compared to several other banknote series.

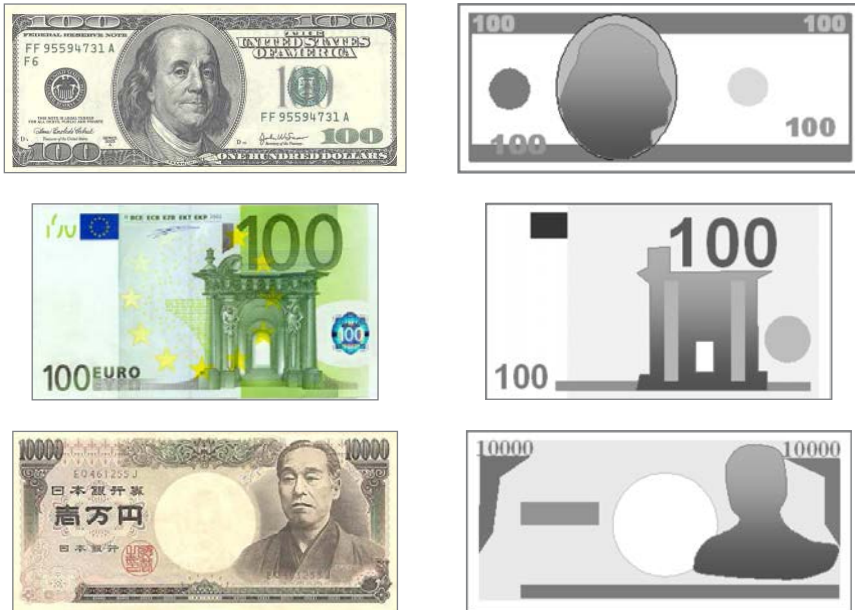
In addition to a balance diagram analysis, it is possible to perform a spatial frequency analysis as introduced by De Heij in 2010 (figure 5.21) [192]. Such simplified images will help to score the design parameters as presented in table 5.7.

Table 5.7

Design parameter	US dollar like (score 1)		European like (score 7)	
1. Colour - number	Similar colours		Different colours	
2. Colour - brightness	Pale		Bright	
3. Colour - dominance	No colour dominance		One colour dominant	
4. No border lane - border lane	No border lane		Border lane	
5. Shape watermark area	Oval		Rectangular	
6. Framed - off running design	Framed		Off-running	
7. Banknote orientation	Landscape		Portrait	
8. Vertical - horizontal	Horizontal bars		Vertical bars	
9. Main image - silhouette	Identical		Different	

Examples of banknote design parameters and their minimal and maximal position. On the left more US dollar style and on the right more European style.

Figure 5.21



Three world currencies (left) as seen by people with slightly narrowed eyes. In technical terms the images on the left have been transformed to the images on the right by using lower spatial frequencies and grey scales.

Design profile

So far a banknote design analysis has been made by balance diagrams and spatial frequency images. The outcome of these analyses can be brought together in a so called 'design profile' as shown in table 5.8 for three currencies: US dollar, euro and Japanese yen. When a design parameter of the euro banknotes shows 2 or more points (arbitrary units) difference to both other currencies, this score is marked green. The overview made in table 5.8 demonstrates the characteristic differences between the three DYE-currencies. The euro design distinguishes itself from the Japanese yen and US dollar especially on its lay-out, its geometry (clear border lane, off-running print). Furthermore the number of colours used in the euro design is more ambiguous. This analysis shows also the similarity between the yen and the dollar, both characterized by horizontal design elements, while the euro is characterised by vertical strokes/bars.

A design profile will bring further insight to the central bank on the similarities and differences between banknotes of other currencies, which might be used to differentiate future designs further. Such analysis is input for competitive banknote design, the subject of the coming section 5.7.

Table 5.8

Design profile	USD	EUR (100)	YEN
1. Colour			
Brightness: pale - bright	4	5	4
Variation: different - similar colours	2	4	2
Dominance : non - one	4	6	5
2. Geometry/layout			
Orientation: landscape - portrait	1	1	1
Border lane: non - clear	1	4	1
Frame: non - off-running	1	4	2
Shape watermark: oval - rectangular	4	4	2
3. Main image			
Silhouette: identical - different	3	3	4
Bars/strokes: horizontal - vertical	1	5	3

Exercise characterizing three currencies on prototypical design parameters. Scores are given on a 1-7 scale. This table is prepared to be an example to illustrate the developed methodology; presented results are the interpretation of the author.

 = ≥ 2 points difference from the other two

5.7 Competitive banknote design

The previous subsection made a first design analysis on the DYE-currencies. Competition between banknote designs is not only important because of the nation’s identity; there is also a clear financial interest. A national currency is a revenue source by way of monetary income or ‘seigniorage’, as the income realised on coins and banknotes is also called. An explanation of how monetary income works today is provided in 2011 by the Bank of Canada [217]:

‘If the Bank of Canada invests the proceeds from issuing the \$ 20 note in a government security generating 5 per cent interest, this note will indirectly yield \$ 1 per year of interest revenue. The overall production cost for the note is 9 cents. Given an average life of three years for a \$ 20 note, the annual production cost of the note averages out to 3 cents. If average distribution expenses of about 2 cents per year are added to this, the total average annual cost of putting this note into circulation and replacing it when it is worn is approximately 5 cents. Thus, the Bank of Canada clears an annual net revenue of about 95 cents for each \$ 20 note in circulation.’

Seigniorage

The term 'seigniorage' is usually unknown and although outside the scope of this study, a short explanation of the history of the term will provide background insight to banknote designers.

Italian authorities were the first to charge goldsmiths in the 14th century for coining bullion into legal coin, a tax known in Italian as 'signoraggio'. Coinage became typically assigned to the ruler, the sovereign or in French 'le seigneur'. Profit for the seigneur is the original seigniorage, being the face value of the coins issued minus the cost of the bullion, minting and logistics costs. Today, all cash money circulating of one currency is in fact a zero interest loan by the public to the state. Therefore seigniorage is also referred to as a 'stealth tax'. Others like to see it as a merit for a country or as monetary income.

Monetary income from non-domestic banknotes

Especially banknotes stored as savings contribute to central bank's revenues and the monetary income may be increased when banknotes are circulating outside the country [e.g. 191]. The FRS has a long experience with large amounts of dollar banknotes circulating outside the USA and they discriminate between two different user groups: domestic and non-domestic users. Both have different requirements; opposite to domestic users, the non-domestic users are more interested in authenticity features and the USD 100.

The euro banknotes have proven to be an attractive alternative for dollar savings. It is estimated that between 20 % and 25 % of the euro banknotes in circulation are held abroad, which is probably also due to the different financial crises, like the banking crisis in 2007-2008 [e.g. 249]. It is not difficult to understand why a person in an instable or developing country would like to keep euro banknotes under their mattress. Although the euro currency came in 2012 in more stormy wheater, the competitive advantages of the euro over other world currencies are:

- High banknote denominations, e.g. euro 500,
- Good resistance to counterfeiting,
- Humanistic, democratic and friendly identity,
- Financially stable, low inflation.

As a result, the monetary income of the countries that introduced the euro went up, not in the least because of the savings or hoarding component; Dutch guilders were less used for cash savings than euro banknotes are today and this brings additional profits to DNB. The exchange office may show the banknotes as in figure 5.22a, but ultimately it is the value of the currency that matters most. On a small scale, currencies compete at exchange offices; on a larger scale, they do so at the financial markets (figure 5.22b).

Figure 5.22



Competitive currencies.

- a) US dollar and euro compete with each other at this money exchange office in Paramaribo, Suriname (Photo by De Heij, 2011).
- b) Schematic view of competitive design fields for three world currencies: euro, US dollar and Japanese yen (in short DYE). The euro is competition with both the US dollar and the Japanese yen.

Competitive currency design

Chapter 3, section 3.4 on currency design elements introduced the visual and verbal identity of a currency, relevant for the design of competitive currencies, and concluded that the verbal identity of a currency is found more dominant than the visual identity. The verbal identity can not be changed without changing the name of the currency, but the visual identity can be adapted, if desired, to strengthen a currencies competitiveness.

It was also concluded that the currency symbols seems to be stronger than the visual identity of the (designs of the) coins and banknotes. Design parameters influencing the visual identity of the DYE-currencies have been discussed in the previous subsection 5.6 on balance diagrams. Just one more design policy exercise, listing a competitive currency/banknote design profile, could be thought over by the central bank before the search for a graphic designer, the subject of the next section. Such a competitive design profile as provided in table 5.9 could be made in addition to the design profile of table 5.8 and provides further details of the differences between the banknotes of competitive currencies. This analysis has to be extended, since today these three DYE-currencies face increasing competition from the BRICS-currencies (Brazil, Russian Federation, India, China and South Africa). Although being world currencies, outsiders usually have no idea what the coins and banknotes of the DYE- and BRICS-countries look like. While most world citizens probably know the US dollar, especially the one dollar note whose design has not changed since 1929, they are less likely to recognize most of the other banknotes shown (figure 5.19). For coins this situation is even worse; very few outsiders will recognise the coin designs (figure 5.23).

Table 5.9

Competitive design profile (additional to table 5.8)	USD	EUR (100)	YEN
1. Dimensions			
Height / width ratio	2.5	2.1	1.8
Small - large	2	5	4
2. Orientation			
Front: landscape - portrait	landscape	landscape	landscape
Reverse: landscape - portrait	landscape	landscape	landscape
3. Typography			
Numerals, frequency	4	2	2
Frequency large numerals (> 15 mm)	-	1	-
Frequency small numerals (< 15 mm)	4	1	2
Letter type numerals: a-typical or typical	1	4	2
Currency indication, frequency	1	1	1
4. Texture			
2D - 3D	4	4	4
5. Foil			
Stripe or patch	-	patch	-
Stripe width	-	-	-
6. Substrate			
Material	cotton/flax	cotton	cotton
7. Denomination characteristics			
Number of denominations	7	7	4
Unused denomination(s)	1	1	-
- which?	USD 2	EUR 200	-
Note/coin boundary	USD 1	EUR 5	JPY 1,000
ATM denomination (s)	USD 20	EUR 20, 50	JPY 2,000, 5,000
Highest denomination	USD 100	EUR 500	JPY 10,000

Example of a competitive banknote design profile analysis, further details, for three currencies.

5.8 Selection of banknote designer

Once the central bank has developed a clear view on the design policy items as introduced in the previous sections of this chapter, the bank may start with the search for a graphic designer. Again, several policies are possible. Every graphic designer will be interested in the assignment for a new banknote and would like to create the iconic banknote, the absolute design classic. The client, the central bank, is usually the party setting the limitations. Two questions have to be answered,

Figure 5.23



Coins of the US, Japan, Eurozone and BRICS countries.

one concerning the selection process of the designer, the subject of this section. The other topic concerns the degree of design freedom which will be discussed in section 5.9.

Standard banknote designer or top designer?

The selection of a designer for the new banknote depends on the basic design policy the central bank has opted for. In case of an upgrade policy a ‘standard’ banknote designer will do. However, if the central bank would like to issue a new or even advanced banknote design, they have to look for an outstanding designer. For example, DNB invited in 1986 the 6 best graphic designers of the Netherlands to enter a contest for this purpose, asking them to submit designs that mirrored the time spirit [69, 100, 190]. Artists such as painters were not invited, a learning point from the 1965 design contest for a new 5 guilder banknote. Graphic designers will pick up banknote design quickly, so is the experience of DNB. A good example is designer Jaap Drupsteen, invited in 1986 for a new banknote contest because of his ground breaking graphic work for television, using the latest video technology. Furthermore DNB had employed in 1981 an engineer in industrial design as project manager, Hans de Heij, and one of his tasks was to support the graphic designer on security technology and other issues. Today DNB would also consider inviting a designer specialising in games, i.e. an inter-action designer and also an ‘image constructor’, might be invited like for example Ruud van Empel, a Dutch artist working mainly with Photoshop.

A central bank may opt for one of the five different selection processes as listed in table 5.10.

Table 5.10

Selection of design/designer	Design management	Examples/remarks
1. Open design competition	Any designer may apply.	Worldwide: Sweden (2011). Residents only: Israel (2011).
2. Design competition based on invitation	Designer selected by (aesthetic) advisors.	NLG (1987), Euro series Ages and Styles (1996), Switzerland (2005), Denmark (2005).
3. Commission designer	Commissioned work. Designer will work in a design team, managed by central bank.	Independent banknote designers (France, Netherlands, Switzerland).
4. Designed by printer	Internal by printer.	a) Central bank printer (USA, Casa da Moeda do Brasil), b) Commercial printer (DeLaRue, G&D, Oberthur).
5. Competitive design teams	Team A, B and C produce a design and a printing proof.	3 Independent development teams like in car industry (BMW); unknown in banknote industry.

Different processes towards the selection of a banknote designer or a banknote design.

From 'Design Brief' to 'Programme of Requirements'

Next item to be managed by the central bank is the description of the design assignment for the designer. Usually a central bank specifies the new banknote in a Design Brief, a written document for a design project focused on the desired results of design and not the aesthetics. Design Briefs are commonly used in consulting engagements, when an independent designer or a design agency executes a design on behalf of a client. The Programme of Requirements (PoR) evolves from the Design Brief and is similar an other term often used: a Product Design Specification (PDS).

While the Design Brief outlines the design goal and major constraints and considerations, the PoR, a sturdy instruction manual, goes further and determines the precise limits for the full set of requirements in the product being designed, to ensure the product will meet the needs of the user. A PoR is a document of what a not-yet-designed product is intended to do. Such a PoR will not only clarify the design assignment, but will also make the design process better manageable in terms of time and costs. Working with a PoR leads to a shorter development time and to a higher quality of the design.

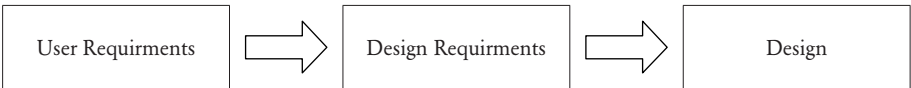
Design Briefs for a new banknote are often unclear, hiding many implicit aspects. To overcome this situation the central bank must collect feedback on the previous

issues, including public comments and remarks from other users and stakeholders. Eventually all of this is brought together in a PoR for banknote design as promoted by De Heij in several publications [69, 141, 178, 187]. The requirements in the PoR are *user-oriented* and to arrive at such user oriented requirements, the central bank has to do research, similar to marketing research done by commercial companies. The user requirement defines the why, the target; the design requirement defines the how, the means. A user-oriented banknote design starts with listing the user requirements, which are translated to the design requirements as illustrated by the following example. Value recognition is improved by using main images from different image categories (section 5.3). Translated to a *design requirement* the central bank indicated that these images should be taken respectively from the categories women, men, animals, plants and buildings. Finally the graphic designer will select for each category a subject and applies the design requirement into a design (figure 5.24).

Faced with this concept of collecting all requirements in a PoR, banknote designer Oxenaar called this DNB document in 1982 ‘an instruction manual the size of a telephone directory’. Once familiar with the method Oxenaar turned more positive [54]. To Jaap Drupsteen, Oxenaar’s successor, the applied methodology appeared as ‘a textbook example of a thorough, well-organised and flexible procedure; openness to innovations and improvements was structural’ [55]. Like his predecessor, Jaap Drupsteen was impressed by the size of the PoR: ‘When I received a commission to design a new banknote, I also received a three-centimetre-thick paper full of requirements that revealed all the security tricks. But eventually, all these obstacles led to solutions you would otherwise never have come up with.’ [73]. In reality, the PoR document Drupsteen was given numbered 63 pages and was 8 millimetres thick [141]. Both designers shed their initial scepticism after they read through the PoR and realised this was the ‘bureaucratic’ document they would have to deal with. The advantage for the designers was that they needed less time for (endless) meetings with the paper maker, printer and central bank and could spend their time on designing.

Creating an adequate PoR is not a waste of time; its composition is in fact already part of the design process, since a PoR is the desired product described in words. Working with a PoR, with user requirements formulated as problems

Figure 5.24



From user requirements (target) to design requirements (means) to design.

to allow maximum freedom to the designer to come up with solutions, will trigger new developments and will provide a unique contemporary identity to the new banknotes. Over the years DNB implemented this strategy of a problem setting, user-oriented PoR and repeated several successful graphical and technical innovations for the guilder designs as demonstrated by the overview provided in table 5.11. To underline the importance of user requirements, two new examples will be provided of innovative concepts:

- 1) Banknotes with two functional sides: a wallet and a banknote processor side,
- 2) Signatures supporting trust.

Table 5.11

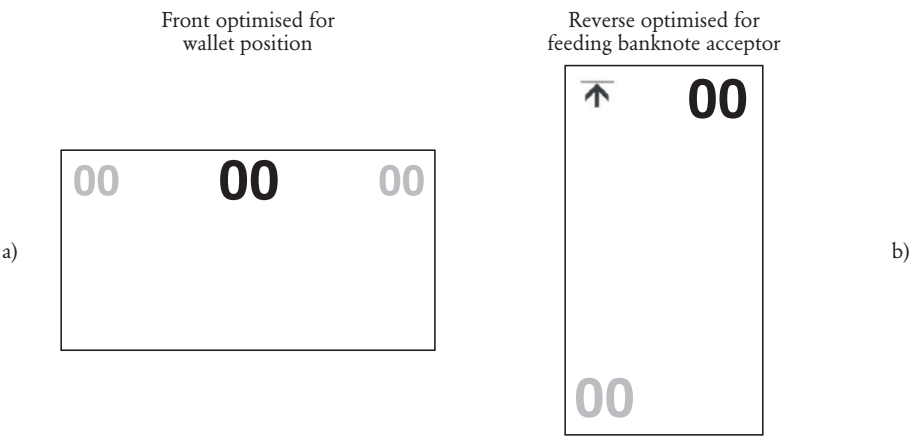
In circulation	Banknote	Graphic design	Innovative technology
1954	NLG 10/Hugo de Groot	- Series design (instead of single issues)	- Film of synthetic varnish (1957)
1971	NLG 10/Frans Hals	- Bright colours - Innovative gravure style	- Special fluorescent fibres - Marks for the blind - OCR-B numbering - ISARD - See-through register - Dry offset (Simultan)
1974	NLG 5/Vondel 1	- (Note design similar to 1966 version)	- Cotton paper with synthetic fibres (Paressyn)
1981	NLG 100/Snipe	- Bird instead of portrait	- Circular screen traps - Density from 100 % to zero - Magnetic numbering ink - Long grain paper
1982	NLG 50/Sunflower	- Bright orange and yellow colours	- BFIS
1986	NLG 250/Lighthouse	- Outstanding design - Penalty text replaced by names of search lights	- 2x Simultan press - Barcode watermark - Metameric colour pair
1990	NLG 25/Robin	- Abstract design - Banknote named after watermark	- Barcode numbering - Tactile pattern for the blind instead of single marks - Colour outside euroscale
1993	NLG 100/Little Owl	- Poem on banknote	- Iridescent planchettes - Integrated electrotpe watermark (eyes of the owl) - Silk screen covering 80 % - Foil patch in colour of the note, overprinted - Transparent intaglio - Wet offset
1996	NLG 1,000/Lapwing	- Contemporary poem specially written	- Semi-transparent bismuth ink on reverse
1997	NLG 10/Kingfisher	- Off-running design - Currency ISO code: NLG	-
2002	Euro banknotes	- Euro currency	-

Overview of the results of DNB's banknote development strategy in the 1950-2002 period. This strategy focussed both on outstanding graphic design and on innovative technologies.

ISARD = Intaglio Scanning and Recognition Device (relief ink detector)

BFIS = Banknote Fitness Inspection System (fit-unfit detector).

Figure 5.25



Banknote design concept based on today's use of a banknote
a) Horizontal position in wallet. One clear numeral in the middle and optional two more numerals in the upper corners.
b) Vertical position to feed banknote into a banknote processor.

Wallet and banknote processor side

Today's banknotes are more-and-more used in ATMs and banknote acceptors. Especially for automated banknote validators a vertical banknote orientation would help the public feeding the machine [118, 169]. Future banknotes could be designed with one face for optimal use in a wallet while the other side could be optimised for feeding banknote automates (figure 5.25). Reasoning along similar lines triggered in 2010 the idea for a conceptual banknote bearing all public features on the front and all retail features on the reverse [192].

Signatures supporting trust

The public is usually quite familiar with the face of the chairman, governor or president, but not their signature, although supporting trust is today's major function of the signature (see appendix A1.13). It may be questioned if a hand-written signature is still the most adequate design, especially if the signature is not combined with a specification of the position and name of the signer, like 'President X.Y. PQRSTUVWXYZ'. Instead of an unreadable signature, the third president of the ECB, Mario Draghi, wrote his name on the euro banknotes, a step in the proposed direction (figure A1.48c). Further innovation of the signature function could be found in replacing the signature by a small photo. This will most probably support the confidence perception of the note, as people will recognise the face (see figure 5.26). A counter argument to such a concept is that a central bank may not want to print living persons on their banknotes, although there are many examples of both

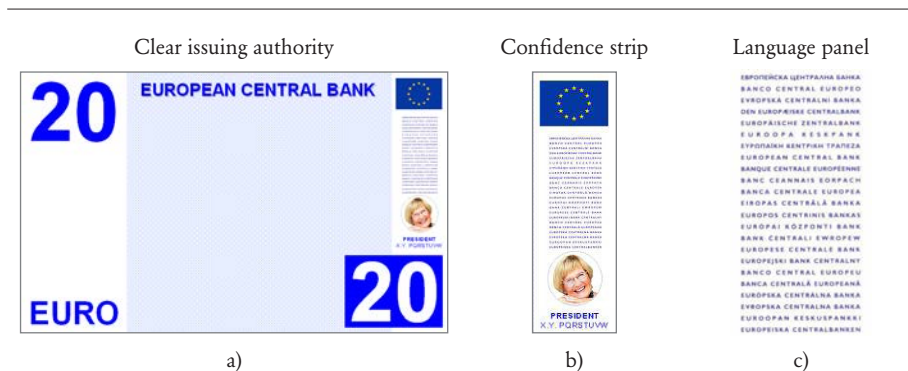
coins and banknotes portraying living people. Also if the purpose of the signature is to honour the official, this purpose would be better served if the note also stated the name of the official in small lettering.

In the Netherlands in 1934 one banknote has been issued with the portrait of a former president of DNB, Willem Cornelis Mees, as shown in figure 2.17c.

5.9 Design freedom

Once the central bank has selected a graphic designer, it has to decide on the ‘design freedom’ of the graphic designer [205]. If something new is required, the designer needs freedom; if an upgraded banknote is required the role of the designer will be limited. The Dutch banknote designers Oxenaar and Drupsteen were free within the frame of a brief identity description as provided in chapter 4, section 4.1 and DNB’s policy is classified on level 9 of table 5.12, which provides 10 classifications of ‘design freedom’. There are no known cases of banknotes where the designer was left completely free (level 10). The designers contributing to the Swiss 2006 banknote design competition received the motto ‘Switzerland open to the world’ indicating level 8. The design freedom given in 2006 to the new Danish banknotes is set at level 7, since the Danish designers were more restricted than


Figure 5.26



Innovative concept of supporting trust through a photo signature.

- Example of a ‘banknote photo signature’ of a female president of the European Central Bank. Together with the flag and a ‘language strip’, a kind of ribbon is created, a confidence strip validating the design comparable to diplomas or other official papers such as a notarial deed. The signature is positioned in the bottom right-hand corner of the note to stress the function of the signature: approval of the proof print. Another clear indication of the issuing authority ‘European Central Bank’ instead of abbreviations (BCE, EBC, EZB, EKT etcetera) and a language panel showing, in micro-lettering, the full name of the European Central Bank in all languages of the EU. Concept by De Heij.
- Confidence strip: EU flag, language panel, photo signature of president including text. Including the text PRESIDENT and the name of the President: X.Y. PQRSTUUVW.
- Language panel: the name of the European Central Bank in all languages of the Eurosystem.

Table 5.12

Design freedom	Policy	Example	
	High	10. Completely free	-
		9. Identity description	Netherlands (since 1976)
		8. Prescribed motto	Switzerland (2006)
		7. Prescribed theme	Denmark (2006)
		6. Prescribed main subject	France (1982), Israel (2011), Sweden (2011)
		5. Keep motif	-
		4. Adapt image	UK adapts portrait, euro (ES2)
		3. Keep image	USA, Chili (re-engraved portraits), South Africa
		2. Keep lay-out	Hungary
	Low	1. Minor change	Signature change euro, USA

Banknote designers receive different design assignments from their central banks; from a minor change (low) to a completely free assignment (high).
ISARD = Intaglio Scanning and Recognition Device (relief ink detector)
BFIS = Banknote Fitness Inspection System (fit-unfit detector).

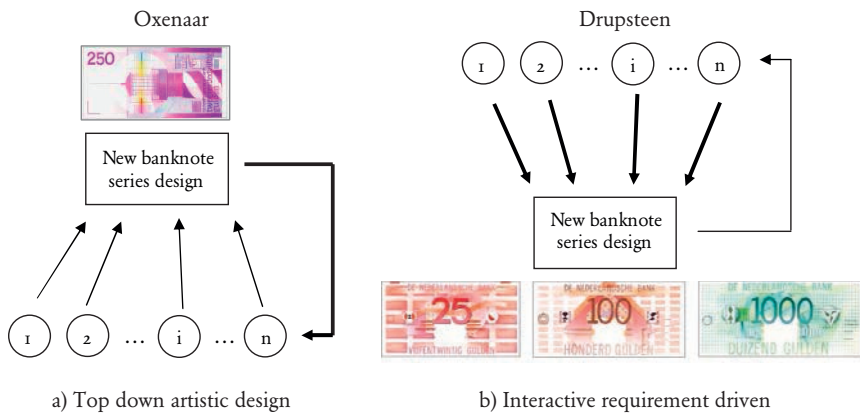
their Swiss colleagues. The Danish assignment read: The banknotes are to be of the same size and signature colours as the existing series, with the theme of bridges and landscapes near the bridges or details from these landscapes. When designer Roger Pfund accepted the assignment for a new banknote series for the Banque de France in 1982, he received a high degree of design freedom: ‘I was given carte blanche, the Bank saying they wanted to forget the kraft paper appearance of the previous series, adding colour and life’ [231]. However, since the main subjects were described, the level of design freedom for Pfund was 6.

A change in a signature on a note, as was done several times on US dollar and euro banknotes, is a minor change and the design freedom is close to zero, indicated by level 1.

While banknote designers may have the same level of design freedom, they do operate in different ways. Oxenaar used to sketch the banknote design in pencil and brought the drawings to every meeting with the printer to make sure that they would be reproduced as accurately as possible (top down approach, figure 5.27a). In contrast, Jaap Drupsteen was primarily interested in the interaction between the craftsmen of origination and his initial design. Details of his designs were (partly) left open, inviting ideas and skills of the involved experts (interactive approach, figure 5.27b).

The flip-side of high freedom of design is that the central bank management may take unexpected corrective decisions. Jaap Drupsteen experienced this in 1993 when the proposed watermark, a green frog (figure 5.28b), was not accepted by DNB’s

Figure 5.27



Two basic approach principles for a banknote design process:

- a) Top down approach. Example: Robert Oxenaar: always put his drawing on the table. This is what it should look like. The required features should follow the basic design. Oxenaar: 'the final banknote is not the sum of all required elements, but it is the result of a design which is sustained to the end' [27].
- b) Interactive approach. Example: Jaap Drupsteen: a basic plan without details, followed by interaction with a project team (experts of paper mill, printing works and central bank).

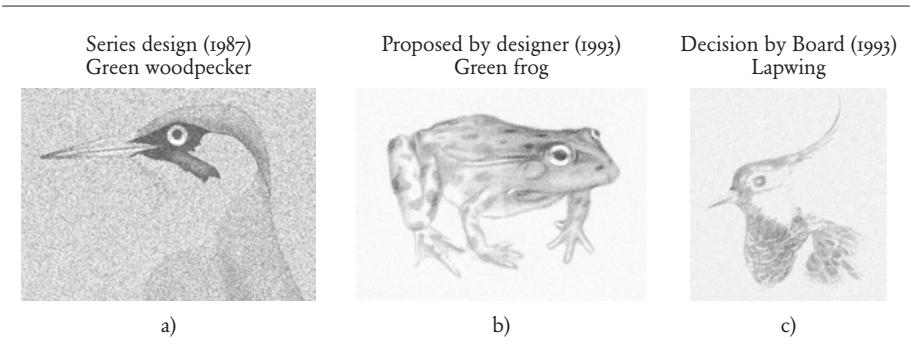
president Duisenberg, who became for a moment a designer himself and proposed a lapwing instead of a frog (figure 5.28c). The original concept had featured a green woodpecker (figure 5.28a) [e.g. 66, 237]. The green woodpecker and the frog are both green which creates a link associated with the green banknote. Although the lapwing ended up in the final design, the frog was still a better proposal, because this is an animal from an other class than birds, which helps the recollection further (section 5.3 on series design).

Interference with the design may result in decreased design quality. The banknote design may become a collection of design elements rather than a consistent design. In the worst case the new banknote design is chaotic, patchwork or looks like a cut and paste job. The top down method described above and favoured by Oxenaar is a safe method to yield banknotes of outstanding graphic design. An interactive method may also lead to successful banknote designs, as proven by Drupsteen. Such a bottom up method requires higher skills of the central bank's design management though [141].

5.10 Future banknote design

The last subject of this last chapter is the future, what types of tangible money will be there?

Figure 5.28



Dutch designer is not always free... Watermark designs and watermark NLG 1,000/Lapwing as issued in 1994. Designer: Jaap Drupsteen.

- a) Original watermark proposal: a green woodpecker (1987).
- b) Proposal when working on design NLG 1,000: a green frog (1993).
- c) Design made on request of DNB Board: a lapwing (1993). This design ended up in the final banknote although the frog would have been a better choice for recollection by the public.

Since the earliest primitive use of money, there has been a shift within payment systems from objects, to gold, to coins and paper to electronic currencies. Cash, debit and credit cards have become popular payment instruments and more recent arrivals are electronic payments by internet and by mobile phone. Today the banknote as a means of payment has many competitors and the developments in these new fields are fast. How will banknotes evolve? What are their strong and weak properties? These questions will be answered in the following subsections:

- 5.10.1 The future of cash
- 5.10.2 Banknotes and information technology
- 5.10.3 Engage people's emotions in future banknote designs

5.10.1 The future of cash

Recently DNB research delivered an overview of the figures of cash and other payment systems [260]. Other central banks are publishing payment statistics like Australia, Denmark and United Kingdom. This study does not want to go in detail on the statistics of the different payment systems. In general, so may be concluded, cash payments are decreasing, while debit card payments are increasing. For 2011 the following figures were found for the number of payments done at a so called Points-of-Sale (POS) in the Netherlands:

- Cash: about 62 %.
- Debit card: about 35 %,
- Chip card: about 3 %,
- Credit card: about 0.5 %.

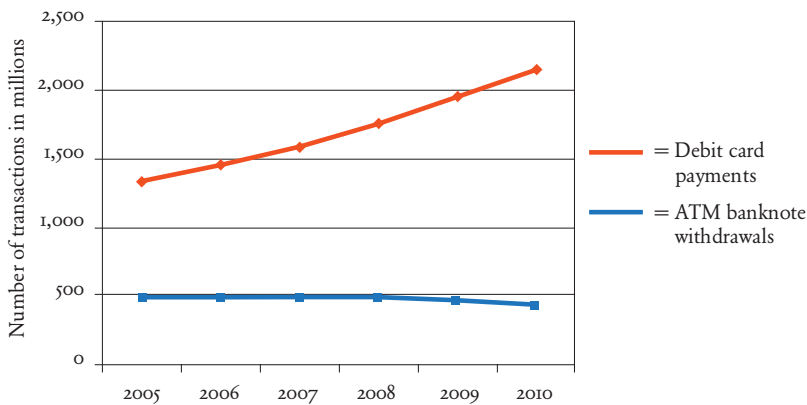
The decline of the use of cash in the Netherlands is illustrated by the graph of figure 5.29; the number of debit card payments is clearly increasing, while the number of banknote withdrawals by an ATM are slightly declining.

The use of cash money will most probably further decrease while non-cash payments will increase their popularity and is the result of the increased use of debit cards for smaller amounts as found. Especially purchases of up to 20 euro are paid in cash [236]. The central bank of Australia reported similar figures and here as well, the amounts paid in cash are decreasing: 80 % of the amounts paid in cash are below ASD 25 [232]. Still, it is very unlikely that cash money will disappear completely; the public prefers to use a mix of different means of payments, one of them being cash. Especially coins and small notes are expected to remain in demand [e.g. 219]. Studies of recent date indicate that youngsters are a major group of cash users, as are elderly people [e.g. 232, 260]. From such studies it is also concluded that cash is specifically used for the following type of payments:

- Fast-food restaurants, cafés, bars and cafeterias,
- Daily shopping, like supermarket,
- Consumables,
- Pharmacies,
- Fuelling stations.

Also, cash is still the means of payment that may be resorted to in the event of a breakdown of the electronic payment system.

Figure 5.29



Increasing number of debit card transactions (red curve) and slightly decreasing ATM banknote withdrawals (blue curve) in the Netherlands [239].

Cash and non-cash payments

Payment transactions can be divided into cash and non-cash or in C-money and E-money (E stands for electronic). Payment systems have several payment channels, summarized in table 5.13, like coins and banknotes for cash. The electronic payment products are issued by different organisations, such as credit card companies, commercial banks and other payment service providers. There are two forms of electronic money; directly linked to a bank account and E-money not linked to a bank account but to another type of account. Innovations using the internet and/or smart phones are frequently presented and increasing players take part. Having to deal with different types of money and different payment channels, people will develop different perceptions of money (figure 5.30). All these different means of payments, products and the companies behind them create a diffuse identity of the currency-issuing organisation, the central bank.

Public uses more-and-more different means of payment

About 20 years ago Dutch people could leave their home and take only cash with them. Today they have to think first which type of payments they foresee. Parking a car requires either a chip card for street parking or a credit card for easy access to a parking building. For public transport the Dutch have to bring their public transport chip card ('OV Chipcard'). Before entering a fuelling station people already have to choose their means of payment: cash or cards (e.g. Berchem, Luxembourg). More than in the past people have to think about the means of payments they may need is the conclusion (figure 5.31). Once the payment has to be done, the Dutch are able to use the instrument of their choice; in less than 3% of the transactions they were forced to resort to other instruments [260].

Table 5.13

Money	Indication	Type	Product/payment channel (in payment system)
Cash	C-money	Coins	Coins
		Banknotes	Banknotes
Non-cash	E-money (electronic money)	Linked to bank account	Forms (bank account) Internet (bank account) Debit cards Credit cards
		Not-linked to bank account	Pre-paid cards (chip cards or electronic purse) On-line purses (internet) e.g. using smart phones

Limited overview of the different forms of access to money.

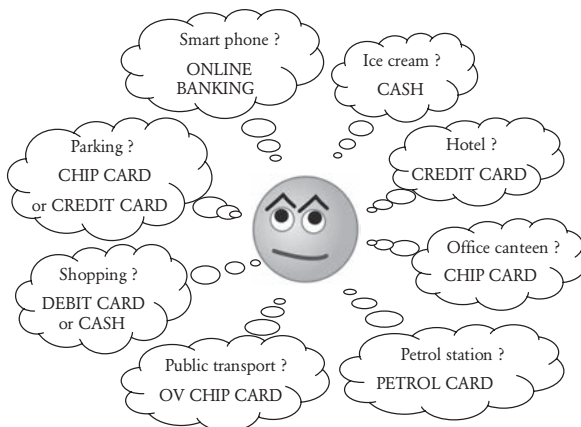
Figure 5.30



Impression of the competition of payment systems; what does this mean for future banknote designs?

- a) ATM and debit card (ING Bank, 2008).
- b) Internet payment using Random Reader and debit card (Rabobank, 2008).
- c) Debit/credit card payment (circa 2010).
- d) Mobile telephone with app to check bank account (ABN AMRO Bank, 2010).
- e) Google Wallet, smart phone with app (2011).

Figure 5.31



Do I have all means of payments with me? Before leaving home, people have to think about their means of payment in advance.

Convenience

Convenience seems to be the dominant factor of a payment transaction, at least to the Danes as reported by the Danish central bank in 2011 [233]. Privacy turned out to be the least dominant factor. Transaction speed is not mentioned explicitly in this publication, whereas convenience is (table 5.14). However, speed will be part of the convenience parameter and is a measurable parameter although central banks report here different figures. The average cash payment in Australia takes 20 seconds, which matches the 19 seconds reported earlier for the Netherlands [106, 232]. British cash transactions seem to take a bit more time, an average of 27 seconds is reported in 2012, compared to 36 seconds for handling a card payment [261]. A breakdown of these payment times is not delivered and probably would explain the differences found.

User criteria for cash

It is impossible to forecast the future of banknotes without including coins. Table 5.15 lists the strong (+) and weak (-) points of cash money. To ensure a future for cash, the strong points will have to be reinforced and the weak points addressed [192]. Jaap de Vries has performed such an exercise for one of the disadvantages of E-money. To get your finances tangible he developed a ‘visual purse’ in an attractive wire shape. ‘When you pay you will see money disappearing from your screen and the wire form becomes smaller. And conversely, if your amount of money grows, because your salary is paid, you will see the wire form increasing.’ [229].

Table 5.14

Reasons for using	Payment method			
	Cash (%)	Debit card Dankort (%)	Debit card Other (%)	Credit card (%)
It is convenient	34	63	37	33
Control of my finances	16	6	11	13
I had no other option	11	11	26	19
To get rid of cash	9	-	-	-
Instant payment	-	4	10	-
To use the credit facility	-	-	-	27
Other reasons	29	16	16	9

Payments behaviour of Danish public in 2010. Dankort is the national debit card in Denmark.

Table 5.15

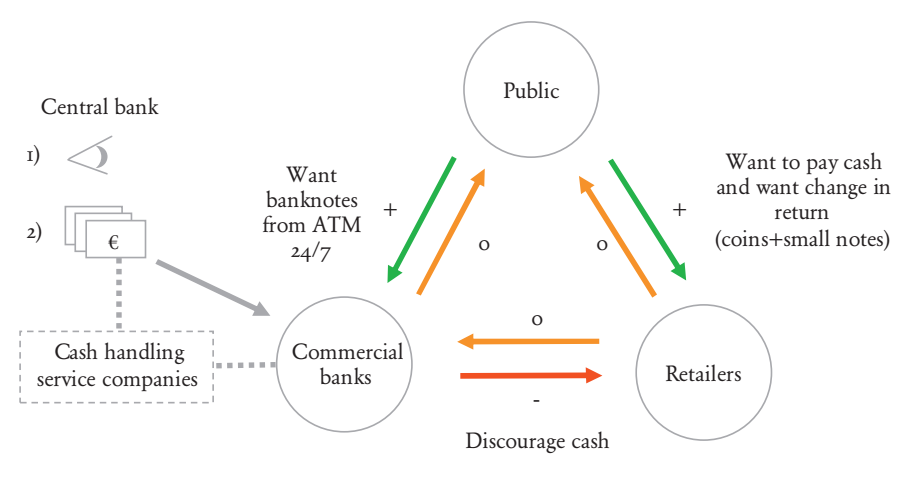
User criteria public	Cash money: coins and banknotes	
	+	–
1 Accessible	ATMs available 24/7.	You may not have enough with you.
2 Acceptance	Person-to-person payment.	Sometimes difficult to spend (e.g. higher denominations).
3 Time spent	Fast; time to settle cash transaction is about 20 seconds.	–
4 Amount of work	Provides instant settlement; one handling.	Need to get cash from ATM/bank.
5 Privacy	100 % privacy (anonymity). Store of value (hoarding).	Avoid (VAT) tax payments. Used for money laundering. Used by criminals (e.g. ransom money).
6 Confidence	Certainty of acceptance. Reliable (does not depend on technology).	Banknote may become invalid: – Out of circulation, no longer exchangeable at central bank, – Value decrease because of high inflation.
7 Security	Security check possible.	Losing it: – Pick pocketing, – Mugging. Can be counterfeit. Ram raids of ATMs and attacks on CIT companies.
8 Cost	Fee-free for end users.	No interest compensation.
9 Comfort	Nice to look at (design).	Portability: – Need a wallet, – Coins may be heavy. Can be dirty.
10 Budget control	Tangible, visible. Value perception of cash is positive. Less willing to spend; cash payments are painful (card payments relatively painless).	–
11 Emotions	Close-to-me product (carried on the body).	–

Overview of the pro and cons of cash money.

Analysing stakeholders

The use of cash money is first of all driven by the public demand. The public would like to withdraw banknotes at any time, 24/7. Forced by the public preference for cash, two other stakeholders of the cash cycle have to deal with cash too: retailers and commercial banks. Figure 5.32 displays this cash cycle and identifies the attitudes of these three main players. Since the attitudes towards cash are dissonant, the diagram shows instability and is an indicator of future changes. Commercial banks will keep trying to eliminate cash payments and promote other means of payment over banknotes. Banknotes are already a cost item and require increasingly expensive

Figure 5.32



The attitudes of three different parties towards cash money. The public has a positive attitude towards cash (green, +). They want banknotes from their commercial banks and they want change from the retailer (banknotes and coins). Commercial banks and retailers fulfil this public need indifferently (orange, o). Retailers are also clients of the commercial banks and require deposits and withdrawals, especially coin availability to provide change to the public. The attitude of the commercial banks towards cash is rather negative, because of the handling costs, security risks and lack of income on cash holdings. Finally the central bank has to ensure accessible and efficient payment systems in its capacity as overseer, but has also an interest in the monetary income from banknotes.

security measures. Many see ATMs as a none-core business and something to outsource completely. Non-cash payments may bring some profit, while the banks do not receive an interest fee on their cash stock.

Retailers react pragmatically and accept the banknotes offered by the public and have to provide change, especially coins and low banknote denominations. The retailers need the banks to provide them with small change for cash payments. The banks' reaction is one of discouragement; bankers would rather not provide any coins or small banknote denominations at all. Security is also becoming more and more of an issue to retailers. Since 2010 several shops in Amsterdam have operated without cash for security reasons and their number is growing. These shops identify themselves with 'no cash' stickers (figure 5.33a). Retailers may also become critical on cash for other reasons, like Marqt. This modern 'honest' food store operates without cash, not only for safety and efficiency reasons, but they also do not like the armoured Cash In Transit (CIT) cars bringing and collecting cash and parking on the pavement with their motor running.

Payments using a smart phone

A recent development is payments by smart phone using an app (figure 5.30d). For several years there have been more mobile phones in the Netherlands than

Figure 5.33



Stickers telling that cash is not always king...

- a) 'No Cash' shop in Amsterdam (2012). Photo: De Heij.
- b) Dutch super market check-out 'PIN only' (2010).
- c) Discouraging robbers: sticker NO CASH (USA, 2009).

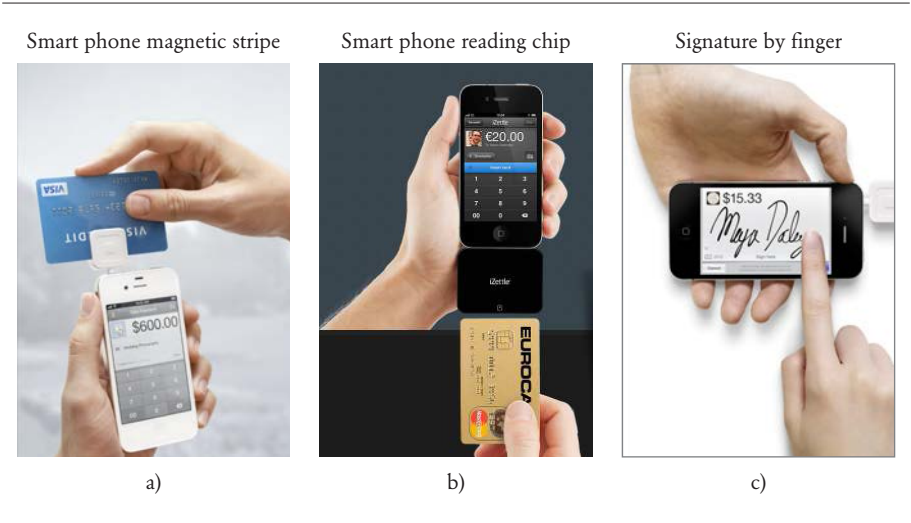
inhabitants. And for 2012 the expectation is that over 40 % of the Dutch will have a smart phone. There is no doubt that the opportunities offered by smart phones represent a potential revolution in the way that secure documents are examined and validated (e.g. image-processing algorithms, reading spectral signatures of taggants). One of the latest developments is the transform of a smart phone into a payment terminal. A special device is connected to a smart phone which reads a card's magnetic strip or EMV chip (figure 5.34).

Instead of a PIN-verification supermarkets are experimenting with a fingerprint authenticity check as illustrated in figure 5.35.

Retailers issuing their own money

The ticket machines of the Dutch railways have not accepted banknotes since 1985 although coins continued to be accepted. In 2009 a further step was made to decrease cash payments within the Dutch public transport services when a standard public transport chip card was introduced named 'OV Chipcard'. The public has to pre-charge this card with at least 10 euro and pre-charging is also possible using cash. The organisation behind the OV Chipcard, Trans Link Systems BV, will receive seigniorage on all these preloaded cards.

Figure 5.34



Smart phone transformed to a payment terminal for debit or credit cards.
a) Payment terminal using mobile phone suitable for magnetic stripe (Company Square, US).
b) Payment terminal using mobile phone suitable for EMV chip (Company iZettle, Sweden).
c) Client's signature by finger on the touch screen of a smart phone.

Figure 5.35



Identification by fingerprint instead of PIN-code.
a) In 2008 Edeko in Germany had 120 supermarkets equipped with this type of payment device.
b) Albert Heijn started in 2008 with 'finger payments'.

Task for central banks

Usually the central bank is responsible for the smooth functioning of the nation's payment systems. In 2011, DNB's board formulated four leading principles within the scope of the further development of payment systems [212], i.e. payments should be:

- 1) Accessible,
- 2) Reliable (e.g. continuity),
- 3) Secure,
- 4) Efficient (e.g. fast, cost).

These four principles may be at odds with the banknote issuance and its merits. The role of the central bank is twofold as illustrated in figure 5.32. On the one hand the central bank provides banknotes to the commercial banks and is therefore a direct stakeholder. On the other hand central banks have the mandate to optimize all payment systems, including cash, by encouraging convenience, bringing cost reductions and supporting confidence, with security becoming a key factor. The dissonance in the model of figure 5.32 has to be solved, to bring cash money, including banknotes, a positive future.

Advantages of cash

Research showed that there will be a continuing need for cash money, since cash has several sustainable competitive advantages over electronic money. A payment in cash is quick and private. Cash money is also given as a gift or as a reward (tip, reward for school report) and as reported, the public would like to have at all times some coins and small denominations in their pockets. High banknote denominations are also popular; the euro 500 showed the largest increase of issuance and outperformed all other denominations. The future of medium denominations might be at stake, they might be used less in daily transactions, although there is no such sign yet. However, to elaborate on the future of individual denominations is beyond the scope of this study.

Future developments E-payments

The last decades several new electronic payments were developed (table 5.13). Money has increasingly grown to be just an electronic blip on a computer screen or in a database; table 5.16 provides an overview. One of the recent developments is Google Wallet, an app released by Google in 2011 (figure 5.30e). This mobile payment system allows its users to store credit cards, loyalty cards, and gift cards among other things, as well as redeeming sales promotions on their mobile phone. Google Wallet uses near field communication by tapping the phone on any PayPass-enabled terminal at checkout.

Although future developments of E-payments are outside the scope of this study, a glimpse of things to come is provided here. The current state of mobile payments

was recently described by two US Federal Reserve Banks in their joint 2011 paper ‘Mobile Payments in the United States, Mapping out the Road Ahead’ [203]. The authors report that, over the past 50 years, new payment options have been developed, but none have been eliminated. They further state that it took ten years for US consumers to use ATMs in meaningful numbers. The use of cards at Points of Sale - in the US mainly credit cards - also took 20 years to come into its own. The optimal means of moving forward would be an ‘open mobile wallet’. Key to this concept is interoperability; one system should facilitate all types of payment alternatives, just as a physical wallet holds coins, notes and cards. A technology already there are ‘bumping telephones’, two smart phones have to touch each other to settle a payment. Future payments from person-to-person may be made through ‘talking smart phones’, when voice-ordered payment instructions are made possible, possibly combined with biometrics recorded by for example a webcam as illustrated in figure 5.36.

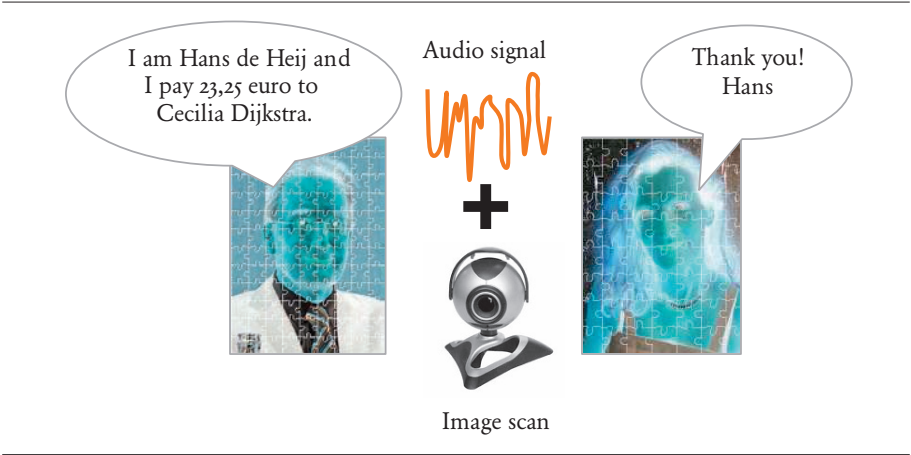
Influence of banknote design on other means of payments

The appearance of banknotes influenced the design of other means of payment like the first Travellers Cheque in 1895 and the guaranteed giro cheques in the Netherlands in the 1970s and 1980s (see figure 5.37). On its turn, future banknotes might be influenced by the developments of E-money and especially by the information technology used, as will be discussed in the next subsection.

5.10.2 Banknotes and information technology

In general, the information technology is an area where many innovations take place. Up to now, banknote innovations making use of information technology

Figure 5.36



Voice ordered payment supported by an image scan.

Table 5.16

Year	Payment product	Remark
1868	Clearing office for transferable money	DNB started to participate as a clearing office for transferable money.
1887	Concept of credit card	The concept of using a card for purchases was described in 1887 by Edward Bellamy.
1895	Traveller Cheques	In USA.
1918	Postcheque- en Girodienst (PCGD)	Netherlands, established by Dutch Government.
1921	Credit card for frequent customers	Western Union issued charge cards to its frequent customers.
1929	Giro invoice	In Netherlands by PCGD. In Dutch 'acceptgiro'.
1950	Credit card, general purpose	General purpose charge card by Diners Club.
1958	World-wide credit card	American Express created a worldwide credit card network.
1959	Computer processes accounts centrally	Bank of Scotland was one of the first.
1965	Salaries paid out on account	Salaries paid out by giro.
1967	Giro cheque (guaranteed)	Very popular: in Dutch 'girobetaalkaart'. See Figure 100a.
1967	First ATM	Barclays Bank, London. Inventor: John Shepherd-Barron.
1971	Debit card (PIN)	Direct debit card.
1973	Eurocheques (guaranteed)	Reaction of the banks to giro cheque 1967.
1980	Loyalty cards, fuelling cards	
1982	Chip-card (or stored value cards, prepaid cards, electronic purse)	Chipcard trial in Woerden (Netherlands).
1984	ATMs and debit cards	Breakthrough.
1986	Telebanking	Telephone line modem. Discontinued in 2005, succeeded by Internet banking.
1990	National efficiency of payment orders in NL; intermediary account no longer necessary	Establishment of Interpay, later Equens. After 20 years of discussion on 'Nationaal Betalings Circuit' (NBC).
1997	Internet banking	Account-to-account credit transfers.
1998	E-payment: Paypal	Standard for internet payments (incasso).
2002	Euro coins and banknotes	
2005	E-payment iDEAL	Standard for internet payments.
2007	Electronic invoice	
2009	Contactless payment (public transport)	In the Netherlands: 'OV Chipkaart'.
2010	Mobile phone used as payment terminal	US (Square), Sweden (iZettle).
2011	App payments	Google Wallet. In Netherlands ABN AMRO app.
2012	IBAN	International Bank Account Number
2012	SEPA (Single European Payment Area)	EMV chip (Europay, MasterCard and Visa) makes it possible to pay with debit and credit cards throughout the European Union.

Historic, limited overview of the development of payment products excluding cash in the Netherlands [101, 164, 222]. For the overview on cash payments see table 2.1.

Figure 5.37



Four examples of cheques.
a) Girobetaalkaart (cheque), the Netherlands. Guaranteed up to NLG 100 (1965). Design: R.D.E. Oxenaar.
b) Eurocheque.
c) American Express Travellers Cheque, EUR 100.
d) Swiss Bankers Travellers Cheque, American Express Company, CHF 100.

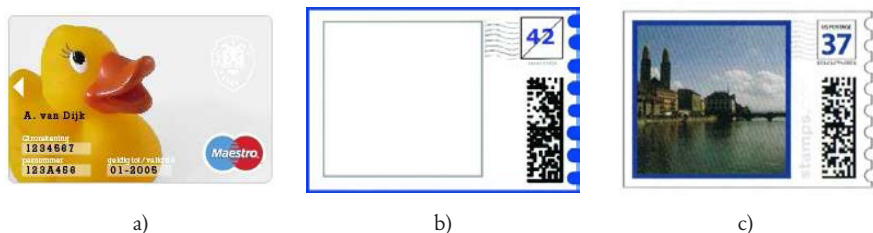
have been limited, but this may change. Two new banknote forms can be foreseen from this perspective:

- 5.10.2.1 Individually designed banknotes
- 5.10.2.2 Communicating with banknotes

5.10.2.1 Individually designed banknotes

Cards like debit or credit cards carry a magnetic stripe or a chip which is the actual payment instrument. The card itself is only a carrier and may have any design and is the reason why since 2005 clients of the Postbank (later ING) in the Netherlands have been able to design their own debit card. People may send their own digital image to the bank, which will be printed on the debit card (figure 5.38a). Similarly, people may print since 2005 their own postage stamps (figure 5.38b and c). Stamps may disappear fully when a code is written on the envelope or postcard (figure 5.39). Travellers may print their flight tickets and international railroad tickets at home, an other development in these years. The 2D barcodes on these tickets link the paper to an electronic database of the airline or railroad company (figure 5.40a). Paper is not needed anymore if the code is presented on the screen of a mobile phone (figure 5.40b). These developments trigger a similar question for banknotes. Is it possible to print banknotes at home? The young Dutch designer Tom van Enckevort made already

Figure 5.38



Example of individual print on a debit card and a postage stamp.

- a) Individual print on debit card (Netherlands, 2005).
- b) Template for individual postage stamp (Switzerland, 2004).
- c) The client filled the template with an image of Lake Zurich.

some proposals in 2008 as part of his bachelor studies in graphic design [155]. Such banknote design concepts are innovative, since the area outside the (traditional) banknote is also used (figure 5.41).

5.10.2.2 Communicating with banknotes

An individual code like the banknote number is the link between a banknote and information technology. Such individual codes can be represented as a barcode or on a chip. Doing so, new communication media like mobile telephones may communicate with the printed banknote, as will be explained in the following.

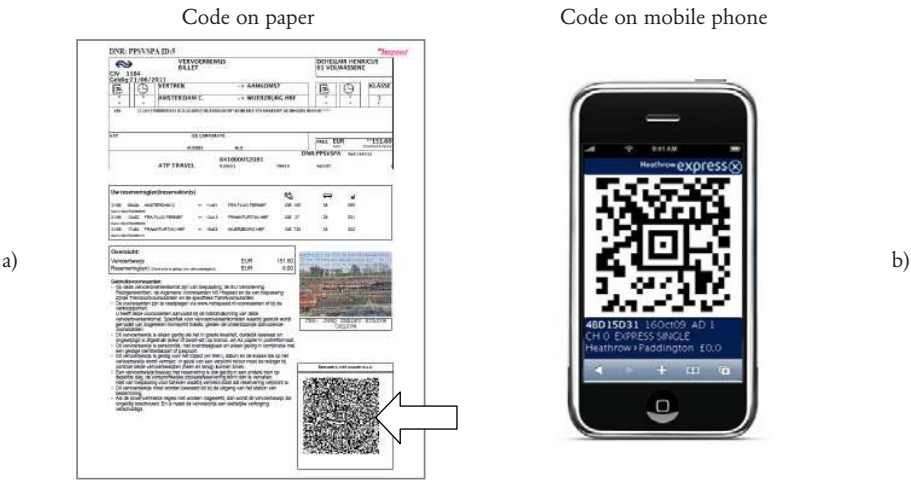
Figure 5.39



The postage stamp replaced by a code.

- a) A postage stamp code of 9 characters received by mobile phone.
- b) The code received is written by hand on the letter at the location of the stamp.

Figure 5.40

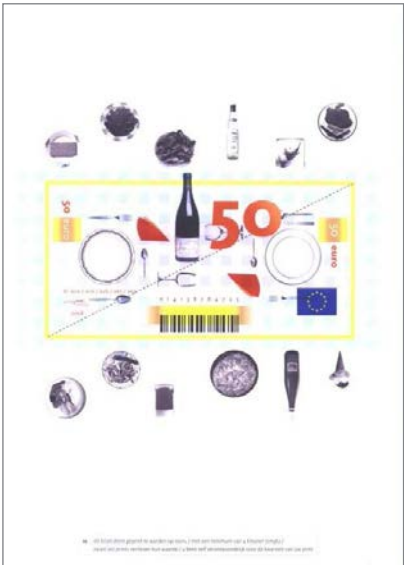


The two dimensional code is your ticket.

a) International train ticket in the Netherlands, 2011. The 2D-code in the lower right corner is the 'real' ticket.

b) Ticket for train or airplane on the screen of smart phone (simulation).

Figure 5.41



Print your own banknote. A4 sheet with euro 50 banknote. The area outside the banknote is part of the design. The concept is 'inviting people to sit together at the table of the banknote'. A proper motto for a euro banknote and demonstrates a little humour.

Using banknote numbers online

To date the public may type banknote numbers as input in two different systems, both available on the internet:

- Bill tracking systems,
- Numbers on counterfeit banknotes.

Like the way ornithologists track birds' migration by ringing them, 'bill tracking systems' are facilitated by a private website set up for tracking the movements of banknotes. A user may register a bill by entering its banknote number. If someone else has already registered this banknote, then the 'route' of the bill is displayed. One of the first bill tracking systems was 'Where's George?' named after George Washington who is portrayed on the one US dollar banknote. The site was created by Hank Eskin in December 1998 and was followed by many others, e.g. 'Canadian Money Tracker' (1999), 'Euro Bill Tracker' (2002), the 'Australian Money Tracker' (2006) and the Indian 'Track Gandhi' (2007).

Instead of a website, a radio show can also be used. 'Make 10,000 euro of your 10 euro note!' was the slogan of a radio quiz show in the Netherlands in 2007 when 10 banknotes of 10 euro were circulated among the public. Listeners to Radio Veronica could report the numbers on the banknotes in their pockets on a website; a total of 142,848 euro 10 notes were registered.

A more serious use of banknote numbers are websites offering the receiver of a banknote tools to verify if the banknote number is unique. This is the idea behind the 'Euro Check Web Site' (ECWS), launched in early 2007 by the European Central Bank. The ECWS provides information on counterfeit euro banknotes. The number will be verified against a database of known counterfeited banknote numbers. Access to the site is reserved to those who need such information in the line of business, e.g. professional cash handlers, law enforcement agencies and manufacturers of banknote handling machines.

Quick Response codes

The Quick Response code (QR-code) or flash code on a banknote was first proposed by DNB in 2007. Each denomination receives its own QR-code. When scanned with a mobile telephone, the website of the central bank is activated, which for example provides relevant information on the public security features of recent counterfeits [126, 205].

App for visually impaired (2011) and public security features (2011)

App is short for Apple I-phone applications. Apps penetrated the smartphones market from 2007 and in 2011 the first apps for banknotes were launched. The very first app for a banknote targets the visually impaired and was developed by the US Bureau of Engraving and Printing. This 'EyeNote App' may be downloaded free since 2011. The EyeNote app uses image recognition technology to determine a note's denomination. When the camera of the mobile phone has scanned 51 %

of the surface of a US dollar banknote it will tell - audibly or by vibrating - the denomination. Audible responses are available in both English and Spanish. The vibrations are coded by one pulse for the USD 1, two pulses for the USD 2 and so on, up to five pulses for the USD 100.

In 2011 also the first app's appeared providing information on the public security features of euro banknotes (e.g. SmartChecker by Hologram Industries [201]). Instead of using one of the app's already known, DNB decided to develop an app based on 'hyper reality' with a fun factor, using the feel-look-tilt principle. Hyper reality refers to features being 'more-real-than-real'; colours and effects are exaggerated. The related term is augmented reality. The app became available in the app-store in November 2011 (figure 5.42). At the same time DNB also introduced a mobile website providing similar content (<http://dnb-web.nl>).

Security feature for mobile phone

Some research projects linking smart phones and banknotes have been presented in 2012 [e.g. 251, 252]. In spring 2012 the Czech National Bank launched an app which tells if the security features are in the right place or even there at all. A new public security feature could be based on the spectrum of the camera, using e.g. metamerism colours or near infrared, using the camera of the smart phone as a sensor [126]. In that case the slogan Feel-Look-Tilt will be extended to Feel-Look-Tilt-Smartphone.

Figure 5.42



App developed by Visual Space on order of DNB. The app uses the functions of a smart phone such as movement and touch. When the screen is touched in the tactile area of the banknote the phone will vibrate (feel). The watermark will appear when the phone is held up to the light (look). Tilting the phone will display the holographic effects (tilt).

a) App 'Eurobiljet' launched by DNB in 2011.

b) Symbols developed in 2005 by Bureau Mijksenaar are used [115, 126].

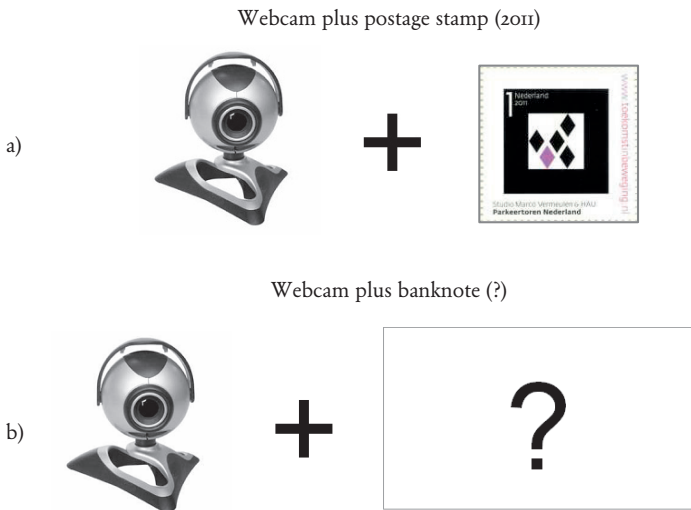
Web-camera and banknote

A Dutch stamp issued in 2011 could be recognised using a webcam, and the 2D building on the stamp was made visible in 3D on the screen (figure 5.43a). In 2011 the Dutch mail distributor PostNL also unveiled the first stamps with sound. When a smartphone with a special app is held close to the stamp, music is played. The code is invisibly integrated into the printed design. Instead of a mobile phone, a web-camera could be used to verify a banknote's authenticity (figure 5.43b).

Code from ATM

This outlook to the future ends with what may be called a wild idea and may solve logistic and security disadvantages of ATMs. People go to an ATM to get their banknotes. The most frequently withdrawn denomination in the Netherlands is the 50 euro. These notes are used in the supermarket or any other shop for cash payments. Most 50 euro banknotes received are not returned for change by the retailer to the public and the retailer deposits these notes at a commercial bank. This note has been used only once and the return frequency is high; euro 50 notes return around 6 times per year to the central bank. The efficiency of this euro 50 note is therefore low and the security risks are high and increasing.

Figure 5.43



Printed images can be captured by a web camera and uploaded to a specific website which provides more information on the printed matter.

- a) Web camera and post stamp. 3D images of future Dutch architecture are made visible on the website www.toekomstbeweging.nl. Postage stamp issued by TNT Post in the Netherlands in 2011.
- b) Schematic presentation of new possibilities for a web camera and a banknote.

As said, the public is not much interested in medium denominations, but they do like to have some coins and low banknote denominations with them. What if an ATM could provide a ticket, a kind of credit voucher, instead of real banknotes, a receipt with a code? The public might take the voucher to the retailer and receive the desired coins and small denominations as change (figure 5.44). The ATMs would no longer need to be restocked, eliminating major costs and security risks. Such out of the box thinking creates elsewhere probably new problems, like how to ensure that the retailer will have enough cash stock and how to guarantee the security of the voucher? And one may also ask, why shouldn't future ATMs not provide the desired coins and small denominations while people will use mainly a debit card to purchase their daily needs? However a similar idea - just before finishing this study in July 2012 - comes from KAL. Instead of cash from an ATM a Retail Teller Machine (RTM) prints vouchers that consumers bring to the register in exchange for cash. Once the retailer receives the voucher, the money is immediately credited to the retailer's bank account.

Coming to the end of this section on the future of banknotes, the conclusion is that the future of cash money has to be sought in strengthening the advantages of cash over other payment methods, such as convenience, direct settlement, privacy and no infrastructure needed. On the other hand, the disadvantages of cash payments should be reduced, such as a poor portability (heavy coins, torn notes), average cleanness (e.g. keyboard of ATMs), risk on a counterfeit and an unknown sustainability. And especially for retailers, improvement should be made on security, handling time and transaction costs.

Figure 5.44



Instead of banknotes the ATM gives out vouchers or cash-out tickets.

5.10.3 Engage people's emotions in future banknote designs

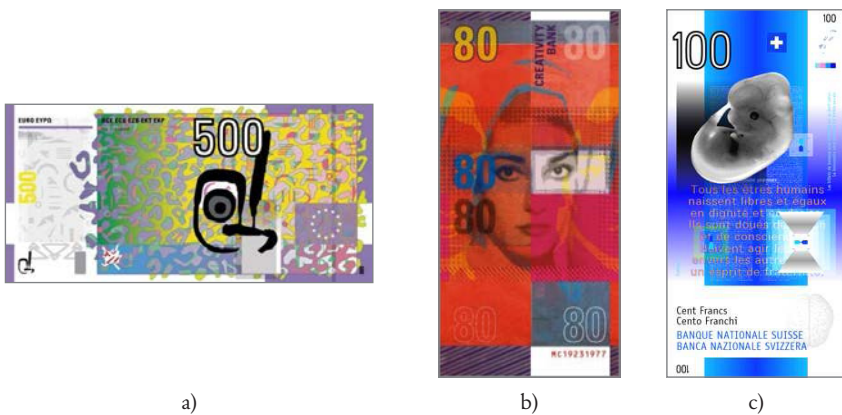
Future banknotes could be improved on the human factor and especially 'emotional' design parameters are of interest [e.g. 125]. Banknote designer Roger Pfund advocates that emotion should be added to a banknote design, especially by including art [e.g. 126, 182]. Two of his designs are shown in respectively figure 5.45a and 5.45b. However, the central bank should not exaggerate. An embryo on a banknote as shown in figure 5.43c provokes too much negative emotion, as happened in 2005 in Switzerland [e.g. 126].

Several artists are using banknotes in their work. How would they incorporate emotional aspects? An overview is provided in Appendix AII on artists using the identity of banknotes.

Following the example set by the European Monetary Union (EMU), several new monetary unions are expected to emerge. Such supranational banknotes require a different design policy than national banknotes, stressing the diversity theme. On the other hand, supranational banknotes should look similar, otherwise it is impossible for the public to distinguish counterfeits.

A new concept is found by replacing the rather large image on national banknotes by several smaller ones on supranational banknotes, applying to the 'unity by diversity' motto. These icons or symbols could be selected on the basis of public

Figure 5.45



Examples of 'emotional banknotes'.

- Proposal of Roger Pfund for a euro 500 banknote in the category 'Abstract/modern', with art elements of a painting by Miró (1996) [86].
- Fantasy banknote by Roger Pfund, featuring a portrait of Maria Callas. Design is presented at Currency Conference, 2007 [see also 182].
- Proposal for a new Swiss banknote CHF 100/Embryo (2005). Designer Manuel Krebs.

Figure 5.46



Functional banknote design concept for the 'Unity by Diversity' theme. Such a concept is input for a graphic designer. The above design concept uses clear numerals, in both positive and negative print. The 4 central images serve as security features and are designed in 2D silhouettes. There are two tactile areas, indicated by the two angles, one to the left and the other to the right of the design. The issuing authority, i.e. European Central Bank, is clearly indicated in English, and in all the other relevant languages in micro text. A portrait of a woman is used for a so-called 'photo/seal signature' including the name of the president. EYPQ and other script variants of EURO have been moved to the reverse side, including the copyright notice.

The watermark shows Ludwig van Beethoven (European anthem, Ode to Joy). The images that serve as the security features are the Eiffel tower, the tower of Pisa, Big Ben and a portrait of a woman by Rogier van der Weyden. The QR-code is a link to an app on security features. Design by De Heij [213, 226, 238].

input. The graphic designer can translate such public suggestions into banknotes that combine various icons, which would be no problem since contemporary designers like to quote from the design history. Such a concept could be further developed by introducing new series design concepts. Instead of one graphic designer shaping all denominations, several designers could be invited (architects) which should deliver their designs within a series plan (town planning) [192].

A conceptual example for new euro banknotes, following the concept provided above, is shown in figure 5.46, providing the emotive factor by including European icons and human figures as proposed by the Dutch in 2011. Continuity as desired by the ECB could be found in architectural subjects, while the top-down European identity could be represented by e.g. the word euro, the map of Europe, the currency logo € and the European flag.

However, quoting from design history is not a forward-looking approach as part of the general identity policy of the EU. The design instruction for future euro banknotes could just be: make a contemporary European banknote, including the human factor and expressing diversity. And the design instruction should include if the architectural theme has to use existing European towers instead of non-existing.

5.II Conclusions on creating identity in new banknote designs

- 5.II.1 In the Netherlands the use of cash money is on the decline, while the use of other means of payments, especially debit cards, is increasing. However, the Dutch will keep asking for cash money and especially for coins and low banknote denominations. There is also a demand for a high denomination for hoarding, which has its own set of requirements.
- 5.II.2 Cash money has three main competitive advantages over other means of payments: privacy, fast and reliable. On the other hand there are several cons on the use of cash money, like portability, losing it, can be dirty and can be counterfeited. Future banknotes should strengthen the advantages and should try to solve the cons.
- 5.II.3 The development of a design policy, including an identity description, should be the very start of the banknote design process. Such a design policy should be managed by the central bank - in fact they should be the driver - and should not be seen as something that comes later. This work should start with a design and communication analysis of the notes to be replaced, including the use of public feedback. Clearly this is an underdeveloped policy aspect of banknote design and should be deepened.
- 5.II.4 When it comes to banknote design, several design policies are possible. Usually central banks opt for an ‘authenticity design policy’, targeting the man in the street as their first level of defence to stop large scale counterfeiting. Other design policies give priority to ‘confidence’, ‘durability’ or ‘celebratory’. A user-oriented design approach is advised and should include:
- Value recognition,
 - Handling,
 - Authenticity check,
 - Receiving message (including emotions).
- 5.II.5 The commitment and effort of the highest central bank management is required to achieve outstanding contemporary banknote design. If this effort is absent, the new banknotes tend to be middle of the road designs. Positioning and balance diagrams are methodological tools to assist the (the Governor of the) central bank in clarifying in which directions new banknote design should be headed. Ideally, these are based on public input. The Board/Governor of the central bank should provide a design policy, including an identity description, which should not take more than half a page.

- 5.II.6 Upgrade designs will tend to lose the public's interest. A banknote design may be upgraded twice, so is the hypothesis. It seems that after three iterations changes remain unnoticed, because they are too close to earlier versions and a completely new design has to be made.
- 5.II.7 An emergency policy is not necessary if a central bank controls the design project, using proven 'off the shelf' alternative security features.
- 5.II.8 To support value recognition, banknote series design should be based on images from different categories like human figures, animals, plants and buildings. The human figure can be anonymous again, like in the 19th century, and may even be a non-existing person. Different image classes will increase the identity of each of the notes.
- 5.II.9 Future banknote design could introduce innovative concepts for the use of the front and reverse of the banknote, like e.g. a wallet side and a banknote acceptor side. The banknote's signature could be a 'photo signature', supporting confidence.
- 5.II.10 New user requirements are expected from the interaction between communication technology and banknotes. Especially the interaction between smart phones and banknotes is expected as a driver for innovations. Examples here are the introduction of QR-codes on banknotes and the increasing importance of the banknote number, which makes it possible to print banknotes at home. A smart phone may scan a banknote and make an internal or remote analysis on genuineness.
- 5.II.11 Supranational banknotes require different design concepts as national banknotes, expressing the supranational character of such banknotes. A new concept is found by replacing the rather large image on national banknotes by several smaller ones, applying to the 'unity by diversity' motto. These icons or symbols could be selected on the basis of public input.
- 5.II.12 Competitive banknotes are primarily determined by the currency and secondly by its graphic design. Monetary aspects of the currency, like inflation, financial markets, interest and exchange rates determine a currency's competitive position amid other currencies. Colours are a dominant competitive design element and so is the basic layout.

- 5.II.13 Future banknotes could be improved on the human factor and especially 'emotional' design parameters are of interest. Positive emotions, like for example eliciting a little smile, will provide a positive feeling about the banknote.
- 5.II.14 The selection of a graphic designer depends of the favoured design policy. In case of an upgrade design a standard designer can do the job. If a new and innovative design policy is followed, the central bank has to contract an outstanding designer or should organise a design competition.
- 5.II.15 The freedom of design provided to the graphic designer can be indicated on a scale of 1 to 10, respectively from minor change to completely free. Central banks tend to suppress the design freedom to a scale between 3 and 7, limiting innovative banknote designs.

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Appendices - Designing banknote identity

- A₁ - Currency design elements
- A₂ - Banknote design elements
- A₃ - Periods of Dutch banknote design
- A₄ - Monetary unions, currency boards and global currencies
- A₅ - Examples of banknote design familiarity
- A₆ - Examples of banknote positioning diagrams
- A₇ - Examples of balance diagrams for banknote design
- A₈ - Questionnaire on the identity of euro currency
- A₉ - Eurosystem within European organisations
- A₁₀ - Visual identity of Europe
- A₁₁ - Examples of artists using the identity of banknotes

Appendix A1

Currency design elements

Several currency design elements as applied on banknotes find their roots in coins or early forms of paper money and are listed in this appendix. The leading questions underlying are: what and how did it look, and why, and who came first? Currencies used in the region of what is presently the Netherlands receive additional attention, with the aim to highlight the Dutch heritage of paper money designs. In addition, appendix 2 provides an overview of the typical banknote design elements.

This extensive appendix is subdivided as follows:

- A1.1 Currency unit (name)
- A1.2 Languages
- A1.3 Currency symbol
- A1.4 Material; from gold to polymer
 - A1.4.1 Precious metal (silver and gold)
 - A1.4.2 Paper (cotton)
 - A1.4.3 Synthetic (polymer)
- A1.5 Size
- A1.6 Shape
- A1.7 Main image
- A1.8 Issuing authority
- A1.9 National symbol (seal, coat of arms, flag)
 - A1.9.1 Seal
 - A1.9.2 Coat of arms
 - A1.9.3 Flag
 - A1.9.4 Text
- A1.10 Motto
- A1.11 Denominations
 - A1.11.1 History of denominations
 - A1.11.2 Denomination systems
 - A1.11.3 Note-coin boundary
- A1.12 Value indication
- A1.13 Signature
- A1.14 Date
 - A1.14.1 Approval date of the design/printing proof

- AI.14.2 Date/year of first issue
- AI.14.3 Year in copy right notice
- AI.14.4 Year of production
- AI.14.5 Date/year of a new president/treasurer/governor
- AI.15 Place
- AI.16 Typography
- AI.17 Legal tender (coins)
- AI.18 Number
- AI.19 QR-codes

AI.1 Currency unit (name)

Currency names are introduced in chapter 3, subsection 3.4.1. The focus in this section AI.1 is on the currency names of the dollar, yen and euro.

The silver for the 'Joachimsthaler Guldengroschen' (or 'great guilder') came from the silver mine close the town Joachimsthal - 'thal' or 'tal' meaning valley - today known as Jáchymov in the Czech Republic. Since 1519, this mine produced the silver for the popular Guldengroschen, which was referred to by an abbreviation of its name, i.e. thaler or taler. Before the nation states were established in the 19th century, coins crossed borders easily and the thaler was used in Italy (tallero), Spain (dalero), Scandinavia (daler) and the Netherlands (daalder). The English corrupted taler to dollar for the Spanish piaster, being the most common coin in North and South America in the 18th century.

The first time the word dollar was mentioned in written form dates back to 1603. In an English translation the Spanish colonial eight-real coin was commonly referred to as Spanish dollar. The US dollar did not become the official national currency unit until 1786, ten years after the USA gained independence in 1776. The Coinage Act of 1792 created the US dollar coin and specified a dollar to be based on the Mexican peso at one dollar per peso. The first dollar coins were minted in 1794.

As pound sterling was 'British', Canada and Australia switched from the pound to the dollar in 1816 and 1966, respectively. For the same reason, in 1961, South Africa changed its currency from pound into rand.

Japan and China use similar characters for their currencies, respectively ¥ (yen) and ¥ (yuan). Yen means circular and yuan means silver lump.

The euro replaced the ECU on 1 January 1999, at the value of 1 EURO = 1 ECU. Two of the countries participating in the ECB, i.e. Denmark and the UK, did not join the Eurozone, while a third, Greece, joined later in 2001. On the other hand, the currencies of two nations that joined the Eurozone from the beginning, Austria and Finland, were not part of the ECU basket, since these countries had joined the EU in 1995, two years after the ECU composition was frozen.

The ECU itself replaced the European Unit of Account (EUA), also at parity, on 13 March 1979.

First euro coin minted in 1971

Instead of écu, EUA, ECU or euro, the currency unit of Europe could also have been ‘Europa’ as used in the 1928 on commemorative coins minted in France (see figure A1.1b). These coins supported the plea in 1929 to the League of Nations for a European currency by former German chancellor Gustav Stresemann (1878-1929). After the First World War (1914-1918) several new nation states were established in Europe, increasing economic division, which brought Stresemann to the proposal of a European currency. In 1926 Stresemann was co-winner of the Nobel Peace Prize.

The story of the euro started in the 1970s. In The Hague in 1969, Pierre Werner (1913-2002), the former Prime Minister of Luxembourg, submitted a plan leading to the adoption of a single currency in the six countries constituting the EEC. His report was published in October 1970 and recommended centralisation of the national macroeconomic policies entailing ‘the total and irreversible fixing of parity rates and the complete liberation of movements of capital.’ The Werner report triggered in 1971 Time Magazine to organise a contest for a suitable name for a single European currency. Over 1,000 entries were received and included names like alpha, ecu, spes and valor. Ultimately, the name euro, proposed by the Dutch firm Prad was selected and a design was made. An edition of 500 pieces was minted

Figure A1.1



Forerunners of the euro coin.

- The first ecu coin made of gold and issued in France by Charles VIII in 1483. The first silver ecu was minted in 1641, and the last one of this kind in 1793.
- Commemorative one Europa coin ‘Federated States of Europe’, minted in 1928 in several denominations to celebrate the 69th anniversary of the Third Republic (1871-1940).
- 1-euro coin proposed in 1971 by the Dutch advertising agency Prad. Text: *Communitas Europeana*. The design is made by the Dutch artist Eric Claus.
- Commemorative ECU coin minted in celebration of the 40th anniversary of the Fifth Republic (1959-1979). The gold coin bears an emblem representing the 9 countries joining the ‘ECU currency basket’; e.g. the Netherlands are represented by a tulip.

and for the very first time - in 1971 - the word euro was literally coined as shown in figure A1.1c [52]. In March 2011, one bank bought one of the pieces at an auction in Amsterdam for 312 euro [202].

In 1979, the first ECU coin was issued - again a French commemorative coin - depicting the nine currencies forming the ECU. The design was probably the first coin to literally express the motto unity by diversity (figure A1.1d).

The word 'eurocent'

The euro is subdivided into 100 eurocents. The word cent finds its origin in the Latin word 'centum', meaning hundred. Because 'cent' was also the name of the smallest denomination coin of the old sovereign currency of the Netherlands, the word cent contributed positively to the acceptance of the euro by the Dutch.

European Currency Unit (ECU)

ECU is an abbreviation of European Currency Unit. Ecu is also the name of an ancient French coin ('écu') dating back to 1483 (see figure A1.1a). Besides this French-biased past, there was another drawback: pronounced in German, ecu denotes a cow and was therefore found inappropriate. Unlike dollar or yen, the new name euro was launched like a brand name. Euro can be pronounced rather easily in all languages of the European Union, although the writing can be different. The name euro was proposed by Germany and adopted at the European Council meeting in Madrid in December 1995. Other suggestions were rejected because of their national connotations. These included the ducat, ecu, florin and franken. Adding a prefix to the existing currency names was also considered, like euro-mark and euro-gulden [140].

Euro born on 1 January 1999

On 1 January 1999 the single European currency was introduced for scriptural payments in eleven EU countries. Therefore 1 January 1999 is the date of the birth of the euro. Exchange rates were fixed and from then on all eleven currencies were euro currency. Or as DNB president Nout Wellink phrased, when holding up a 10 guilder banknote: This is the euro, but in the jacket of the guilder.

Since all national languages within the Union are equal, euro banknotes feature the currency name in both Latin and Greek characters (see figure A1.2a). For future euro banknote series it will need to be decided whether the banknotes must feature the currency name in capitals in all relevant languages or in just one? In other words: will unity or diversity become dominant on euro banknote designs? If the latter option is chosen, two new spellings will be added to the list, i.e. EIRO for Latvia, which plans to join the Eurozone in 2014, and EBPO for the Cyrillic version of EURO as used in Bulgaria, which has set 1 January 2015 as target date for accession to the Eurozone (see figure A1.2b).

Figure A1.2



Euro is written differently in different alphabets.

- a) Euro printed both in Latin (EURO) and Greek (EYPO) on the euro banknotes issued in 2002.
- b) New EU members like Bulgaria would like to see the word euro on future euro banknotes in Cyrillic (i.e. EBPO). Photo by De Heij (Sofia, 2006) [e.g. 137].

In an interview in 2008, the ECB Director of Banknotes at that time, Heinonen, stated the following: 'For the ES2 there will be a very view changes in the design, regarding the map (i.e. including Malta and Cyprus), the inclusion of the Bulgarian Cyrillic alphabet and the abbreviations of the ECB, which should better reflect the current reality of the European Union.' [142]. Or should pragmatism be allowed to prevail, and next generations of euro banknotes only feature EUR, the official ISO 4217 code for the euro?

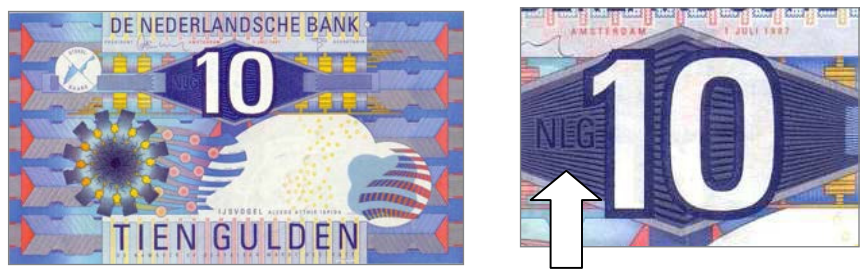
The NLG 10/Kingfisher was the first banknote carrying the ISO 4217 currency code, as shown in figure A1.3. The ISO 4217 is a standard published by the International Standards Organization and defines each currency in a three letter code. The first two letters are usually the letters of the country code (ISO 3166-1) followed by the first letter of the name of the currency.

The graphic design of the currency unit can be used to accentuate certain letters (see figure A1.4).

A1.2 Languages

In 1867 the Austrian and Hungarian Kingdoms were united as the Austrian-Hungarian Empire (1867-1918). Their first banknote issue was innovative for occurring in different languages. For each language a different banknote was issued, in this case just two. These two banknotes were identical except for the language

Figure A1.3



The ISO code for Dutch guilder is NLG and is printed in front of the denomination figure of the NLG 10/Kingfisher, issued in 1997.

used; on one banknote the texts were printed in German (figure A1.5a) and on the other in Hungarian (figure A1.5b).

Language on European banknotes

Languages have been respected on several European banknotes like e.g. on the Belgian and Swiss notes. The Belgian banknotes are using both Dutch and French languages and also German. The Dutch and French languages were systematically alternated on the front of the denominations, e.g. Dutch on the front of the 100 franc and French on the front of the 200 franc. On the reverse of all notes the name of the central bank was displayed in both languages and the value indication in the opposite language used on the front. The German language was for the value indication on all reverse sides.

The Irish and Luxembourg banknotes also displayed two official languages. The former Irish banknotes used Gaelic on the front of all denominations and English on the reverse. The notes issued by Luxemburg followed a similar policy: French on the front of all denominations and German on the reverse.

Figure A1.4



Different graphic designs for the word EURO.

- a) Plain.
- b) Using the currency logo.
- c) Stressing EUR, the ISO currency code.
- d) Stressing EU, European Union.

Figure A1.5



A 5 gulden banknote of the Austrian-Hungarian Empire issued in two different languages

- a) German version.
- b) Hungarian version.

The Finish banknotes added in English 'Finlands Bank' to the back of the notes, explaining Suomen Pankki, the official name of the national bank of Finland.

The Swiss banknotes carry four languages: French, German, Italian and Romansh. The languages are divided two by two to respectively the front and the reverse and alternate between the front and reverse of the different denominations. Given the quadrilingual populace, Latin is used for language-neutral inscriptions on the coins.

Language panel and language rotation

Another solution to represent different languages on a banknote is provided by Indian banknotes. India has 22 official languages and 17 are used on Indian banknotes. English and Hindi are used on the front (figure A1.6a) and 15 others appear in alphabetical order in a 'language panel' on the reverse, telling the denomination and the currency unit (figure A1.6b and c).

South Africa has 11 official languages and the currency unit rand is identical for all coins and banknotes. The front of the coins only displays the currency indication 'rand' or 'c' (for cent), just as the common side of euro coins display 'euro'. The banknote fronts are identical too, unlike those of euro banknotes. Since 2005, different languages are only shown on the reverse sides of rand banknotes. Each of the 5 banknote denominations now display 'South African Reserve Bank' on the front (figure A1.6d) and, in two other languages, on the reverse, including, once more, English on the ZAR 200 (figure A1.6e).

The basic principle used for the coins is to make sure that each denomination features South Africa in a different language, e.g. 'Suid Afrika' (Afrikaans) and 'Afurika Tshipembe' (in Tshivenda). In two languages, in Sepedi and Sesotho, the

Figure A1.6



Two examples of different uses of languages on a banknote.

- a) Front side of Indian 10-rupee banknote (INR 10) using English and Hindi, issued in 2006.
- b) Reverse side of INR 10 showing a language panel with 15 languages telling the denomination and the currency unit.
- c) Language panel on INR 10.
- d) Front side of South African 10 rand banknote (ZAR 10), using English, issued in 2005.
- e) Reverse side of ZAR 10, featuring South African Reserve Bank in two of the languages spoken in South Africa.

spelling of South Africa is identical: ‘Afrika Borwa’. This leaves 10 ways to write South Africa. Until 2002, there were 9 coin denominations, so one coin, the 5-rand circulated in two versions. Since new series of coins are minted once a year, a coin denomination could each year feature a different language. With 10 different languages, it would take 10 years to complete the full cycle. Such ‘language rotation patterns’ are published by the Government and the South African Mint Company. With the abolition of the 1- and 2-cent coins in 2002, the language rotation pattern was adapted.

Languages on the euro

The language policy followed for the euro banknotes is as follows. First of all, text on euro banknotes was kept to a minimum. Secondly, the currency unit is written in two different alphabets, Latin and Greek, on both the front and the reverse sides, which in a way conflicts with the first policy guideline, i.e. to keep text to a minimum. Thirdly, the issuing authority is represented by five different notations of the abbreviation of the European Central Bank (ECB BCE EZB EKT EKP). French legislation prescribes that all public information provided by the French state should be using the French language, but the French authorities, were satisfied with BCE being the abbreviation of ‘Banque Centrale Européenne’.

A1.3 Currency symbol

A currency symbol is used to indicate the currency in short, without any further texts. In a way a currency symbol is a central bank's logo. Applied on banknote, both are used to communicate the origin of the currency.

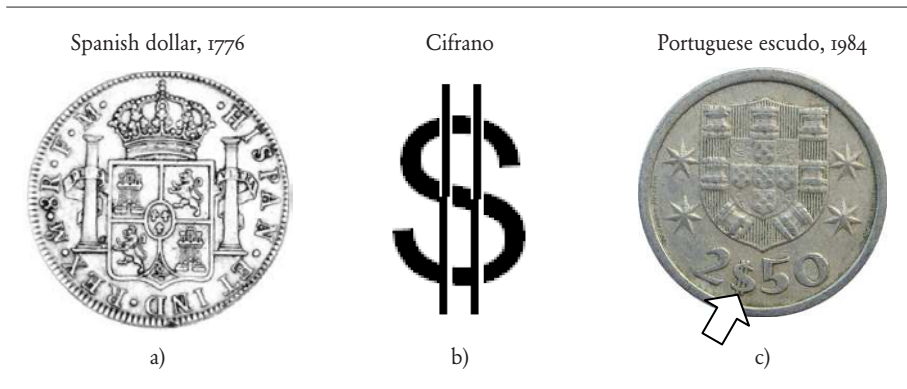
One of the oldest currency symbols is the \$ symbol, which will be discussed below, just as the origin of the ¥ and € symbols.

Origin of \$ sign

For the origin of the currency symbol for the dollar (\$) several explanations prevail. The most common explanation is that the symbol is the evolutionary result of the Spanish piaster, which was widely used in the 18th century in the south of the USA. The traditional abbreviation of an amount in piaster was ps, ps or PS. Oliver Pollock, a trader and planter in New Orleans combined the p and the s, which gradually developed into the symbol \$. Congressman Robert Morris copied Pollock's writing and used the \$ symbol for the first time in official documents of the United States.

Another explanation for the USD currency symbol is that it represents the letters U and S superimposed on each other. The two vertical lines crossing the S are the U, whose curve coincides with the bottom curve of the S. Over the years, the symbol

Figure A1.7



Dollar sign and cifrano.

- a) Spanish dollar dated 1776. These silver coins derived from the Spanish 8-reales coins first minted in 1497, one year after Columbus discovered America. These coins circulated worldwide as trade coins. The name of the currency unit of Malaysia, the ringgit, for example, refers to this Spanish dollar. Because of the practice of cutting the coin into eight equal segments, these Spanish dollars were also known as 'pieces of eight'. The Spanish dollars were minted at various mints in the new world (Potosi, Lima, and Mexico City) and could be distinguished from the ones minted in Spain, featuring the Pillars of Hercules on the reverse. In the 19th century, the coin's denomination was changed to 20 reales and finally to two escudos.
- b) Portuguese cifrano.
- c) Cifrano on 2.5 Portuguese escudo coin.

evolved into an S with just one vertical line. This theory does not consider the fact that the symbol was already in use before the formation of the United States.

A third explanation goes back to the Spanish dollar displaying the Spanish coat of arms. Part of this symbol is the ‘Pillars of Hercules’. The myth goes that Hercules raised two columns or rocks on the shores of the Strait of Gibraltar in memory of one of his labours. The S-shaped ribbon is the symbol of the waves washing these rocks. These Pillars of Hercules on the silver Spanish dollar take the form of two vertical bars and a swinging cloth band in the shape of an S as shown in figure A1.7a. However, this explanation would seem to be more suitable to account for the *cifrano* (figure A1.7b), which symbol is often confused with the symbol for the dollar. Where the dollar uses one horizontal stroke, the *cifrano* uses two vertical lines. Today it is the official currency sign of the Cape Verdean escudo (CVE) and a common unofficial sign of the Brazilian real (sign: R\$). It was formerly used by the Portuguese escudo before being replaced by the euro (figure A1.7c).

Origin of ¥, ¥ and € symbol

The Japanese and the Chinese currency share the same character ‘yen’ as base unit. This character developed further into a currency symbol based on the Latin letter Y. In case of Japan two horizontal bars are added to the Y, creating the ¥ for the Japanese yen. The Chinese currency symbol has a single stroke through the Y, resulting in the ¥ for the Chinese yuan. When only the currency symbol is used to indicate the Japanese or Chinese currency, this minor difference leads to confusion.

When, in 1974, the euro currency symbol was designed (chapter 3, figure 3.17a), the currency unit of Europe was the European Unit of Account (EUA). The design was inspired by the Greek letter epsilon (E), referring to the cradle of the European civilisation. Two horizontal parallel lines cross the symbol and stand for the stability of the currency unit (while reminding of the £ symbol). One of the selection criteria was also that it had to be easily written by hand. The existing currency symbol € was adopted, or rather continued, for the euro by the European Commission in 1997. Today there are several typographic varieties of the symbol, as illustrated in figure A1.8.

Figure A1.8



Several variants of the currency symbol of the euro.

Central bank logo's on banknotes

The currency symbol is the logo of the currency, of the product. The organisation behind the product is the issuing authority, the national or central bank. In some cases the logo of the central bank is printed on the banknotes, as in the case of Japanese banknotes and also one older Dutch banknote model (see figures A1.9a and A1.9b, respectively). From a branding point of view this is a doubtful policy since it would lead to two logos on the note: a currency symbol and logo representing the issuing organisation. It seems that the use of one logo, in the case of banknotes the currency symbol, is preferred to the central bank logo. Instead of a logo or abbreviations it is advised that banknotes bear the name of the central bank in full.

A1.4 Material: from gold to polymer

The material of which tangible currencies are made is one of the dominant elements of currency branding. Since the issue of the first Australian polymer notes in 1988 (see chapter 5, figure 5.3b), there has been a debate on paper versus polymer banknotes. For coins a similar discussion is being conducted, since plastic and aluminium coins are disliked. Indeed, these materials are not remotely like the traditional silver and gold coins used. The use of material as a currency branding element is explained in the following three subsections:

A1.4.1 Precious metal (silver and gold)

A1.4.2 Paper (cotton)

A1.4.3 Synthetic (polymer)

Figure A1.9



Two examples of the central bank logos used on banknotes.

- a) The logo of the Bank of Japan as used on Japanese banknotes.
- b) The logo of the De Nederlandsche Bank on the NLG 25/Sweelinck note, issued in 1956. In fact, this logo was borrowed from this banknote and would serve as DNB's logo until the early 1990s.

A1.4.1 Precious metal (silver and gold)

Silver and gold coins spread from Lydia (Turkey) to Greece and, from there, to the Roman Republic (509 BC-27 BC). Roman coins were produced in the temple of Juno Moneta, from which the word money derives. As in the case of the Greek coins, the currency unit bore no name, although occasionally coins featured control marks such as small symbols, letters, or monograms used to indicate the issuer of a particular coin.

Cutting pieces off silver and gold coins became a custom. For low-value payments, however, coin pieces were reduced to such small sizes as to become unfit for handling. Therefore other, less valuable metals, such as copper, were already introduced by the Greek, for smaller payments. Around 280 BC, the Roman Republic introduced a large cast bronze coin named 'as', the Latin name for copper, which became the currency unit of the Roman Republic.

First international standard: fiorino d'oro

In 395, the Roman Empire was split into a Western and an Eastern Empire (Byzantium). The western Roman period ended in 476 and the East Roman period ended officially in 1453, when Byzantium was conquered by the Turks. When the East Roman period came to an end, the 'fiorino d'oro' was already frequently used among the traders of the 15th century.

In 1252 the 'fiorino' was born in the Italian town of Firenze (Florence). It was a little gold coin with a high gold content, measuring 21-mm in diameter and weighing 3.5 g. One side showed the effigy of John the Baptist (see figure A1.10a), the other side the image of a lily. In Latin a flower is a 'floreus', in Italian 'fiorino'. In the years

Figure A1.10



Four historic coins used in the region of what is today the Netherlands.

- Saint John the Baptist, patron of the city of Florence, on the 'fiorino d'oro' (in Dutch 'gouden florijn' or in short 'florijn'). On the other side a lily.
- The first 'Hollandse goudguldens' or golden guldens were minted in Dordrecht in 1349 [196].
- Emperor Charles V (1500-1555) introduced the Carolus guilder, which was equal to 20 stuiver. The first Carolus gulden, minted in 1517, was an alloy of gold (1.7089 g), silver (0.9155 g) and copper (0.3062 g) weighing 2.9296 g. In 1521, it was made equal to 20 stuiver. Already in 1522 the coin was devalued to 22 stuiver. In 1544 a silver Carolus gulden was minted ('Carolus d'argent'), which value was again 20 stuiver.
- First coin with effigy of William of Orange 1583.

that followed the fiorino d'oro became an international currency unit, not in the least because of its high gold quality. In the region that today is the Netherlands, this coin was first seen before 1300 and used as a unit of account called 'florijn' after the Latin florenus. Up to 2002, the currency sign for Dutch guilders was f or fl, short for florijn.

The fiorino was minted for the first time in the Netherlands in 1349, where it was referred to as gulden (in English guilder) after the material of which it was made. The fiorino d'oro was popular and was imitated throughout Europe; around the year 1400 there were about 20 different mints that produced the fiorino. The coins were not identical in image details. Just as in the case of the fiorinio d'oro, there were several regional variants of the gold gulden, like the Hollandse, Rijnse (Gelderland), Philippus and Zwolse gold gulder (see figure A1.10b for one of the first coins, the 'Hollandse goudgulden').

Over the years inflation made the gold coins too precious and silver came into view as an alternative. One example is the golden Carolus gulden issued in 1521 (figure A1.10c) and, another one, the silver Carolus first minted in 1544. Figure A1.10d shows a silver coin, the first with an effigy of William of Orange.

First paper money

In the 17th century merchants used silver and gold coins to pay each other. With increasing transactions the counting, transportation and storage of coins became increasingly cumbersome. To overcome these inefficiencies some money-changers offered to store the coins at their safe offices. In exchange, the merchants received a formal document telling that the merchant could pick up his coins at any time at the office of the money-changer or the other sales man. These obligations were only legally binding because of the signatures of both the money-changer and the merchant. The merchant could transfer the document to a third party, who had to sign the document subsequently. Often, the document was also sealed. In Italy, these formal documents, i.e. the first forms of paper money, were called 'lettera di cambio', and in England 'running cash notes'.

Banknotes representing gold

In the 18th century, some nations, e.g. England, used gold as basis for their currency system, while others opted for silver, as in the case of the United States. In the period that followed, countries struggled with currency systems based on both gold and silver, since the market prices for gold and silver price did not develop according to a fixed ratio.

One of the first countries to experience this difficulty was France. In 1795, the French Revolutionary Convention established the 'franc' as the national currency of France, deciding that a 1-franc coin should contain 4.5 g of fine silver. In addition, in 1803 a gold franc was created containing 9/31 g of fine gold, setting the ratio between the silver and gold coin weights at 1:15.5 ($9/31 \times 15.5 = 4.5$). Such a currency system is

piece, passed in England for 17s. 6d'. Newton became Master of the Mint in 1699, a position he held until his death in 1727.

Today coins have a fiduciary value, meaning that the intrinsic value is much lower than the face value. Banknotes backed by a gold standard are 'fiduciary money'. Their value no longer depends on their intrinsic metallic content, but on trustworthiness of the organisation that issued the notes as well as the prospect that the holder could exchange her or his banknotes for silver or gold at that organisation. Later, when coins were no longer made of silver or gold, the coins became fiduciary money too.

Table A1.1 provides an overview of the different situations.

Presidency campaign over gold or silver in the USA (1896)

All coins in the early USA were made of silver. One dollar was specified by 371 4/16 grain (24.1 g) pure or 416 grain (27.0 g) standard silver and since very little silver was traded, the Coinage Act of 1792 fixed the weight ratio between the US dollar and gold, setting a bimetallic standard. Later, from 1834-1900 one dollar was 23.2 g of silver or 1.5 g of gold. Its weight and purity varied significantly between mints and over the centuries.

The discovery of large silver deposits in the Western United States in the late 19th century created a political controversy. In 1853, the weights of US silver coins were reduced, except the dollar itself, which was rarely used. In 1878 extra silver bullion was bought to be coined into silver dollars. Due to the large influx of silver, the value of silver in the nation's coinage dropped precipitously. In the run for presidency of the United States of America in 1896 the competing parties' chief campaign issue was what should back the US currency, silver or gold? On the one side, the United States Greenback Party wanted to retain the bimetallic standard in order to inflate the dollar and thus enable farmers to repay their debts more easily. On the other side were the promoters of Eastern banking and commercial interests, who advocated a switch to the gold standard.

The winner was William McKinley, and a true gold standard came to fruition in 1900. The struggle with the bimetallic standard led to different types of paper money, 'silver certificates' and banknotes (see figure A1.11). The public could distinguish between the two types by the colour of the seal: silver certificates bore a blue seal and banknotes a red seal (although there were some exceptions).

From 1900 to 1971, the dollar value was only expressed in gold.

Gold and silver standards in the Netherlands

When the first guilder banknotes were introduced in the Netherlands in 1814, no gold or silver standard was set. The only regulation was that the banknotes issued should be covered by 40% coinage. This seems low, but in other countries a similar coverage rate was used, or even lower, e.g. 33.3 % in Italy in 1893. The Dutch

Figure A1.11



The struggle with the bimetallic standard resulted in the use of different types of paper money within the USA.

- a) US dollar silver certificate, 1878.
- b) US dollar silver certificate, 1899.
- c) US banknote, 1901.
- d) US dollar gold certificate, 1922.

Coin Act of 1816 followed the American example of a bimetallic standard; 10 silver guilders were equal to one gold coin of 10 guilder. The gold/silver ratio was 1 to 15.5, similar to the French ratio set in 1803.

The bimetallic standard created tensions between gold and silver coins due to the volatility of market prices of silver and gold, also in the Netherlands. With both gold and silver coins in circulation one of the two had to be adjusted to the other. In 1839 it was decided to adjust the amount of silver in the silver guilder coins and maintain the gold content of gold coins. To overcome such problems in the future, in 1850 a monometallic, silver standard was adopted. The choice for the silver standard was not in line with international developments on the silver market and in 1875 the Dutch had to switch to a full gold standard.

Banknote circulation more homogenous

By introducing a gold standard the national monetary system was no longer private but was brought under state control. This was a motive for several European countries to link their currencies to the British gold standard and, in general, to follow the British example of establishing a national bank (established in England in 1694). Table A1.2 provides an historic overview of the establishments of central

Table A1.2

Year	Nation	National or central bank
1668	Sweden	Sveriges Riksbank
1694	United Kingdom	Bank of England
1695	Norway	Central bank of Norway
1800	France	Banque de France
1814	The Netherlands	De Nederlandsche Bank N.V.
1868	Japan	Bank of Japan
1893	Italy	Banca d'Italia
1907	Switzerland	Swiss National Bank
1914	United States of America	Federal Reserve System
1925	Chile	Banco Central de Chile
1934	Canada	Bank of Canada
1948	China	People's Bank of China
1999	European Union	European Central Bank

Limited historic overview of the establishment of national or central banks.

banks. The resulting central banks would receive privileges, like a monopoly on note issue rights. The effect was that variations in banknotes were reduced and banknote circulation in European countries became more homogeneous. The population grew to have confidence in the state's ability to manage the value of this form of money. Coins usually remained the responsibility of the Treasury or Ministry of Finance.

French banknotes were first printed in 1703 under Louis XIV. A lot of notes were printed, but the production of paper money in France slowed, because the population mistrusted this form of payment also because of the circulating counterfeits. By the end of the 18th century there was a new trial supported in 1791 by the establishment of a central bank. After the Revolution, Napoleon Bonaparte established the Banque de France in 1800. Many states waited with the production of banknotes until the 19th century, like the Dutch.

End of gold standard

The international gold standard collapsed in the wake of the 1930s due to the financial crises and economic world depression. Great Britain and Germany abandoned the gold standard in 1931 and private gold ownership was, jewellery excluded, outlawed for US citizens in 1933. After 33 years the gold standard was obsolete. Most countries followed the USA and also left their gold standard in 1933. From then on banknotes were only exchangeable for other banknotes and no longer redeemable in gold or silver coins. In 1936, the Netherlands was, together with France and Italy, one of

the last nations to abandon the international gold standard. As a consequence, the text on the banknotes ‘Pays to the bearer’ disappeared (figure A1.12a). The first gulden banknote without this text would not appear until 1949, following the entry into force of the 1948 Dutch Bank Act (see figure A1.12b). Remarkably, several contemporary banknotes still contain the promise to ‘pay to the bearer’, such as the British pound and Indian rupee.

A1.4.2 Paper (cotton)

Around 120 BC, when in Europe silver and gold coins were still used for daily payments, the first paper-like money was introduced in China. The leather from the white deer, a rare animal which only occurred in the imperial Chinese gardens, was the carrier of the imprint.

The earliest real paper money dates back to the 7th century. A shortage of coins prompted the Chinese authorities to issue banknotes by way of printed paper. This issue was not successful for long, and there are no samples left of this first paper money in the world. A second issue of paper money was, in AD 812, again prompted by a shortage of coins, and was more successful. The notes, which could be replaced by coins any time, were called ‘kesj’ or ‘ch’ien’, translated by the English into ‘cash’, the word still used today to indicate tangible money like coins and banknotes. To do away with the inconvenience of having to transfer large numbers of the standard copper cash coins over large distances, the Tang government decided to pay merchants in paper money. Due to their tendency to fly away to other regions, the notes were dubbed ‘flying cash’.

Figure A1.12



First gulder banknotes without the text ‘pays to bearer’ (in Dutch: betaalt aan toonder).
a) NLG 10/Greybeard, issued in 1934. First gulder note without the text pays to bearer. However, later gulder banknotes did carry the pays to bearer text again. Designer: C.A. Lion Cachet.
b) NLG 25/Flora, issued in 1949, the second gulder note without the text pays to the bearer. From then on banknotes depended fully on trust. Designer: Johannes Roozendaal.

The paper used for the Chinese banknotes was made from the bark of the paper mulberry tree, just as modern Japanese banknotes [224]. One of the best known pieces, depicted in figure A1.13, includes an explanation of the Chinese characters [14]. In its centre is an illustration of the pile of coins for which it could be exchanged, making the note understandable to people who could not read. The note was worth 1,000 cash, which was represented by 10 strings of 100 copper cash coins each. Other, earlier Chinese banknotes dating back to the Tang Dynasty (860-874) looked quite similar.

First paper money in Europe in 1574

As in China, the production of the first paper money in Europe was also triggered by a shortage of metal for coins. During the Spanish siege of 1574, the population of the Dutch city of Leyden, today Leiden, created paper planchets, which were struck using the same dies as used to mint coins. The planchets were made from covers and paper taken from hymnals and church missives. So, the first European paper money was a round piece of paper dimensioned like a coin (see figure A1.14a).

Card money

Another early issue of paper money, triggered - again - by a shortage of coins, is playing card money. Coins in the colony of New France in Canada had to come

Figure A1.13

Top
General valid paper money of the Great Ming Dynasty.

Text above image
1 kuan (being a string of 1,000 cash).

Image in the middle
10 strings of 100 cash coins each. The strings are connected by a string, bundling it into 1,000 cash.

In seal script
On the right: In circulation in 'all under the sky' (the whole Chinese Empire).
On the left: Value note of the Great Ming.

Below
The Department of Revenue has been granted permission by the Throne to issue Ming-value notes in addition to bring the usual banknotes into circulation.

Whoever forges this banknote will be punished by death. Whoever reports the forger, will receive the sum of 250 silver teal and also the criminal's assets.



A Chinese banknote of 1,000 cash, issued in 1375 by the Chinese Ming emperor Hong Wu (1368-1398). The paper, made of bark of the paper mulberry tree (*Broussonetia papyrifera*), measures 340 mm x 225 mm, larger than an A4 size paper.

in by ship from France. Often these shipments arrived late, which was the case in 1685. In a desperate move to keep day-to-day commerce humming, the governor of New France issued playing cards with a written promise to pay what was owed when the next shipment of coins would arrive (figure A1.14b). Historic records show that cards were cut into halves or quarters or their corners clipped to enhance the recognition of the different denominations. People got used to the playing card money and in 1729 plain card stocks were issued which circulated like banknotes until New France fell to the British in 1759 [42].

Other countries introduced card money for similar reasons, like Surinam in the period 1761-1828.

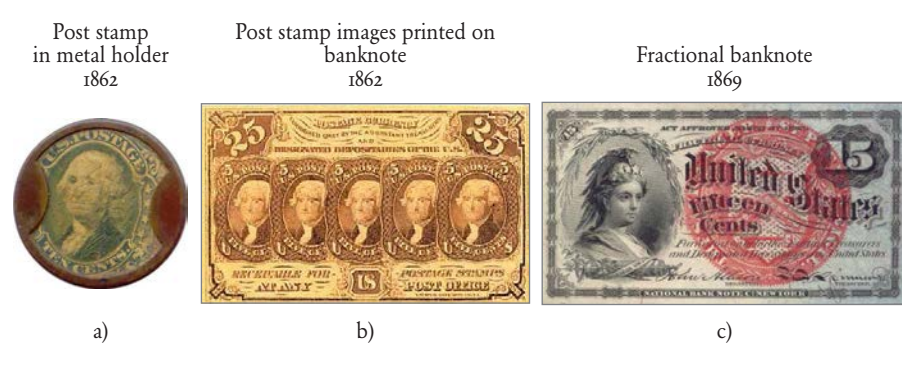
Fractional currency

Just before the Civil War in the United States, around 1860, there was a shortage of silver to mint coins, and many people started to use postage stamps instead. To meet the demand for such small change or fractional currency, postage stamps were authorised and became legal tender. John Gault, an entrepreneur, offered a solution to keep the stamps in condition. The corners of the stamp were folded and the stamp was placed within a brass frame and covered with a thin sheet of mica (figure A1.15a). These patented frames were offered to merchants at a small profit and the reverse could be used for advertising. However, another solution was needed, also in view of the risk of postage stamp shortages. After Gault’s patent had been granted in 1862, the Federal Government banned the use of postage stamps for money in January 1863.

Figure A1.14



Figure A1.15



Examples of fractional money issued in the United States.

- a) First postage stamp money clipped in a metal brass holder (1862). The stamp denominations used were the 1, 3, 5, 10, 12, 24, 30 and 90 cents.
- b) Postage stamp images used on fractional banknote of 25 dollar cents issued in 1862. Other denominations were 5, 10, 25 and 50 cents.
- c) Example of a fractional banknote with a very large red seal. Shown is a 15 cents banknote first issued in 1869, part of the 4th issue. Other denominations were 10, 25 and 50 cents.

Post stamps were also used in other countries as a temporary solution in case of silver or gold shortages. In Spain for example post stamp coins circulated during the Spanish Civil War (1936-1939).

As people had now gained confidence in post stamps instead of banknotes, the first fractional currency was designed to look like postage stamps! The 25-cent note (see figure A1.15b) showed 5 stamps of 5 cents each! Later issues of this fractional money abandoned the reference to post stamps as shown in figure A1.15c.

Emergency money

In Europe, there was also frequently a shortage of silver and/or gold for the production of new coins and the authorities had to search for alternative solutions. A special variant of the emergency money is the 'clipping' of existing banknotes in a special, safe cut, as happened in Greece (1922) and Finland (1946) [253].

In 1920 the German national currency became hyper-inflated to the point of worthlessness and coins were being hoarded for their metal. To find a solution, German cities started to print their own emergency currency, named 'notgeld'. This paper money was printed with letterpresses by commercial printers, creating familiarity. Thousands of different designs were printed, illustrating aspects of local cultural and history proliferated, some amazingly nicely done (figure A1.16)

Currency notes and silver coupons

In the Netherlands coins are issued by the Ministry of Finance and banknotes by the central bank DNB. When DNB was established in 1814 it was determined that

Figure A1.16



Two examples of German emergency money ('notgeld') issued by city communities.

- a) 10 pfennig note issued by the German town of Allenstein in 1921.
- b) 50 pfennig note issued by the German town of Hameln in 1921 illustrating the pied piper of Hameln leading away the mice.

the lowest banknote denomination to be issued was 25 guilder. Later this lower limit was first reduced to 10 guilder (1904) and then to 5 guilder (1948). Coins with a high silver content, like 5 and 10 guilder were expensive to produce and the Ministry opted several times for alternative paper money. In order to distinguish these notes from the banknotes they were called currency notes, in

Figure A1.17



Silver shortage in the Netherlands made it necessary to issue 'coin notes' ('muntbiljetten') and 'silver coupons' ('zilverbonnen').

- a) Coin note NLG 2.5, first issued in 1949.
- b) Silver coupon NLG 1, dated 1 October 1918.

Dutch ‘muntbiljetten’ or ‘coin notes’. The first currency notes of 5, 10 and 20 guilders appeared in 1846 and last in 1949 (figure A1.17a). The Ministry of Finance also issued currency notes with higher values like 100 and 500 guilder, which competed to with the banknotes of those denominations [36].

Another alternative form of emergency notes in the Netherlands was named silver coupons (in Dutch ‘zilverbonnen’). Like the currency notes, the silver coupons were issued by the Ministry of Finance (figure A1.17b). The first issue of silver coupons was parallel to the issue of the first currency notes in 1846. The last silver coupons were issued in 1944 [36, 37].

Paper blends

Up to 1988 all banknotes were paper based, although the paper composition could vary from cellulose (wood fibres) to cotton based. In the case of cotton based banknotes the so-called linters are used, a residual product of the cotton industry. A well-known natural fibre blend is the paper used for US dollar notes. It is composed of approximately 75 % cotton and 25 % flax fibres. An overview of different banknote paper compositions was provided by De Heij in 2002 [82]. Some of the compositions once used, but no longer existing, are:

- Cotton blended with 15 % eucalyptus pulp (Finland),
- Cotton blended with 15 % flax (Netherlands),
- Cotton blended with 20 % abaca, fibres from the banana plant (Philippines),
- Cotton blended with 25 % recycled cotton/lumps (Canada).

A1.4.3 Synthetic (polymer)

The development from paper based banknote substrates into fully synthetic substrates can be seen of an evolution of adding synthetic fibres to finally a full replacement of all cotton by synthetic material.

Adding synthetic fibres to paper

Especially in the 1970s paper mills experimented with banknote papers based on the mixture of cotton and synthetic fibres. All major paper suppliers have experimented with synthetics right up to the present. It is difficult to complement the desired properties of natural fibre banknote paper with synthetics without undesirable consequences. This was just the case, for example, with ‘Paressyn’, a semi-synthetic paper made by the Dutch paper mill Van Houtum & Palm. A substantial percentage of plastic fibres were added to the cotton to increase both the tensile strength and the tearing resistance. In 1974, the NLG 5 banknote was printed on this paper and issued by DNB. However, the circulation trial indicated a lower life for this type of note. On close inspection it was found that the plastic fibres were not fully embedded in the cotton fibres and, consequently, juttred out from the paper. Being made of plastic, they attracted dirt more easily because of static electricity [82].

Synthetic banknotes

The first full plastic banknote was issued in Haiti, in 1974, and printed on ‘Tyvek’, a synthetic fibre material and not a foil. Tyvek is a spun-bonded Dupont product, commonly used for tear-resistant mailers and house wrap. Ten years later, in 1984, an experimental batch of GBP 1 banknotes printed on Tyvek was issued on the Island of Man. These first synthetic banknotes were printed on a generic, white coloured substrate without windows or any other security feature. The experiment was not successful, mainly because ink failed to adhere during circulation.

The first successfully introduced synthetic banknote was issued in 1988, by the Central Reserve Bank of Australia. It was printed on ‘Guardian’, made by Securrency. The material used is a bi-axially-oriented polypropylene (BOPP), in short: polymer, consisting of two laminated layers of 37.5 µm each. BOPP is a non-fibrous and non-porous polymer.

The first ASD 10 was followed up by a new ASD 10 design (figure A1.18a), after which a full series of polymer notes was issued. After Australia, several other central banks also replaced their cotton notes by a polymer note series, like New Zealand (1999) and Romania (2000) [82]. The central bank of Mexico made a strategic decision in 2002 to replace the note on the note-coin boundary (MXN 20) and the subsequent denomination (MXN 50) by polymer notes and keep the other denominations cotton-based (figure A1.18b).

In 2011, around 35 countries adopted the polymer substrate, including Canada. Central banks opt for polymer because this is more durable than banknote paper,

Figure A1.18



Two examples of polymer banknotes promoting familiarity with banknote design. The transparent polymer substrate is covered with a light grey print distinguishing this type of banknote from paper-based banknotes.

- a) ASD 10, issued in Australia on 1 November 1993. The portrait is Dame Mary Gilmore (16 August 1865-3 December 1962) a prominent Australian socialist poet and journalist.
- b) The 2006 follow up to the MXN 20 polymer banknote first issued in 2002. The portrait shows the Mexican president Don Benito Juárez García (1806-1872).

harder to tear, waterproof, and more resistant to folding, soiling, and micro-organisms. About 15 % of all banknotes used are today made of polymer.

In 2010, Bouhdaoui, Bounie and Van Hove [191] conducted a study of the cost savings feasible by the transition from cotton to polymer. There are also some indications that polymer notes have better behaviour in banknote automates due to less mechanical defects.

Polymer banknotes seem to have three advantages over banknotes printed on cotton paper substrates:

- 1) Several authenticity features are difficult to imitate,
- 2) More durable,
- 3) Better performance in banknote automates.

Composite substrates

Banknotes can also be printed on composite substrates, using one or two layers cotton and a synthetic material. The first research on composite or laminated substrates was commenced in Canada in the 1990s, when two companies, DuraNote and Domtar, began looking for ways to combine the best of cotton and synthetic substrates. In 2009, multi-layer substrates for banknotes became available in two variants developed by different paper mills:

- 1) Film-paper-film (named Hybrid, produced by Papierfabrik Louisenenthal and Arjo-Wiggins),
- 2) Paper-film-paper (named Durasafe, produced by Landqart).

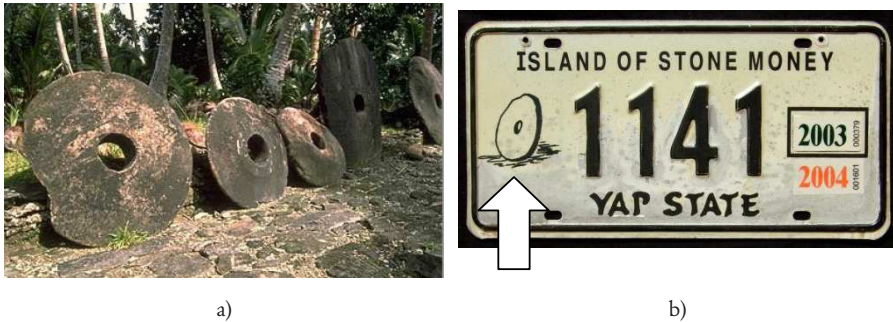
To date, over 20 banknotes have been issued on composite substrates. The Latvia 500 lats issued on 19 January 2009 - an existing design printed on Hybrid - claims to be the first. Other early adaptors are Mauritania (MRO 100, 2010) and Swaziland (SLZ 100, 2010). It is expected that the coming new Swiss banknote series will also be printed on Durasafe.

A1.5 Size

The famous Yap-stones are certainly the largest type of money ever, although this money was not meant to be used for daily payments (figure A1.19a). These disc-shaped stones could be up to 4 meter in diameter, while the smallest still had a 35-millimeter diameter. A Yap-stone is part of the license plates of cars registered on the isle of Yap, one of the Federated States of Micronesia in the Pacific Ocean (figure A1.19b).

Original money was not only large and heavy; it was also vulnerable, e.g. the tea brick money. Historic paper money was also large; the Chinese example shown in figure A1.13 is larger than an A4 paper we use today. By modern user standards, cash money should be portable and fit easily in a wallet, and coins should not be heavy.

Figure A1.19



Stone money provides the Yap Island its identity.

- a) Examples of Yap stones.
- b) As is clear from this license plate, the island considers its ancient stone money its chief mark of identity.

Identity by sizes

Worldwide, banknotes tend to become smaller and banknote series are increasingly tending towards a uniform height between 65-75 mm [118]. If the notes in a series are all equally high, length is the only dimension left by which a denomination can be distinguished. In 2009, De Heij presented a concept for the dimensions of a series of banknotes based on a combination of both banknote orientation and a length increment system [169].

Research to sizes of euro banknotes

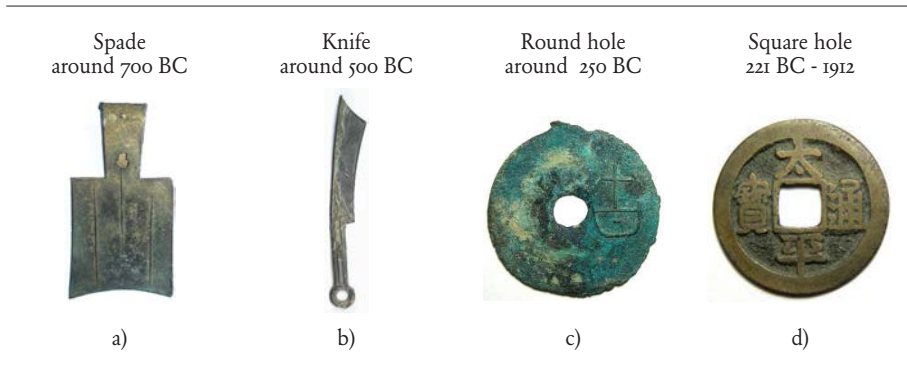
It seems that central banks seek to ensure that their banknotes' dimensions match the requirements of today's customers. But what are these requirements?

A clear requirement is that banknotes should fit properly in a wallet. DNB asked the Dutch in 2009 for their opinion about euro banknote sizes within the scope of DNB's biannual public opinion poll. The outcome was clearly that the sizes of the euro banknotes are suboptimal. The euro 5 is too small and the high-value notes value notes (50 and more) are found too large. The size of the 20 euro banknote (height 72 mm) was considered the best, with 94 % of the respondents judge this 'exactly right'. Also the size of the 10 euro banknote was accepted by 92 % [162, 169].

A1.6 Shape

The Katanga cross shown in chapter 2, figure 2.1d is an example of a typical shape, just as the Yap-stones with the hole at their centre. Early Chinese coins have a square hole (see figure A1.20d). Strings of such cash coins were depicted on Chinese paper money (see figure A1.13).

Figure A1.20



Impression of the development of Chinese coins.

- Spade coins were the first coins in China. The coin portrayed is one of the first, dating back to the 'Early Period Hollow Handle Spade'. Height ca. 95 mm; weight ca. 27 gram.
- A knife coin. The monetary designation of knife money is 'hou', derived from a character denoting to change or to exchange in trade. Height about 150 mm; weight about 16 gram.
- A round coin with a round hole, successor of the spade coin. Diameter ca. 42 mm, weight ca. 10 g.
- A round coin with a square hole, successor of the spade and knife coins, introduced by the Ch'in dynasty (221 BC-206 BC). The coin shown is a bronze 1 cash coin, issued under Emperor T'ai Tsung (976-997). In script: Money of the Heavenly Kingdom. Diameter ca. 25 mm; weight ca. 3.5 g.

Typical Chinese coin shapes

The Chinese coin history boasts a rich variety of coin shapes (see figure A1.20). The first Chinese coins were shaped like a spade and therefore called 'spade money' (figure A1.20a). Of a later date is the 'knife money', shown in figure A1.20b. The arrival of the cash coins marked the end of knife and spade-shaped coinage. In terms of durability, these coins are the most successful means of payment in the history of mankind, since they have been used for over 2,100 years, in a great many varieties. The first generation was characterised by a round hole at the centre (see figure A1.20c), but soon follow-up version appeared with square holes (figure A1.20d). The cash coins became popular during the Han-dynasty (206 BC-220), when the unit of account was a spoon of grain. Remaining in circulation after the fall of the Han-dynasty, the 'five-spoon grain' coin ('Wu zhu' coin) circulated for almost 700 years!

Japan

The development of Japanese paper money was more or less similar to that of European paper money. The earliest local currency in Japan was called 'yamada hagaki'. This private note was issued by merchants and used for small change instead of silver coins and first appeared around 1600 in the busy trading area of what is now the central Japanese city of Ise. These notes were issued without interruption for 300 years. Around 1630, during the Fukuyama period, the 'hansatsu' was issued. From a design point of view they remind of a bookmark, because of its similar length-width ratio (figure A1.21a).

Japan abandoned the vertical banknotes in 1868, when the Bank of Japan was established. After the gold standard was introduced in 1872, the Bank of Japan issued banknotes that were convertible to gold. An early example of a Japanese banknote with a portrait is shown in figure A1.21b, including a red seal for ‘state money’, similar to the red seal on US dollar banknotes.

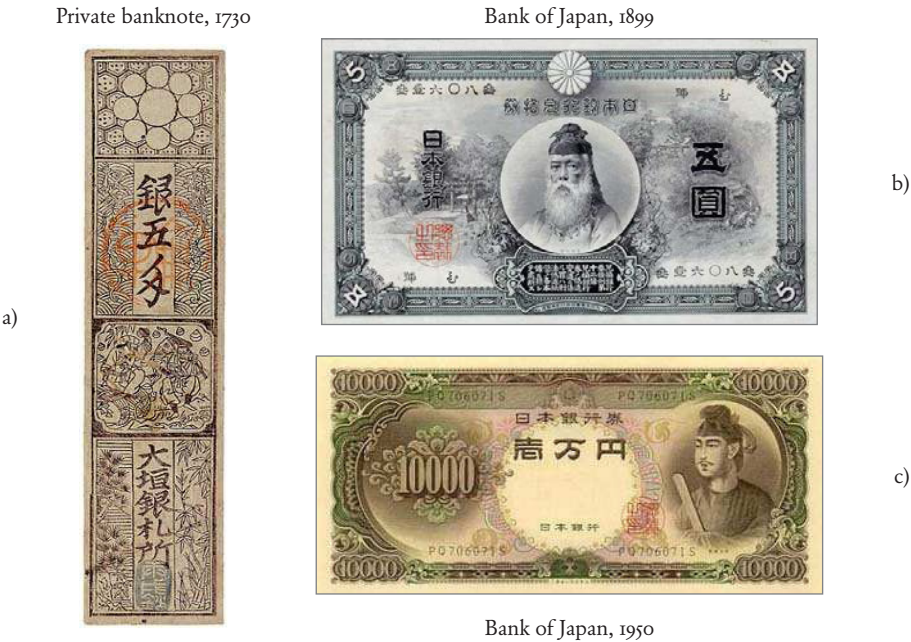
Vertical banknotes

The banknote orientation is a dominant banknote design parameter, with just two variants [118, 169]:

- 1) Vertical or portrait style (figure A1.22a),
- 2) Horizontal or landscape style (figure A1.22b).

The orientation seems to be culture-driven, since both the first Chinese and Japanese banknotes were vertical (as shown in figures A1.13 and A1.21a, respectively). The Austrian and Russian banknotes (figures A1.23b and c, respectively) also had a

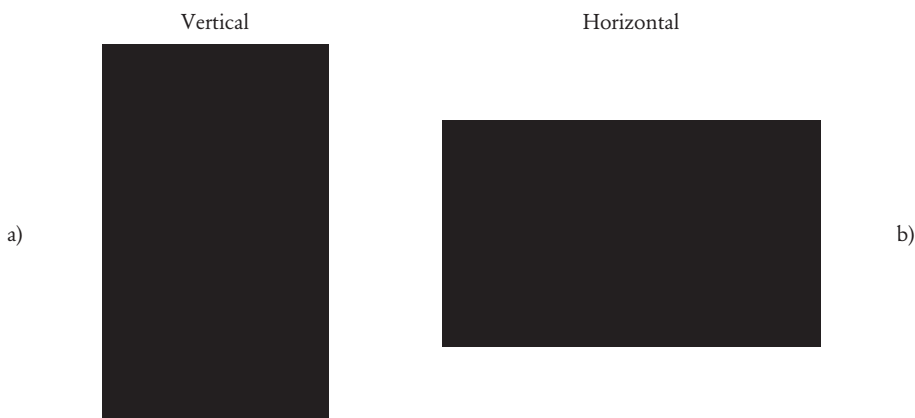
Figure A1.21



Impression of the development of Japanese banknotes.

- a) Hansatsu banknote. A note worth five ‘momme’ of silver issued by the Ohgaki clan of the Mino region in 1730. Vertical or portrait style design known by collectors as ‘bookmarker money’ [224].
- b) An early Japanese banknote of 5 yen, issued by the Bank of Japan in the period 1899-1910. This banknote with the portrait of Takeuchi Sukune at the centre is convertible to gold. The text on the note reads ‘Nippon Ginko Promises to Pay the Bearer on Demand Five Yen in Gold’.
- c) JPY 10,000, issued in 1950.

Figure A1.22



Two basic orientations of a banknote: vertical or portrait style and horizontal or landscape style.

Figure A1.23



The first vertical banknotes.

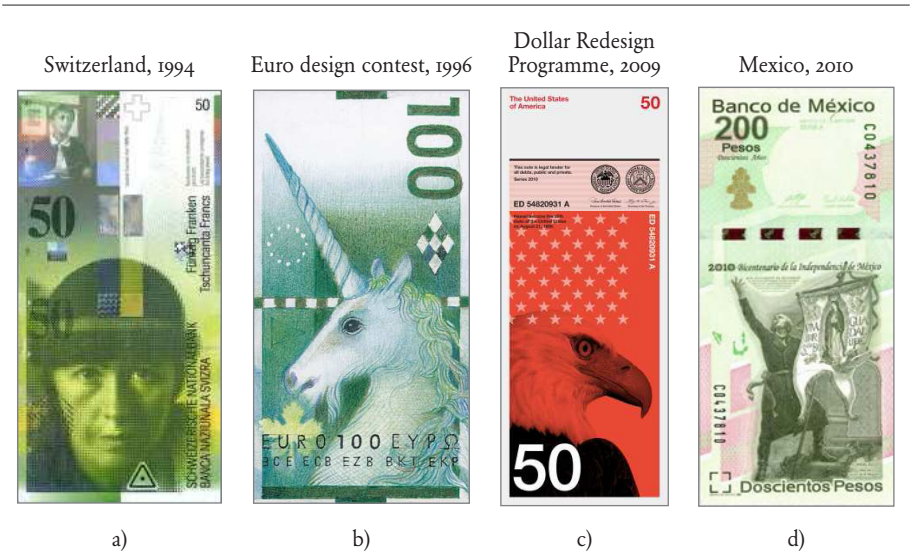
- a) China, Ming Dynasty, 1 kuan, 1643.
- b) Austria, 2 gulden, Wiener Stadt Banco, 1800. Austria issued vertical banknotes from 1796 until 1882.
- c) Russia, 10 Roubles, 1909.
- d) China, central bank, Custom Gold Units (CGU), 1930. CGUs were issued to facilitate payment of duties on imported goods. Unlike the national currency, which suffered from hyperinflation, the CGUs were pegged to the US Dollar at 1 CGU = USD 0.40. The peg was removed in 1935 and the bank allowed CGUs to be released for general use. Already awash with excessive paper currency, the CGUs only added to rampant hyperinflation.

tradition of vertical note design. Finland and Poland also issued vertical banknotes at the end of the 19th century.

Vertical formats being re-introduced

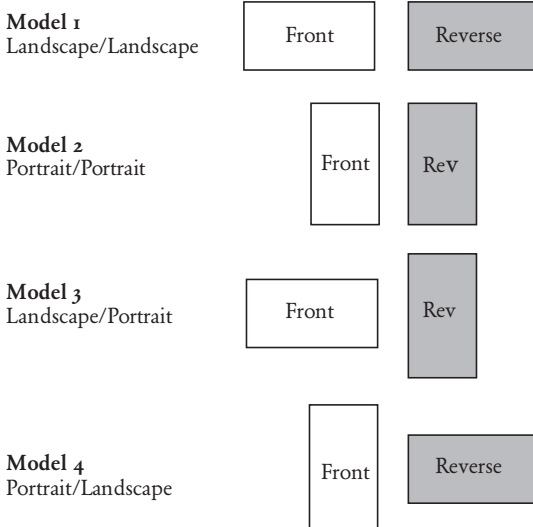
In modern banknote design, Switzerland re-introduced the vertical format in 1994, keeping this format up-to-date since (figure A1.24a). This format will be applied again for their future banknote series. Recently, several South and Mid-American nations issued vertical banknotes, like Bermuda, Colombia, Mexico, Nicaragua and Venezuela. It is an additional argument for the statement by Hymans, as quoted in chapter 1, that central banks seem to follow or copy each other. The most recent Mexican vertical note design is shown in figure A1.24d. Two more vertical designs are presented here, one made for the euro design contest in 1996 (figure A1.24b) and one for the US dollar made in 2009 (figure A1.24c).

Figure A1.24



- Overview of modern vertical banknote designs.
- a) CHF 50/Sophie Taeuber-Arp. Design by Jürgen Zintzmeyer for the Swiss National Bank. Issued in 1994.
 - b) EUR 100/Unicorn. Design by Robert Oxenaar for De Nederlandsche Bank, 1996. Not issued.
 - c) Proposal for a USD 50 by Dowling Duncan, part of the Dollar Redesign Programme, a private initiative. Not issued.
 - d) MXN 200/Independence of Mexico, showing Miguel Hidalgo. Commemorative banknote, issued in 2010.

Figure A1.25



Overview of four possible combinations of the different orientations of a banknote front/reverse (landscape or portrait).

Dual note orientation

Given the two basic positions of a banknote, horizontal and vertical, four combinations of the front and reverse can be made (figure A1.25). Today people use a banknote in two ways:

- 1) Vertical to feed banknote automates,
- 2) Horizontal to store banknotes in their wallets.

Future banknotes could have a 'dual note orientation' for optimal banknote use. Model 3 as shown in figure A1.25 seems most appropriate: the front of the note has a horizontal orientation, while the design of the reverse is done in portrait style.

Length-width ratio

Next to the orientation, the length-width ratio is an important design parameter with respect to branding. The typical length-width ratio (L/H) of any US dollar banknote is 2.3 (156 mm/66.3 mm) and gives this currency a branding advantage, since dollar notes are usually quickly recognised by this typical ratio. The L/H ratio of European banknotes is lower. The Swiss CHF 50, for example, shown in figure A1.24a, has an L/H ratio of 2 (148 mm/74 mm), while for the euro 50 this ratio is 1.8 (140 mm/77 mm) [192].

Figure A1.26



Different shapes of money.

- a) The Spanish Eight Reale. The coin could be cut into two, four and finally into eight triangular pieces, giving the coin its name 'pieces of eight'.
- b) A hexagonally shaped (size 95 mm x 80 mm) banknote issued in Surinam by the Bank of the West Indies in 1837. This bank issued loans to plantations. In 1831, the issuing bank ran into trouble because it issued too many uncovered banknotes. In 1848, the bank was ingloriously liquidated.

Triangular, hexagonal and square money

Cutting coins into smaller pieces, different shapes appeared, like triangles and pieces of eight (figure A1.26a). Square coins were used in the Netherlands in 1574, called 'stuiver' (figure A1.39a). This typical square shape was used again for a stuiver in 1913 (figure A1.39b). Examples of poly-angle coins abound, like pentagonal (5 sides), hexagonal (6 sides), and heptagonal (7 sides, e.g. British 50 pence piece) and even coins with 20 sides for the three pence coin issued in the United Kingdom in 1952. There have been some deviant shapes of paper money too, like the hexagonally shaped 25-cent notes issued by the Bank of the West Indies in Surinam in 1837 (figure A1.26d) [36].

A1.7 Main image

The development of main images on banknotes is described in chapter 2.

A1.8 Issuing authority

Monograms and other symbols on the Greek and Roman coins refer to issuer's name. An abbreviation of Athena (AΘE) is used on the Greek coins (see figure 2.4b). Today abbreviations of the issuing authority may also be found on the euro banknotes (BCE ECB EZB EKT EKP).

Euro banknote identity from organisation perspective

The public's perception of the euro banknotes is not only made by money, but also by the organisations behind it. In case of the euro banknotes this is the Euro System of Central Banks (ESCB). The ESCB is the European Central Bank (ECB) together with all 27 central banks of the European Union (EU); the euro money is used in 17 of these 27 countries, also known as the Eurozone.

In daily practice the ECB is the organisation behind the euro banknotes; in fact the ECB is the (juridical) issuing authority of the euro banknotes. This fact is, from a design perspective, camouflaged by combining several abbreviations of the European Central Bank, representing all the languages used in the 12 countries that introduced the euro banknotes in 2002: BCE ECB EZB EKT EKP. Table A1.3 provides the origin of these abbreviations.

Name of issuing authority supports confidence in banknotes

With the introduction of fiduciary banknotes in the 20th century, the issuing authority gained importance. The organisation behind the banknotes is of major

Table A1.3

Abbreviation	Meaning	Language	Used in country
BCE	BANC CEANNAIS EORPACH	Irish	1. Ireland
	BANCA CENTRAL EUROPEA	Italian	2. Italy
	BANCO CENTRAL EUROPEO	Spanish	3. Spain
	BANCO CENTRAL EUROPEU	Portuguese	4. Portugal
	BANQUE CENTRALE EUROPÉENNE	French	5. Belgium
			6. France
ECB	EUROPEAN CENTRAL BANK	English	7. Luxembourg
			1. Ireland
			<i>United Kingdom</i>
	EUROPESE CENTRALE BANK	Dutch	8. Netherlands
			5. Belgium
EZB	DEN EUROPÆISKA CENTRALBANK	Danish	<i>Denmark</i>
	EUROPEISKA CENTRALBANKEN	Swedish	<i>Sweden</i>
	EUROPÄISCHE ZENTRALBANK	German	9. Austria
			10. Germany
EKP	EUROOPAN KESKUSPANKKI	Finish	7. Luxembourg
EKT	ΕΥΡΩΠΑΪΚΗ ΚΕΝΤΡΙΚΗ ΤΡΑΠΕΖΑ	Greek	11. Finland
			12. Greece

Explanation of abbreviations BCE, ECB, EZB, EKT and EKP as used on the euro banknotes issued in 2002. At the time of the introduction of the euro banknotes in 2002 there were 15 EU member states. The abbreviations also covered the three EU-countries who did not introduce the euro in 2002: Denmark, Sweden and United Kingdom, marked in italics.

importance in establishing confidence in the pieces of paper. It seems that the Dutch prefer a clear name of the issuing authority on the euro banknotes, like European Central Bank, the legal, English name. Alternatively, ‘European Central Bank’ could be printed, with around it, in microtext, the full name of the European central bank in all the languages used (see figure A1.27a). Another alternative is to print the abbreviations like BCE ECB EZB EKT and EKP in a microtext (e.g. 2 mm high) below the text European Central Bank (see figure A1.27b).

An attractive alternative is to use a language panel as used on the Indian banknotes (figure A1.6b and c). This concept is presented in chapter 5, figure 5.26.

A1.9 National symbol (seal, coat of arms, flag)

Signatures could not be set on metal coins, and coins were by tradition marked with a die, a seal type mark. The mark on a coin was continued as a seal on the first paper money. The seal developed into a national symbol, like the coat of arms and a flag, the reason why this section is subdivided into the following topics:

A1.9.1 Seal

A1.9.2 Coat of arms

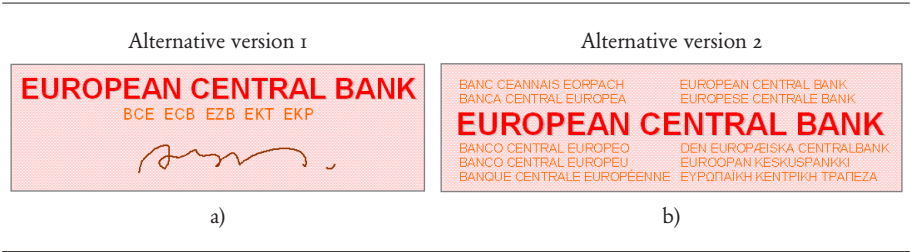
A1.9.3 Flag

A1.9.4 Text

A1.9.1 Seal

Instead of a hand signature, some Asian banknotes use a seal, typically reading ‘the seal of the Governor’. Such seals are called ‘stamps’ or ‘chops’. Contemporary Japanese banknotes have one round seal printed on both the front (figure A1.28a) and reverse sides, while Korean banknotes use one round seal only on the front. Chinese banknotes bear a square shape seal on the reverse side. In the latest series

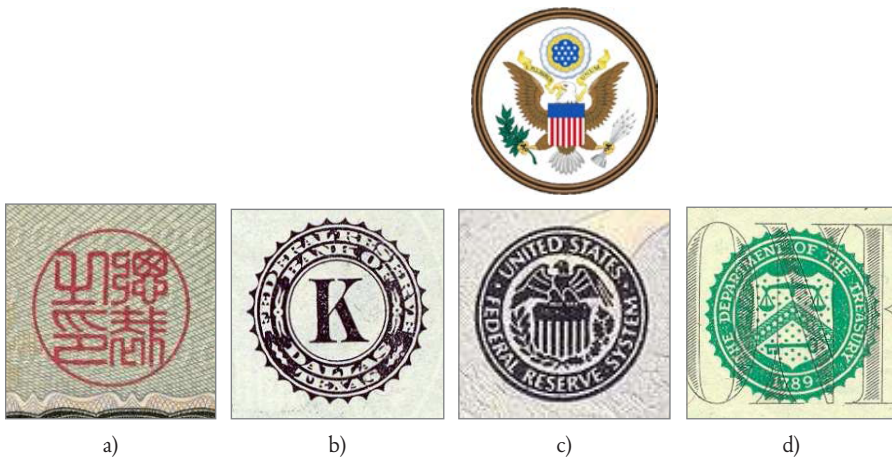
Figure A1.27



Alternatives for abbreviation BCE ECB EZB EKT EKP.

- a) Legal English name ‘European Central Bank’ and, below, in microtext the relevant abbreviations of ‘European Central Bank in all languages of the Eurosystem and the President’s signature.
- b) Legal English name ‘European Central Bank’ and, below, the full name of the European Central Bank in all languages of the Eurosystem.

Figure A1.28



Four examples of seals on banknotes; one Japanese and three American.

- a) Seal of the Governor on JPY 10,000. Japanese banknotes have two seals, one on the front and one on the reverse.
- b) Seal of the Federal Reserve Bank of Dallas. In the US there are 10 Federal Reserve Banks. Since 1996 this seal has only been used on the one dollar notes.
- c) Great Seal of America on US dollar banknotes. Above, the original Great Seal showing the American eagle with the shield at its breast. The first design of the Great Seal was made in 1782 and features a coat of arms (see Subsection 3.8.2 on coat of arms). In several stages the seal evolved into the seal of 1904, which has adorned the reverse of the dollar notes since 1935. The Great Seal has marked the fronts of all dollar denominations since 1996.
- d) Seal of the Department of the Treasury (1789). The seal displays a pair of scales, symbolising a balanced national budget, and a key.

of South Korea the round seal, representing the signature of the Governor, is made smaller and is replaced by a square one.

The US dollar banknotes have a rich seal tradition, bearing several ones, as shown in figure A1.28b, c and d.

A1.9.2 Coat of arms

A coat of arms is a sign related to a person, family, city or state, or a certain group of people. Traditionally, it was displayed on the shields that were used in battle. Soldiers also wore their coats of arms on the battle field. At later days, the use of coats of arms was extended to include also helmets. This coat of arms was so placed as to facilitate recognition of a certain group in a battle.

Today a coat of arms is used mainly to indicate ownership, authority over a territory and as a means of verification. It is also used to acknowledge outstanding achievements and deeds.

A coat of arms is a distinctive heraldic design usually composed on the basis of the elements that together form a blazon. This generic design includes shield-coverage,

a shield, supporters (one left and one on the right), a motto and a compartment. Also the colours have symbolic meanings, with red standing for courage and sacrifice; blue for science, and green for mildness and hope. Purple denotes dignity, orange ambition, brown authority, yellow wisdom and wealth. Black represents danger and strength and, finally, grey stands for loyalty [197].

Five examples of coats of arms as printed on banknotes are provided in figure A1.29a to A1.29e. Figure A1.29f shows a proposal for a European coat of arms - there is none yet - by a young Dutch designer Joost van Drost. The proposal is meant to be used for the European passport. Van Drost collected all coats of arms of the 27 countries of European Union, subjected these to a ‘visual analyses’ and then came up with this format which incorporates elements of all existing coats of arms [197].

Figure A1.29



- Six different coats of arms.
- a) Chinese Arms on 1 yi jiao banknote, 1962.
 - b) Burundi Arms on 20 francs banknote from Burundi, 2005.
 - c) Trinidad and Tobago Arms on 1 dollar banknote from Trinidad and Tobago, 2003.
 - d) Uzbekistan Arms on 1 sum banknote from Uzbekistan, 1992.
 - e) Ghanese Arms on 5,000 cedis banknote from Ghana, 1996.
 - f) Proposal for a coat of arms for the European Union, designed by Joost van Drost (2010). Slogan ‘In Varietate Concordia’ (Unity in Diversity) [225].

Figure A1.30



French flag on the reverse of a 2 Francs paper money, issued in 1944 as Allied Military Currency (Supplemental French Franc Currency).

A1.9.3 Flag

In antiquity ‘flag-like’ field signs were used in warfare. During the Middle Ages flags came to be used primarily as a heraldic device. During the peak of the age of sail, beginning in the early 17th century, ships had to carry flags designating their nationality.

One of the first notes with a flag was the 2 franc note issued in 1944, part of the ‘Invasion currency’ (figure A1.30).

The European Union has no coat of arms and the 1996 design brief for a series of euro banknotes made no mention of the European flag. When the design proposal of Robert Kalina was accepted (figure A1.31c), the Governing Council of the European Monetary Institute (EMI), forerunner of the ECB, wanted to enhance the European identity of the winning design by adding the European flag (figure A1.31d). In some cases, like the French franc banknote issued in 1987, a (part of a) flag is displayed on the note (figure A1.31a). More recent examples are the SLL 10,000 issued in Sierra Leone in 2004 (figure A1.31b) and the 2006 banknote series issued in Kazakhstan.

A1.9.4 Text

A country’s name can also function as a national symbol. The text ‘CANADA’ is used as a national symbol in the graphic design of the Canadian banknotes issued in 1986 (figure A1.32).

A1.10 Motto

A motto is a short promotional text used as part of a currency’s identity. Slogan and credo are both synonyms for motto, just as one-liner, catchword and tag-line. Mottoes appeared first on coins and later also on banknotes. The Greek coins

Figure A1.31



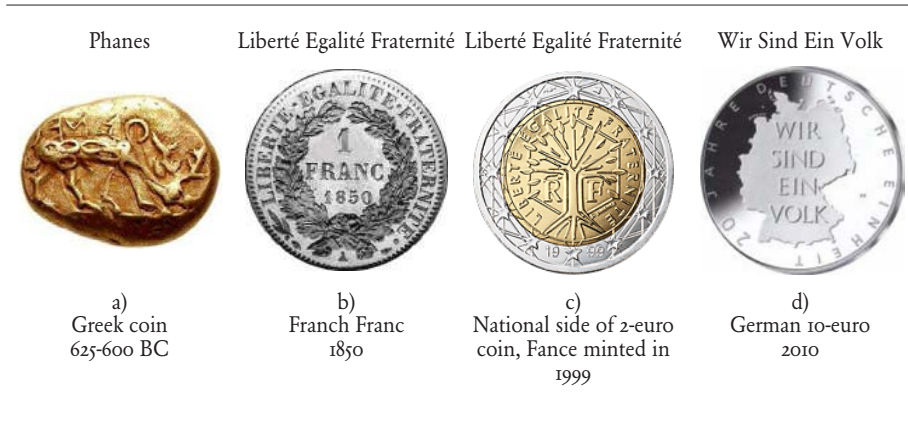
- Flags on banknotes.
- a) FFR 100/DeLaCroix, issued in 1987. The image in the background shows Marianne in 1789 with the Revolutionary flag, later the flag of France.
 - b) Flag of Sierra Leone on SLL 10,000, issued in Sierra Leone in 2004.
 - c) Original design proposal by Robert Kalina without EU flag (1996).
 - d) Final design of the euro series with EU flag (2002).

Figure A1.32



Canada in large lettering on the reverse of a CAD 5 banknote issued in 1986.

Figure A1.33



Promotional texts on coins.

- The Greek text above the deer figure spells Phanes, the name of the person who minted the coins from 625- 600 BC. The deer symbolizes the wealth and power of Phanes.
- The slogan 'Freedom Equality Brotherhood' ('Liberté Egalité Fraternité') has been on the French coins since 1850.
- 'Liberté Egalité Fraternité' on the national side of the French 1- and 2-euro coins.
- Commemorative 10-euro coin issued in Germany in 2011. Motto: 'We are one people'('Wir sind ein volk').

were probably the first currency to feature promotional texts like 'The God' or 'Phanes' (figure A1.33a). A consistent and famous creed is 'Liberté Egalité Fraternité' ('Freedom Equality Brotherhood'), which has graced French coins since 1850 (figure A1.33b). Today this motto can be found on the national side of the French 1- and 2-euro coins (figure A1.33c). A clear message, 'We are one people' is spread through a special coin issued in commemoration of 20 years of unification of West and East Germany (figure A1, 33d).

American banknotes printed during the War of Independence (1776-1783) made use of mottoes like 'We are one' and 'Mind your own business!' (figure A1.34b). This war was largely financed by printing banknotes. Both contending parties had their own banknotes: the 'continentals' issued by Congress (figure A1.34a) and the 'bills of credit' issued by the States (figure A1.34b). At the end of the war, hyperinflation made the continentals worthless. We are still reminded of this event, when we stay at a hotel and order a continental breakfast.

With this poor experience in mind, US Congress - which in 1789 was assigned the sole power to coin money and regulate its value - did not issue any dollar banknotes yet, but only silver coins. The issuance of banknotes was left to private banks.

The first official dollar banknote had to await issuance until 1862 and bore no creeds. It was president Franklin D. Roosevelt (1882-1945) who in 1935 ordered the design of a new reverse of the dollar bill. He requested that the design be based on the symbolism of the Great Seal of America. The design, by Edward M. Weeks, contained several Masonic symbols, of which Roosevelt, being a Freemason

himself, was well aware [95]. This new generation of dollar notes showed three mottoes on the reverse:

- 1) E pluribus unum (Out of many, the one),
- 2) Annuit Coeptis (He has favoured our undertakings),
- 3) Novus Ordo Seclorum (A new order of the Ages).

And in 1957 a fourth creed was added:

- 4) In God we trust.

In God We Trust

The motto ‘In God We Trust’ was already used on US coins during the Civil War (1861-1865) to accommodate the increased religious sentiment (figure A1.35a). The phrase first appeared on a coin in 1864 (two-cent). In 1955, Congress mandated the use of this phrase on all US currency. In 1956, it became the official motto of the United States and has marked all dollar banknotes issued since 1957 (figure A1.35b). The edge lettering on the new USD 1 coin (2007) also reads ‘In God We Trust’ (figure A1.36a).

Figure A1.34



- Banknotes issued during the War of Independence in the United States (1776-1783).
- a) Continental banknote of 5 dollar, issued by the Congress in 1775. Transcription of the text: ‘This Bill entitles the Bearer to receive FIVE SPANISH MILLED DOLLARS, or the Value thereof in GOLD or SILVER according to a Resolution of CONGRESS Passed at PHILADELPHIA, November 29, 1775’.
 - b) Bill of credit of 1/3 dollar, issued by the Union in 1776. The 13 circles represent the 13 states. At the centre the text: ‘American Congress. We are one’.

Figure A1.35



Text 'on US currency.

- a) The text 'In God We Trust' has been on USD coins since 1864.
- b) The text 'In God We Trust' has been on USD banknotes since 1957.
- c) The, truncated, pyramid on the 1937 design of the USD 1-dollar banknote. The Latin lettering on the bottom course signifies that the construction of the pyramid was begun in 1776. There is no indication as to when it will be finished. The truncated pyramid seems suggestive of 'work unfinished'. Above the pyramid a glory, with an eye inside a triangle, represents the eternal eye of God and thus places the spiritual above the material.

The mottoes and symbols on the US dollar notes received - and still receive - much interest, like in Dan Brown's bestseller 'The Da Vinci Code' published in 2003 [87]. In 2004, David Ovason published 'The Secret Symbols of the Dollar Bill', a book full of references to Freemasonry symbols like the numbers 9, 13, 72 and 666 [95]. A case in point is the pyramid with 13 completed courses, referring to the foundation of the United States in 1776, which then numbered 13 colonies (see figure A1.35c). 'Annuit Coeptis' would not mean 'He has favoured our undertakings', but

Figure A1.36



Two examples of edge lettering on coins.

- a) Circumscription 'E pluribus unum' and 'In god we trust' for a 1-dollar coin design (2007).
- b) Circumscription on Dutch NLG 2.50 coins: 'God be with us' ('God zij met ons').

‘Announcing conception’. The pyramid will be completed with the aid of the all-seeing God or the Supreme Being. The eternal eye is another subject of speculation. The eye would be the ‘Eye of Providence’ representing the sun, since it is a right eye, while a left eye is linked with the moon. And the eye could even be the eye of Lucifer, the fallen angel.

‘God be with us’, also on euro coins

The Dutch also have a long tradition issuing coins with creeds. The first circumscription appeared in 1807. Napoleon’s brother, Louis Napoleon, was King of the short-lived Kingdom of Holland (1806-1810). The circumscription read in capital letters: ‘Praise the name of the Lord’ (in Dutch: ‘De naam des Heeren zy geloofd’). In 1810, the Netherlands were fully occupied by France and the edge lettering on the Dutch coins read ‘God protects France’ (in French, on the Dutch coins: ‘Dieu protege la France’).

In 1814, the Netherlands were liberated from the French and it took several years before new coins were issued. The circumscription on the 1-guilder coin issued in 1818 read ‘God be with us’ (in Dutch, including separation marks ‘GOD*ZY*MET*ONS’; in 1910 changed to ‘GOD*ZIJ*MET*ONS’ (figure A1.36b)). This motto is also used for the Dutch 2 euro coins (see also chapter 4, subsection 4.2.3 on measuring European identity in the Netherlands (DNB research 2011).

The mottoes on euro banknotes are discussed in appendix A10 on European visual identity.

Propaganda

In some cases banknotes are used for propaganda purposes, going beyond a slogan. A historic example of a banknote in this category is the 5,000 rouble banknote

Figure A1.37



Propaganda on a Russian 5,000 rouble banknote issued in 1921: Workers of the world, unite!

issued by the Soviet Union in 1921, which reads: ‘Workers of the world, unite!’ in several languages like German, Chinese, Italian, French, Arab and English (see figure A1.37).

Propaganda symbols

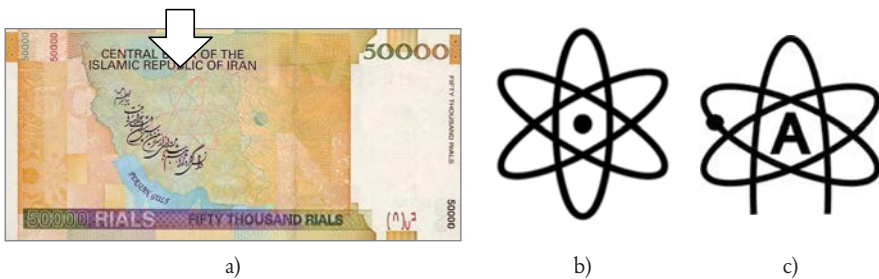
Instead of a written motto, a pictogram could be displayed on coins and banknotes. The history of banknotes contains several examples of banknotes using political symbols, like in the Soviet Union (hammer and sickle) and Nazi Germany (swastika). And there are many examples of suppressors putting their images on banknotes, like Saddam Hussein (ruling from 1979 to 2003) on Iraqi banknotes regime, and Muammar Gaddafi (ruling from 1969-2011) on the Libyan banknotes.

A recent example of the use of a propaganda symbol is an Iranian banknote issued in 2007, showing a portrait of Khomeini (1902-1989) on one side, and a nuclear symbol on the other (figures A1.38a and b). The nuclear symbol bears a close resemblance to the symbol of the American Atheists Organisation (figure A1.38c).

From motto to stepping stone

Modern governments are increasingly stepping back, leaving more and more responsibilities to citizens, who have become better educated and able to form their own opinions in the course of the past century. This implies that mottoes as discussed above have been gradually abolished, since these can be seen as patronizing. Instead of traditional mottoes, central banks provide instructions, e.g. ‘Feel Look Tilt’ for the euro banknotes introduced in 2002, to check banknotes for authenticity. Central banks began to support the issue of a new banknote with publication campaigns creating a motto revival. In 2003, the Federal Reserve

Figure A1.38



Banknote IRR 50,000, issued in 2007, showing a nuclear symbol.

- a) The nuclear symbol printed on the reverse in a pale pink.
- b) Nuclear symbol.
- c) Symbol of the American Atheists Organisation. This organization, founded in 1963 chose the symbol to emphasize that humanity can only improve its conditions through scientific analysis and research. The letter in the middle stands for the country where the organization is based, i.e. USA.

introduced 'Safer. Smarter. More Secure.' followed in 2005 with 'Take Note' by the Bank of England. In 2006 the Bank of Korea opted for 'More secure, more elegant, more convenient'. And in 2010, the Bank of Uganda created their variant 'Secure, Convenient, Pleasant and truly Ugandan'.

The efficiency of such slogans, which - as far as known - has not been researched, may be questioned. A security check is based on two pillars, the operation and the detail to be distinguished; Feel Look Tilt only refers to the operation and does not help to find the feature and verify it.

De Heij proposed to introduce modern instructions supporting the wayfinding design of the security features, like 'look under the bridge', 'all features in a row' or 'follow the fish'. Such tag-lines are to be used as a stepping stone to remember and to make finding the public security features attractive [115, 192].

AI.II Denominations

The first decimal system for coins was introduced by the French in 1795: 1 franc = 10 decimes = 100 centimes, but it took several centuries to come to this decision. In the past there were several complex denomination systems, like the one used by the Romans and the British, often based on dividing into halves and redoubling. The system of dividing into halves and redoubling starts with the unit of account, usually the unit 'one'. To create higher denominations this unit is redoubled several times creating a binary sequence like 1, 2, 4, 8, 16, 32. Usually such schemes are adapted, e.g. the first series of NLG banknotes in 1814 was 25-40-60-80-100-200-300-500 and 1,000 guilder. Since the 1900s such schemes are usually adapted to the decimal system 1, 2, 5, 10, 20, 50, 100.

To create lower denominations the basic unit is divided into halves like $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$. Just as with redoubling, the sequence of dividing into halves is adapted to the decimal system: 0.5, 0.25, 0.10, 0.05, 0.02 and 0.01. One of the last countries that switched to the decimal system is Great Britain. On 15 February 1971 the decimal system was introduced and one pound became 100 pence instead of 240 (old) pence. This also resolved two typical English coins: the three pence and the six pence. Stock prices in the United States were provided in fractions (e.g. 80 $\frac{3}{8}$) up to the year 2000 when it changed to decimals (e.g. 80.375).

Efficient cash payments are in the interest of the public, retailers, banks and the central bank. It is clear that the costs for counting, control, transportation, security, sorting and destruction will be reduced if people pay each other efficiently. The definition of 'efficient cash payment' can be made from different views:

- Number of coins and banknotes involved,
- Time needed to settle the payment,
- Time needed for an additional check on counterfeits.

This section breaks down into the following three topics:

A1.II.1 History of denominations

A1.II.2 Denomination systems

A1.II.3 Note-coin boundary

A1.II.1 History of denominations

The very first currencies were not subdivided into several coin weights or denominations. Although the Greek coins used some subdivision, the Romans were the first to introduce coin denominations. These denominations of the 'as' were quite complex and were not yet standardised into a decimal system as is used in our modern world. The as was subdivided by using different reciprocals of 4, 5 and 6; the 'quincunx' for example was equivalent to $\frac{5}{12}$ as. The as was multiplied by different values, like 2, 2.5, 3 and 5, to create larger denominations.

The 'sestertius' was the first denomination made of silver with a value of 2.5 as. A popular value was the 'denarius', a silver coin representing 10 as. One as is thought to equal around a 10 to 30 days' pay for a legionnaire at the beginning of the Roman Empire and would be today about 150 euro. The value of the currency unit, of one as, is estimated to be 15 to 30 times its metal content.

After 300 years the currency system was revised and the Romans introduced in 27 BC their first golden coin, the 'aureus', which was equal to 400 as. The popular 'sestertius' received in this Augustan system a value of 4 as and the denarius was from then on worth 16 as. In 312 the aureus was replaced by the 'solidus' an alloyed coin holding about 4.5 gram of gold.

System based on 20 and 12

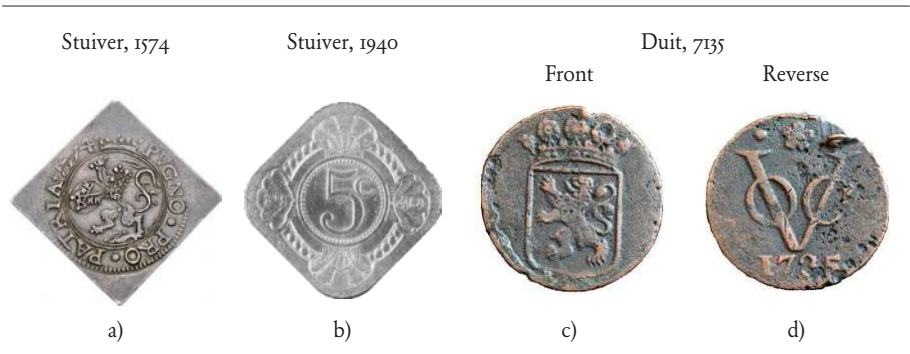
The result of these early private minting initiatives was often a currency mess, the reason why, Charlemagne (742-814) introduced the 'livre', which was equal to one pound of silver. The word livre came from the Latin word libra, a Roman unit of weight. The livre was subdivided into 20 sous or sols, each of 12 deniers. But here also many variants appeared because mints in different regions used different weights for the denier leading to several distinct livres of different values.

This system and the denier itself served as the model for the British pound, which was divided into 20 shilling and each shilling into 12 pence. Shilling comes from the Roman solidus and the letter d was used as unit indication for the old penny derived from the Roman denarius.

20 stuiver to one guilder

Philip the Good (1396-1467) was the first to bring four Dutch provinces together (Flanders, Brabant, Hainaut and Holland) and ordered in 1434 that identical coins had to be minted, called 'four countries' (in Dutch 'vierlander') [208]. The next step in organising the currency system of the Netherlands was made in 1521 by Charles V (1500-1555) when he introduced the division of the golden Carolus gulden in 20

Figure A1.39



Three examples of coins used in the Netherlands.

- a) Stuiver as used in 1574, minted on a square coin disc. The stuiver was the basic unit of account. A double stuiver is still called a 'dubbeltje'. A Dutch nickname for stuiver was 'oortje'.
- b) Stuiver as first issued in 1913. The typical square shape of the original stuiver was used again.
- c) An example of a duit, which was equivalent to 1/8 stuiver. The duit shown is issued in 1735 by the VOC, the Dutch East India Company (Vereenigde Oostindische Compagnie).
- d) On the reverse probably the first currency's letter logo on a currency: a large capital V' with an O on the left and a C on the right leg.

units named 'stuiver', a name derived from the oldest coins made in Mechelen, the place where he made this announcement. The stuiver was the unit of account, one Carolus gulden is 20 stuiver. The stuiver coins were made of silver. The shape of the stuiver was square (figure A1.39a) and this shape returned in the Netherlands in the 20th century (figure A1.39b). Later, in 1544 the first silver guilder, florin, was issued also equal to 20 stuiver. This pure silver guilder - not an alloy - contained 23 gram of silver and devaluated over the decennia to just 10 gram of silver in 1600. On its turn one stuiver was subdivided in 8 'duit' (figure A1.39c and d). For a long period the stuiver was the basic unit of coinage, until in 1816 the cent was introduced.

History of Dutch denominations

The Netherlands introduced the decimal system by Napoleon in 1800; the smallest currency unit was from then on the cent - French for hundred - and the stuiver was no longer a unit of account. From then on 100 cent - instead of 20 stuiver - was equal to one guilder.

When the Dutch central bank opened its desks on 5 April 1814 it offered 9 different denominations to its customers: 25, 40, 60, 80, 100, 200, 300, 500 and 1000 gulden. Today such a denomination series seems odd. Why a 40 and 60 unit and not a 50? And why a 25 and not a 250? The major explanation is that the decimal system was still in development. The decimal system for coins was introduced with the Dutch Coin Act of 1816. This coin act still allowed coins of 3 gulden.

Figure A1.40



Some odd coin and banknote denominations.

- a) 14-guilder coin, the Netherlands. Also called 'Golden rider' (in Dutch 'Gouden rijder').
- b) 6-pence coin, United Kingdom, issued in 1912.
- c) 300-franc banknote, issued in France in 1938.
- d) 15-kopek coin, Soviet Union, issued in 1940.
- e) 1/4-guilder coin, Netherlands East Indies, 1942.
- f) 3-peso banknote with portrait of Che Guevara, Cuba, 2004 (3-peso banknotes also issued in Cuba before it was a communist state, e.g. in 1872).

Odd values

Mathematically logical values as employed today became only slowly introduced. DNB's banknote denominations of 1814 were not uncommon as is proven by a French 300 franc note issued in 1938 (figure A1.40c), the British six pence coin in use until 1971 (figure A1.40b), the 15 kopek coins that were popular in the former Soviet Union until the 1970s (figure A1.40d), and on Cuba a 3-peso banknote is still in use (figure A1.40f).

Today the most popular cash denomination system is based on the weight box units, following the units of 1, 2 and 5. This system was also adopted for the euro coins by EU's Economic and Financial Council (Ecofin) and for the euro banknotes by the EMI Council in November 1994 [140].

A1.11.2 Denomination systems

Several Dutch studies exist in which the development of an optimal denomination sequence is explored, usually from an econometric point of view. For example, Cramer researched the mathematical aspects [26], while Kippers (DNB) focused on the transition of the Dutch guilder to the euro [92, 102]. The euro denomination

system (1-2-5) included a 50-cent piece, which made this system more efficient than the Dutch guilder system (1-2.5-5). However, if a 50 cent piece would be introduced, both systems are about equally efficient.

Ideal cash denomination structure

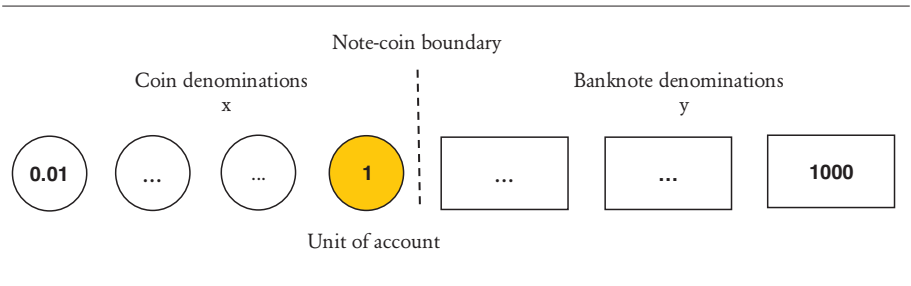
No studies seem to be available of what would be the ideal cash denomination structure from a perception point of view. Figure A1.41 outlines a basic cash denomination structure using *x* coin denominations and *y* banknote denominations. Central to this structure is the unit of account, usually the unit ‘one’. The highest coin is followed by the banknote representing the ‘note-coin boundary’. The note-coin boundary is defined as the lowest banknote denomination, usually the banknote following the highest coin denomination (the coin-note boundary would be the highest coin denomination, following the lowest banknote denomination).

Different denomination systems

Next, decisions on a denomination system are the dividing and multiplication factors of the ‘one unit’ [177]. Several systems are possible (see figure A1.42). Today the most frequently used system is the weight box system (1-2-5) as shown in figure A1.42a. The US dollar is a typical example of dividing into halves and redoubling ($\frac{1}{2}$ and 2) (see figure A1.42b). The third system was used in the Netherlands: the guilder was divided into halves and multiplied by 2.5, resulting in a quarter guilder (‘kwartje’), 2.5 guilder (‘rijksdaalder’) and banknotes of 25 and 250. This system is also used in Lebanon and, in 2011, the new country of South Sudan introduced this system too, using a 25 piaster coin and a 25 South Sudan pound banknote (figure A1.42c).

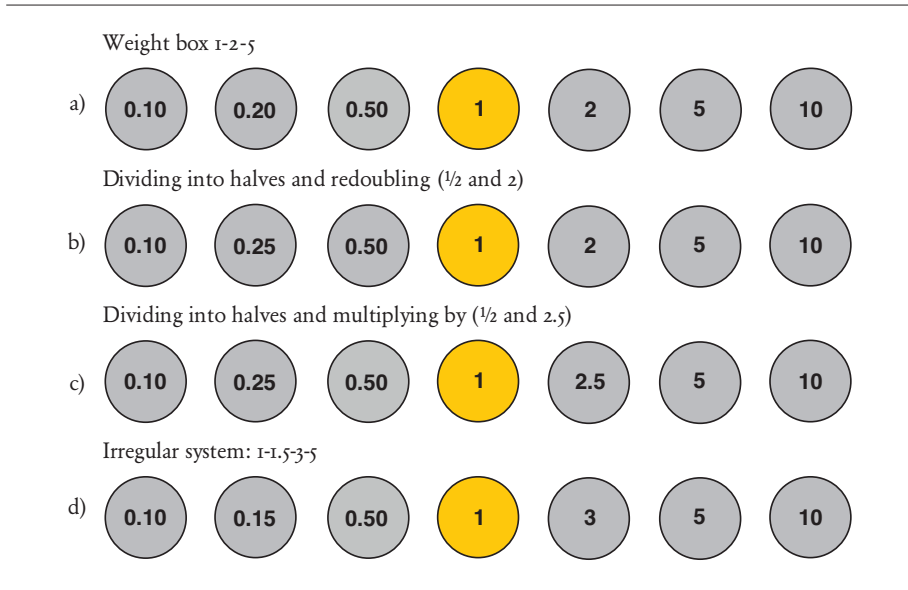
Finally, there are irregular systems (see figure A1.42d). In such currency denomination systems some historic denominations are still in use, like the Cuban 3-peso banknote.

Figure A1.41



Denomination structure as seen from a branding point of view; conceptual model. Total amount of denominations: *x* + *y*. In a symmetric cash denomination structure the account unit is the centre of all denominations. *x* · *x* = *y* (*x* = *y* is another option).

Figure A1.42



Four basic principles for a set of decimal denominations.

- a) System of dividing into halves and redoubling (e.g. US dollar),
- b) Weight box 1-2-5-10 system (many countries, e.g. euro),
- c) Dividing into halves and multiplying by 2.5 (Netherlands, Lebanon, South Sudan),
- d) Using the denomination 3: 1-3-5-10 system (former Soviet Union, Cuba).

All these typical denomination structure contributed to the currencies identity. From that point of view currencies loose some identity, since today there is a clear trend for currency systems to base their denominations on the 1-2-5-10 system.

Predominance of denominations 1, 10, 100, 1,000

People have preferences for certain denominations and some denominations are more popular than others. Currency branding should take these preferences into account. Banknotes with a face value starting with the figure 1, like 10, 100 or 1,000, are often the most popular denominations. Remarkably, an increasing number of Dutch people think there is a 1,000 euro banknote, i.e. 11 % in 2011 against 2 % in 2002, whereas there is none [143, 204]. Perhaps such a 1,000 euro note as used in the advertisement shown in figure A1.43a, explains why people think there is a 1,000 euro note. Advertisements often use denomination figures starting with 1, 10 or 100 or 1,000. Another explanation is that there used to be a NLG 1,000 note. Up to 1969, the US dollar was also available in a USD 1,000 denomination (figure A1.44b). It is unknown for how long US citizens recalled this 1,000 dollar denomination.

Figure A1.43



Two examples of ‘advertisement banknotes’ using elements of euro banknote designs.
a) Advertisement of a Dutch private bank (RaboBank Zuid West Drenthe), based on an imaginary banknote of euro 1,000. The image used is the gate on the euro 100 notes (2008).
b) Phoney cheque to promote the lottery of Dutch lottery organisation. The image used is that on the euro 10 note; August 2008.

From a branding point of view high denominations, that rarely change hands and are used by a small part of the population, add an element of excitement to a currency. ‘I never see the 200 euro note, but I know that it exists’.

Denominations starting with the figure 2 less popular

Banknotes with a face value starting with 2, i.e. 20 and 200, are often less popular. A case in point is the USD 2 banknote, which has been in circulation for 80 years, but nevertheless is one of the least popular dollar notes (figure A1.44a). Some more evidence is delivered by a survey of the ECB prior to the launch of the euro. Denominations starting with the figure 2 were the least known banknote values (the 2-cent and 2 euro coins and the euro 200 banknote). The 10-cent coin and the euro 10, 50 and 100 banknotes were known best [81].

The appreciation of denominations starting with 5, i.e. 50 and 500, is halfway between the levels of public recall of notes starting with 1 and notes starting with 2. The Dutch public clearly did not favour the 50 guilder denomination - although they loved the design - judging by the use made of this note, which was less than was to be expected. The historic preference of the Dutch for units of 25 may still be observed today (figure A1.43b).

888.88

The weight box system (1-2-5) has a characteristic mathematical property. When all denominations are filled in, the values of all coins and banknotes add up to 888.88. The number 8 is produced by the sum of 1 + 2 + 5; the zero in the values determines the ‘position’ of the 8. For the original, full euro cash denomination structure all euro denominations added up to 888.88 (0.01 + 0.02 + 0.05 + 0.10 + 0.20 + 0.50 + 1 + 2 + 5 + 10 + 20 + 50 + 100 + 200 + 500 = 888.88).

Figure A1.44



Two unfamiliar US dollar denominations.

- a) USD 2: for over 80 years unpopular, but still in circulation. The note shows the portrait of Jefferson.
- b) USD 1,000: withdrawn in 1969. The note shows the portrait of Cleveland.

Owing to inflation, the current cash denomination structure is no longer complete. As early as three years after the launch of the cash euro, the Netherlands abolished, the 1- and 2-cent coins, thus changing the sum total to 888.85. In the case of the euro banknote series, the EUR 200 notes would be the first to disappear, as it is used but little.

Netherlands change-over from guilder to euro

The introduction of the 'euro cash' in 2002 would not only replace the 1-2.5-5 system by the 1-2-5 system it would also bring more denominations of both the coins and the banknotes to the Netherlands, as is shown in table A1.4. The public would have a choice of two more coins and one more banknote. The traditional and popular 'quarter'; a 25 cent piece would become a 20 cent piece, which is the euro equivalent of 10 euro cent. And a 50-cent piece would be introduced. Comparing the NLG and the EUR could be done quite easily, since the note-coin boundary for both currency systems is more-or-less on the same value (NLG 10 = about EUR 5) and the exchange rate of the euro to the guilder was slightly over factor 2 (EUR 1 = NLG 2.2031).

The cent unit returned in the euro, but since the euro is the unit of account the cent was defined the other way around: 1 euro = 100 eurocent.

Comparing the NLG and the EUR could be done quite easily, since the note-coin boundary for both cash denomination systems is more-or-less on the same value (NLG 10 = about EUR 5) and the exchange rate of the euro to the guilder was slightly over a factor 2 (EUR 1 = NLG 2.2031).

Kippers was the first to come with key figures on cash transactions in the Netherlands. These figures are the result of research conducted in 1998 and were used to prepare DNB for the change-over to the euro. In summary, Kippers reported that in the average transaction the consumer pays 0.86 banknote and the retailer returns 0.61 banknote. On average 1.5 banknotes are used in cash transactions that involve banknotes. For the use of coins these figures are respectively 1.40 coins used by the

Table A1.4

COIN												
	0.01	0.02	0.05	0.10	0.20	0.25	0.50	1	2	2.50	5	Total
NLG			x	x		x		x		x	x	6
EUR	x	x	x	x	x		x	x	x			8
BANKNOTE												
	1	5	10	20	25	50	100	200	250	500	1000	Total
NLG			x		x	x	x		x		x	6
EUR		x	x	x		x	x	x		x		7

Overview of the coin and banknote denominations in guilder (NLG) and euro (EUR).

consumer for a cash transaction and the retailer on average returns 2.17 coins. On average of 3.5 coins are used per cash transaction and the retailer has a shortage of 0.77 coins.

After the euro was introduced in 2002, Kippers found that the Dutch on average use 1.1 euro banknotes and 1.3 euro coins. Furthermore, people carry on average 3 euro banknotes and 13 coins in their wallets, with an average value of about 60 euro.

A1.11.3 Note-coin boundary

When a new currency is introduced the note-coin boundary is often positioned in the centre of the denominations. Ideally, the currency unit is a coin - with the unit 1 - as shown in figure A1.41 and A1.42. Over the years, inflation will push the note-coin boundary upwards. A fine example is the 1-dollar bill, which was first issued in 1862. Up to four times the US Treasury tried to introduce a one dollar coin with the intention to push up the note coin boundary to the 5 USD (figure A1.45). The perceived value of the dollar changes with the form that dollar takes; a dollar banknote is believed to be almost twice the value as the coin, as found by Adam Alter and Daniel Oppenheimer in 2008 [145, 154].

Research on note-coin boundary

In 1981, Payne and Morgan published a paper proceeding from the public’s perspective on the note-coin boundary. They provided evidence that the denominational structures across 35 countries fitted one ideal sequence consisting of six coins and six notes, although each place in the sequence was not necessarily occupied by a coin or note in every country. One measure taken to define the sequence was the

Figure A1.45



Four different coin designs as used for the issuance of USD 1-dollar coins (1971-2007). The US coins are produced since 2007 in large quantities - under a Congressional mandate - by the US Mint, resulting in large stocks.

- a) Eisenhower dollar (1971-1978). The coins were never very popular, primarily due to their large size and weight and the fact that they were rarely accepted by vending machines.
- b) Susan B. Anthony dollar (1979-1981; 1999).
- c) Sacagawea dollar (2000-present), issued in several different design variants all using Native Americans as theme.
- d) Presidential dollar, reverse view (2007-present). Several different design variants using different presidential themes. Design by Don Everhart.

average day's pay represented by the symbol D . The note-coin boundary was found at either $D/50$ or $D/20$ [13].

Koeze (DNB) published two papers on the subject, presenting a technical criterion for the note-coin boundary based on the life and cycle times of banknotes. Koeze proposed that the ratio of the average life to the mean cycle time of banknotes should be used as a technical criterion for the note-coin boundary. This ratio represents the average number of loops traversed through the circulation. When it tends towards 1, replacement of banknotes in the denomination concerned by coins should be considered and taken in hand. When this ratio is below 1, most banknotes become unfit before one circulation has been completed. In such a case, the central bank loses the opportunity to withdraw and exchange them for new notes. If the mean life of banknotes exceeds the mean cycle time, the banknotes should be replaced by coins [34, 85].

At the end of the 20th century, Dutch consumers were used to withdrawing banknotes from ATMs. In the Netherlands, the 5 euro banknote makes up only 9 % of the withdrawals in 2003, Kippers found [92]. Today this share has dropped to close to zero. This leads to the assumption that the lowest banknote denomination withdrawable from an ATM should be the one marking the note-coin boundary.

In conclusion, the note-coin boundary is/should:

- 1) Be equal to between $1/20$ and $1/50$ of the daily average day's pay,

- 2) Be in the middle denomination in the range of cash denominations,
- 3) Be equal to the lowest ATM denomination,
- 4) Avoid both a coin and a banknote of the same denomination,
- 5) Be replaced if the mean life approaches the mean cycle time,
- 6) Be replaced if the production costs of the notes become too high.

A1.12 Value indication

Once the central bank has decided on the denominations, the attributed values are ready to be designed. The first period in history when weight or value indication appeared on coins was during the Roman Empire. On paper money, the value indication first appeared in text only. On French banknotes, values were indicated in text up until the 1930s (e.g. figure A1.40c). Criteria for value recognition are set out in 'Banknote design for the visually impaired' published by DNB in 2009. A good design for the visually impaired is a good design for everybody, one of the conclusions reads [169].

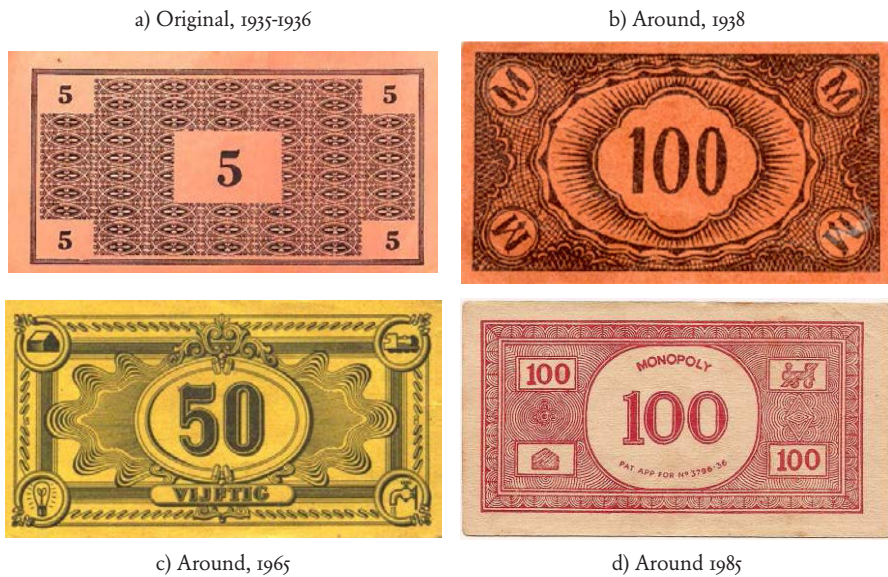
Figure A1.46



Four examples of banknotes whose value indication dominates other design elements.

- a) 1 krone, Denmark, 1918.
- b) DEM 2, issued in Germany in 1948.
- c) Large numerals in this design proposal from Austria for euro banknotes. Designer Robert Kalina, 1996.
- d) Large Roman numerals on design proposal from Germany for euro banknotes. Designers Klaus Michel and Sanne Jünger, 1996.

Figure A1.47



Monopoly money is optimised for quick value recognition during the game. Several designs are made:
a) Original form 1935,
b) Around 1938,
c) Around 1965,
d) Around 1985.

The design history of banknotes shows that the denomination has been the major design element of a banknote (see figure A1.46a and b). A special moment in the design history of paper money was the introduction of ‘play money’ by Monopoly in 1935. This play money is optimised for quick value recognition during the game. The Monopoly money with its large clear numerals and bright colours certainly inspired the Dutch banknote designer Ootje Oxenaar (figure A1.47). Value indication was also a design driver in 1987 for Dutch designer Jaap Drupsteen (see chapter 4, figure 4.2b). And several of the designs prepared for the euro used large numerals for their designs (figure A1.46c and d) [86].

Positive and negative numerals

The Bank of Canada researched the readability of the large numerals. One of their findings was that the numerals on a banknote should be printed in both a positive and a negative design since about half the respondents favoured the negative numeral and the other half the positive one [169, 172].

A1.13 Signature

Coins do not bear a hand signed signature, but since the 15th century coins show a 'privy mark' of the mint master responsible for the coin production. Such marks are often referring to the personality of the mint master; examples are an arrow and bow, grapes, hammer and anvil, a cock and a fish. Other marks on coins are indicating the mint house and the Head of State. The mint house may be indicated by a symbol or by a letter as is done in Germany and the USA. On the common side all the euro coins there is even a mark of the coin designer Luc Luyckx (1958), represented by his initials L L.

An overview of these coin signatures on the euro coins in the Netherlands, Belgium and Germany is provided in table A1.5.

Signing culture of Dutch banknotes

When the first banknotes were issued, only the issuer put his signature to it and the collector had become anonymous. Perhaps in compensation and in order to gain trust in the notes, the first banknote carried 10 different signatures (see chapter 2, figure 2.6a). Many nations required at the end of the 17th century that all privately issued banknotes should be hand-signed by at least one person to produce a formal document.

From 1814 to 1825 Dutch banknotes the date, denomination and banknote number (in double digits and letters once) were filled in by hand. Following these preparations, the notes were signed by the bank's board, a ceremony that took place each Wednesday morning. Four signatures in all were placed on it: those of the president, two directors and the secretary. In order to imitate these Robin banknotes, as they were known, a counterfeiter would have to master eight different handwritings.







Over the years, the number of signatures on Dutch banknotes decreased. The sheer number of notes in circulation around 1860 rendered it impossible for banknotes to be all signed and completed by hand. As of the 1860 model banknote, the bank's board members' signatures and dates were printed by security printer Joh. Enschedé. From 1860 up to 2002, just two signatures were printed on the guilder notes: the president's and the secretary's.

When a signature is printed it no longer serves as proof of a banknote's authenticity and is no longer legally required as a consequence. However instead of leaving it out for that reason, the element has been retained and signatures still feature prominently on a great many contemporary banknotes.

Difference in signature policy between euro and US dollar notes

There is a difference in signature policy between the US and the Eurosystem. The euro banknotes bear the signature of the president of the ECB, while the dollar notes are not signed by the chairman of the Board of Governors of the Federal

Table A1.5

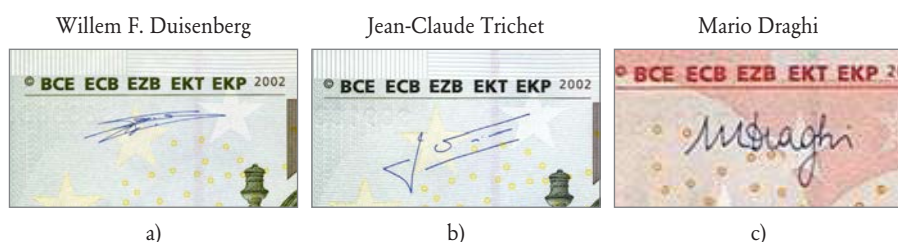
	Netherlands		Belgium		Germany
Coin designer		Not used		Luc Luyckx initials on common side euro coins	Not used
Mint master		Course setting sails (Maarten Brouwer)		Goose-quill (Serge Lesens)	Not used
Mint house		Mercure staff		Arch angel Saint Michael	A = Berlin D = Munich F = Stuttgart G = Karlsruhe J = Hamburg
Head of State		Not used		Monogram King Albert II	Not used

A coin does not have a signature, but a mark of the designer, and/or mint master and/or mint house and/or Head of State. Such marks differ on the national side of the euro coins as shown above for the Netherlands, Belgium and Germany.

Reserve System, but by the Treasurer and the Secretary of the Treasurer. When one of them is appointed, a new banknote series is created to accompany the introduction of the new signature(s). This US practice arises from the Treasury's legal obligation. As the US Treasury explains on its website: 'The Federal Reserve Act of 1913 authorized the production and circulation of Federal Reserve notes. Although the Bureau of Engraving and Printing (BEP) prints these notes, they move into circulation through the Federal Reserve System. They are obligations of both the Federal Reserve System and the United States Government.'

All euro banknotes bear the ECB president's signature. On 1 November 2003, when Jean-Claude Trichet became president of the ECB, the signature of Wim Duisenberg was replaced (figure A1.48a). In 2004, many people did not know that banknotes with both signatures (Duisenberg and Trichet) were in circulation. People also remarked that Trichet was not yet president in 2002, while the banknote said 2002 (the year on the notes was not changed to 2003). When people got the first notes in hands with the signature of Trichet (figure A1.48b), some called the genuineness of these notes into doubt. Many retailers, bank employees and - of course - collectors contacted DNB in that period and inquired about this changed signature. In 2011 Mario Draghi became president of the ECB and the signature on the notes is adapted once more (figure A1.48c).

Figure A1.48



The signature on the euro banknotes is changed when a new president arrives.

- a) Willem F. Duisenberg, the first President of the European Central Bank (1998-2003). Wim Duisenberg's signature was printed around $3,5 \times 10^9$ times on NLG notes and around 25×10^9 times on euro notes. For both currencies, the same signature was used, i.e. the one first used on the NLG 50/Sunflower issued in 1982 [105].
- b) Jean-Claude Trichet (2003-2011).
- c) Mario Draghi (2011-....).

Applying signatures because of the appointment of a new governor, president or other officials is a backward looking policy dating back to the time when a handwritten signature was still necessary. Suggestions to a more innovative approach of the confidence function of the signature were made in section A1.8 and in chapter 5, section 5.8, figure 5.26.

As changing the signature on banknotes creates small variations in the banknotes, it is a questionable custom from a public communication point of view. Policies to change signatures on banknotes in circulation are not in the interest of the public and automatic sorting systems; the public gets confused and the signature area has to be covered for automatic sorting systems, making sorting processes more complex and less adequate. Furthermore, the public is asked to inspect their banknotes for small deviations that could indicate a counterfeited banknote. By creating variants of genuine banknotes, the central bank impedes the detection of counterfeits by the public and do not make this public task any easier.

Study on signature customs

In 2008, Åke Lönnberg published a study on signatures on contemporary banknotes [144]. The banknotes of 184 states were analysed reflecting the situation at the end of 2005. The vast majority of the signatories are central bank officials (67 %), the most common signatory being the governor of the central bank, while 18 % of the banknotes researched carried the signatures of both central bank and ministry of finance/treasury officials. On European banknotes, the signature of the governor is used in about 90 % of the countries included in the study. In Europe, none of the banknotes included signatures of officials of the ministry of finance, reflecting the central bank's autonomy.

The number of signatures on banknotes correlates with the issuing country's income level. The high-income countries have the largest relative share of banknotes with one signature, while lower middle-income and low-income countries have the larger share of two-signature banknotes. According to Lönnberg only seven countries lack both signatures and seals. Table A1.6 provides an overview.

According to Lönnberg there are six different categories of signature:

- 1) Chairman of the board of the central bank,
- 2) Governor of the central bank,
- 3) Deputy governor of the central bank,
- 4) Other officials of the central bank,
- 5) Official of the ministry of finance/treasury,
- 6) Other.

Function of signature

No matter how important a signature might be for central bank employees, to the public, the signature seems irrelevant. Only 5 % of the Dutch recall having seen a signature on euro banknotes in 2009, which percentage remains quite stable over the years (4 % in 2002, 3 % in 2005). About 1 % mentions the signature as a security feature (2011) [115, 143, 204]. And what does a signature on a banknote signify? In 2006, De Heij identified the following reasons [115]:

- 1) Approval of the (first) printing proof,
- 2) Approval for the new design to be issued,
- 3) Appointment of a new president, treasurer, governor or other official.

Looking at the signature from a functional point of view, today the signature has a double function:

- 1) Supporting trust in the banknote,
- 2) Personal satisfaction for the person who signs.

Table A1.6

Number of signatures	Applied on different banknotes	Example
None	5 %	Azerbaijan, Belarus, Laos, Myanmar, Russia, Vietnam, Uzbekistan
1	39 %	Cuba, Eurozone (ECB), South Africa, United States of America. Seal type signature in China, Japan and South Korea.
2	52 %	India, many African countries
3	4 %	Belize, Guatemala, Haiti, Honduras, Hungary, Peru and Uruguay

Numerical difference between signatures on the banknotes of different states as reported by Lönnberg in 2005.

It seems that an approval is the most logical use of a signature on a banknote. Approval could be granted by the governor and/or the board member responsible for payment systems, which includes the issuance of banknotes.

AI.14 Date

The date on paper money goes back to the very first forms of paper money. Like the signature, also the date on the banknotes is not something the general public will remember by heart. Just 1 % of the Dutch people recall that euro banknotes contain dates [115, 143].

Several customs are found for providing a date on the banknote:

AI.14.1 Approval date of the design/printing proof,

AI.14.2 Date/year of first issue,

AI.14.3 Year in copyright notice,

AI.14.4 Year of production,

AI.14.5 Date/year of a new president/treasurer/governor.

AI.14.1 Approval date of the design/printing proof

New banknote designs are approved by the highest management of the central bank, usually during a meeting of the board. Approval of the design is usually done in two steps. First to approve is a drawing or computer simulation, the sketch design, and the second one to approve is the printing proof. When production takes off, e.g. a zero production run, a third approval is usually required by the board. From a design and technology perspective the most appropriate approval date is the approval of the printing prove and is the most logical date on a banknote as will be argued.

The first argument is that the approval date of the printing proof on the note will not change over time and therefore not confuse the public or automatic sorting systems. Secondly this date will not have to be changed during the mass production and will, third argument, not lead to misinterpretation as is the case with the year (2002) and the signature on the euro banknotes as explained in section AI.13.

The methodology of applying the approval date on the banknote was used for the Dutch guilder banknotes. The date of approval of the first printing proof was printed on the banknote, along with the place of signing, i.e. Amsterdam. In some occasions, this date was altered, usually because the incumbent president wished to leave the decision regarding the signature position to the just appointed successor. Thus president Jelle Zijlstra left the signing of the NLG 50/Sunflower to Wim Duisenberg, who would take over on 1 January 1982. The date on the Sunflower note is 4 January 1982, this being the first working day of 1982. When Wim Duisenberg was appointed as president of the ECB on 1 September 1997, he in turn left the signing of the NLG 10/Kingfisher to his successor Nout Wellink. The date on the NLG 10/Kingfisher is

1 September 1997. The next new date on banknotes used by the Dutch would be the just year 2002, the year of the introduction of the euro banknotes.

AI.14.2 Date/year of first issue

Printing the date of the first issue on the note would fit best in a user-oriented approach, since this date represents the first day that the new banknote will be in the hands of the public. However, a drawback of this policy is that the date of issue is often delayed, as was recently the case with several new planned banknotes like the US 100 dollar, the euro series 2 and the new Swiss banknote series [178, 192]. Instead of a date marking the day of issue, the date could also be confined to the year of issue, as was done on the first euro series, which only reads 2002.

AI.14.3 Year in copyright notice

The year 2002 on the euro banknotes, as illustrated in chapter 3, subsection 3.4.3 on name of the central bank, figure 3.21a, is part of the copyright notice

© BCE ECB EZB EKT EKP 2002

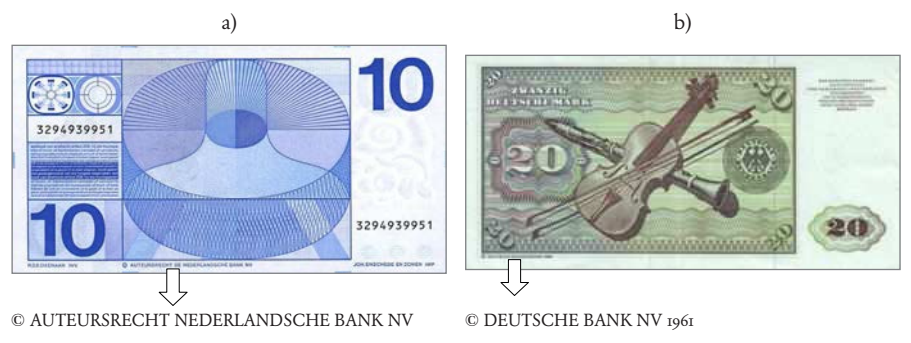
The copyright notice using the copyright indication originates from the American Copyright Act (first version 1790, latest version 2009). Until 1979, the Copyright Act required that any text published should be complemented by a copyright notice. The latest description is: 'If a notice appears on the copies, it shall consist of the following three elements:

- '1) The symbol © (the letter C in a circle), or the word "Copyright", or the abbreviation "Copr."; and
- 2) The year of first publication of the work; in the case of compilations or derivative works incorporating previously published material, the year date of first publication of the compilation or derivative work is sufficient. The year date may be omitted where a pictorial, graphic, or sculptural work, with accompanying text matter, if any, is reproduced in or on greeting cards, postcards, stationery, jewellery, dolls, toys, or any useful articles; and
- 3) The name of the owner of copyright in the work, or an abbreviation by which the name can be recognized, or a generally known alternative designation of the owner.'

Internationally, copyrights are laid down in the Berne Convention Implementation Act of 1988. Copyright protection is automatically granted and the inclusion of a copyright symbol or statement is not required. Today the © symbol is only a reminder. Even if a work does not contain the © symbol, it will enjoy copyright protection.

The first banknote using a copyright notice is probably the NLG 10/Frans Hals, issued in 1971 (figure AI.49a). The text did not follow the US template, since it

Figure A1.49



Copyright notice on banknotes, both on the reverse.

- a) First banknote with a copyright notice, the NLG 10/Frans Hals, issued in 1971.
- b) Copyright notice on this DEM 20/Elsbeth Tucher, first issued 10 February 1961, was printed on the 1980 issue of this note.

made no mention of a year and both the © symbol and a copy right text (in Dutch ‘Auteursrecht’) read:

© AUTEURSRECHT DE NEDERLANDSCHE BANK NV

The copyright notice on the DEM 20, while bearing an older date, was only printed on the German mark notes since 1980 (figure A1.49b). The German copyright notice, too, did not follow the convention that the year should come after the © symbol.

The NLG 250/Lighthouse was printed in 1985, and this was also the year that was added to the text:

© AUTEURSRECHT DE NEDERLANDSCHE BANK NV 1985

With the issue of the NLG 25/Robin in 1990, the copyright notice DNB followed for the first time fully the convention:

© 1989 DE NEDERLANDSCHE BANK NV

Usually NV is written as N.V., but since printing such small dots was considered as a risk, they might be missing, the dots were not included.

The year 2002 printed on the euro notes is not in the position conventionally used in copyright notices. The use of this prominent, quite complex copyright notice on the euro banknotes may therefore be called into question. However, as said, a copyright notice is not statutorily required and any construction is allowed. If the

Figure A1.50



Two examples of dates on banknotes.

- a) Example of indication of year of production on CAD banknotes: ÉMISSION DE 2004/ISSUE OF 2004 (of CAD 100).
- b) Example of Series indication on USD banknotes: SERIES 2004 A (of USD 10). The series date changes when a new signature is printed.

policy of signature changes is maintained, the year printed on the euro banknotes could be the year in which the new ECB president took office as in the United States, which would avoid the situation that the signature doesn't match to the date (see section A1.13).

A1.14.4 Year of production

Coins usually display the year of production. Central banks might consider adopting this custom to print the year of production on the notes. Some have already done so (see figure A1.50a).

A1.14.5 Date/year of a new president/treasurer/governor

The policy to change signatures when a new president or other officials take office also implies a change of date on the note. Such a policy is followed for the US dollar banknotes, where a new signature leads to a new series as the date on a note should match the date of entrance into office of the man or woman behind the signature. The year of the new series, for example Series 2004, is printed on the notes as shown in figure A1.50b. A new series indication is also triggered by a new banknote design. The policy followed in this context for the euro banknotes is different: as said, the signature changes with the appointment of a new president, but the year does not (section A1.13).

A1.15
Place

The place of issue was often printed on the first private banknotes. Today it seems that on most banknotes the place of issue is not mentioned. On all Dutch guilder notes the place of issue, Amsterdam, was clearly printed on the front of the notes.

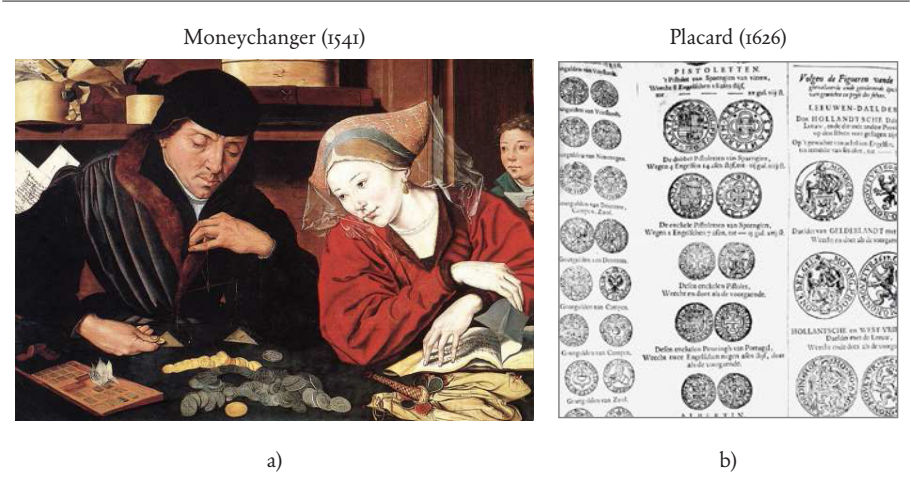
A1.16
Typography

The very first banknotes were largely handwritten, providing the notes a unique typographic character. Later special typographic fonts were developed for banknotes, making them unique. An example is the numbering font ‘Flag and Roman’ (‘Vlag en Romein’) especially designed for the banknotes by the famous Dutch typographic designer Jan van Krimpen (1892-1958) and applied for the first time in 1947 [66]. Also the typography of the guilder notes designed since the 1980s was especially designed for the banknotes, often taking a Univers as a starting point. The small figures printed below the barcode on Dutch banknotes are another example of a dedicated font (see figure A1.53a), designed by the Dutch letter font designer Bram de Does.

A1.17
Legal tender (coins)

European 16th century coins circulated widely beyond Europe, just as the Greek and Roman coins did in earlier times. With all these different coins in circulation

Figure A1.51



If a great many different coins are in circulation, people need moneychangers (a) and governmental oversight (b).

- a) The moneychanger and his wife (1541) by the Dutch painter Marinus van Reymerswale (circa 1490-circa 1546). From the collection of the Museo del Prado in Madrid.
- b) Part of a placard of the Republic of the Seven Provinces published in 1626. The placard provides an overview of all 388 coins, domestic and foreign, allowed in the Republic [194].

it was the moneychangers' task to check if the metal value of the coins offered matched their face value. An impression of a moneychanger, painted in 1541, is provided in figure A1.51a.

An early description of moneychangers is provided by the Bible, in the section describing Jesus arriving at the temple of Jerusalem on Palm Sunday. The Jewish population could buy sacrificial animals. Since they had to pay tax to their occupants, the Romans, they also could change their local money into the proper Roman currency at the temple. Jesus called it a robbers' den and chased them out of the temple. It is believed that the tables of the moneychangers were beaten to pieces. In a region where local coins lost their qualities, foreign coins would rapidly come to circulate at a premium. The composition of the currency would thus vary from region to region at different times. It was the work of the goldsmiths to reconvert the old, clipped coins into bullion. Several goldsmiths became moneychangers and some started a bank. People running such banks were called goldsmith-bankers and their paper money were called goldsmith notes.

Especially in the age of triumphant mercantilism, the 16th and 17th centuries, it was common for foreign coins to circulate alongside domestic ones. At the beginning of the 17th century as many as 82 currencies were identified in France, and in the Netherlands even up to 388 different coins were counted to be in circulation. With so many different coins, merchants did not know what to trust for a payment; do the coins possess the correct quality and weight in gold? And would the coin be accepted for payment? The authorities helped to answer this last question by declaring certain coins as legal tender, as was done in the Netherlands in 1626 (figure A1.51b). This situation continued for about two centuries; in 1859 as many as 90 different metallic currencies were legal tender in Italy [65].

Legal tender - coins

Legal tender is a medium of payment allowed by law or recognized by a legal system as a valid instrument for meeting a financial obligation. Legal tender is variously defined in different jurisdictions and is often misunderstood. Formally, it is anything which, when offered in payment extinguishes a debt. However, parties have always been free to agree to accept any form of payment, whether legal tender or otherwise, according to their wishes.

Legal tender sometimes has a special meaning in the settlement of debts. If, for example, no change is available, the exact amount should be paid. Another example is that a payment effected in legal tender in court will prevent a debtor from being sued for non-payment. Of a later date are national laws restricting the maximal amounts that can be settled by coins or banknotes. A recent example of a statutory provision in this context concerns payments in euro coins. Under this provision, no party is obliged to accept more than 50 coins in any single payment [59]. Up to 2002, coins issued by France were legal tender in Monaco, while coins issued by Monaco were legal tender only there.

A1.18 Number

We all know the stereotypical remark of a criminal in a movie: 'The banknotes should be unregistered.' This remark refers to one of the functions of a banknote number: registration of ransom money. Usually the crook also wants used banknotes and non-sequential numbering.

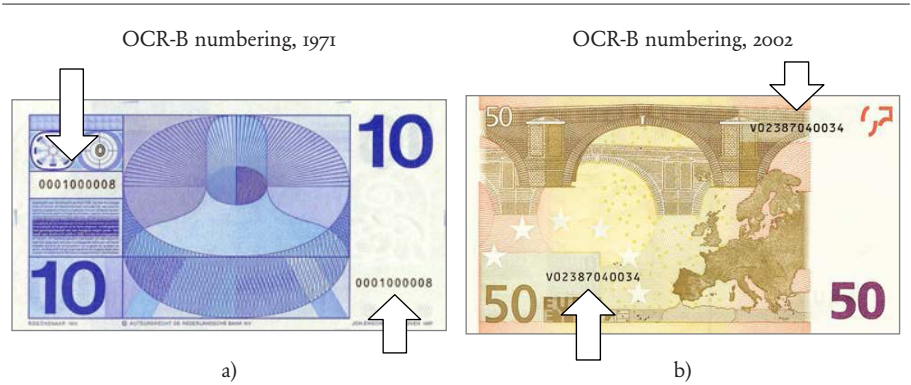
Just as the signature and the date, the number is a banknote design element finding its origin in the very first forms of paper money. No banknotes are issued without numbers (as far as is known). This is remarkable, since no coin has ever been issued stating a number.

The number, which is unique for each banknote, allows the note to be traced and identified. Early banknotes were generally numbered by a central bank clerk, in clearly legible handwriting; a practice that prevailed for almost a century. Two centuries later, banknotes are still numbered, albeit that their everyday use and significance as well as the overall production volumes have changed.

Automatic number reading by DNB since 1968

The very first guilder banknotes were numbered by hand. For reasons of security, in 1860 the board decided that all notes would be numbered by the bank rather than the security printer. However, these serial numbers were no longer added manually.

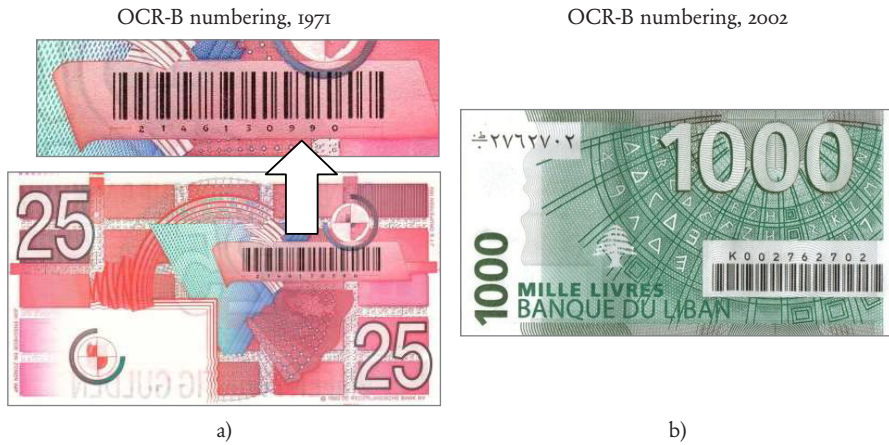
Figure A1.52



Optical Character Reading (OCR) reading of banknote numbers was introduced by the Dutch in 1971 and adopted for the euro banknotes in 2002.

- a) NLG 10/Frans Hals (reverse), issued by the Dutch Central Bank in 1971. It was the first note in the world to feature OCR-B numbering. The note includes two OCR-B numbers - the so-called A number on the left and the B number on the right - both of which in accordance with ISO specifications R1871. Both the A and the B numbers were read by a camera and compared to each other (for detection purposes and in order to correct reading errors).
- b) EUR 50/Renaissance issued by the European Central Bank in 2002. Two OCR-B numbers on the back of the euro banknote. Top right: the black OCR-B number used for automated reading. Bottom left: the number printed in OCR-B font in a colour that also appears on the note.

Figure A1.53



The only two examples known of individual barcode numbering of banknotes.

- a) The barcode introduced on the Dutch guilder notes in 1989.
- b) The barcode was introduced on Lebanon notes in 1994. Displayed is the LBP 1,000 issued in 2004 with both Arab (top right) and barcode numbering (bottom left)!

Instead, use was made of a letter press at the bank. For that matter, the introduction of a letter press heralded the birth of banks' in-house printing facilities.

The numbering system that was put into use for Dutch banknotes in 1968 was unique in the world. DNB was the first issuing authority to introduce machine readable numbers on banknotes (OCR-B). It was also the first organisation to establish a database of all banknotes in circulation, requiring banknotes to be registered (by means of a reading process). Although many central banks were intrigued by this numbering system, none of them actually introduced the concept. By the turn of the century, banknote printers adopted the practice of reading and storing banknote numbers (on CD-ROM, for example). As highlighted by figure A1.52, euro notes currently feature similar OCR-B characters as the 1971 guilder notes.

Barcode on NLG banknotes

A little over 20 year later, in 1989, DNB again scored a first when it introduced bar code numbering on banknotes. With the introduction of the barcode on the NLG-banknotes in 1989 it was possible to have a very high reading accuracy (figure A1.53a). As far as known, there is only one other country making use of bar-codes for banknote numbering since 1990: Lebanon (figure A1.53b). The barcode borne by Canadian banknotes since 1988 is a denomination code which is the same on each note of a given denomination.

DNB remains up to date the only central bank to register banknotes in circulation on a daily basis.

What is the use of a banknote number?

A number on a banknote clearly has a currency branding function - it makes the note unique - but it serves other functions besides. An overview of the development of banknote numbering and its applications was provided by De Heij and Van Gelder (DNB) in 2006, with the publication of 'Banknote numbering. What is their use?' [116, 117]. Next to concluding that one number on a banknote suffices, they concluded that numbers are used for:

- Detecting counterfeits,
- Registering banknotes used for ransoms,
- Quality assurance,
- Discouraging internal and external fraud,
- Circulation trials.

Instead of issuing banknotes, a central bank may in the future only issue banknote numbers, as described in chapter 5, subsection 5.10.2 on banknotes and information technology.

Number on the front or on the reverse?

US dollar banknote numbers are printed on the fronts of the notes (figure A1.54a), while in Europe numbers were traditionally placed on the reverse. Therefore, the euro banknote number can also be found on the reverse (figure A1.54b). The anticipated developments would plea for banknote numbering on the front, though. Such numbering will clearly be a one or two dimensional barcode. A chip in a banknote is another possibility, but less preferable in view of the desired public perception; a chip will be seen as traceable, non-anonymous and will make a person a robbery target as the banknotes 'can be read from a distance'.

Figure A1.54



Three examples of numbers on banknotes.

- The banknote number of this USD 100 banknote is AE 77665544B. Numbers are on the front.
- The banknote number of this euro 200 banknote is P00000313759. The letter P stands for the national Eurosystem bank that commissioned this banknote. The letter P before the number indicates that this banknote was commissioned by De Nederlandsche Bank. Numbers are on the reverse.
- The plate number of this euro 50 banknote is G021D5. The first letter, the G, stands for the printer, in this case for the Dutch banknote printer Royal Joh. Enschedé. Plate number is on the front.

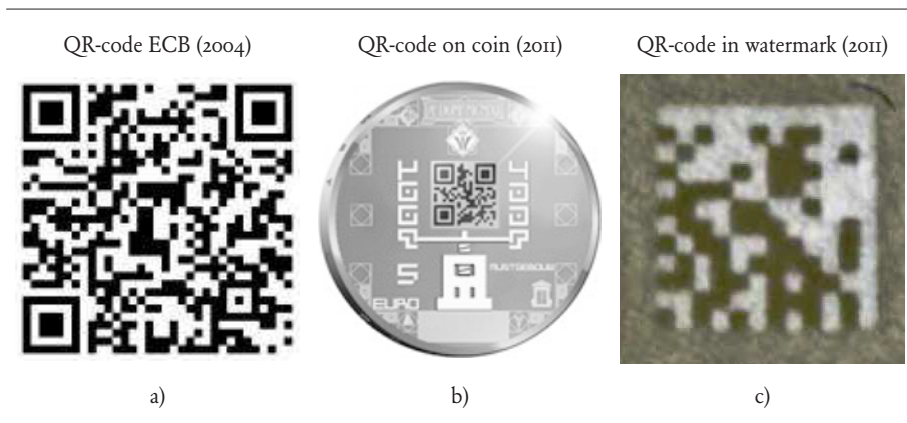
Letters on the euro banknotes

The number on the euro notes is not a public security feature, but serves as information for the central banks of the Eurosystem. Especially during the first months in 2002, the numbering system of the euro banknotes, which was not made public, was a subject of much debate and speculation. Within a few days, the correct translation of the letters were circulating on the internet (P = DNB, figure A1.54b). The letter in the banknote number of the euro banknotes indicates which central bank commissioned this particular banknote. Little more time was required for decoding the letter in the plate number on the front of the notes (G = Joh. Enschedé, figure A1.54c). Its policy being that correct solutions should be affirmed, the ECB quickly provided standard answers to all the NCBs. Later, all the NCB or country codes could be found on the ECB website.

A1.19 QR- code

QR-codes (Quick Response) were invented in 1994 by Denso Wave, a subsidiary of Toyota. The code was developed to track vehicles during the manufacturing process. The QR-code is a two-dimensional code (or matrix barcode) that can be read at high speed. The code consists of black modules arranged in a square pattern on a white background. The encoded information may contain of any kind of data (e.g., binary, alphanumeric or others).

Figure A1.55



Three examples of QR-codes.

- QR-code of ECB: 'ecb.de press key' (2004).
- First official coin with a QR-code, which can be scanned by a smart phone (with a QR-reader). Commemorative 5 euro coin issued in the Netherlands in 2011 on the centenary of the Royal Dutch Mint building. Design: Juan José Sánchez Castaño.
- Two-dimensional watermark 'SigmaQR' produced by Fabriano in 2011. The code can be read by smart phones. Over 11 million different codes can be provided.

QR-codes became popular as a link between the internet and a product around 2003. In 2004 the ECB introduced its press key code (see figure A1.55a). In 2007 DNB proposed to print QR-codes on euro banknotes for the following applications [126, 205]:

- 1) When scanned with a smart phone, the QR-code will bring up information about the public security features on the website of the central bank. Information provided is up to date, close to real time.
- 2) Each denomination receives its own QR-code. Samples of a QR-code on an imaginary banknote are provided in chapter 3, figure 3.20b and in chapter 5, figure 5.46. Two more examples of QR-codes in cash money are provided in figure A1.55b and A1.55c.

Appendix A2

Banknote design elements

Currency design elements find their roots in coins or early forms of paper money and are listed in appendix A1. This appendix A2 lists the design elements which appeared - in general - for the first time on banknotes. The leading questions are once more: what and how did it look, why and who came first? Netherlands gulden banknotes receive once more additional attention, with the aim to highlight the Dutch heritage of banknote designs.

The first private banknote was issued in 1661 by Stockholms Banco (see subsection 2.2.4 on private banknotes, figure 2.6), the starting point of the following topics to be discussed:

- A2.1 Promise to pay
- A2.2 Security features
- A2.3 Legal tender (banknotes)
- A2.4 Warning text
 - A2.4.1 Penalty text
 - A2.4.2 Public information text
- A2.5 Colours
- A2.6 Gravures, guilloches and rainbow printing
- A2.7 Symmetry
- A2.8 Series design
- A2.9 Portraits (trust)
- A2.10 Unprinted area on edge
- A2.11 Name of the note
- A2.12 Name of printing house and designer
- A2.13 Personal remarks by designer
- A2.14 Register marks
- A2.15 Geographical maps
- A2.16 CDS features
- A2.17 Wayfinding features
- A2.18 Marks for feeding direction

A2.1 Promise to pay

Essential for banknotes is that a note was payable to the bearer of the note and no longer on name like on running cash notes or gold smith notes. Writing their full name on so many paper notes became a burden to the directors. The solution found was a money-scrivener who had to write the anonymous ‘I promise to pay the bearer on demand the sum of ...’. From then on the cashier had to sign the notes on behalf of the bank. This promise meant that the note could be exchanged at the bank for gold or coinage by anyone presenting it.

Handwriting on banknotes was further reduced and by circa 1860 banknotes were fully printed, including the signatures (subsection 2.2.4 on private banknotes, figure 2.8). Later these texts were shortened to promise to pay. The Dutch variant ‘betaalt aan toonder’ disappeared in 1949 as explained in appendix A1, section A1.4 on material: from gold to polymer.

A2.2 Security features

To distinguish them from ordinary pieces of paper, banknotes were protected against counterfeiting. The notes were printed on special (e.g. marbled) paper and often carried a watermark. Other security features were special type-fonts and seals created by paper deformation using a die (dry embossing).

The first guilder banknotes in 1814 had four security features and the last Dutch banknote issued in 1997 had 20. One of the conclusions in 2010 is that central banks could choose from among some 50 public security features, whereas only three to six are needed [192]. Today there are about 60 to 70 public security features.

Security features form part of the identity of a banknote, and several were uniquely used in Dutch banknotes, as is shown in chapter 5, section 5.8 on selection of banknote designer, table 5.11. Despite the wide choice, globally, security features have become more and more similar. Today all banknotes printed on cotton paper include a watermark and almost all feature relief printing (intaglio gravure). Nowadays the *design* of the security features contribute to the banknote’s identity, while the *technology* is quite similar [121, 126].

Since security features were the subject of the extensive 2010 study on ‘Banknote design for retailers and public’, we leave this subject here [192].

A2.3 Legal tender (banknotes)

In the Netherlands, payments with high-denomination banknotes are a legal grey area. Retailers may refuse large euro banknote denominations if they announce this in advance [192]. Two recent examples are shown in figure A2.1. Feeding notes into payment terminals is often suboptimal [126, 169] and the environment of the terminals is not always clean, a negative contribution to banknote branding.

Figure A2.1



Two examples of banknote accepting machines accepting only the smaller euro banknotes.

- a) Only 5, 10 and 20 euro banknotes are accepted by a money changer in IJmuiden (NL). The environment of the terminal is unclean (2011, photo by De Heij).
- b) Only 5, 10 and 20 euro banknotes are accepted by this automate for tickets for the public transport system in Würzburg, Germany. Banknotes must be inserted according to the instruction: Align the banknotes with the blue stripe (2011, photo by De Heij).

A2.4 Warning text

Warning texts on banknotes are an intriguing element. One of the first warnings printed is 'to counterfeit is death'. This short and clear warning appeared in 1777 on paper money issued in Philadelphia (figure A2.2). Later such texts were further developed and made reference to the Penal Code, like was the case on the example from French Polynesia, provided in figure A2.2b. The banknotes of the Bank of England did not carry a Panel Code. However, forged banknotes were punishable by death or being sent to Australia. Several people were executed between 1797 and 1821. The penalty text on Dutch guilder notes - the copier or forger will be punished etcetera - was replaced in 1989 by a public information text. The development of a reactive warning text into a pro-active informative text is described in the following two subsections:

A2.4.1 Penalty text

A2.4.2 Public information text

Figure A2.2



Two examples of a penalty text on paper money.

- 'To Counterfeit is DEATH', issued in 1777 in Philadelphia.
- Banknote of Banque de L'Indochine, 100 francs, 1939. Text refers to Penal Code: 'L'ARTICLE 139 DU CODE PÉNAL PUNIT DES TRAVAUX FORCÉS CEUX QUI AURONT CONTREFAIT OU FALSIFIÉ LES BILLETS DE BANQUES AUTORISÉES PAR LA LOI'. The Banque de L'Indochine was a minting and banknote-issuing bank established in Paris in 1875, for the territories of France in Asia, including French Polynesia. In 1905 they opened a branch in Papeete on Tahiti.

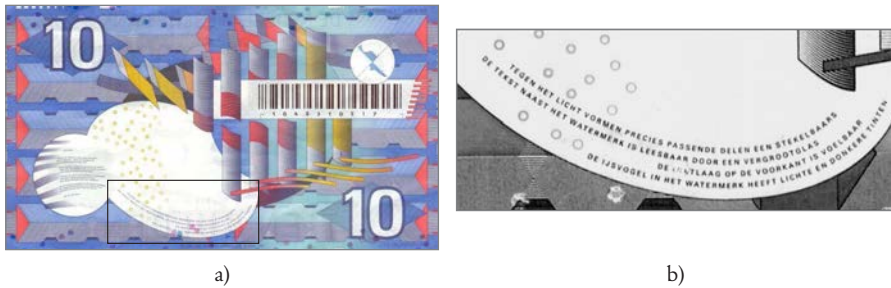
A2.4.1 Penalty text

The French banknotes issued in 1842 were probably the first to carry punishment texts [77]. The Dutch followed suit in 1859 with a clear penalty text on the red reverse of the NLG 1,000, in fact the only text used next to the figure 1,000 (figure A2.6d). Public information was not introduced by central banks until the 1980s. The Swiss were the first to issue a public information leaflet in 1979. Accepted wisdom held that to give information on a banknote's security features was to help the counterfeiters.

A2.4.2 Public information text

To help the public memorise the public security features, DNB was the first central bank to print a brief instruction for use, a memory text, on the notes. Why print leaflets that people may discard or forget if a short memory text may be printed on the note? The first memory text was designed as a security feature on the NLG 25/Robin, issued in 1990. This microtext also referred to itself, reading: this text should be legible. In fact, the smallest letters are so minute that in subsequent issues the memory text became a feature in its own right. This memory text is shorter than those in the leaflets, which explains the features more in detail. In 1993, the order of the 4 public security features was changed on the basis of public opinion polls. The best known feature was referred to on the last line (the watermark); the least-known feature (see-through register) was on the first line as shown in the example provided in figure A2.3 [79].

Figure A2.3



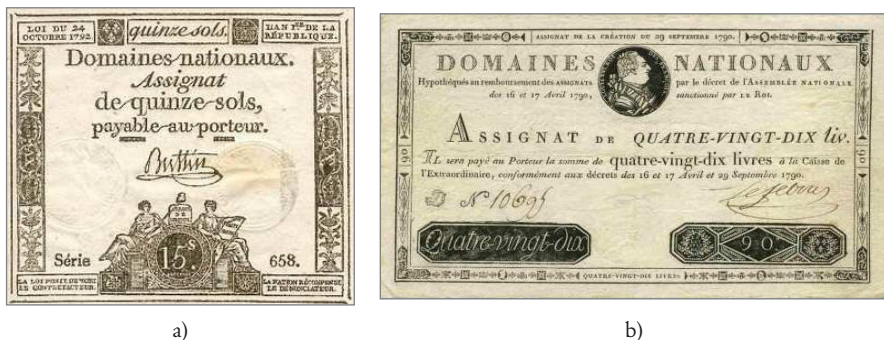
The printed memory text on the 4 public security features of the NLG 10/Kingfisher. Issued in 1997. Design: Jaap Drupsteen.

- a) Public information text on NLG 10/Kingfisher, reverse side.
- b) Enlargement of public information text as shown in Figure 133a. The memory text on the NLG 10/Kingfisher reads 'Viewed against the light, the exactly fitting elements form a stickleback.' The text next to the watermark can be read through a magnifying glass. The ink layer on the front is palpable. The kingfisher in the watermark has light and dark shades.

A2.5 Colours

Colour seems to be one of the major design variables as concluded several times by DNB researches since 1983 [69, 79, 115, 126, 169]. Banknote colours were kept constant in the Netherlands, because they became synonyms for the value. All 10 guilder notes, from the first issue in 1904, were blue.

Figure A2.4



No colour in these two assignat notes issued by the French Republic. The Banque de France was established later, in 1800.

- a) 15 sols, dated 27 October 1792. Text: 'pay to bearer' (in French 'payable au porteur'). Including two paper seals. Line watermark: Fleur-de-lys.
- b) Curious value of 90 livres, dated 29 September 1790.

However, colour was not used - or remained very limited - in the very first banknotes. The black-and-white French ‘assignats’ issued by the French Republic in the early years after the Revolution are an example (figure A2.4). These assignats soon lost most of their value, which imparted a negative experience and considerably delayed the advance of fiduciary money in France. Having been occupied by the French from 1795, the Dutch were familiar with the assignats and when DNB issued the first guilder notes in 1814, there was a strong reluctance against using them; the first guilder banknotes were not popular and hardly used [40].

Without colour on the front of the banknote, people may nickname it by the colour of the reverse. The greenback has kept its colour since it was first issued in 1862 (figure A2.5). The Dutch ‘red back’ had been issued a few years earlier. The Dutch gave this popular name to the 1,000 guilder note issued in 1859, which had a black front and a red reverse as shown in figures A2.6c and d. The term ‘red back’

Figure A2.5



Three successive issues of the one US dollar banknote.

- a) US silver certificate 1896; Educational Series. Allegorical figures representing ‘history instructing youth’ in front of Washington DC.
- b) The reverse of figure A2.5a featured portraits of George and Martha Washington surrounded by an ornate design.
- c) One silver dollar banknote, recognisable by the blue seal (1928). Text: ‘Payable to the bearer on demand’.
- d) Reverse of figure A2.5c.
- e) Front of one-dollar banknote used to date.
- f) Reverse of figure A2.5e. The dollar banknote was changed by Benjamin Franklin in 1937, introducing the Great Seal and the symbols of Freemasonry.

(in Dutch slang: 'rooie rug') is still used today for an amount of 1,000 euro. Three other Dutch banknotes of older days are also recalled because of their colours. The yellow Dutch banknote shown in figure A2.6a, introduced in 1862, was called 'little yellow' (in Dutch slang: 'geeltje'). Despite the fact that this denomination had been

Figure A2.6



Four examples of Dutch paper money designs inspired by colour.

- NLG 25/Relief border, issued by De Nederlandsche Bank in 1860. The texts on this note were printed in black on a yellow background, earning the note its nickname of 'geeltje' ('little yellow').
- Reverse of figure A2.6a. Unprinted.
- NLG 1,000/Relief border, issued by De Nederlandsche Bank in 1859. A helmeted woman in the medallion.
- Reverse of figure A2.6c. A red-printed back or in Dutch: 'rode rug'.
- Paper money issued in 1943 by the Dutch Government in exile. Printed by the American Bank Note Company.
- Reverse of figure A2.6e. An orange reverse, the colour of the royal Dutch family.
- NLG 50/Sunflower, (front) issued in 1982. Design: R.D.E. Oxenaar and J.J. Kruit.
- Reverse of figure A2.6g.

red since 1921, the nickname remained synonymous with an amount of 25 guilders until the introduction of the euro in 2002, when units of 25 and 250 disappeared from the range of available denominations.

The Russians also gave nicknames to their banknotes based on colour, like e.g. ‘canary’ to the yellowish one rouble circulating in the early 20th century.

In 1943 Dutch paper money was issued with an orange back, the national colour of the Netherlands (figure A2.6e and f). These banknotes had been commissioned by the Dutch Government in London, ready to be used when the Netherlands would be freed from German occupation.

Colour in Dutch banknotes

Taking this popular custom into account, the central bank and the designer could use a banknote’s colour as the starting point in their search for subjects. Looking for a ‘yellow subject’, the Dutch designers Oxenaar and Kruit proposed a sunflower for the NLG 50 issued in 1982, the first banknote whose subject followed from its colour, see figure A2.6g and h [16].

The reader might be intrigued by the Dutch banknotes as shown in figure A2.6e and f since they look so similar to the US dollar banknotes. After the Second World War this was not exceptional; several banknotes issued in those days reflected the US dollar designs, including a 20 D-mark note issued in Germany (figure A2.7).

Colour scheme of euro banknotes

The Dutch tradition of using banknote colours in a functional way inspired DNB in 1995 to submit a colour proposal for the prospective euro banknotes [115, 169]. Until that moment nobody had thought about the colours of the euro banknotes; the Design Brief for the first euro series did not mention colour. The colour scheme proposed by DNB was slightly changed; the colours for the euro 50 (yellow) and

Figure A2.7



German banknote with a US dollar-like greenback.

a) Front of a DEM 20 banknote, issued in 1949.

b) Reverse of figure A2.7a.

Figure A2.8



Colour scheme of the euro banknotes, proposed by DNB (De Heij).

200 (orange) were switched on the grounds that printers were not used to printing yellow colours and were reluctant to use yellow for this important denomination. When the grey 5 euro becomes a coin, it was argued, the colours may continue to be used for decades (figure A2.8).

A2.6 Gravures, guilloches and rainbow printing

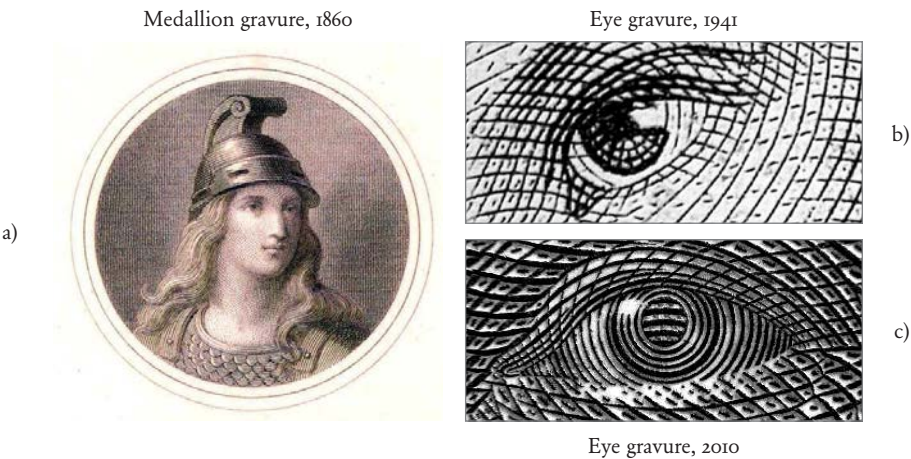
Typical banknote design elements produced by special printing presses are gravures, guilloches and rainbow printing. These techniques were especially developed for the security printing industry, first of all to be used on banknotes. Gravures are still used, whereas guilloches and rainbow printing have lost ground. However, guilloches are still used to lend character to value-bearing items such as credit cards.

Gravure techniques were used for the very first banknotes to provide security and lend a characteristic identity. Copper plates were used to print the first British banknotes in 1694. The plates wore down quickly, usually after 5,000 to 10,000 copies. The engraver had to make new plates for the next batch, which were never exactly the same. Two genuine notes of the same denomination could be quite dissimilar, which made it difficult to identify forgeries. In 1819 a solution was found in masters of steel. A thin layer of copper is grown on the steel mother plate by electroplating. The shell is carefully removed and transferred to a metal bearer. Thus one original can be used to produce a limitless supply of replicas. This method, invented by Jacob Perkins, was called ‘Plate Transfer Press’. It took another 17 years before the Plate Transfer Printing was adopted by the Bank of England in 1836. In 1838, Boris Jakobi (1801-1874) discovered a method of making printing plates by electroplating (galvanoplastics or electrotyping). This technique was applied for the first time in 1839 to print Russian banknotes. A stereotype or copy plate was grown from an original mother plate made of copper (instead of steel). Over the years gravure techniques were further developed bringing a higher resolution and special inks (figure A2.9b and c).

Gravure requirements by DNB (1860)

In preparation for a new banknote series in the 1850s, one of DNB’s directors visited several printing houses. The design requirements for the gravure were determined

Figure A2.9



Development of the resolution of gravures.

- a) Gravure of medallion by Heinrich Nüsser, printed by F.G. Wagner. NLG 1,000/Relief border, issued in 1860.
- b) Eye gravure by Karl Bickel, printed by Orell Füssli for the Swiss National Bank, 1941
- c) Modern high resolution gravure using Computer to Intaglio Plate (CtIP), KBA, 2010.

by the Bank and recorded in writing, which is seen as DNB's very first Programme of Requirements for a new banknote [66, 141]:

- 1) An extremely fine artistic engraving, with either a vignette or something else, by an artist who stands out for his sophisticated style.
- 2) An engraving produced on guilloching or die-stamping machines, which achieve a degree of fineness which the hand cannot hope to trace.
- 3) Typography, with its typical difficulties for hand-copyists.

The contract was granted to gravure printer F.G. Wagner Junior in Berlin and the selected engraver became Heinrich Nüsser, working in Düsseldorf (figure A2.9a).

Guilloches

Guilloches are mathematical patterns produced by vector graphics. A typical 'guilloche banknote' is shown in figure A2.10a; the patterns produced by a special guilloche machine. The design of guilloche patterns is one thing, but to print such complex patterns is another. Ivan Ivanovich Orlov (1861-1928) invented a specialised ink distribution technique for use within a printing press. Several different inks

Figure A2.10



Guilloche similarity in the 1930s.

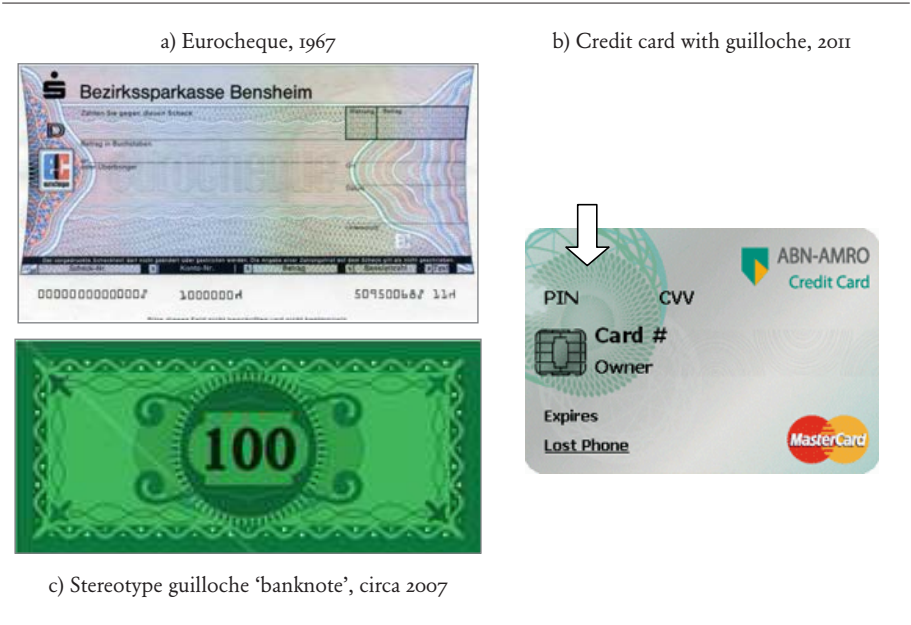
- a) Banknote using 'guilloche style'. NLG 50/Minerva, reverse. Design by Jacob Jongert (1930).
- b) 50 reichsmark, Germany 1934. Printed by Bundesdruckerei Berlin.
- c) 25 latu, Latvia, 1938.
- d) 5 franga, Albania, 1939.

could be printed simultaneously without getting mixed, a method known as Orlov printing.

Guilloches and Orlov printing found its way to almost all security printing works. It is not surprising that the notes produced show a high degree of similarity, witness the four examples shown in figure A2.10.

Other security printing products, such as the eurocheques in 1967, also incorporated such guilloche elements to express safety (figure A2.11a). However, guilloches lost their security value in the 1960s through the improvements of commercial offset printing. Their defensive role was taken over by screen and scan traps. A clear example is the NLG 100/Snipe issued in 1981 with a large circle in the background of the bird. This circle is a screen trap constructed by specific line patterns which create moiré patterns when reproduced in offset [192]. A modern variant of vector graphics, fractals were used by DNB for its NLG 25/Robin design issued in 1989, which contributed to this banknote’s contemporary look [38, 66]. Guilloches are still prototypical elements associated with value as proven by the stereotype banknote shown in figure A2.11b and the 2011 credit card issued by ABN AMRO (figure A2.11c).

Figure A2.11



Examples of the use of guilloche elements in historic banknotes and other payment products.

- a) Eurocheque full of guilloches, 1967.
- b) Prototypical (fake) banknote based on guilloches by Shutterstock images (around 2007).
- c) Guilloche element intended to give the credit card a 'valuable' identity (ABN AMRO, 2011).

Rainbow printing

Orlov printing presses were not only able to print the guilloche elements in separate colours, these machines were also able to create a controlled mixture area of two inks, a colour gradation or 'rainbow print' (figure A2.12a). With the innovation of the dry offset simultan presses in the 1960s this rainbow printing area was further improved (figure A2.12b). The colours in the rainbow area change so slightly and so gently from colour A to colour B that reproduction systems would not be able to reproduce this gradation. Instead they would show strips of different colours.

A2.7 Symmetry

In 2007 the principle of pre-set layouts for banknote design was introduced by De Heij [126]. One of the dominant graphic design principles mentioned is the use of a symmetry axis. For almost a century, from about 1850 till 1945, banknote designs used vertical symmetry as illustrated in figure A2.13a. Several examples based on this principle are shown in figure A2.14, resulting in similar overall images.

The US dollar banknotes are based on a horizontal symmetry axis (figure A2.13b) in combination with a vertical symmetry axis (figure A2.13a).

A diagonal axis is a third symmetry principle (figure A2.13c). In its ultimate being this principle was used for Brazilian banknotes in the 1980s.

Symmetrical banknote designs by famous artists

Most banknotes used to be designed by graphic designers working for printing houses. In some cases famous artists, like e.g. Alfons Maria Mucha (1860-1939) were invited to make a banknote design. Mucha was a Czech Art Nouveau painter and decorative artist, best known for his distinct style and his images of women. When

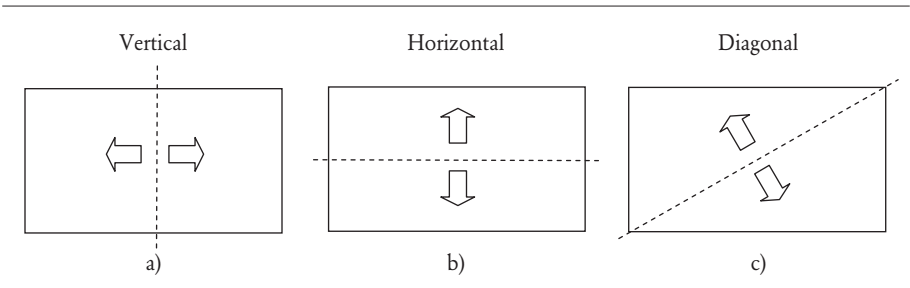
Figure A2.12



Rainbow printing.

- Principle of rainbow printing. Two dry offset inks, A and B, have a mixture or gradient colour area of about 8 mm.
- NLG 25/Sweelinck, issued in 1972. Clear example of rainbow printing behind the portrait area. Design: R.D.E. Oxenaar.

Figure A2.13



Three symmetry principle used for banknote design.

- a) Vertical symmetry axis.
- b) Horizontal symmetry axis.
- c) Diagonal symmetry axis (in this case: bottom left to top right)

Czechoslovakia won its independence after World War I, Mucha designed the new postage stamps, banknotes, and other official documents for the new state. Mucha applied vertical symmetry in his designs (figure A2.14a).

The famous Dutch graphic designer Maurits Cornelis Escher (1898-1972) was invited by DNB in 1950 to propose new guilder designs. Escher used complex symmetry principles; positive and negative design elements completing each other (figure A2.14b and c). Unfortunately his designs were never used. Jaap Bolten: ‘If only the powers that be had been less afraid of what in the fifties was a design novelty, the Netherlands would have been the richer for having several of very interesting and intelligently conceived banknotes’ [66].

A2.8 Series design

The development of series designs is described in chapter 5, subsection 5.3.1 on series designs.

A2.9 Portraits (trust)

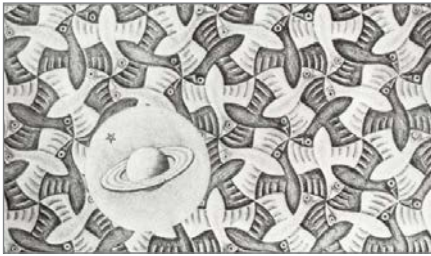
The development of portraits is described in chapter 2, subsection 2.2.8.1 on confidence in banknotes by portraits (1920-1995).

A2.10 Unprinted area on edge

The development of unprinted areas or lanes is described in chapter 4, subsection 4.2.2 on identity of euro banknotes.

Figure A2.14

a) Alphons Mucha



b) Maurits Escher, watermark



c) Maurits Escher, NLG 50/Christiaan Huygens

- a) 10 korun banknote, first issued in Czechoslovakia in 1919 and re-issued, with some different colouring, in 1927. The girl on this note is the designer's daughter Jaroslava. Design: Alfons Mucha.
- b) Watermark design for a Dutch banknote by Maurits Escher, 1950.
- c) NLG 50/Christiaan Huygens, pencil drawing, 1953. Design: Maurits Escher.

A2.11 Name of the note

If a banknote has a name it will be recalled more accurately. If something gets popular or is cuddly it may receive a nickname. If a central bank fails to name a note, the public may give a nickname. Nicknames are, as discussed in section A2.5 often triggered by the banknote's colour (greenback), but could also use the banknote's value ('joetje' for 10 Dutch guilders, grand for 1,000 dollars) or picture ('Loonie' for the Canadian Dollar, after the national bird known as the Loon on the Canadian one-dollar coin). A very successful banknote name in the Netherlands was 'snip' (Snipe) in the 1980s, named after the bird on the 100 guilder note and snipe became synonym for 100 guilders.

The banknote's name was first printed on Dutch notes in 1904 ('Arbeid Welvaart', Labour Prosperity). Since 1949 the name of the note has been printed on all Dutch banknotes, preferable in one or two syllables, DNB's Programme of Requirements stated from the 1980s.

Unlike the Dutch cash money, the euro cash money received no nicknames as researched in 2011 by the Dutch Society Our Language ('Genootschap Onze Taal'). Only 'euri' for the plural of euro is sometimes used, further, no nicknames were reported.

Criteria for banknote names

In devising new brand names the focus is usually put on memorability. Another approach is by the sound of the name. Human sounds can be analysed by the concept of ‘front’ and ‘back’ vowels. Front vowel sounds are made with the tongue held forward in the mouth, such as the vowel sound in ‘mill’. Back vowel sounds are ones that are made with the tongue farther back in the mouth, such as the vowel sound in ‘mall’. Perceptions of brands may be enhanced if the fit between the sound symbolism and the product attributes is maximized, is a statement made by Lowrey and Shrum. In 2007 they researched the relation between two product categories and sound symbolism [132]. The two categories researched were:

- 1) Small, fast, sharp objects (knives, convertibles),
- 2) Large, slow, and dull (hammers, SUVs).

Front vowels were preferred for the first category and back vowels for the second. Being small and rather dull, banknotes have some elements of both categories. The words dollar, euro and lira have elements of both categories, while ‘yen’ would be an example of category 1 (small, fast, sharp), just like the word ‘snip’. A banknote name like ‘wala’ would not be suitable and the researcher found that the ‘yoo’ sound, like in the word ‘putrid’ is least preferred by consumers, regardless of product category. From this respect the word ‘euro’ would not be an optimal choice.

Name of the series

The banknote series should also have a name, preferably with some emotional elements in it. ‘Euro Series 1’ and ‘Euro Series 2’ are examples of detached naming, as are formal series indications as ‘Third edition’ (China) or ‘Note Series E’ (UK). Banknote series issued by DNB received a name, such as Mercury, Forebears and Abstract. An overview of the Dutch banknote series and their names is provided in appendix A3.

Name of public features

A name should also be given to the public features, like for example the ‘Chameleon number’ in the case of the Swiss 1994 series. To aid the public in finding a name for a public security feature, DNB decided in 1989 to print the name of the figuratively designed security feature close to the feature. The argument for this measure was found in the literature: if a feature has a name, it will be better recalled [79, 126].

A2.12 Name of printing house, name of designer

On the private banknotes issued in the 19th century the printer’s name was often printed in a small type font. The name of the Dutch printer Joh. Enschedé could first be found on the 50 guilder note issued in 1930:

JOH. ENSCHEDÉ EN ZONEN. IMP.

The addition IMP. stands for 'impressit', Latin for 'has printed this'. The graphic designer was also mentioned for the first time on this NLG 50/Minerva:

JAC. JONGERT. FEC.

The addition FEC. is short for 'fecit', latin for 'has made it'. A successor of Jongert, Eppo Doeve changed this Latin addition to DEL., short for 'delineavit', meaning 'drawn by'. A third variant was used by Robert Oxenaar in 1965 and was kept by Jaap Drupsteen. They added the traditional INV. behind their name, short for 'invenit' or 'has designed' (or for 'inventor', the designer).

Finally the engraveur could add the letter INC. meaning 'engraved it'. However the name of the engraver was never printed on Dutch banknotes.

DNB's Programme of Requirements limited the font size of these letters was to a maximum of 1 mm. In 1986 the letters VHP, referring to the Dutch security paper mill Van Houtum & Palm, were incorporated in the watermark of the NLG 250/Lighthouse.

For the euro banknotes it was decided not to include names of printers and/or designer, the policy being to minimise the amount of text on the euro banknotes.

A2.13 Personal remarks by designer

Personal design elements introduced by the designer are a special category. Such marks usually receive much attention and have high anecdotal value. People enjoy them, probably because such designer's mischief has an emotional appeal: we are all just people.

An early example of a personal remark is the 10 koruna - issued in 1927 - on which Mucha portrayed his daughter (figure A2.14a). In 1921 Dutch banknotes depicted Grietje Seel, artists' model at the Rijksacademie in Amsterdam. Seel was the favourite model of designer Nicolaas van der Waay (chapter 2, figure 2.16b). People also like to hear the anecdote about the woman portrayed on the 10 guilder note issued in 1925. She is Geertrui Walraven from Goes, the servant of De Nederlandsche Bank's local agent in Middelburg (chapter 2, figure 2.16c).

A touch of humour in such naughty provocation of the authority is well appreciated by the public, or at least by the Dutch public. Banknote designer Oxenaar certainly challenged DNB with his personal remarks, especially in his last banknote design, the NLG 250/Lighthouse. In the beacon of the lighthouse he hid three women's names, as it emerged after the banknote was issued, from top to bottom: Eugenie (a friend) in mirror writing, Hannah (granddaughter) and Ria (a friend). The engraver had, unbeknown to the Bank or his employer, incorporated these names at the behest of the designer, who pledged him to secrecy [66]. Also the rabbit in the watermark was a pat of a friend of Oxenaar, which was known to DNB.

Already in his first note Oxenaar had suggested a special text element. A passage from Homer's Iliad in Joost van den Vondel's free translation is used in the architrave on the reverse of the NLG 5/Vondel 1, issued in 1966:

TWEE VATEN HEEFT JUPIJN ('Jupiter has two casks').

The NLG 5/Vondel 2, issued in 1976, continued with the second verse:

HY SCHENCKT NU ZUUR NU ZOET ('he pours now sour, now sweet').

On the frieze of the building, in the look through under the architrave, is the name by which the designer is familiarly known: 'OOTJE'. In Dutch 'Ootje' also refers to to fool someone ('iemand in het ootje nemen').

Oxenaar also quoted the late Roman poet Claudianus on the Vondel 1, issued in 1973:

TOLLVNTVR IN ALTVM

which is part of 'Tolluntur in altum ut lapsu graviore ruant' ('They are raised that they may fall more heavily').

Oxenaar's thumb-print is incorporated in Spinoza's curling hair on the left. Since people have only limited capacity to remember the security features of a banknote, DNB was never in favour of such personal remarks, as they take away attention for the security features. Such personal remarks receive such keen attention in reflections on the banknote designs of Oxenaar [e.g. 218, 237].

Oxenaar's successor, Jaap Drupsteen, refrained from such personal notes on his designs. Instead a present-day poet was invited to contribute a poem to the theme of the note.

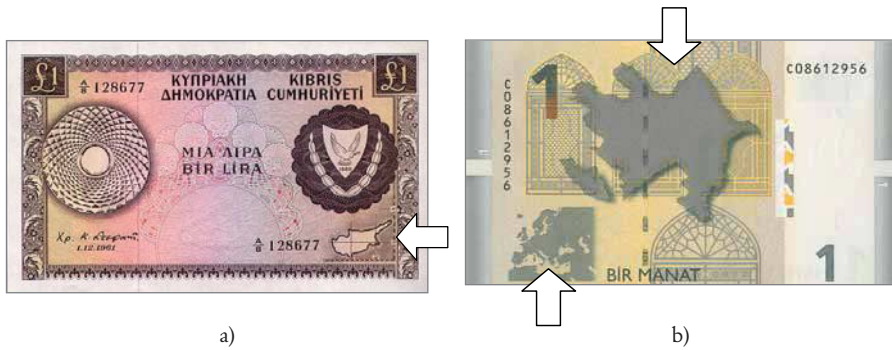
Some foreign banknotes, too, show personal remarks. On the reverse of the GBP 10, honouring Michael Faraday (1791-1867), several employees of the Bank of England are depicted, rather small though visible against the background.

Robert Kalina, the designer of the euro series, used his birthday 29061955 to fill the banknote number on his 1996 euro designs [86].

A2.14 Geographical maps

It is unknown when the first geographic maps were introduced on banknotes. One of the first is probably Cyprus, which had the outline of the island printed on its banknotes in 1960 (figure A2.15a). A geographical outline of the IJsselmeer polders was displayed on the NLG 50/Sunflower (1982) and the coast line of the Netherlands was printed on the NLG 250/Lighthouse (1986).

Figure A2.15



Two examples of geographic maps on banknotes.

- Map of Cyprus on the Cyprian one-pound banknote, issued in 1960.
- Two maps on this banknote of AZN 1 (Azerbaijani manat) in 2005: the map of Azerbaijan and the map of Europe (as shown on the euro banknotes). Design: Robert Kalina.

The proposal by designer Robert Kalina to put the map of Europe on the euro banknotes contributes successfully to the identity of the euro banknotes. According to DNB's 2011 survey the map of Europe is the most strongly contributing pictorial element (chapter 4, subsection 4.2.3 on measuring European identity in the Netherlands (DNB research 2011), table 4.5). The map of Europe was also used on the Dutch post stamp issued in 2008 on the occasion of the 10th anniversary of the European Central Bank (figure A2.16).

Since the euro banknotes incorporate a map of Europe, maps are found more frequently on banknotes. Examples are the notes from Azerbaijan (2005, see figure A2.15b), Kazakhstan (2006), and Uganda (2010). The map design is usually an outline or a silhouette.

Figure A2.16



Dutch post stamp issued in 2008 on the occasion of 10 years ECB. Bridges and gates from euro banknotes used on a stamp. In the sheet a bridge connects DNB with the ECB. Design by Yvo de Ruiter (Koeweiden Postma).

The map on the future euro banknotes (ES2) will be updated to include Malta and Cyprus [142].

A2.15 Register marks

Definitely contributing to the identity of Dutch banknotes are register marks. Register or quality marks used for the Dutch banknotes were listed by De Heij in 2008, including suggestions for quality marks on future banknotes [148]. The Dutch register marks had three purposes, they:

- 1) Enable the central bank to check each individual note for tolerance compliance,
- 2) Contribute to the high-tech image of the note (message: not easy to counterfeit)
- 3) Allow easy process control by printers (no tools are required).

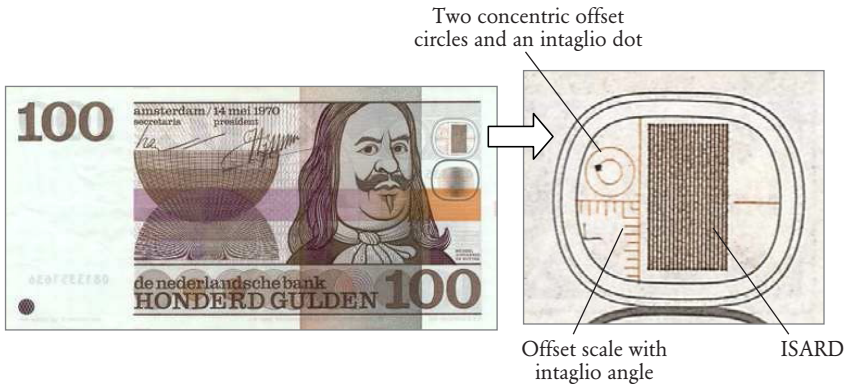
The first register marks were introduced in the NLG 5/Vondel 1, issued on 19 December 1966. These marks included an intaglio dot within an offset circle. If the register between the two print technologies is within tolerance, the dot should not touch the circle. This was a very successful concept, which was kept for over 30 years (figure A2.17). Cutting marks appeared in 1968 on the NLG 10/Frans Hals. It also included a unique register mark for letterpress and dry offset. In 1989 two new user marks were introduced: the so called BQIS-element for an automatic register check and stacker marks for sorting machine operators.

A2.16 CDS features

Around 1995 the first ‘CDS features’, features for Counterfeit Deterrence Systems, appeared on the banknotes. Counterfeit Deterrence Systems are generally aimed at preventing counterfeiting by the use of standardized off-the-shelf reproduction techniques. In 1990 the Bank of International Settlements (BIS) took the initiative towards developing such systems [192]. The first CDS features, tiny circles, first appeared on the banknotes around 1995. These circle marks were also used in the watermark area on both the front and the reverse side of the NLG 10/Kingfisher, issued in 1997. The circles contribute to the banknote’s identity, since they may be found on banknotes from many different nations. Such circle marks are clearly visible in the 10 euro banknote (figure A2.18).

A second CDS feature developed around the year 2000 is directed against the casual counterfeiter trying to manufacture counterfeits at home using a personal computer and scanner. This feature is hidden within the line work of the note and is therefore less prominent than the small circles.

Figure A2.17



Register marks within the so-called ‘television screen’ in the NLG 100/Michiel de Ruyter, issued on 15 December 1972. The register for the offset and the intaglio is located in this ‘technical element’. Design: R.D.E. Oxenaar.

A2.17 Wayfinding features

The Swiss central bank was the first to introduce wayfinding features on banknotes as shown in figure A2.19 [79, 126]. In 2001 DNB proposed to mark all public security features on a euro banknote with symbolic icons. These elements would serve as stepping stones in finding the features on the note.

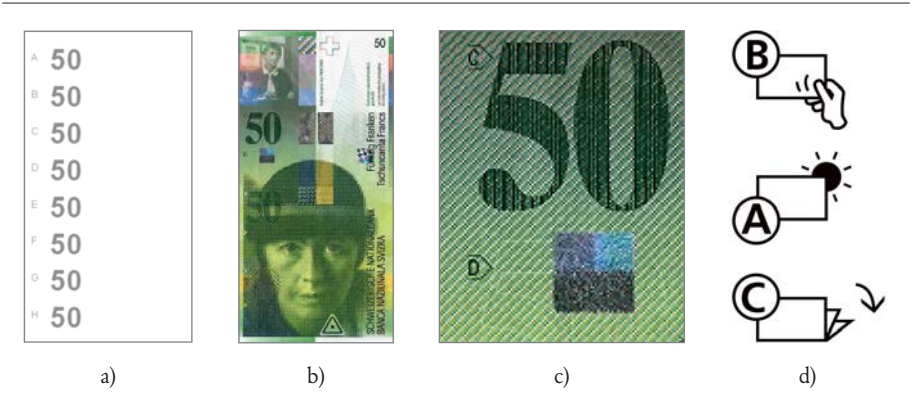
Apart from the description of security features the public often does not know what they look like or where to look for them. Finding a security feature is a four-step process:

Figure A2.18



Euro 10 banknote with many small circles.

Figure A2.19



Two examples of wayfinding features.

a) Co-ordinates A, B, C et cetera in CHF 50/Sophie Taeuber, first issued on 3 October 1995.

b) Enlargement of detail of a) with wayfinding features C and D.

c) Icons feel, look and tilt as proposed by DNB in 2005. The location of the symbols is free. The symbols may be printed in any printing technique.

FEEL: Rub, scratch, feel with the finger or nail. Example: ink relief (intaglio).

LOOK: Hold up to the light. Examples: watermark, security thread and see-through register.

TILT: Move, turn the note. Examples: hologram, colour shifting ink, iridescent stripe, latent image.

- 1) Orientation - where is it?
- 2) Navigation - how to get there?
- 3) Identification - what is it?
- 4) Information - what do I have to do?

The design of banknotes could be improved if designers would be more aware of these four steps. A solution to this problem is the use of so-termed wayfinding features or road signs, which are tiny symbols, printed close to the security features. Paul Mijksenaar was commissioned by DNB to design these wayfinding features. Three different symbols were developed for respectively feel, look-through and tilt actions (figure A2.19d). A further three symbols were developed for tools such as special lighting (e.g. UV or IR), filter or magnifier. The features were researched for comprehensibility and printed on test notes. Respondents found 4.7 symbols/features on average compared to just 2 without the symbols. Later on, a look-at symbol was added. The features have not yet been printed on banknotes; however, they have been used successfully in communication tools of central banks all over the world [185]. The symbols are also applied in DNB's mobile phone app, launched in November 2011.

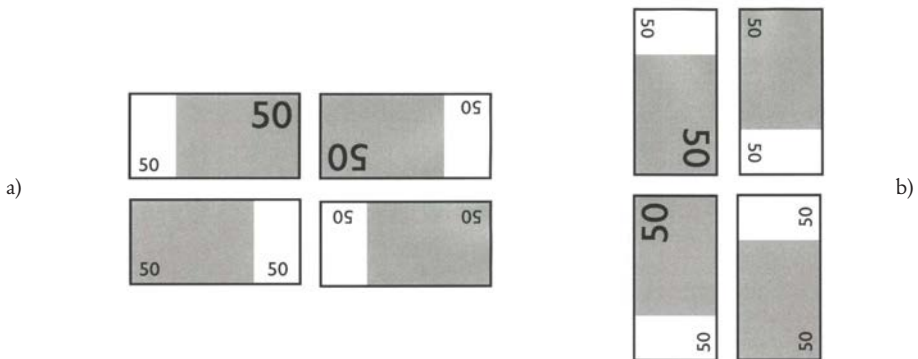
A2.18 Marks for feeding direction

The first time banknotes could be used for payment using an automated banknote acceptor was in the 1980s. Today banknotes are widely accepted by machines such as parking and other ticket dispensers. In 2005 DNB commissioned Paul Mijksenaar once more, this time to study banknote orientation from the point of view of the users of banknote acceptors. In short the findings were:

- There are 8 different ways to insert a banknote in a banknote acceptor: 4 different horizontal and 4 different vertical orientations (see figure A2.20). As a result feeding the machines often leads to confusion.
- To help find the correct feeding direction, a little arrow on the banknote can be useful (figure A2.21a).
- While there appears to be no ‘natural’ turning direction, feeding a banknote with the large denomination first seems more ‘natural’ than the other way around.
- This problem, too, would be solved if the feeding direction were indicated on the banknote proper. If this feature is provided on what to all users is clearly the front side of a banknote, a reference to this feature on the back of the banknotes will probably not be necessary.

In chapter 5, section 5.8 on selection of graphic designer, figure 5.25, it has been suggested to develop future banknotes with one side designed for wallet use (horizontal position) and the other side designed to feed the note into banknote acceptors (vertical position). Furthermore, a vertical position will create new possibilities for security features (e.g horizontal foil stripe) and durability (figure

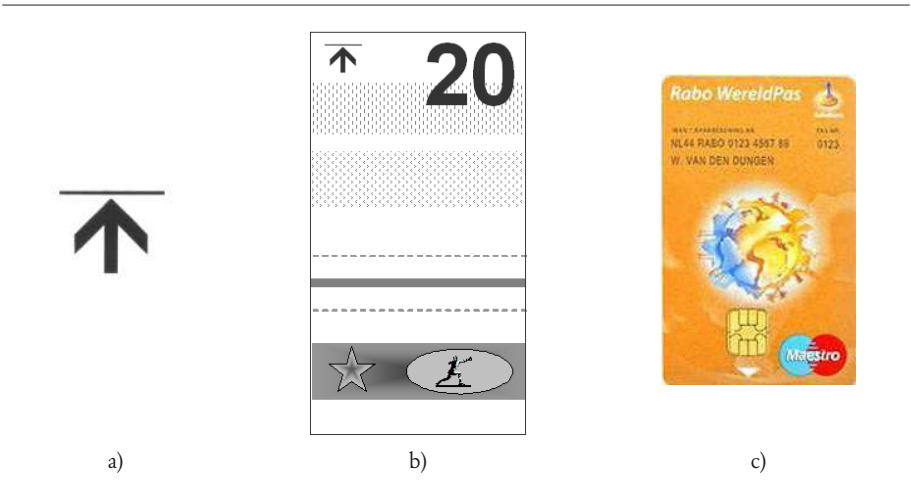
Figure A2.20



There are 8 ways to insert a banknote into a banknote acceptor.

- a) Four horizontal feed methods.
- b) Four vertical feed methods.

Figure A2.21



- Design aspects of banknote feeding.
- a) Arrow symbol indicating the feed direction.
 - b) Vertical orientation creates new design possibilities, e.g. a registered foil stripe with a vertically oriented image.
 - c) To assist the public use of 'top-down vertical pinnen' the Dutch Rabo-bank introduced in 2012 a debit card in a vertical design.

A2.21b). In 2012 the Dutch Rabo-bank was the first in the Netherlands to introduce a debit card in portrait style, supporting the new way of 'top-down vertical pinnen' in the Netherlands (figure A2.21c).

Appendix 3

Periods of Dutch banknote design

Between 1814 and 2002 the Dutch central bank DNB developed 157 different guilder banknotes of which 136 were issued [66]. Most banknotes were designed as elements in a larger series. The guilder designs can be divided into 10 design periods, as presented in table A3.1 and first published by De Heij in 2005 [123]. In that year DNB received a request from the Dutch Ministry of Finance to make a proposal for naming eleven of their new meeting rooms based on the design history of Dutch banknotes. DNB proposed to take a banknote from every design period. The eleventh note was selected from the ‘homey’ period, in Dutch ‘Huisje-Boompje-Beestje’ (‘House-Tree-Animal’), by Ootje Oxenaar, to do justice to these public

Table A3.1

Banknote design periods	Denominations issued (NLG)	Banknote designers
1. 1814 - 1860 Robins	25 40 60 80 100 200 300 500 1,000	Joh. Enschedé
2. 1860 - 1904 Relief border	25 40 60 100 200 300 1,000	F.G. Wagner, J.H. Morriën
3. 1904 - 1930 Grietje Seel	10 20 25 40 60 100 200 300 1,000	J. Visser, N. van der Waay
4. 1930 - 1940 Paintings 1	10 20 25 50 100 500	C.A. Lion Cachet, J. Jongert
5. 1940 - 1945 Paintings 2	10 25 50	L. Gestel, W. de Jonge, A. Th. Van der Vossen
6. 1945 - 1953 Royalty and bible persons	10 20 25 50 100 1,000	Thomas De La Rue, Waterlow & Sons, C.A. Mechelse, J.B. Sleper, J. Roozendaal
7. 1953 - 1966 Forebears 1	10 20 25 100 1,000	J.F. Doeve
8. 1966 - 1981 Forebears 2	5 10 25 100 1,000	R.D.E. Oxenaar
9. 1981 - 1989 House-Tree-Animal	50 100 250	R.D.E. Oxenaar
10. 1989 - 2002 Abstract series	10 25 100 1,000	J.T.G. Drupsteen

Banknote design periods of Netherlands Gulden (NLG) between 1814 and 2002.

favourites. Also, it was decided to use popular nicknames rather than official names. Nine other rooms were to be named after Dutch coins. In every meeting room a picture of the coin or banknote was shown with a short description.



1. Robin
1814, design by Joh. Enschedé staff

The first banknotes of DNB looked like receipts. Dutch merchants deposited their silver and gold coins with DNB for safekeeping and received a deposit slip: this banknote. This proof of delivery was not registered and the merchant could use it in payment to others. At any time, the bearer could retrieve the coins from DNB.

All notes were similar in appearance, with a red face. The back was left unprinted and the red ‘breast’ was associated with a robin, which gave the note its name. The value and date were filled in by scribes and on Wednesday mornings the DNB directors signed all notes to be issued in the coming week by hand.



2. Relief border
1860, designers Johannes Hendericus Morriën (low denominations) and F.G. Wagner (high denominations)

All notes had a clear border and only a small image. The low denomination showed the Dutch lion (25, 40 and 60 guilders) and the high denominations (100, 200, 300 and 1,000 guilders) showed the Dutch Maiden.

The low-denomination banknotes have a clear colour and were designed by Morriën. The reverse was unprinted. The 25 guilder had a yellow front and was nicknamed ‘little yellow one’ (in Dutch: ‘geeltje’).

All notes designed by Wagner had a black front and a coloured reverse. The back of the 1,000 guilders was red and received the nickname ‘red back’ (in Dutch ‘rode rug’).



3. Grietje Seel

1921, designer Nicolaas van der Waay

One type of design for all denominations. Equal sizes, only the colours differed.

The woman depicted is Grietje Seel, who posed as a model at the Amsterdam Academy of Art, where Van der Waay taught. Grietje Seel symbolizes the Dutch Maiden. She is sitting on two other symbols widely used in Dutch banknotes: the cornucopia and the staff of Mercury (Mercury is the God of Commerce). If she would stand up, she would not fit within the note.

During this period, offset print was introduced. Heretofore, only intaglio and letterpress had been used.



4. Lute-player

1931, Series Paintings 1, designer Lion Cachet

During this fourth design period several strongly different designs were issued, although seven were by Lion Cachet. Most notes used images of paintings, including Rembrandt's 'Greybeard' on a 10 guilder banknote. The public noticed the random designs and asked for images of the Monarch. In 1940 a note was issued bearing the portrait of the Queen Regent and Queen Mother, Emma (1858-1934).



5. Liefstinck's tenner

1945, Series Paintings 2, designer André van der Vossen

Quite different designs were again issued during this period; all were single designs without a serial approach, although once more Dutch paintings were used for the theme, especially paintings showing women. The period ended with a 10 guilder banknote named after Piet Liefstinck, the Dutch Minister of Finance in these days. Although the Minister had nothing to do with this banknote, it received his name because of the monetary reform in September 1945. To overcome this transition week, every Dutchman could transfer 10 'old guilders' into 10 'new guilders', in coins otherwise there would not be any change (5 x 1 guilder and 2 x 2.5 guilder).



6. King Solomon

1952, Series Royalty and Biblical figures, designer Jan Sleper (Joh. Enschedé)

Five new banknotes were ordered during this period from the British printer De La Rue, bearing images of former kings of Holland. Meanwhile, DNB held a contest to find a new designer. The winner was Johannes Roozendaal, but the printer was not satisfied and suggested its own designer, Jan Sleper. His first - and last - banknote pictured the biblical King Solomon, showing a Catholic cross, which raised questions in Parliament.



7. Erasmus

1954, Forebears 1 series, designer Eppo Doeve

Finally, in 1953 the Bank found a new designer, Eppo Doeve. To avoid disputations, the persons to be portrayed were famous Dutchmen, selected by DNB's Board from a book by Jan and Annie Romein, widely read at the time, called 'Forebears of our Civilisation' (in Dutch 'Erflaters van onze beschaving').

For the first time in many years DNB issued a complete series of 4 denominations, the Forebears 1 series (10-25-100-1000 guilders). The famous Dutch humanist Erasmus was portrayed on the 100 guilder note.



8. Vondel

1966, Forebears 2 series, designer Ootje Oxenaar

The Banking Act of 1948 paved the way for DNB to issue banknotes with a value below 10 guilders. One of the first public surveys of DNB, in 1963, inquired after the public's need for a 5 guilder banknote, which came out positive. Ootje Oxenaar won a design contest for this note, for which 3 designers had been invited. Eventually, Oxenaar designed 9 banknotes for DNB, more than any other designer. When the Forebears 2 series was finished, the 5 guilder note was redesigned to make it fit better in the series. There was also a technical reason: the introduction of the optically readable number (OCR-B).



9. Snipe

1981, House-Tree-Animal series, designer
Ootje Oxenaar

After successfully completing two Forebears series, Oxenaar was commissioned by DNB to design a reserve banknote of 100 guilders, the most-used and most-counterfeited banknote. This time, the DNB board did not provide a theme and Oxenaar proposed a bird, a snipe. This note was the first in the western world to break the trend of portraits. The note was a great success not only in design, but 'snip' soon became synonymous with the amount of 100 guilders. In 1998 there is even talk of the 'Salmon Snip' (in Dutch 'Zalmsnip'), a 100 guilder tax reduction named after Minister Gerrit Zalm. After the success of the Snip, the DNB board left the selection of a theme for future banknotes to this graphic designer, providing an identity description instead.



10. Lighthouse

1986, House-Tree-Animal series, designers
Ootje Oxenaar and Hans Kruit

Theme of the note is the coast of the Netherlands. This banknote was a public's favourite; 91 % of the Dutch rated this design as beautiful in 1991. The security features were a rabbit (watermark), lighthouse (raised print), an oystercatcher (see-through register) and a list of Dutch towns that had a lighthouse (micro text, 0.3 mm). A second very small micro text (0.2 mm) is a strophe from the poem 'Kustland' (Ivoire Country) by Jan Jacob Slauerhoff.



II. Kingfisher

1997, Abstract Series, designer Jaap Drupsteen

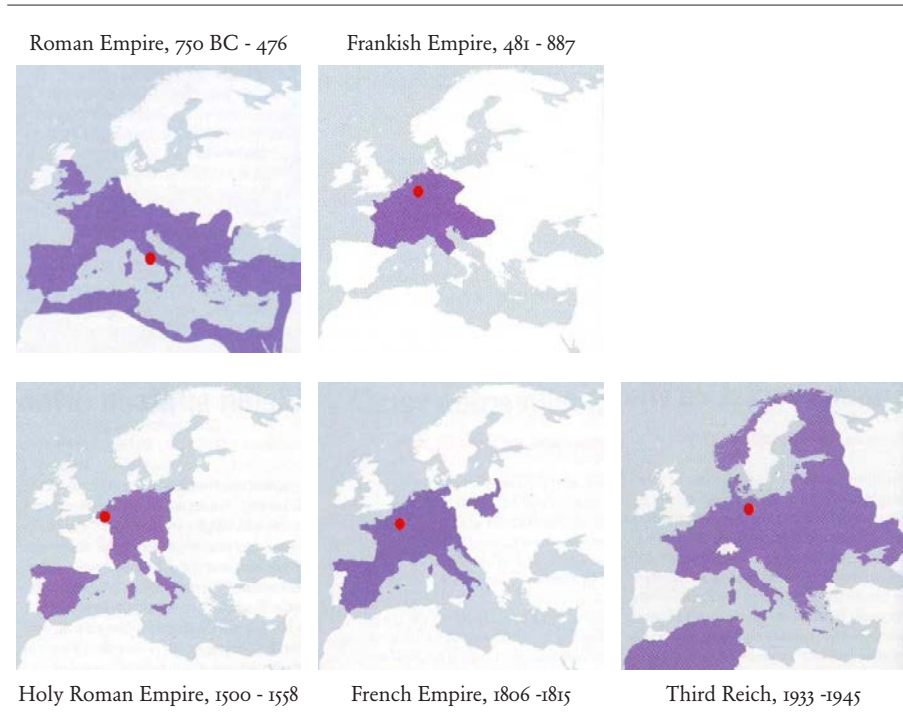
The last banknote issued by De Nederlandsche Bank. The value of the banknote is the design concept of this 'abstract series': the 25 guilders had 25 blocks, the 100 guilders received 100 circles and the 1,000 guilders a 1,000 rhombic shaped elements. All notes are named after their watermark. The design of the watermark was associated with the note's colour, the kingfisher for the blue 10 guilder. Especially for this banknote, poet Arie van den Berg was asked to write a poem. This poem 'De IJsvogel' ('The Kingfisher') is printed on the reverse in 0.3 mm tall micro-text.

Appendix 4

Monetary unions, currency boards and global currencies

Monetary unions, like the Latin Monetary Union and the Scandinavian Monetary Union are introduced in chapter 2, subsection 2.2.6 on currencies of monetary unions. The first monetary unions were established at the end of the 18th century and became quite popular in the 19th century as may be read from table A4.1. Before such unions were founded on a voluntary basis, there are several examples of the use of a common currency in occupied areas. Figure A4.1 provides five different periods of an occupied Europe covering over 2,000 years. For some thinkers the ultimate goal would be a global currency, as introduced in chapter 2, subsection 2.2.11 on global currencies.

Figure A4.1



A historical impression of occupied Europe covering over 2,000 years.

Table A4.1

Monetary union	Period	Remarks
United States	1789 - 1792	Silver dollar was created in 1789. Thirteen states formed the USA in 1792; dollar became national currency.
French Empire	1808 - 1814	Based on the metallic franc; one to one exchange rate to lira and Belgian frank. No central bank. No paper money.
Ottoman Empire	1831 - 1919	No central bank. No paper money.
Germanic Monetary Union	1838 - 1871	Custom union in 1834. Common thaler of the north, with a 1 to 1.75 fixed exchange rate with the southern gulden. Silver standard.
Switzerland	1850	Introduction of a single common currency but with several banks of issue and no central bank until 1907.
Italy	1861	Unification. Banknotes issued by six different private banks. Central bank in 1893.
Germany	1875	Unification. The Prussian Bank became the Reichsbank in 1876 and centralised banknotes issue. German states within the Empire retained the right to issue coinage.
Latin Monetary Union	1865 - 1927	Banknotes not included. No LMU central bank; central role for France. Multiple currencies with a fixed 1:1 exchange rate. Initially bimetallic, adapted the gold standard in 1873.
Scandinavian Monetary Union	1873 - 1924	Intense cooperation, but no common central bank. Single currency named crown minted nationally. Gold standard but with a dominant paper circulation. Ended by the Great Depression.
United Kingdom - Ireland	1922 - 1979	Parity between British Pound and Irish Pound. Until 1961 Irish banknotes were marked 'payable in London'. Ended when Ireland joined European Monetary System (EMS).
Austro-Hungarian Empire	1919 - 1927	Defeat at war. Creation of several new nation states.
Kingdom of Yugoslavia	1919	In 1920 the National Bank of Serbia became the National Bank of Yugoslavia, using the Serbian dinar as common currency. Entirely unified currency and coinage.
Poland	1991	The new Polish mark, pegged to the German mark, was destroyed by hyperinflation in 1924, while francs and dollars constituted the real currency. The Bank of Poland was created in 1924 together with the zloty, equal to a French gold franc.
Russian Empire	1918 - 1920	Creation of several new nation states.
Soviet Union (USSR)	1917- 1991	Peaceful dissolution of the federal pact in 1991.
Belgium-Luxemburg	1922 - 1999	Belgian franc and Luxembourgian franc were set at a fixed parity in 1922. Parity was revised in 1935 and 1944.
Common Monetary Area	1974 - ...	Member states: South Africa, Lesotho, Namibia and Swaziland.
Germany	1990	Unification of East and West Germany. The Bundesbank extended its function as central bank. One-to-one exchange rate of DDM into DEM decided at political level.
CIS	1991 - 1994	Commonwealth of Independent States; three members: Russian Federation, Republic of Belarus and Ukraine. Ukraine stepped out in 1994.
Czechoslovakia	1993	Political divergences, creation of new nation states (Czech Republic and Slovakia).
Yugoslavia	1991 - 1999	Political unrest, civil war, creation of several new states.
Montenegro introduced the euro in 2002.		
European Monetary Union	1999 - ...	Started with 11 countries of the European Union.
East African Monetary Union	2012?	Burundi, Kenya, Rwanda, Tanzania and Uganda

Limited overview of monetary unions. Source: Michael Bordo and Lars Jonung [64, 91].

Overview of monetary unions

After the monetary unions in the US and the Latin Monetary Union, many monetary unions followed as listed, with a bias towards Europe. Some unions involved only two countries like was the case with Belgium and Luxemburg. Monetary unions also occurred when states were unified, like the German and Italian unification in the 19th century and recently in 1990 the German reunification.

In most cases a political union preceded a monetary union. Critics of the European Monetary Union often use this argument: a political union is a requirement for a (stable) monetary union.

On the other hand these former unions were often first a political union, while the European Union is has to make several steps to further political integration, leading to a political union, often referred to as the United States of Europe.

From one monetary union to another

Two countries, Belgium and Luxemburg, moved from one monetary union into another; both countries joined EMU in 1999. On a smaller scale the monetary arrangements of France with Monaco and Andorra, and those of Italy with Vatican and San Marino merged into EMU. These four smaller European entities rely for their euro banknotes on, respectively, France and Italy. However, they are allowed to issue their own euro coins as shown in figure A4.2.

Currency boards

Countries that wish to keep their own coins and banknotes but are not strong enough to pursue their own monetary policy may opt for a currency board, a currency union which maintains a fixed exchange rate with a foreign currency. The monetary authorities peg their currency to an anchor currency. A currency board maintains unlimited convertibility between its notes and coins and the anchor currency, at a fixed rate of exchange, with no restrictions on account transactions.

Figure A4.2



Euro coins were issued since 2002 in Vatican, San Marino and Monaco. A monetary agreement was signed by Andorra and the EU on 30 June 2011. After ratification, the agreement will make the euro Andorra's official currency and allow Andorra to mint up to 2.4 million coins.

No seigniorage for currency boards

A country with a currency board does not have a monetary income as it do not issue money. The peg with the foreign currency tends to keep interest and inflation rates closely aligned to those in the country against whose currency the peg is fixed. A currency board has no power to affect the monetary policy, does not lend to the government and does not regulate reserve requirements. It just has to follow the anchor currency. To meet their spending commitments such countries have two income sources: taxes and profit from interest on foreign reserves.

The East Caribbean Currency Union is an example of a currency board, with members like Antigua, Bermuda and Grenada. A total of eight countries have been united since 1965 in the Organization of Eastern Caribbean States and use a common currency, the East Caribbean dollar, which is pegged to the US dollar. A banknote of this currency board is shown in appendix 5, figure A5.9e.

Instead of printing their own banknotes and pegging this currency to another currency, central banks may just use another currency. A recent example is the introduction of the US dollar on the BES-islands (Bonaire, Saba and Sint Eustatius). These three former islands of the Dutch Antilles became in 2010 a part of the Netherlands. Instead of introducing the euro they opted for the use of the US dollar (figure A4.3). Another example is Montenegro, formerly a part of Yugoslavia, which uses the euro banknotes without being part of the Eurosystem.

Figure A4.3



Coin ‘Caribbean Sunrise’, issued in October 2010 on the occasion of the introduction of the US dollar on Bonaire, Sint Eustatius and Saba, also known as BES-islands.

- a) Front side. Bonaire on the left (leeward island) and Sint Eustatius and Saba on the right (windward islands). The leeward and windward islands are far from each other and are now overseas municipalities of the Netherlands. The sea connects the three islands together visually and birds fly from one island to the other, also connecting the islands. People on all three islands see the same Caribbean sunrise.
- b) The flipside of the coin is clearly the value of the currency. The word ‘dollar’ is surrounded by three circles which again symbolize the BES islands. These circles are constructed from the rays of the front. The circles are lower in the nucleus together where they overlap. This represents the island union.

First design concept by DNB (De Heij). Detailed design and production: Royal Dutch Mint.

CFA franc

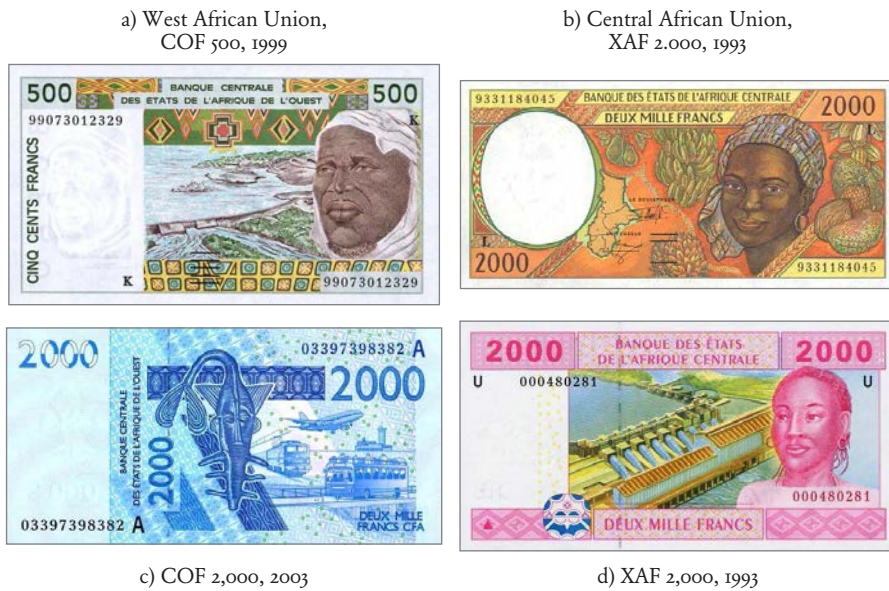
Political and monetary unification went hand in hand when the African CFA was introduced in 1945, a currency guaranteed by the French treasury. CFA stands for 'Communauté Financière Africaine' or 'African Financial Community' and is used in fourteen countries. Several countries never had their own currencies but used the French franc until they joined the CFA. The CFA is split in two currencies:

- 1) West African CFA franc (XOF),
- 2) Central African CFA franc (XAF).

Both CFA Francs currently have a fixed exchange rate to the euro and are interchangeable, but do not co-circulate. The CFA franc circulates in 14 countries, while 8 countries use the XOF and 6 the XAF (figure A4.4).

Next to the CFA franc there is also the CFP franc - currency code XPF - circulating in three countries: French Polynesia, New Caledonia and Wallis and Futuna.

Figure A4.4



Banknotes from two monetary unions in Africa. Left the West African Union and on the right the Central African Union. Members of the West African Union are: Benin (B), Burkina Faso (C), Cote d'Ivoire (A), Guinea-Bissau (S), Mali (D), Niger (H), Senegal (K) and Togo (T). In the past the letter E was used for Mauritania. The corresponding letter of the country used on the banknote is given in brackets. Members of the Central African Union are: Cameroon (U), Central African Republic (M), Chad (C), Republic of the Congo (T), Equatorial Guinea (E) and Gabon (A).

- a) COF 500, issued in 1999. K for Senegal.
- b) COF 500, issued in 2003. A for Cote d'Ivoire.
- c) XAF 2,000, issued in 1993. L for Senegal.
- d) XAF 2,000, issued in 2003. U for Cameroon.

The participating countries of the CFA all have a small national design element on their banknotes, a letter, providing some national identity to the note. This letter can be traced to the issuing country, like for example K for Senegal.

Currency interchangeability agreements

Third forms of joint banknote use are currency interchangeability agreements. From a design point of view are of interest the commemorative 20 dollar banknotes of Singapore and Brunei (figure A4.5). These notes have a national front and a common reverse, a concept similar to the euro coins. These notes were issued in 2007 when both countries celebrated their Currency Interchangeability Agreement. At first Malaysia was also part of this currency agreement, but they stepped out in 1973.

Proposals for a world currency

Five proposals for a world currency were shortly discussed in chapter 2, subsection 2.2.11 on global currencies. This subsection elaborates on the last three proposal for a global currency.

Third proposal for world currency (1944)

The third time a global currency was seriously discussed was during the Bretton Woods Conference in 1944. In this winter sports resort 45 countries discussed how

Figure A4.5



Joint-issue of a commemorative banknote in Brunei and Singapore in 2007, issued on the occasion of the 40 years Anniversary Currency Interchangeability Agreement. The two issues have similar size and reverse and the banknote numbers on both issues were also chosen to be similar.

to go further after World War II. Proposals were made for the erection of three major institutions:

- The International Monetary Fund (IMF),
- The World Bank,
- The Organisation for Economic Co-operation and Development (OECD).

The IMF should focus on monetary stability, including stable exchange rates. The task of the World Bank would be to stimulate the global economy. Trade barriers should be addressed by the OECD.

The United States used its dominant position at the conference to bury the British ideas about a global currency named 'Bancor', and the leaders decided to pursue a policy of tying the world's currencies to the dollar instead of to gold. The US dollar would, in turn, be convertible into gold at a fixed price of USD 35 per ounce (= 31.1 gram). The United States accounted for over half of the world's manufacturing capacity and held about 2/3 of the world's gold, and this fixed price was expected to hold. Governments were allowed to sell their gold to the United States treasury at the price of 35 dollar per ounce. This system of fixed exchange rates between currencies, enacted in 1946, became known as the Bretton Woods System. In fact, it meant that all world currencies were pegged to the US dollar. Meanwhile, nations could still pursue their own (limited) monetary policies. In the Netherlands for, example, it was decided that at least 50% of all banknotes and deposits should be covered by gold or foreign exchange. The first adjustment came as early as 1946 when several currencies, including the British pound and the Dutch guilder, had to devalue against the dollar by 30 % or more.

Offshore currencies (1960)

The development of telecommunications channels in the 1960s made it possible to transfer money reliably and safely over large distances. Dollar transactions between New York and London became simple book-keeping operations. Currencies could be transferred easily around the globe and could be transacted outside the country of issue. From New York, for example, dollars could be lent and borrowed in South Korea; currencies became offshore currencies. This raised questions regarding the role of states in matters such as managing, controlling and regulating international money and, above all, regarding the inherent risks.

With the spread of the Internet in the 1990s, this development received another boost.

Demise of the Bretton Woods System (1973)

In the 1960s a continuing trade deficit between the US and the rest of the world resulted in systematic dollar selling. While this led inflation in the US, the fixed price of 35 dollar for an ounce of gold could be preserved. Some ten years later, in 1973, when the costly Vietnam War had ended, the USA had to relinquish its fixed exchange rate against gold. The trading of gold at the fixed price had been stopped

by the President of the USA on 15 August 1971. At that point, for the first time in history, formal links between the major world currencies and real commodities such as gold or silver were severed. As a result the dollar devalued, inciting people to sell their greenbacks for gold, and gold was re-priced several times. The oil crises of 1973 further undermined the value of the dollar and the US government severed all links between the value of the dollar and gold. With the breakdown of the gold standard in the early 1970s, all currencies in the world became purely fiduciary or fiat currencies and the gold standard has never been used since in any major economy.

The value of the SDR (unit of account for the Fund) was fixed in terms of US dollars. Over time, the value changed as follows: SDR 1 = US dollar 1 through November 1971. Since 1 April 1978 the value of the special drawing right, which was previously also defined in terms of gold, has been defined only as the sum of the values of fixed amounts of a number of currencies. Since 1 July 1974 the International Monetary Fund has been using this 'standard basket' technique to determine the equivalent of an SDR unit in national currency.

1 July 1974 saw the introduction of a Special Drawing Right (SDR) on the IMF, the value of which was based on a fixed basket of 16 currencies. As the basis for its analyses and calculations, the Commission took a basket of currencies constructed on similar lines to those of the SDR basket and with the same value as the SDR basket as at 28 June 1974: the existing units of account valued at 0.88867088 gram of fine gold have an 'official' dollar value of USD 1.20635.

In 1971, US President Richard Nixon (1913-1994) removed the gold backing from the US dollar, causing a collapse in the Bretton Woods system that managed the world's currencies. The widespread currency floats and devaluations set back aspirations for European monetary union. However in March 1979 the European Monetary System (EMS) was created, fixing exchange rates onto the European Currency Unit (ECU), an accounting currency, in order to stabilise exchange rates and counter inflation. It also created the European Monetary Cooperation Fund (EMCF).

Fourth proposal for a world currency (1976)

A fourth time occurred in 1976 when the agreement on free floating rates was settled. In this arrangement an international, world monetary system was the missing factor. Several economists have thought this situation over. One of them was Nobel Prize laureate Friedrich Hayek (1899-1992). In 1976, in a paper on 'The Denationalization of Money', Hayek advocated the elimination of national currencies. A world monetary system is no longer centred on exclusive government-issued national currencies. According to Hayek, currency substitution could be achieved through co-circulation of currencies. Co-circulation would trigger the issuers of money to compete with each other to produce the best, most stable and healthy currency.

Fifth proposal: G-3 Monetary Union (2005)

Setting limits on extreme currency movements is a topic regularly discussed by economists. In 2005 Nobel Laureate Robert Mundell proposed to ‘consider the possibilities of a monetary union of the Federal Reserve Board, ECB and Bank of Japan, i.e., a G-3 monetary union.’ [109]. His approach is to start out with arrangements for stabilizing exchange rates between the Dollar, Euro and Yen or DEY-currencies and move from there to a global currency. Next the DEY could become the platform on which to build a global currency, which Mundell named INTOR. Special Drawing Rights (SDR) of the International Monetary Fund could be the catalyst bonding the three coins into a global currency. For the branding experts and graphic designers the question is what should such a DEY-banknote look like?

A counter-argument to Mundell’s ideas on a global currency and/or a G-3 Monetary Union is the increasing inter-state cooperation between financial and monetary officials. Since the mid-1970s dominant economic countries have cooperated with each other in bodies such as the Bank for International Settlements (BIS).

Appendix 5

Examples of banknote design familiarity

Several examples of banknote familiarity are provided in this appendix:

- Look-a-likes old (figure A5.1),
- Look-a-likes modern times (figure A5.2),
- Iconic layout (figure A5.3),
- Typical main image like bridges (figure A5.4) or elephants (figure A5.5),
- Political leaders or head of states (figure A5.6),
- Portrait of one person over the decades (figure A5.7),
- Group portraits (figure A5.8).

The principle of an iconic, or more general a pre-set layout was introduced in ‘Public feedback for better banknote design 2’, published in 2007 [126].

Figure A5.1

a) US banknote, 1870

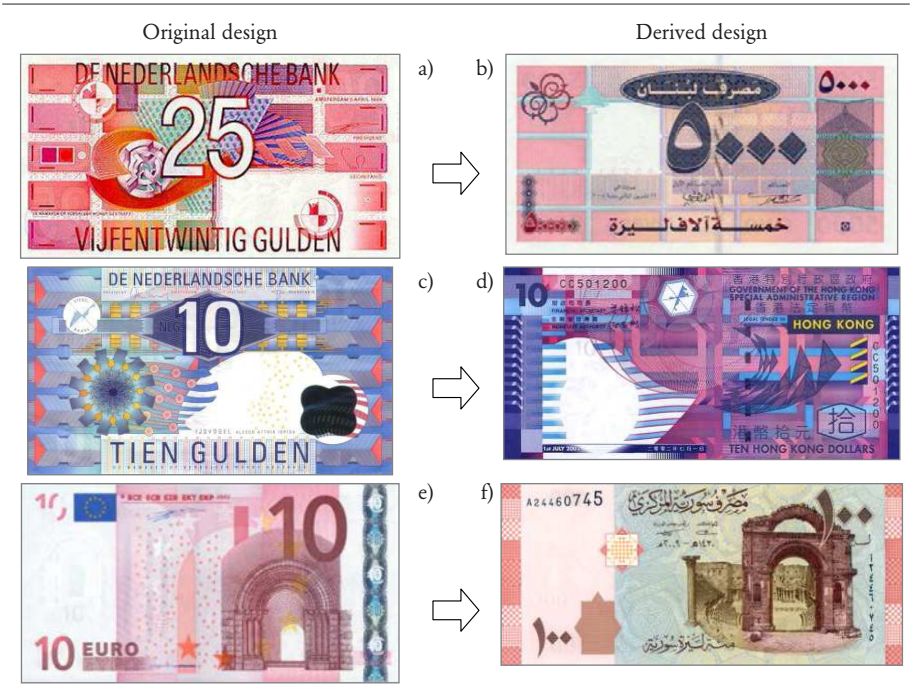


b) Japanese banknote, 1873

Example of a similar design used by the printer for two different countries.

- a) US 10 dollar banknote issued in 1870.
- b) A design made for the Japanese national bank, issued in 1873, following closely the earlier US design.

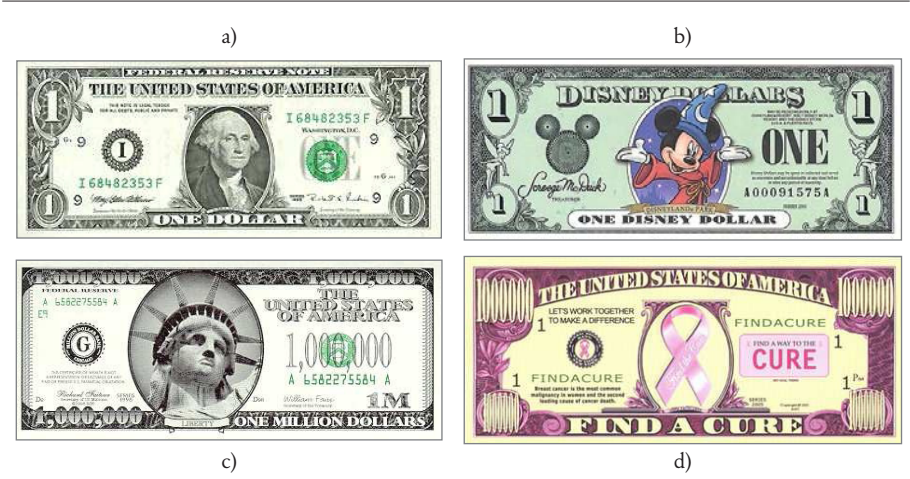
Figure A5.2



The three banknotes on the left were used as design models for the three on the right.

- a) Netherlands: NLG 25/Robin, 1989. Designer: Jaap Drupsteen.
- b) Libanon: LBP 5,000 issued in 1994. Designer: unknown.
- c) Netherlands: NLG 10/King fisher, 1997. Designer: Jaap Drupsteen.
- d) Hong Kong: HKD 10, issued in Hong Kong in 2002. Designer: Inge Madlé.
- e) Euro: EUR 10/Roman style. Designer: Robert Kalina
- f) Syria: SYP 100, issued in Syria in 2009. Designer: Robert Kalina.

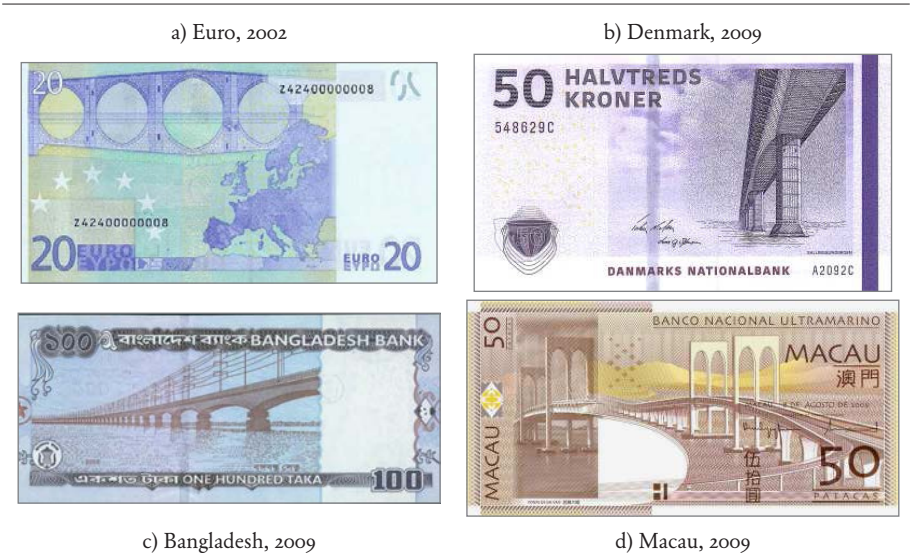
Figure A5.3



Banknote familiarity of US dollar banknote design.

- a) One USD (1929).
- b) Fake banknote one million dollars (1998).
- c) One Disney dollar (2001).
- d) Find a cure note (2009).

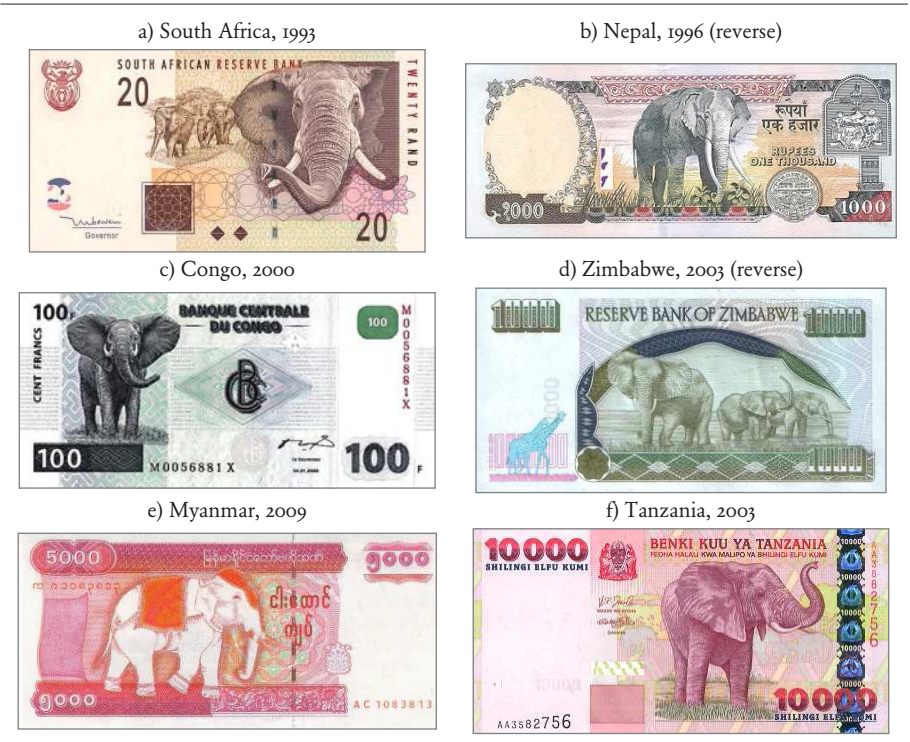
Figure A5.4



Banknote familiarity: bridges.

- a) Euro, EUR 20 (2002).
b) Danish krone, DKK 50 (2009)
c) Bangladeshki taka, BDT 100 (2009)
d) Macau pataca, MOP 50 (2009)

Figure A5.5



Banknote familiarity owing to the main image: elephants.

- a) South African rand, SAR 20 (1993, upgrade 2005).
b) Nepalese rupee, NPR 1,000 (1996).
c) Congolese franc, CDF 100 (2000).
d) Zimbabwean dollar, ZWD 1,000 (2003).
e) Myanmar kyat, MMK 5,000 (2009).
f) Tanzanian shilling, TZS 10,000 (2009).

Figure A5.6



'Head of state' portrait notes – reigning or abdicated – except for Mahatma Ghandi, who was a political leader and was never head of state. The familiarity is enforced by the portrait position on the right side of the note. The portraits on the banknotes of Thailand, Turkey and the UK look into the eyes of the banknote holder, while the others avoid eye contact (India, China and Iran).

- a) Indian rupee, IDR 20 (2001), Mahatma Ghandi.
- b) Chinese yuan, CNY 100 (2005), Mao Tse Toeng.
- c) Thai baht, THB 1,000 (2005), King Rama IX in Supreme Commander uniform.
- d) Turkish lira, TRY 20 (2005), Kemal Atatürk.
- e) Iranien rial IRR 50,000 (2007), Ayatollah Khomeiny, 2007.
- f) British pound, GBP 20 (2007), Queen Elisabeth II.

Figure A5.7



In 1954 the portrait of Queen Elizabeth II was the first printed on a banknote. In 1960 she was the first reigning monarch to be printed on a British banknote. Before, the portrait of King George V, her father, had figured on several banknotes in the British Empire, but never on notes of the United Kingdom. Today the face of Queen Elizabeth II is without doubt the most frequently engraved portrait. She appears not only on British banknotes, but also on the front of many other national banknotes, lending mutual resemblance to all these banknotes. The colonial past still lingers in banknotes of Australia, Canada, several nations in the Caribbean and others, all former members of the Commonwealth. The overview provided spans 57 years and is therefore also an illustration of the development of portrait gravures. From small and no eye contact to a large, softened portrait, Queen Elizabeth II is now looking at us with an open, optimistic face (figure A5.7h).

- a) Canadian dollar, CAD 1 (1954).
- b) Cyprus pound, CPY 5 (1955). Text in English, Greek and Turkish.
- c) East African shilling, XEAS 100 (1958). Texts in both English and Arabic.
- d) British pound, GBP 1 (1960).
- e) East Caribbean dollar, XCD 10 (1993).
- f) Australian dollar, ASD 5 (1995). Polymer banknote.
- g) Canadian dollar, CAD 20 (2004). Text in English and French.
- h) Gibraltar pound, GIP 5 (2011).

Figure A5.8

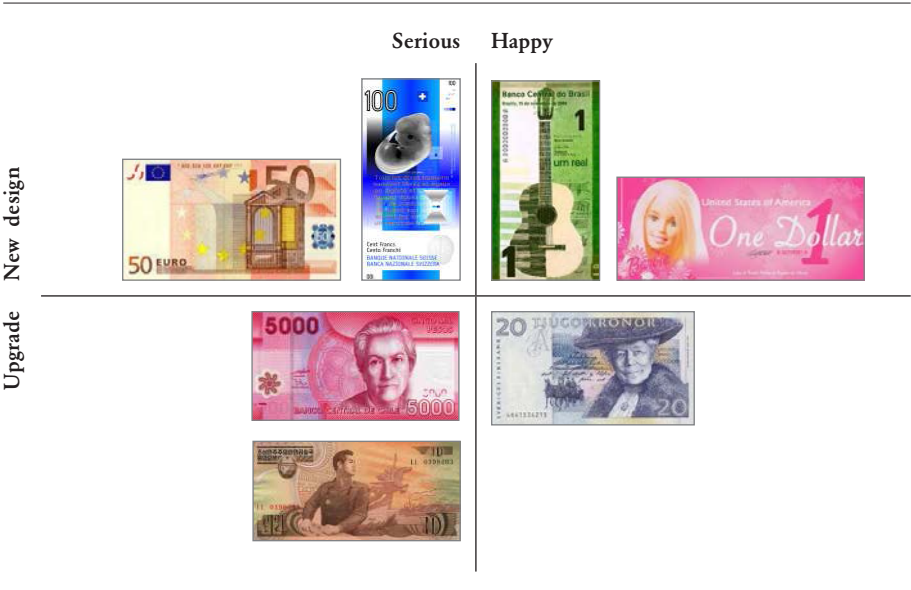


- Group portraits on banknotes clearly show a mutual resemblance.
- a) Chinese yuan, 50 (1987). Three anonymous Chinese workers: an intellectual, a farmer, and an industrial worker.
 - b) Ghanaian cedi, GHC 5 (2007). The Big Six; leaders of the United Gold Coast Convention (UGCC).
 - c) Nigerian naira, NGN 50 (2007). Group of inhabitants of Nigeria (Hausa, Igbo and Yoruba men and a woman), issued in 2007.
 - d) Guatemalan quetzal, GTQ 200 (2007). Three marimba musicians of Guatemala (Germán Alcántara, Mariano Valverde and Sebastián Hurtado).
 - e) Philippine peso, PHP 1,000 (2010). Three people who received the Medal of Honor on the occasion of the centenary of Philippine independence (Abad Santos, Lim, and Escoda).

Appendix 6

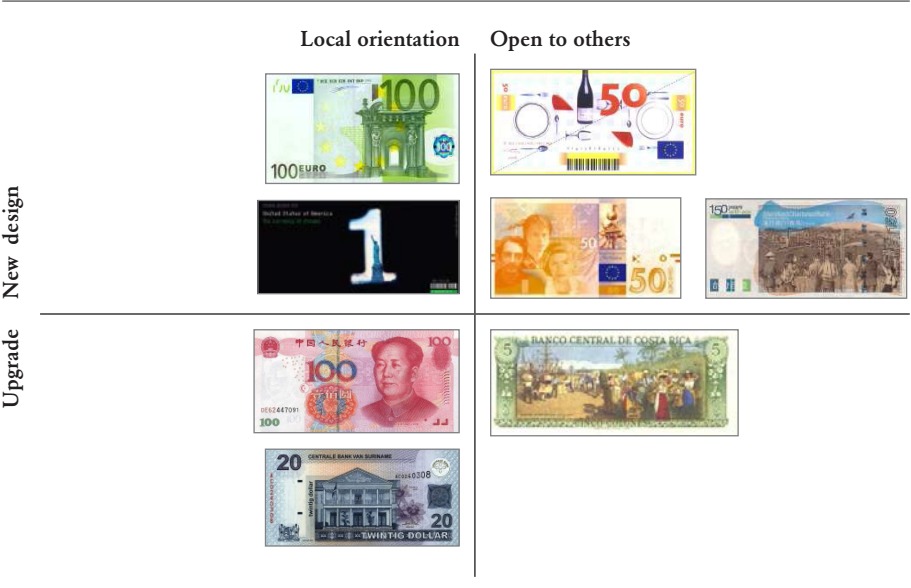
Examples of banknote positioning diagrams

Figure A6.1



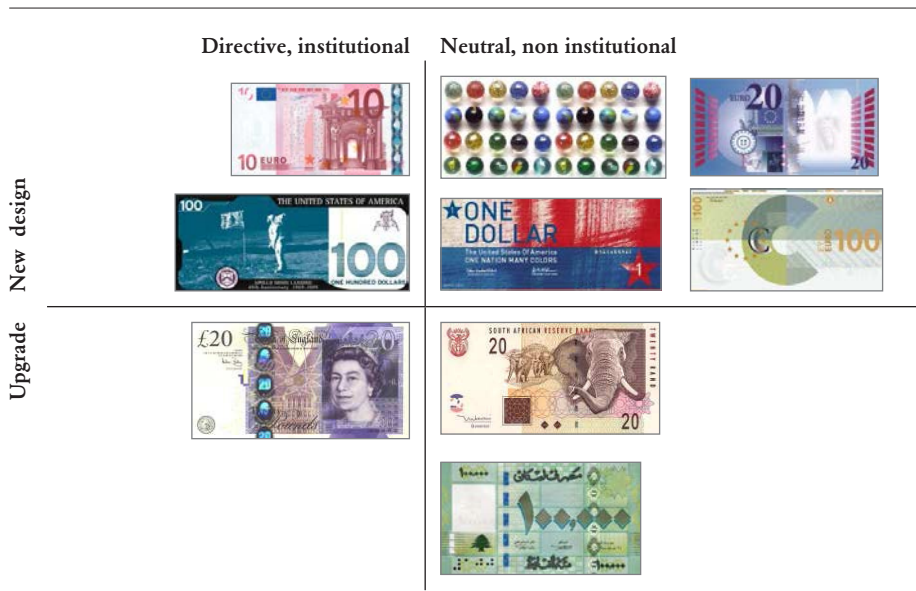
Example of a positioning diagram with the parameters ‘upgrade - new design’ and ‘serious-happy’. Clockwise the following notes are displayed: euro 50 (2002), embryo design by Manuel Krebs (Switzerland, 2005), guitar design by Guilherme Tardin (Brazil, ~2003), Barbie design by University of Minnesota (2009), SEK 20 (1992, 1997), CLP 5,000, new portrait gravure of Gabriela Mistral (1889-1957), polymer (2009) and KPW 10 (1992, 1998).

Figure A6.2



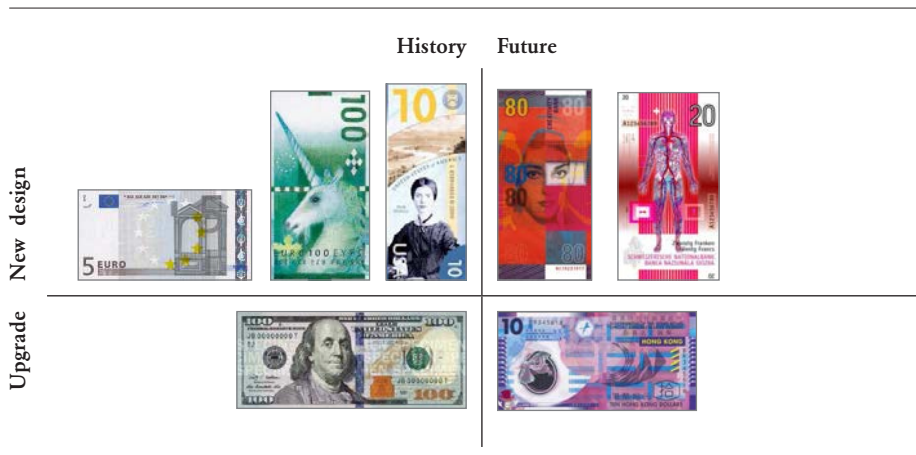
Example of a positioning diagram with the parameters ‘upgrade - new design’ and openness to others (local orientation - open to others). Clockwise the following notes appear: 100 euro (2002), one dollar ‘statue of liberty’ design by Sandra Hill (2009), 50 euro design ‘European dish’ by Tom van Enckevort (2008), 50 euro design ‘European people’ by Maryke de Greyse (1996), HKD 150 design by Henry Steiner (2009), CRC 5 (several upgrades since 1971), CNY 100 (2005), SRD 20 (2004).

Figure A6.3



Example of a positioning diagram with the parameters 'upgrade - new design' and 'directive institutional - neutral, non-institutional'. Clockwise the following notes are shown: 10 euro (2002), 100 dollars 'man on the moon' design by Nate Casliglione (2009), 'marbles' design by Tim Mine (2009), one dollar 'star' design by Bhavika Parekh (2009), 20 euro design by Jaap Druspteen (1996), 100 euro 'Roman numerals' design by Klaus Michel and Sanne Jünger (1996), SAR 20 (2005), LBP 100.000 (1995, 2004, 2011), GBP 20 (several upgrades since 1960).

Figure A6.4



Example of a positioning diagram with the parameters 'upgrade - new design' and 'historic - future'. Clockwise the following notes appear: euro 5 (2002), euro 100 'unicorn' design by Robert Oxenaar (1996), 10 dollars 'Emily Dickinson' by Dean Potter (2009), 80 units 'Maria Callas' design by Roger Pfund (2005), CHF 20 'human body' design by (Manuel Krebs (2005), HKD 10 'abstract' design by Inge Madlé (2004), USD 100

Appendix 7

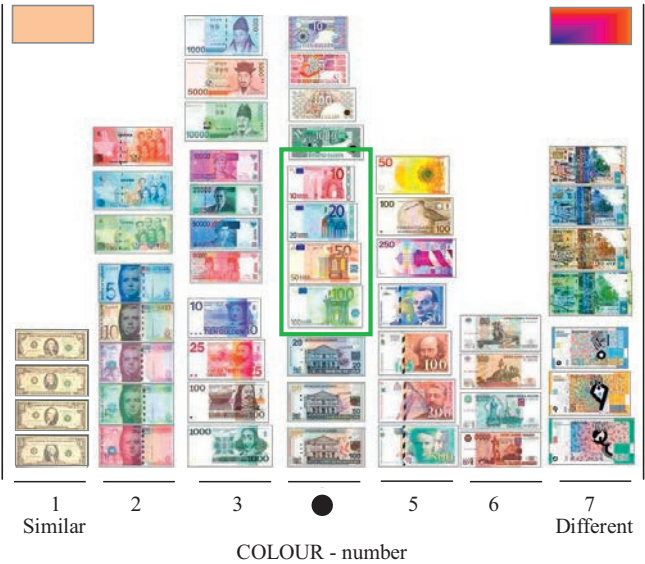
Examples of balance diagrams for banknote design

To provide an example for balance diagrams as proposed in chapter 5, section 5.6, the euro banknotes are compared to banknotes from France, Ghana, Indonesia, Kazakhstan, Netherlands, Russia, Scotland, South Korea, United States and to several banknote designs which were never issued. The scores provided are an exercise; the scoring was done by De Heij.

Based on public feedback, the central bank governors could indicate the design of a next series by using the balance diagrams as introduced and give instructions as follows:

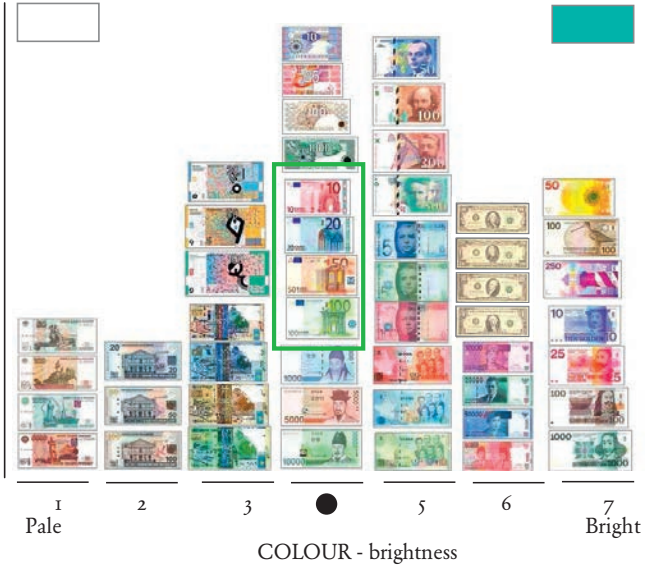
- Move number of colours from position 4 to 5 (figure A7.1),
- Keep colour brightness as it is; keep position 4 (figure A7.2),
- Move white area one step towards intense; from position 5 to 6 (figure A7.3),
- Move border lane one step to the left; from position 4 to 3 (figure A7.4),
- Move silhouette four steps towards different silhouettes; from position 5 to 7 (figure A7.5).

Figure A7.1



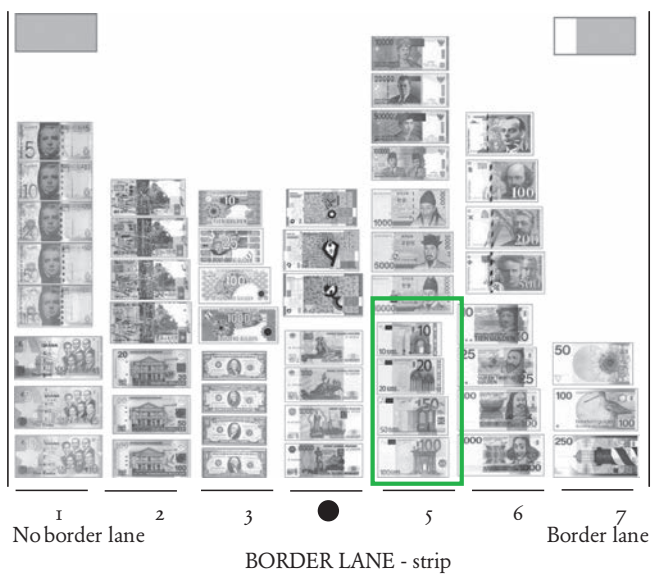
Balance diagram: number of colours used. Euro banknotes in scale 4.

Figure A7.2



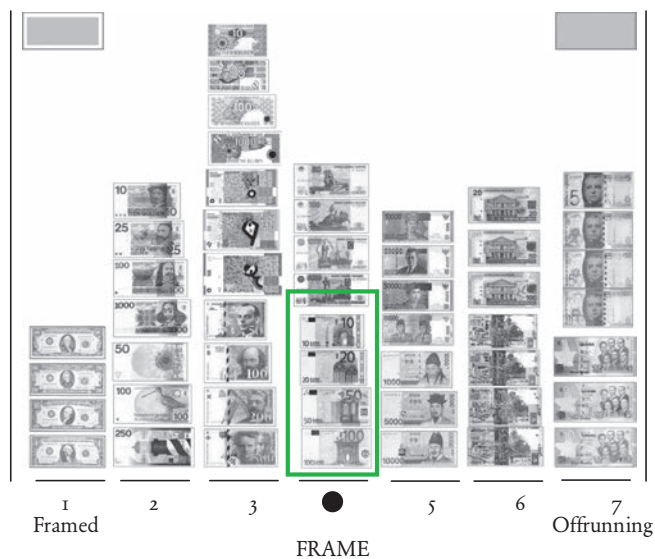
Balance diagram: colour brightness. Euro banknotes in scale 4.

Figure A7.3



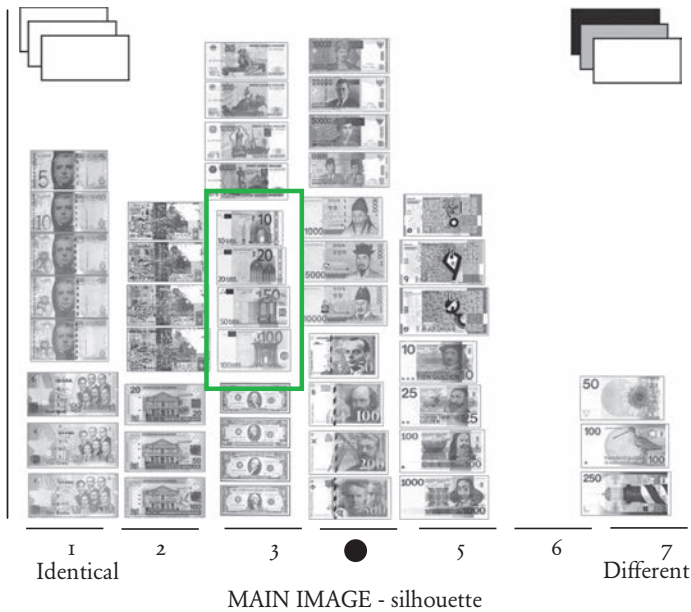
Balance diagram: width of border lane on the left. Euro banknotes in scale 5.

Figure A7.4



Balance diagram: frame around the borders. Euro banknotes in scale 4.

Figure A7.5



Balance diagram: silhouette of the main image. Euro banknotes in scale 3.

Appendix 8

Questionnaire on the identity of euro currency

A8.I Introduction

In the two-yearly opinion poll on euro banknotes in 2011, a number of questions have also been asked about how European respondents feel and whether the current euro banknotes and coins have a European identity. This appendix is a copy of the online questionnaire (respondents answered from behind their computer, using internet). An example is provided in figure A8.i.

Figure A8.I

[illegible]

Example of the online questionnaire. The question is: Which of the following elements of the euro 20 contribute to the European identity of the euro banknotes? Respondents could answer on a 5-point interval scale.

A8.2 Online questionnaire

The questionnaire included the following 15 questions.

Question 1

Introduction

Recently, you participated in a telephone survey on euro banknotes. Additional, we would like to ask you the following questions. Completing this questionnaire will take about 7 minutes of your time.

Question 2 - Open

When you think about Europe, what is do you consider to be typically European? What kind of pictures popup in your mind? What concrete things do you think off?

Question 3 - Left Right Matrix

The Netherlands is part of Europe and therefore we are Europeans. To what extent do you feel European?

I feel ...

Full European ☐☐☐☐☐☐ Not European

Question 4 - Single coded (Scripter: Random)

The Netherlands is part of Europe and therefore we are Europeans. For yourself, to which other countries or regions in the world is Europe most associated to?

- | | |
|------------|--------------------------|
| 1. USA | 5. Russia |
| 2. Turkey | 6. No idea, no opinion |
| 3. Morocco | 7. Different, namely ... |
| 4. Africa | 8. Don't know |

Appearance of the euro banknotes

Question 5 - Single coded

How would you judge the appearance of the euro banknotes on a European look or in other words what is the European identity?

- | | |
|----------------------------------|-------------------------------|
| 1. Very much European appearance | 3. Little European appearance |
| 2. Much European appearance | 4. No European appearance |

Question 6 - Single coded

To what extent do you feel it is important that the appearance of the euro banknote has a European dimension or in other words exudes a European identity?

- | | |
|-----------------------------------|----------------------------|
| 1. Very important | 4. Unimportant |
| 2. Important | 5. Very unimportant |
| 3. Neither important or important | 6. Do not know, no opinion |

Question 7 - Open

Which elements/features of the appearance of the euro banknotes contribute to a European dimension? We do not refer to the fact that we now all use similar coins in Europe, but we refer to the appearance, the look of the notes.

Question 8 - Info

Here you see the front and back of the <50/20> euro note.

Please take your time and have a look at this banknote. When you are finished you are asked to answer a question concerning the appearance of the <50/20> euro note (figure A8.2).

Figure A8.2



The images of the banknotes used for the online questionnaire.

- a) Front and reverse of euro 20.
b) Front and reverse of euro 50.

Question 9 - Matrix (Scripter: Random)

To what extent do the following elements/features of the appearance of the <50/20>-euro banknote contribute to the European identity of the Euro banknotes?

	Very much contribution	Much contribution	Little contribution	No contribution	Do not know/ no opinion
European flag					
Map of Europe					
Word euro					
Euro in Greek					
Signature					
Building front (window, door)					
Different style periods (Classic, Gothic, Renaissance etc.)					
Colours					
Bridge					
Optimism					
Letters BCE ECB EZB EKT EKP					
Euro sign, currency symbol €					
Stars					

Question 10 - Multi coded

Do you see other elements/features of the appearance of the euro banknotes that could contribute to the European identity of the euro banknotes?

2. Different, namely ...
3. Different, namely ...
4. Different, namely ...
5. No
6. Don't know

	Very much contribution	Much contribution	Little contribution	No contribution	Do not know/ no opinion
Different, namely (1)					
Different, namely (2)					
Different, namely (3)					

To what extent do these elements/attributes to the European identity of euro banknotes.

Question 11 - Info

Here you see the front and back of the <50/20> euro note.
Would you like this picture here for you view convenience, because below is a question concerning the appearance of <50/20> euro note (figure A8.2).

Question 12 - Matrix (Scripter: Random)

To what extent do the following elements/features contribute to the appearance of the <50/20>-euro banknote to the European identity of the Euro banknotes?

	Very much contribution	Much contribution	Little contribution	No contribution	Do not know/ no opinion
European flag					
Map of Europe					
Word euro					
Euro in Greek					
Signature					
Building front (window, door)					
Different style periods (Classic, Gothic, Renaissance etc.)					
Colours					
Bridge					
Optimism					
Letters BCE ECB EZB EKT EKP					
Euro sign, currency symbol €					
Different, namely (1)					
Different, namely (2)					
Different, namely (3)					
Stars					

Appearance of the euro coins

Question 13 - Single coded

How would you judge the appearance of the euro coins on a European look or in other words what is the European identity?

1. Very much European appearance

2. Much European appearance
3. Little European appearance

4. No European appearance

Question 14 - Single coded

To what extent do you feel it is important that the appearance of European currencies has a European dimension in other words expresses the European identity?

- | | |
|---------------------------------------|---------------------------|
| 1. Very important | 4. Unimportant |
| 2. Important | 5. Very unimportant |
| 3. Neither important, nor unimportant | 6. Don't know; no opinion |

Question 15 - Open

Which elements/features of the appearance of the euro coins contribute to a European dimension? We do not refer to the fact that we now all use similar coins in Europe, but we refer to the appearance, the look of the coins.

Question 16 - Info

Here you see the front and back of the 1 euro coin (figure A8.3).

Please take your time and have a look at this coin. When you are finished you are asked to answer a question concerning the appearance of the coin.

Figure A8.3



Euro coin

a) Common side.

b) National side of the Dutch one euro coin.

Question 17 - Matrix (Scripter: Random)

To what extent do the following elements/features of the appearance of the 1 euro coin contribute to the European identity of the Euro banknotes?

	Very much contribution	Much contribution	Little contribution	No contribution	Do not know/ no opinion
Diversity: the coins have a national side (e.g. Queen Beatrix)					
Unity: the coins have a common side					
Word euro					
Euro in Greek					
Map of Europe					
Text 'God Be With Us'					
The word eurocent					
Euro sign, currency symbol €					

Do you see other elements/features of the appearance of the euro coins that could contribute to the European identity of the euro coins?

2. Different, namely ...
5. No
3. Different, namely ...
6. Don't know
4. Different, namely ...

To what extent do these elements/attributes to the European identity of euro coins.

	Very much contribution	Much contribution	Little contribution	No contribution	Do not know/ no opinion
Different, namely (1)					
Different, namely (2)					
Different, namely (3)					

Question 18 - Open

What would you recommend to the European Central Bank (ECB) as being typical European features to be used in a new innovative banknote (other than already incorporated in the euro note and coin)?

Question 19 - Multi coded (Scripter: Random)

Which of the following items would you recommend to the European Central Bank (ECB) as typical European characteristics to be used for a new banknote design (other than already incorporated in the euro note and coin)?

1. Football (soccer) (Champions League, European Championship)
2. Song festival
3. European building (Eiffel tower, churches, ...)
4. European Parliament, European Union
5. Peace
6. Unity
7. Democracy
8. Diversity, differences, cultural differences
9. Optimism
10. Different, namely

Appendix 9

Eurosystem within European organisations

The European Union (EU) is not a federal state. It is a conglomerate of 27 states (2012) which have agreed to execute certain tasks together, in a federal way, and to follow certain rules. To complicate, not all states participate in all agreements. Best known are the 17 states that use the euro currency, while 10 states - for different reasons - don't.

The first visions on a united Europe came from France. Voltaire (1694-1778) proposed a 'European Republic'. Later Victor Hugo (1802-1885) was the first to propose a 'United States of Europe'. Both proposed these ideas in a world full of nationalism and their ideas remained anomalies. To be European in those days was to speak French. The Red Cross, founded in Geneva in 1859, and the Universal Postal Union, founded in Berne in 1874, are early examples of European cooperation. In 1944 Belgium, the Netherlands and Luxemburg started an economic cooperation: the Benelux. This economic union was enlarged in 1950 when the Benelux and three other European countries - West Germany, France and Italy - started the European Coal and Steel Community (ECSC). These six countries are referred to as the Europe-6. The ECSC grew out into the European Union in 1992 (Europe-11 or EU-11) and today there are 27 member states (EU-27).

For most people European organisations are abstract concepts, although many have heard of the EU or European Central Bank (ECB). Several 'products' of the EU are probably more familiar, like an European passport, driving licence, car plates, euro coins and banknotes (visual identity). Table A9.1 provides an overview of the most common verbal and visual identities of Europe.

Many studies have been written of the history, treaties and tasks of the EU. This appendix focuses on the position of the ECB within the European Monetary Union (EMU) and EU.

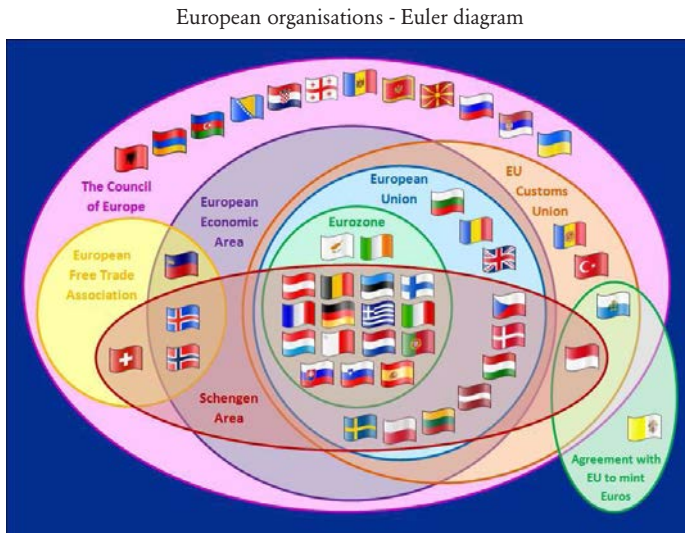
Table A9.1 Limited overview of major verbal and visual identities of the EU.

European identity What people (might) experience		
Year	Verbal identity	Visual identity
1944	Council of Europe	
1953	European Coal and Steel Community (ECSC)	
1955		European flag
1958	European Investment Bank	
1963	European Economic Community (EEC)	‘Made in EEC’
1968		Free movement of labour, European workers
1973	European Community (EC)	
1983	Cultural capital	Basic rights (Treaty of Rome) Flag is used in 1983 (European Parliament), and since 1986 (European Communities)
1985	Schengen	Free movement of people
1990		Free movement of capital
1993	European Union (EU)	Free movement of goods
1995		Uniform format of passport
1998		Format of vehicle licence plate, ring of stars and country code Format of driver licence European Central Bank, President Duisenberg
1999	euro European Central Bank	Building ECB in Frankfurt Exchange rates fixed Education uniformed (e.g. Bachelor and Master titles)
2002		Euro coins and banknotes
2003		EU citizens gates at passport control
2004		Free movement of services
2005		Identity card instead of passport for travelling inside EU
2006		Format of driver licence
2010	President of the EU	Format of vehicle licence plate, size President of the European Council
2013	SEPA	Debit cards standardised; European Single Payment Area: SEPA.

European organizations; Europe is complex

In 1945, there was a strong European spirit and the EU and its predecessors were created to make the countries of Europe cooperate with each other as equals. Today, after 67 years, a complex construction of European organisations has been built as illustrated by the Euler-diagram of figure A9.1. Next to the European Union, several other European organisations are shown, such as the Council of Europe, the European Economic Area, the European Customs Union, the Schengen Area, and the European Free Trade Association and finally the three countries are shown with

Figure A9.1



Euler diagram of European organisations, including Economic Free Trade Association, European Customs Union, Schengen Area, European Free Trade Association (January 2011). The first use of 'Eulerian circles' is commonly attributed to Swiss mathematician Leonhard Euler (1707-1783). An Euler diagram is a diagrammatic means of representing sets and their relationships. They are closely related to Venn diagrams.

which the EU has agreed that they may mint euro currency (Monaco, San Marino, Vatican City).

European organisations can often be seen as a set of matryoshka dolls, as in the case of the EU, the Eurosystem and the ECB. Below, the organizations relevant for the EU and EMU are discussed in more detail:

- Council of Europe (CoE),
- EU: European Council (EC),
- European Committee of Ministers of Finance (Ecofin),
- European Monetary Union (EMU),
- European System of Central Banks (ESCB),
- Eurosystem (eurozone, euro area or eurogroup),
- European Central Bank (ECB).

Council of Europe

The Council of Europe was proposed in 1946 by Winston Churchill (1874-1965). The Council of Europe should not be mixed up with the European Council, which is the highest body of the EU, whose membership comprises the heads of state or

government of EU Member States, along with its president and the president of the European Commission.

On 5 May 1949 the CoE became reality when 10 European states signed the Treaty of London. These nations were Belgium, Denmark, France, Ireland, Italy, Luxembourg, the Netherlands, Norway, Sweden and the United Kingdom. Today the Council of Europe has 47 members (figure A9.2).

According to its very first statute (Article 1a) the main aim is: ‘to achieve a greater unity between its members for the purpose of safeguarding and realising the ideals and principles which are their common heritage and facilitating their economic and social progress.’

The Council of Europe has a particular emphasis on legal standards, human rights, democratic development, the rule of law and cultural co-operation. The best known body of the CoE is the European Court of Human Rights. The quality standards for pharmaceutical products in Europe are set by the European Pharmacopoeia Commission, another well-known body of the CoE.

The CoE is headed by three bodies:

- 1) Committee of Ministers comprising the foreign ministers of the member states,
- 2) Parliamentary Assembly composed of members of parliament from the parliament of each member state,
- 3) Secretary General, usually a former prime minister of one of the member states.

Figure A9.2



Map of the Council of Europe with 47 member states (January 2011). Not participating are Belarus, Kosovo and the Vatican.

Membership is open to all European states which seek European integration, accept the principle of the rule of law and are able and willing to guarantee democracy and fundamental human rights and freedoms.

CoE member states maintain their sovereignty but commit themselves through conventions (i.e. public international law) and cooperate on the basis of common values and common political decisions. Member States of the European Union on the other hand transfer national legislative and executive powers to the European Commission and the European Parliament in specific areas under European Community law.

Economic cooperation in Europe

The successor of the ECSC was the European Economic Community (EEC) or Common Market, established in 1957 by the Europe-6. The three main activities of the EEC were:

- 1) Customs union (free movement of persons and capital),
- 2) Removing tariffs on trade between member nations; common price levels for agricultural products,
- 3) Cooperation in the nuclear power sphere (Euratom).

On 1 January 1993 with 11 Member States (Europe-6 plus Austria, Denmark, Great Britain, Spain and Portugal) the EEC was succeeded by the European Union (EU). The Lisbon Treaty (2009) legalised several activities as defined in the Treaty of the European Union (1992), the so called 'three pillars'. From then on all EU activities have been categorised by the following three levels:

1) Exclusive competence

- Customs union,
- Competition rules necessary for the functioning of the internal market,
- Monetary policy for the Member States whose currency is the euro,
- Conservation of marine biological resources under the common fisheries policy,
- Common commercial policy.

2) Shared competence

- Internal market,
- Social policy, for the aspects defined in this Treaty,
- Economic, social and territorial cohesion,
- Agriculture and fisheries, excluding the conservation of marine biological resources,
- Environment,
- Consumer protection,
- Transport,

- Trans-European networks,
- Energy,
- Area of freedom, security and justice,
- Common safety concerns in public health matters.

3) Supporting competence

- Research, technological development and space,
- Development cooperation, humanitarian aid,
- Coordination of economic, employment and social policies,
- Common foreign, security and defence policies.

EU: European Council

The European Council is the institution of the EU responsible for defining the general political direction and priorities of the Union. Individual steps of the EU no longer have to be approved by all ministers.

The European Council is responsible for the design, production, issue and circulation of the euro coins. These tasks are delegated to the Ecofin.

Ecofin

The Ecofin stand for the European Committee of Ministers of Finance and is part of the EU. This committee decides on the design of the euro coins and all other aspects of the euro coin production and circulation. The execution of these tasks is given to the national central banks (NCBs) of the respective eurozone countries.

Economic and Monetary Union of the European Union (EMU)

The three-stage plan for the creation of an economic and monetary union with a European central bank administering the single currency was proposed by the French minister Jacques Delors (1925) and was adopted in Madrid in 1989. The Economic and Monetary Union (EMU) is an umbrella term for the group of policies aimed at converging the economies of members of the EU in three stages to allow them to adopt a single currency, the euro. All member states, except Denmark and the United Kingdom, have committed themselves by treaty to join the EMU.

The EMU was a reaction to a successful European Monetary System (EMS) the means of European national governments to fix exchange rates among most of the European states. The 1992 Maastricht Treaty established the completion of the EMU as a formal objective and set a number of economic convergence criteria concerning the inflation rate, public finances, interest rates and exchange rate stability. EMU would entail:

- a) The four freedoms, i.e. free movement of goods, services, labor and capital,
- b) Common competition policy,
- c) Binding rules for procedures on budgetary policy,

- d) Single monetary policy based on price stability,
- e) Creation of an independent European System of Central Banks (ESCB) which would consist of the existing central banks and a new European Central Bank; the ESCB would become solely responsible for EC monetary policy,
- f) Irrevocably fixed exchange rates.

In short the advantages of the euro are:

- Reducing transaction costs on intra-European trade,
- Price transparency,
- World currency,
- Seigniorage gains for the members of the EMU,
- Promotion of a European identity.

European System of Central Banks (ESCB)

The legal basis for the single monetary policy is the Maastricht Treaty establishing the European Community and the Statute of the European System of Central Banks (ESCB) and of the European Central Bank (ECB). The ESCB comprises the ECB and the national central banks of all EU Member States whether they have adopted the euro or not. The legal texts which established the ESCB were written on the assumption that all EU Member States would adopt the euro and that therefore the ESCB would conduct all the tasks ensuing from the single currency. However, until all EU countries have introduced the euro, it is the Eurosystem which is the key actor.

The ESCB is responsible for the design, production, issue and circulation of the euro banknotes. These tasks are delegated to the ECB.

Eurosystem (eurozone, euro area or eurogroup)

The Eurosystem came into being when responsibility for monetary policy was transferred from the national central banks (EU-11) to the ECB in January 1999. The term Eurosystem covers the ECB and the national central banks of those EU Member States that have adopted the euro, also known as the eurozone. Countries that joined the European Union after 2002 were required to adopt the euro currency as soon as they fulfil the four convergence criteria on financial stability (budget deficit $< 3\%$, national debt $< 60\%$ BNP, interest rate in line with the eurozone and exchange rate stability (inflation). Today 17 countries (EU-17) have joined the Eurosystem. Greece joined in 2001, Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009 and Estonia in 2011. Ten EU Member States remain outside the eurozone. From 2009 the central banks participating in the Eurosystem have added the additional term Eurosystem to their logo.

Figure A9.3 shows the map of Europe with the 27 EU-members and their status with respect to the euro adaptation on 1 January 2012. The 17 countries that have the euro are shown in green. Three countries are shown in orange: Denmark, Great-Britain and Sweden. These three were already in the EU before the euro was introduced

and for each the situation is different. In 1998 the Danish position was: ‘We are in, unless we vote to stay out’, known as the opt-in position. However, in 2000 the Danish people said no to the euro in a referendum and the Danes stayed out. An opposite position to the Danes is taken by the British: ‘We are out, unless we decide to join’, known as the opt-out position. To date no referendum has been proposed by the British government and Britain did not join the euro. For Sweden, the situation is different again: there will be no referendum, but the government will decide when to join the euro. In a public opinion poll in early 2011, 64 % of the Swedes rejected the euro. As reported in chapter 2, subsection 2.2.8.2 on confidence in banknotes after 1995, the Swedes started in 2011 with the preparation of a complete series of new banknotes.

In fact, the situation is bit more complex, shown in figure A9.4. All member states of the EU are expected to participate in the EMU. An important criterion is the European Exchange Rate Mechanism II (‘ERM II’), in which candidate currencies demonstrate economic convergence by maintaining limited deviation from their

Figure A9.3



Orange: DK = in unless out GB = out unless in S = governmental decision

Map of Europe used by DNB since 2008 at the introduction course of new employees as proposed by De Heij. The map of Europe shows all 27 member states of the EU in one of the following three colours (situation 1 January 2011):

- 1) Green: EU countries using the euro,
- 2) Yellow: EU countries, who will have to adopt the euro as soon as they meet the stability criteria,
- 3) Orange: EU countries who may decide by themselves when they want to join the eurozone (because they were already member of the EU before the euro was introduces).

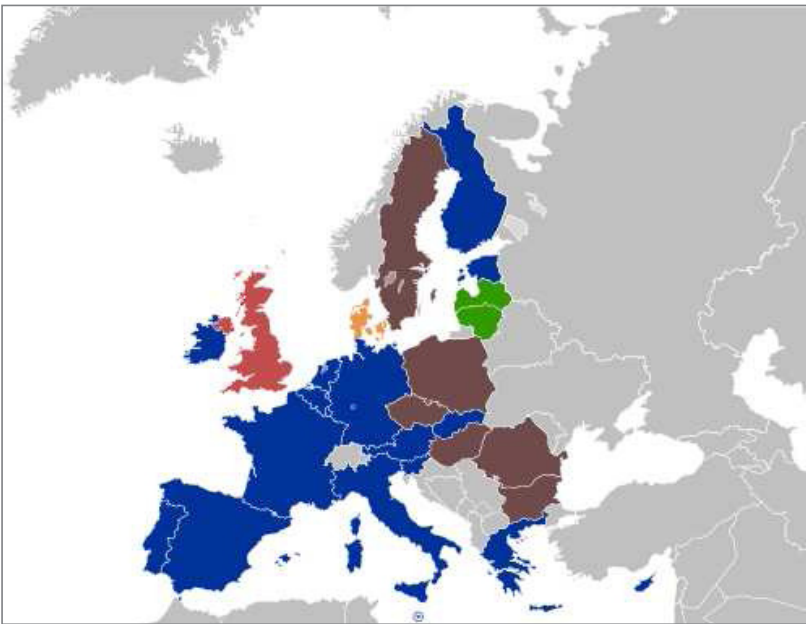
target rate against the euro. Of the pre-2004 members, the United Kingdom and Sweden have not joined ERM II and Denmark remains in ERM II without proceeding to the third stage.

European Central Bank

The European Central Bank was established as from 1 June 1998 as the core of the Eurosystem and the ESCB. The ECB has its seat in Frankfurt, Germany. Forerunner of the ECB was the European Monetary Institute (EMI), operating between 1994 and 1997. The ECB is responsible for conducting monetary policy for the euro and for the euro banknotes. Around 1,700 employees are working for the ECB and about 70 of them are working at the Directorate Banknotes on the euro banknotes (R&D, design, production, issue and circulations).

The ECB has legal personality under public international law.

Figure A9.4



Map of Europe representing the Economic and Monetary Union of the European Union (2012)

- 1) Blue: Members of the eurozone,
- 2) Green: ERM-II-member (Latvia, Lithuania),
- 3) Orange: ERM-II member with opt-out (Denmark),
- 4) Red: EU-member with opt-out (United Kingdom),
- 5) Brown: rest of the EU-members.

Appendix 10

Visual identity of europe

All designers of European products like passport, driving license, coins and banknotes etceteras, have probably asked themselves what is typically European? What are the characteristics of a visual European identity? The design process for these products is similar to the one followed for commercial products, i.e. the process of applied design (information, analysis, problem definition, planning and drafting).

There is a plethora of literature on European identity, although not much has been published on Europe's *visual* identity. Basic references to European identity are provided by the European Council, the supreme decision making body of the European Union, and its predecessors. Many authors take these publications as the starting point for their work. For a designer all this information is not encouraging; it seems that European identity is about shelf upon shelf of text. All too often such studies do not include any images, tables, diagrams or other graphics. Fortunately the EU prepared, in 2003, a draft European constitution, providing an identity description, including five symbols of the Union, which will be introduced below.

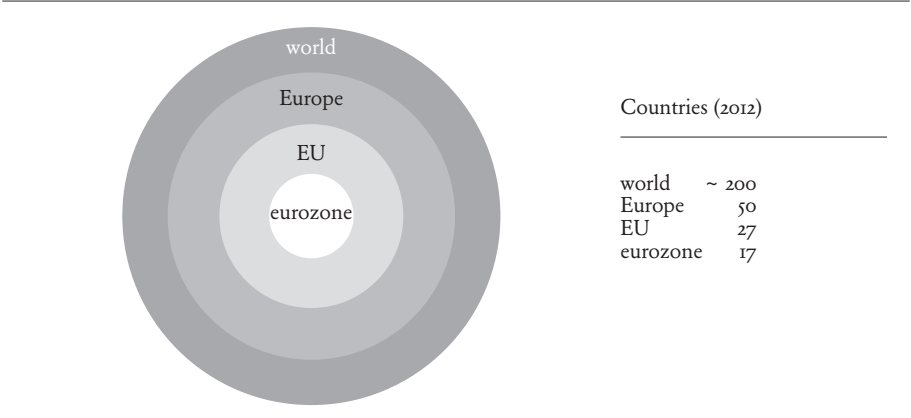
European identity: for whom?

The number of stars in the European flag is fixed to twelve and represents all the peoples of Europe, including those outside European integration. This rises the question what we mean by European identity: is it the identity of all countries in Europe (Europe-50) or does it refer to all countries represented by the Council of Europe (Europe-47)? Does it concern the identity of all EU Member States (EU-27), or does it apply only to the countries using the euro (EU-17)? And what about European fashion or design? Clearly elements of a European identity, but with a bias to North-West Europe, including non-EU countries Norway and Switzerland. Figure A10.1 presents all countries in the world and shows three European subsets.

What is Europe's identity?

The next question is: What is the identity of Europe? This question can be answered from many perspectives; Europe has a multifaceted identity. Just to mention a few of the options, Europe can be defined by geography, history, culture, economy, military, politics, science, religion etcetera. A famous quote ascribed to Henry Kissinger (1923), US Secretary of State in the 1970s runs, 'Who do I call when I want

Figure A10.1



Europe is part of the world and the EU is part Europe. In turn, the eurozone is a subset of the EU.

to talk to Europe?’ Actually, it is uncertain whether he ever said this. In a 2007 interview he said ‘At the time that I was Secretary of State, there was no point of organisational identity, with which we could deal. And so I was reported to have said that I didn’t know the telephone number to call. I am not sure I ever said that, but I now think this is such a good line, why shouldn’t I agree to it?’ [124]. Since 2010 the European Union has had a telephone number: that of the president of the European Council.

Explanations for the name Europe

Often people think that Europe received its name from Europa, the Greek mythological figure (see below). However, this pushes the question backwards: where does the name Europa come from? There are several explanations. The one most commonly held is that the meaning of Europe in Greek is ‘broad views’ derived from ‘eurys’ (broad) and ‘ops’ (face). In ancient Mesopotamia the sun goes down in the west and therefore Europe’s name could also be derived from the local word for sunset.

Use of the word Europe

The word Europe was rarely used before the schism of the Christian church in 1054, when the division between the Eastern Orthodox Church and the western Roman church became permanent. Europe became ‘the west’ and Byzantium, with its capital Constantinople, ‘the east’ or Orient, as described by Gerard Delanty in ‘Inventing Europe’ [50]. The crusaders travelled east in the 11th and 12th centuries retained, according to Delanty, the political identity of their respective kingdoms but their collective identity was that of Christian pilgrims. The symbol of the crusaders was the trans-national symbol of the cross, not a national emblem, and

they were known as ‘the army of God’. The term ‘Frank’ was in more common use than the notion of ‘Europeans’.

With the fall of Constantinople in 1453 and the subsequent colonial expansion of the western European powers, the word Europe became more frequently used. Desiderius Erasmus (~1467-1536) is often called the first European. Erasmus advocated a united European front against Ottoman power and a crusade against the Turks. And when Francis Bacon (1561-1626) used the phrase ‘We Europeans’ in 1623, it is probable that it was already clear who they were.

Enlightenment in Europe (~1650-1800)

Letterpress printing in Europe was either invented by Laurens Janszoon Coster (~1370-1140) in the Netherlands or by Johannes Gutenberg (~1400-1468) in Germany. However, Gutenberg did increase the efficiency of the printing process by introducing the mechanical movable type printing. The wide distribution of the printing press around 1450 within Europe facilitated the spread of knowledge and helped the development of the Enlightenment. The Enlightenment started with the Protestant Reformation in the 16th century and became a cultural movement of intellectuals that mobilized the power of reason. Protestants like Martin Luther (1483-1546) and Jean Calvin (1483-1564) protested against the doctrines, rituals and ecclesiastical structure of the Roman Catholic Church. It promoted science and intellectual interchange and opposed superstition, intolerance and abuses in church and state. While the Reformation divided Europe between a Protestant north and a Catholic south, Christianity continued to be the principal source of cultural identity. The idea of Europe as opposed to Christendom was the seed for the development of a European identity. According to Delanty the Enlightenment is the first expression of a fully-fledged, secular European identity. Church and state were no longer seen as a symbiotic unity but as separate spheres [50].

After the Reformation philosophers like Baruch Spinoza (1632-1677), John Locke (1632-1704) and Voltaire (1694-1778) sparked the Enlightenment. A famous passage comes from the Irish statesman and philosopher Edmund Burke (1729-1797). In his ‘Reflections on the Revolution in France’, written in 1790, Burke sums up his view of Europe: ‘... our manners, our civilization, and all the good things which are connected with manners and civilization, in this European world of ours, depended for ages on two principles, and were, indeed, the result of both combined: I mean the spirit of a gentleman, and the spirit of religion’.

The idea of Europe as a cultural model began to take shape in the 18th century. Peter the Great (1682-1725) wanted the Russian empire to be identified with Europe. Jean Jacques Rousseau (1712-1778) envisioned in 1762 an age when ‘there is no longer a France, a Germany, a Spain, not even England, there are only Europeans’.

Johann Wolfgang von Goethe (1749-1832) was a German scientist and humanism was embodied in Goethe’s concepts. In the 19th century the Romanticists advocated the purified ancient Greece as the cultural root of Europe and not in the Orient. Many sculptures and paintings of Europa as described in the Greek myth were made (figure A10.2a). It was from this time that people have believed that Europe’s derives from the Greek myth.

Europa, several myths

Europa is a mythical woman, part of several ancient Greek myths. She could be a Phoenician princess, seduced by Zeus, the ruler of the Gods. But she could also be, according to Homer who lived in the 8th century BC, the daughter of Phoenix. In another myth, by Hesiodus, who lived in the 6th century BC, Europa was one of the 3,000 daughters (Oceanides) of Tethys, goddess of fresh water sources, and Oceanos, the earth-encircling, fresh-water stream.

The seduction myth seems most popular. Princess Europa abandoned her homeland in present-day Lebanon for the western island of Crete where she later married the king. Here, on a beach Zeus, disguised as a white bull, seduced Europa. That Europa was an eastern import did not worry the Greeks. Today there are over 27 coin designs using the theme of Europa and the bull, of which two examples are shown in figures A10.2b and c. Europa and the bull are also the theme of the statue in front of the European Parliament in Brussels.

Figure A10.2



The theme of the myth of Europe has been used many times in both paintings and coin design. An overview of over 27 coins with the Europa theme was published in ‘Die Göttin Europa auf Münzen’ in 2011 [214]. Three examples:

- a) Painting ‘Europa and the Bull’ (1869) by Gustave Moreau (1826-1898).
- b) Regular 2 euro coin, Greece, issued since 2002.
- c) Commemorative 2 euro coin, Italy, 2005.

First document on European identity (1973)

Since the beginning in 1949, the Council of Europe (CoE) has been building on European identity. The discussions in the early 1950s also touched upon the Greek myth about Europa. Probably the CoE wanted to look forward instead of back to imperial myths of ancient Greece or other imperial eras such as the Roman, Carolingian or Ottoman Empire. Turning a new leaf at the start of the European cooperation, a clean sheet was favoured, without any bias to any of the European countries. For a similar reason it was suggested in 2011 that the idea for a museum of European history should start with the European cooperation after 1945.

The first official document published on European identity had to wait until 1973 [9]. The European identity was agreed to rest on three pillars:

- 1) The unity of the nine member countries of the community,
- 2) European identity in relation to the rest of the world,
- 3) The dynamic nature of the construction of a United Europe.

This document is cryptic and initiated the first articles on the idea of a unified European identity. Without further elaboration on what a European identity is, the European identity as delineated in 1973 was confirmed by the European Council in 1983, as follows: 'The Heads of State or Government, on the basis of an awareness of a common destiny and the wish to affirm the European identity, confirm their commitment to progress towards an ever closer union among the peoples and Member States of the European Community.' (Solemn Declaration on European Union, Stuttgart, 19 June 1983). However, more clear was the agreement made in that same meeting of the European Council to found a European University Institute in Florence.

European citizenship (1992)

Most literature on European identity appeared after 1992, after the Maastricht Treaty. From then on European identity was mainly defined in terms of European citizenship. To detail citizenship further, Willy de Clercq (1927-2011) chaired a study on the issue. De Clercq proposed to treat Europe as a 'brand product'. 'The European Union should be presented as a 'good product' (...) with an emphasis on the beneficial effects 'for me'. It must (...) be presented with a human face: sympathetic, warm and caring.' [44].

In the aftermath of this treaty many publications appeared on European identity and citizenship. One of the most quoted is 'Building Europe' by Cris Shore, published in 2000 [70].

Identity description in preparation of Constitution EU (2003)

The draft treaty on a European constitution in 2003 provided a description of the European identity, summarized by Johan Fornäs in 'Reading the Euro'[138], as follows:

“The 2003 draft of a treaty establishing a constitution for Europe refers to Europe as ‘a continent that has brought forth civilisation’, with inhabitants ‘arriving in successive waves from earliest times’, who ‘have gradually developed the values underlying humanism: equality of persons, freedom, respect for reason’. (...) On this background, the constitution founds the European Union, ‘reflecting the will of the citizens and States of Europe to build a common future’ and based on ‘the values of respect for human dignity, liberty, democracy, equality, the rule of law and respect for human rights’, in a shared ‘society of pluralism, tolerance, justice, solidarity and non-discrimination’, with the main aim to ‘promote peace, its values and the well-being of its peoples’. It offers its citizens ‘an area of freedom, security and justice without internal frontiers, and a single market where competition is free and undistorted’, while promising to ‘respect its rich cultural and linguistic diversity’, and ensuring that ‘Europe’s cultural heritage is safeguarded and enhanced’.”

The draft constitution explicitly specifies five ‘symbols of the Union’:

- 1) The flag of the Union shall be a circle of twelve golden stars on a blue background.
- 2) The anthem of the Union shall be based on the Ode to Joy from the Ninth Symphony by Ludwig van Beethoven.
- 3) The motto of the Union shall be: United in diversity.
- 4) The currency of the Union shall be the euro.
- 5) 9 May shall be celebrated throughout the Union as Europe day.

The treaty for a constitution was not approved; France and the Netherlands rejected the proposal in respectively May and June 2005. The flag is not mentioned in the EU treaties, its introduction having been dropped along with the European Constitution. As a consequence the EU did not have an official flag. In 2008 the European Council decided once more not to introduce an official European flag and also not to introduce an anthem. This decision was interpreted by Dutch journalists as signifying that politicians turned away from Europe [e.g. 159]. Ben Knapen, who later became State Secretary of the Dutch Government: ‘Overcoming fear of commitment, psychology teaches, takes small steps and symbolism.’ [160].

The following table Aro.1 illustrates that the Council of Europe and the European Council differ in their acceptance of the symbols.

European civilisation versus European identity

Every day a little bit more Europe, a popular phrase of European politicians like the first president of the European Council, the Belgian Herman van Rompuy. According to Van Rompuy the European Union will never have a European identity: ‘Europe has no real identity. (...) We will not have a European identity.’

Table A10.1

Symbol	Council of Europe	European Council (EU)
1. Flag	Yes	No (but yes in daily practice)
2. Anthem	Yes	No
3. Motto	No	Yes
4. Euro currency	No	Yes
5. Europe day 5 May	Yes	No
9 May	No	Yes

Overview of the adaptation of the 5 symbols of Europe by respectively the Council of Europe and the European Council of the European Union.

Instead Van Rompuy foresees several identities, but one civilization: ‘In Europe there is room for several cultures, but only for one civilization.’ [189].

Results of building a European identity

What is the result of all these steps to build a European identity? Right from the start in 1973, the European Committee has monitored the evolution of the European identity. Over the years, the majority of people within the EU, around 60 %, have not felt European. Generally speaking, Britons have scored lowest, while countries that have recently joined the EU score highest, e.g. Malta and Estonia in 2004. Many measurements are taken and reported in the Euro Barometer documents; such measurements are outside the scope of this appendix. As noted in chapter 4, subsection 4.2.3 on measuring European identity in the Netherlands (DNB research 2011), the introduction of the euro had no influence on perceptions of European identity.

The five identity symbols mentioned in the draft treaty on a European constitution are discussed in depth in respectively:

- A10.1 European flag
 - A10.1.1 Star
 - A10.1.2 Ring of stars
- A10.2 European anthem
- A10.3 European motto
- A10.4 Euro
- A10.5 Europe day

In addition the following symbol is discussed, which came out as the most typical European element on the euro banknotes in DNB’s 2011 identity research (see subsection 4.2.3):

A10.6 Geography

On the basis of these 6 visual identity topics the euro banknotes will be analysed for European identity in:

A10.7 European identity within euro banknotes

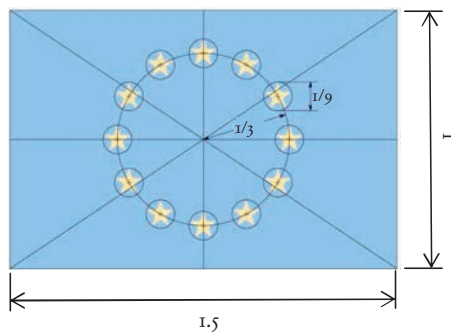
A10.1 European flag

Right from the start in 1949 the Council of Europe was busy defending human rights and promoting European culture. The Council was considering a symbol to be adopted by their organisation and commissioned a flag to be designed. The design made by Arsène Heitz and Paul Lévy was selected (figure A10.3).

The symbolism of the flag is twofold: colour symbolism and image symbolism in the ‘ring of stars’.

The colour blue represents a blue sky, optimism. The gold colour of the five-pointed star comes from the traditional colour of heraldic ornaments. The stars used on the

Figure A10.3



The European flag is rectangular with 2:3 proportions: its fly (width) is one and a half times the length of its hoist (height). Twelve stars are centred in a circle and are spaced equally according to the hour positions on the face of a clock; not touching each other. All the stars are equal and have five points. The stars are in an upright position: one point is straight up and two points down; the stars are not rotated. The diameter of an imaginary circle through the centre of the stars is 1/3 of the height of the flag. The size of the five-pointed star (extreme points) is 1/9 of the flag height. The background colour of the flag is azure blue (Pantone: reflex blue, CMYK: 100 % process cyan and 80 % process magenta) and the colour of the stars is gold or yellow (Pantone: yellow, CMYK: 100 % process yellow).

European flag are similar to the five-pointed stars used on many flags (figure A10.4). Subsection A10.1.1 will elaborate further on the meaning of the five-pointed star. The stars form a circle, symbolising unity. This ring of stars represents solidarity and harmony between the peoples of Europe (see subsection A10.1.2 Ring of stars). Twelve is the symbol of perfection and completeness and anyone is free to perceive other symbolisms as well, including that of the hours on a clock dial or the months in a year. The circle may also be seen as a round table, symbolising equality. As already noted, the 12 stars represent all the peoples of Europe and therefore the flag remains unchanged regardless of EU enlargements. In case of the flag of the USA each star represents one of the States of the USA. The Stars and Stripes was adopted in 1777 and started with thirteen stars, representing the thirteen first states.

Figure A10.4



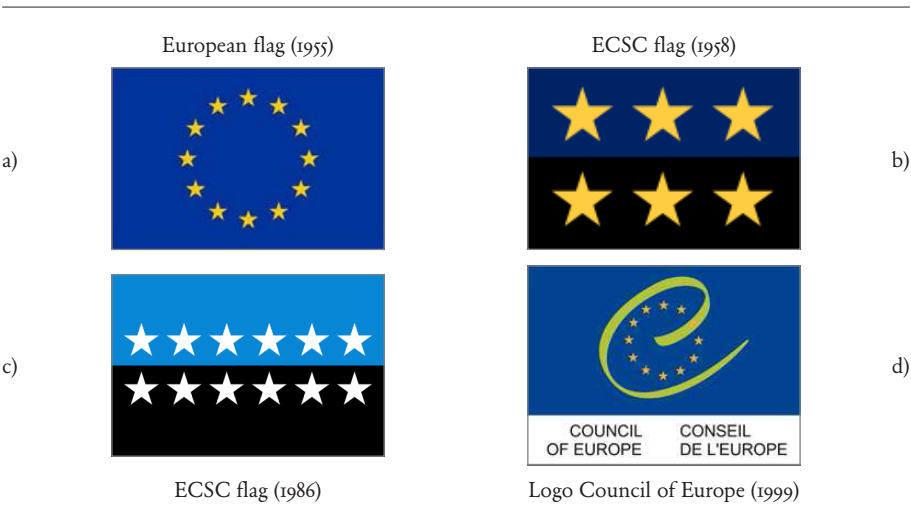
Many countries have the five-pointed star in their flag, creating familiarity. The star could be seen as a world symbol, connecting many (different) countries.

On currency the five-pointed star appeared in the US first in 1792 on a Half Disme (half dime or 5 cents). In 1814 a five-pointed star first appeared as part of the coin circumscription, on the lettered edge of a half-dollar coin. Today the five-pointed and other star types continue to be used in coin circumscriptions all over the world.

Flag approval

The European flag started its life as an emblem, which was unanimously approved by the Parliamentary Assembly of the Council of Europe on 25 October 1955 (figure A10.5a) and was subsequently adopted by the Committee of Ministers. The flag was officially launched in Paris on 13 December 1955. The Council of Europe then encouraged other European institutions to adopt the flag. However, the European Coal and Steel Community (ECSC), a forerunner of the EU, used its own flag, shown in figure A10.5b. In 1985 the EEC, which had no flag of its own, finally took up the call of the Council of Europe and adopted the flag at the initiative of the European Parliament in 1983. Today the European flag is not only the symbol of

Figure A10.5



In 1955 the European flag was both the logo and the flag of the Council of Europe. In 1999 the Council of Europe developed a new logo.

- a) Emblem and flag of the Council of Europe (1955). Since 1985 it has also been the flag of the European Union and its forerunners.
- b) Flag of ECSC, 6-star version (1958-1972). The flag shows two horizontal panels, blue over black. Black stood for coal while the blue stood for steel, the two resources managed by the ECSC. The gold stars represented the states in the community. If a new member joined, an additional star was added, with an odd star, if any, going to the bottom. From 1973 to 1980 a 9 star version was used and from 1981 till its end in 1985 a 10 star version.
- c) Flag of ECSC, 12 star version (1986-2002). Earlier versions showed similar colours and design, but varied the number of stars. Compared to the 1958 design the gold stars became white and the blue lighter.
- d) Emblem of Council of Europe (1999).

the European Union but also of Europe's unity and identity in a wider sense. In 1999 the European Council adapted a new emblem as shown in figure A10.5b. The ECSC eventually merged into the European Union in 2002, and in Brussels the ECSC flag outside the European Commission was replaced by the EU flag.

The flag of Europe is the flag and emblem of both the EU and the Council of Europe. It is also used to indicate the euro and the European Central Bank. Although protected by copyright, the wide private and public use of the European flag is encouraged to symbolise a European dimension.

Once the European flag was there, it was the inspiration to several other flags, such as those of Cape Verde, Bosnia and Herzegovina and Kosovo (figure A10.6).

In 2002 the well-known Dutch architect Rem Koolhaas made a proposal for a completely new European flag (figure A10.6). This proposal was never adopted as a flag, but was used as a logo of the Austrian EU presidency in 2006.

The design of the European flag and the symbols used are discussed in more detail in the following sections:

A10.1.1 Five-pointed star,

A10.1.2 Ring of stars.

A10.1.1 Five-pointed star

Why is the five-pointed star so popular on national symbols like flags and currency? The answer is that the star or stars represent the people of the country, since the five-pointed star can be seen as a (gender-neutral) human figure. Apart from the two colours blue and yellow, the only design element of the European flag is the five-pointed star. What is the history of this star, what does it mean?

The earliest known use of the five-pointed star was in ancient Egypt. It was a hieroglyph of Isis with the name 'sba' that symbolized the spiritual world far before

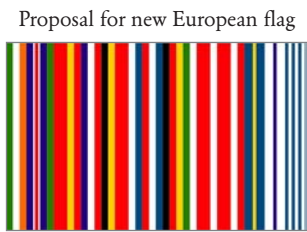
Figure A10.6



Three national flags showing familiarity with the European flag.

- a) National flag of Cape Verde (1992).
- b) National flag of Bosnia Herzegovina (1998).
- c) National flag of Kosovo (2008).

Figure A10.7



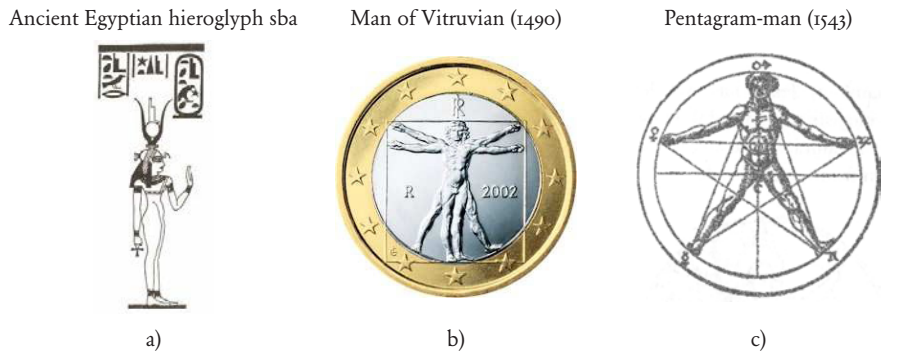
European flag design proposed by Rem Koolhaas (2002).

the start of the Christian era. The projection of a human figure on a five-pointed star was prepared by Leonardo da Vinci (1452-1519), when he drew his famous ‘Vitruvian Man’ around 1490 (figure A10.8b). The picture was completed in Germany in 1534 by Heinrich Cornelius Agrippa (1486-1535), when he draw the pentagram-man (figure A10.8c). The five signs at the pentagram’s vertices have an astrological meaning.

Heraldic meaning of stars

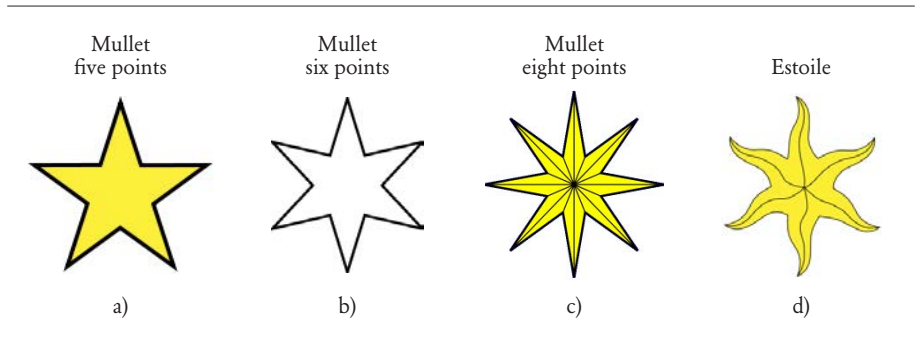
In heraldry, the term star may refer to any star-shaped charge with any number of rays, which may appear straight or wavy, and may or may not be pierced. A star with straight-sided rays is called a mullet (figure A10.9a. b and c) while one with wavy rays is called an estoile (figure A10.9d). While a mullet may have any number

Figure A10.8



- Historical overview of the development of the five-pointed star to a human figure.
- a) First images of the five-pointed star in an Egyptian hieroglyph of Isis (top row, centre). Uncertain date, circa 2000 - 1000 BC [95].
 - b) Man of Vitruvius on the national side of the Italian 2 euro coin. Vitruvian Man was designed by Leonardo da Vinci around 1490.
 - c) Pentagram-man by Heinrich Cornelius Agrippa, 1534.

Figure A10.9



Overview of four different star shapes from heraldry.

- a) Mullet, five points.
- b) Mullet, six points.
- c) Mullet, eight points.
- d) Estoile.

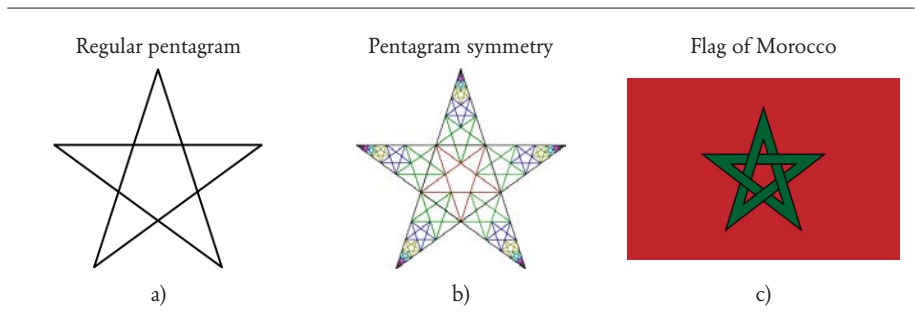
of points, it is presumed to have five unless otherwise specified in the blazon. Estoiles, however, are presumed to have six rays.

The top (North) of the five-pointed star is upright. When the star is rotated by 180 degrees the star is in an instable position and can be seen as a sign of evil.

Five-pointed star is not a pentagram

The five-pointed star looks similar to a regular pentagram, but it is not the same. A pentagram is the shape of a five-pointed star drawn with five straight strokes, as is shown in figure A10.10a. The five-pointed star can be seen as the outline of the

Figure A10.10



Pentagrams.

- a) Regular pentagram. The pentagram contains ten points (the five points of the star, and the five vertices of the inner pentagon) and fifteen line segments. The Pythagoreans saw the pentagram as representing mathematical perfection.
- b) A regular pentagram has complex symmetry groups, which are beyond the scope of this Appendix.
- c) Pentagram on flag of Morocco. It is believed that the pentagram represents the link between God and the nation. It is also a symbol of the Moroccan Alaouite dynasty.

Figure A10.11



Three well known examples of a five pointed star used by beer brewer Heineken and shoe manufacturer Converse.

- a) Five-pointed star Heineken used since 1875.
- b) Five-pointed star Converse (unknown when first used).
- c) Five-pointed stars used in logo of department store Macy's (unknown when first used).

pentagram. The word pentagram comes from the Greek word roughly meaning five-lines. While a solid five-pointed star is found on many flags, the pentagram is relatively rare. It appears on two national flags, those of Ethiopia and Morocco (figure A10.10c) and in some coats of arms. Pentagrams were used symbolically in ancient Greece and Babylonia and also in Christian symbolism, where it represents the five wounds of Christ. The pentagram also appears in the context of Freemasonry and in a number of other belief systems. Related to the pentagram is the six-pointed star, part of the flag of Israel. In ancient Hebrew, a six-pointed star represents Saturn, besides having other esoteric meanings including that of the Star of David.

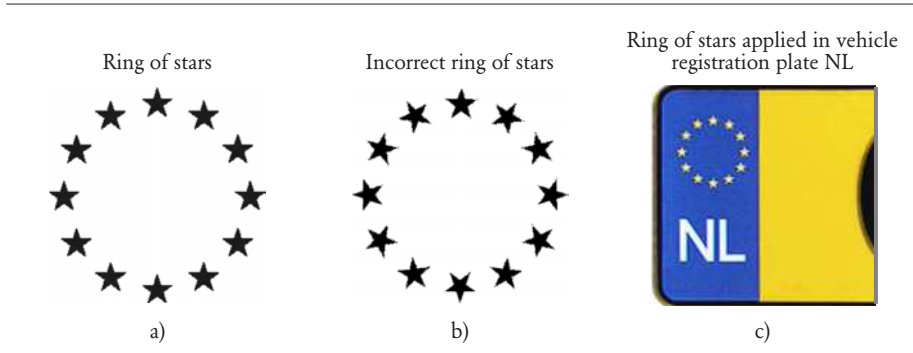
Five-pointed stars are not only applied as part of national symbols, but are also used commercially by companies like Heineken, Macy's and Converse as shown in figure A10.11.

A10.1.2 Ring of stars

The European ring of stars (figure A10.12a) has become a prototypical design element used to express the visual identity of Europe as for example used on euro currency or for meetings of the European Council. Variants of the ring of stars are also used by commercial companies, like for example the Eurosport television channel and for the Eurostar high-speed train running between Brussels and London.

The ring of stars in combination with the country code was first introduced on vehicle licence plates. The common EU license plate format entered into force in 1998 (figure A10.12c). It was based on a plate that had been introduced earlier in Ireland (1991), Portugal (1992) and Germany (1994). Since 2006 the ring of stars, including the country code, has been used on all vehicle plates in the EU. Further format standardisation was done in 2010 by harmonizing the size of the car plate. Format, letter type and colours are still free, as illustrated in figure A10.13.

Figure A10.12



Ring of stars.

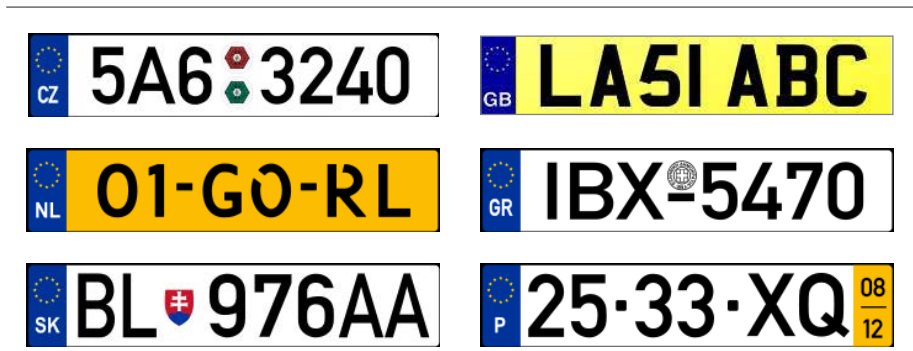
- a) Basic rings of stars.
- b) Incorrect orientation of stars relative to the centre.
- c) Ring of stars applied in vehicle registration plate of the Netherlands (2010).

Sometimes a mistake is made with the upright position of the stars within the ring of stars. Designers like to position the stars relative to the centre, as was done on the first euro coins produced in France in 1999 (figure A10.12b).

EU driving licence

About the same time as the first steps towards a harmonized vehicle licence plate, in 1998, a similar converging policy was introduced to start the harmonisation of the European driver licenses (figure A10.14). Further standardisation of European licences will replace the 110 different models which currently exist within the European Union. Eventually, from 2022, driving licences in all EU countries will receive the same format.

Figure A10.13



Six different EU vehicle registration plates (situation 2010).
Left, top to bottom: Czech Republic, the Netherlands and Slovakia,
Right, top to bottom: Great Britain, Greece and Portugal.

Figure A10.14



Three examples of European driving licences, all according to EU format (2006).

- a) Austria.
- b) The Netherlands.
- c) Romania.

From a design point of view it is remarkable that the ring of stars and the country code are not applied in the same way as on the vehicle licence plates. Instead of the ring of stars and the country code below it, the country code is positioned within the ring of stars of the flag.

EU passports

Passport standardisation seems to be more driven by the rules of the International Civil Aviation Organization (ICAO), a separate organisational part of the United Nations. EU passports were harmonized since 1995. The flag of Europe and the ring of stars are not used in this format. In fact only the dimensions and the colour of the cover are standardized, including the gold foil print (figure A10.15).

It appears, then, that vehicle registration plates, driver licences and passports show considerable design variation. The cover, instead of blue and yellow, is dark red, while most EU driving licences seem to be pink. Nor are the lay-out and typography harmonised, although they do have some prototypical design elements in common. The conclusion must be that there does not seem to be a strong EU identity in EU identity documents. As in the case of plugs and sockets, it will take time before official EU graphic design will become more recognisable as ‘European’.

A10.2 European anthem

The European Council (EU, Europe-27) does not have an anthem, but the Council of Europe (Europe-47) does: the Ode to Joy from Beethoven’s 9th Symphony. The anthem was launched on 5 May 1972, Europe Day, via a major information campaign. Herbert von Karajan provided the musical arrangement of the anthem, orchestrated it and conducted the performance for the official recording. In 1986 the Ode to Joy was also adopted by the European Communities, forerunner of the EU,

Figure A10.15



Three examples of passport covers within the European Union. Dimensions, colour and gold print are standardised.

- a) The Netherlands.
- b) Germany.
- c) Poland.

thus becoming another shared European symbol. The Ode to Joy was proposed in the draft European Constitution to become the anthem of the European Union. Since this proposal for a European Constitution was rejected, the European Union does not have an official hymn, just as there is no official flag (see also table A10.1).

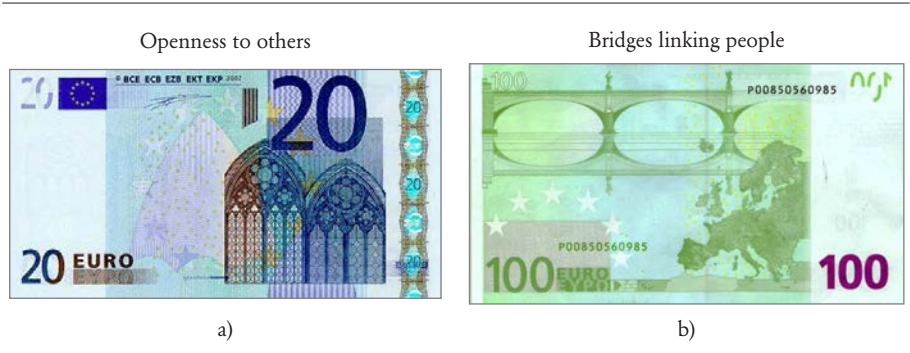
A10.3 European motto

Mottoes are introduced in appendix A1.10. In the year 2000 some 80,000 schoolchildren responded to the invitation to send proposals for a European motto to a website. The winner, ‘unity in difference’ (Latin: ‘in varietate concordia’), was adopted by the European Parliament. The motto was not new: it had been used by the European Bureau for the Lesser Used Languages. It was modified in 2003 into ‘united in diversity’, and with an authorized translation into all the EU languages, it was officially written into the 2003 proposal for a European Constitution. Fornas said about this motto, in 2007: ‘The motto is unknown to ordinary people, but is increasingly used in official EU rhetoric’ [138].

Mottoes of euro banknotes

Since the European motto was developed after 1996, a motto was not part of the Design Brief for a new series of euro banknotes [86]. The mottoes of the euro banknotes ‘openness to others’ (figure A10.16a) and ‘bridges linking people’ (figure A10.16b) were developed by Robert Kalina and a communication advisor. Before proceeding to work on the designs, they first devised the slogan [126].

Figure A10.16



Communication themes of the euro banknotes.

- a) Front: openness to others, symbolised by light shining through a window, door or gate.
- b) Reverse: bridges linking people.

Diversity

In his 2004 speech, ECB president Trichet combined the two mottoes of the euro banknotes with the new ‘united in diversity’ motto, as follows:

‘It is no coincidence that the Governing Council of the European Central Bank chose the theme of European architectural styles to illustrate the banknotes of our single currency, the euro. It is amazing to see how widely these styles have been used throughout Europe, leading to countless buildings, churches and monuments in the Roman, Gothic, baroque and classical traditions. These architectural styles were born in very different areas of Europe, and demonstrate Europe’s cultural richness. They also provide a powerful illustration of this unique concept of unity within diversity, which is the central trait of our continent. (...) We embrace this enriching diversity, which forms an integral part of our identity.’

American individualism versus European diversity

There is a contrast between the so-called American dream and the European dream. Every citizen, regardless of race, gender or origin, may achieve anything as long as they try hard, the basic philosophy of the American dream runs. Everyone should make it on their own and for the losers there is little interest. By contrast, the European dream is less individualistic: cultural diversity and assimilation prevails over individual endeavor. Trichet in 2004 on diversity: ‘We embrace this enriching diversity, which forms an integral part of our identity.’ [93]. Coincidence or not, in 2007 the ECB contributed a poster to the item of diversity, as shown in figure A10.17.

Figure A10.17



There is a large variety of national sides of the euro coins, expressing ‘united in diversity’. Several different euro 1 coins are depicted here.

From left to right, row by row:

Belgium, San Marino, Luxemburg, Malta, Slovenia, Italy, Finland, Germany, Ireland, Monaco, Greece, France, Portugal, Austria, the Netherlands, Malta, Spain, Slovakia.

On unity, Trichet stated in the same speech:

‘The second element, unity, results from our key responsibility as guardians of Europe’s single currency. The single currency is an emblem of Europe’s unity. The Governing Council of the ECB has made sure that all euro banknotes are exactly the same throughout the euro area, and that they portray the architectural styles that are another powerful symbol of this unity.’

Trichet introduced a third element, universality:

‘Universality comes from the fact that we are not inward-looking, but totally open to the world and in close contact with all our colleagues in other continents. We aim to play as active a role as possible in the international financial institutions and informal groups in which we take part, particularly the G7, G10 and G20. We set great store by our discussions with central banks in other continents, and particularly our meetings with central banks in Asia, Latin America and the Mediterranean region. Through Economic and Monetary Union, based on the free will of Member States, we are setting an example for today’s globalised and rapidly unifying world. We are also very keen to assist institutions that are observing the ECB and wanting to know what lessons they can draw from Europe’s unique experiences.’

Openness to others, bridges linking people

The ECB's website refers to the mottoes 'openness to others' and 'bridges linking people':

'On the front, the banknotes show windows and gateways. They symbolise the European spirit of openness and cooperation. The 12 stars of the European Union (EU) represent the dynamism and harmony of contemporary Europe. The bridges on the back symbolise communication between the people of Europe and between Europe and the rest of the world. The windows, gateways and bridges shown on the banknotes are stylised illustrations, not images of, or from, actual constructions.'

Criticism on mottoes euro banknotes

While the bridges may link people, we do not see any people, only bridges. Deeper analysis reveals that these bridges are not linking anything. The bridges start from nowhere and are going nowhere. Furthermore, the bridges are floating rather than serving as solid anchors between two banks. The bridge's function as a crossing facility is not suggested, for we only see the bridge, instead of crossing it [126].

Designer Roger Pfund holds an uncompromising opinion on the message of the euro: 'The representations trivialize European culture. (...) The euro notes don't tell any story, there is no message there so nothing happens on them. And I believe all banknotes must tell a story!' [231].

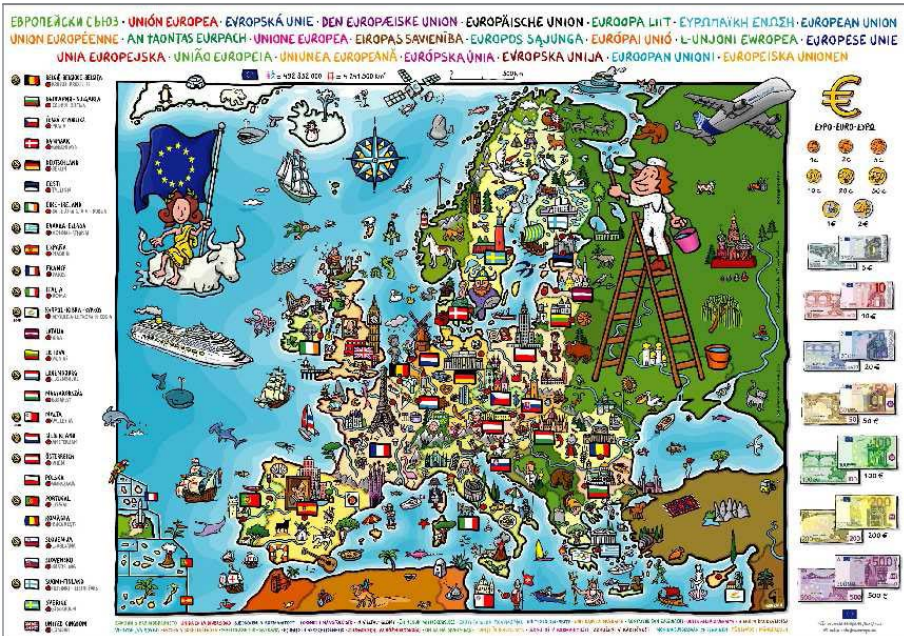
According to German sociologist Heiner Treinen, who in 1995-1996 sat on the advisory group on the selection of design themes for the euro banknotes, national pride got in the way of consensus [247].

'There were too many nations with very nationalistic feelings about their country's symbols. As nations cede more and more of their sovereignty to Brussels, people have a tendency to cling even more ferociously to their own distinctiveness. To me, it was irrelevant who or what from which nation was on the bills, as long as the image was a real, recognizable European icon.'

A10.4 European currency

The draft treaty refers to the euro currency as a visual symbol of Europe. The identity of the euro currency is not made explicit, although the word euro is. The euro also creates a single price language, giving people a sense of living in the new single economic territory of Euroland. It is somewhat like learning a language - it takes time and practice before one can think in the new currency. Citizens of one of the nation states of the eurozone feel themselves to be linked as members of an imaginary community.

Figure A10.18



Example of 'Diversity'. Poster European Central Bank, designed by FreeForm, 2007. Notice Europa on the white bull, coming from the west.

The word euro is well chosen (see chapter 4, section 4.2.3 on measuring European identity in the Netherlands). There seems to be only one minor disadvantage: the possible puns on 'euro' in some languages. Examples are the German 'teuro', from 'teuer', meaning expensive and the Dutch 'neuro' (from neurotic, North-euro and no euro). Also 'euror' may be heard as variant on error.

Brand consistency within the Eurosystem

A corporate visual identity brings visibility and recognisability to an organisation. The visual identity of the members of the Eurosystem is made up of 27 hybrid logos, one for each of the 27 central banks forming the Eurosystem. Each logo shows the original national central bank logo over the word Eurosystem in the national language (see figure A10.19 for three examples).

A10.5 Europe day

Europe Day is an annual celebration of peace and unity in Europe. However, there are two different Europe Days: 5 May for the Council of Europe and 9 May for the European Union (EU). The Council of Europe's day reflects its own establishment

Figure A10.19



Three logos of central banks using the extension Eurosystem in the national or common language.

in 1949, while the European Union’s day celebrates the day the EU's predecessor was proposed in 1950. On 5 May 1964, the 15th anniversary of its founding, the Council of Europe established 5 May as Europe Day (table A10.1).

A10.6 Geography of Europe

Not mentioned in the draft Treaty on a European Constitution (2003), but dominantly used in coins and banknotes is the ‘map of Europe’, the geography of Europe. America, Australia and Africa are from a geographical point of view clearer than Europe, because they are surrounded by water and are not connected to other continents or only through a narrow isthmus. The European and Asian continent are both part of the Eurasian landmass. Two nations are partly in Europe and partly in Asia: Turkey and the Russian Federation. The borderline is also diffuse in the Mediterranean area because of the islands between Greece and Turkey.

Gerard Delanty [50] on European borders:

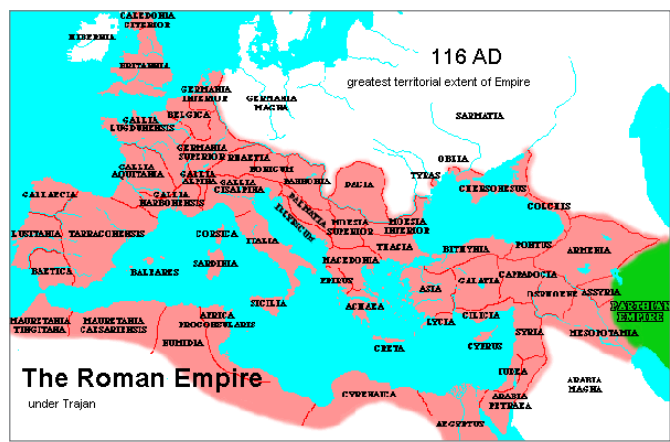
‘After the fall of Constantinople in 1453 Europe was divided in ‘West’ and ‘East’. The eastern frontier was never fixed; its northern moist point was to be found between the White Sea and the Baltic Sea and its southern point variously shifted from the Ural Mountains, the River Don, Caspian Sea to the Black Sea and Aegean Sea. (...) Unlike the western frontier, which has been a frontier of expansion, the eastern one has been a frontier of defence and has played a central role in the formation of the European identity.’

Coming back to the symbolism of the bridge on the euro banknotes, the bridge goes to the west; linking Europe with North America [126].

Greek and Roman maps

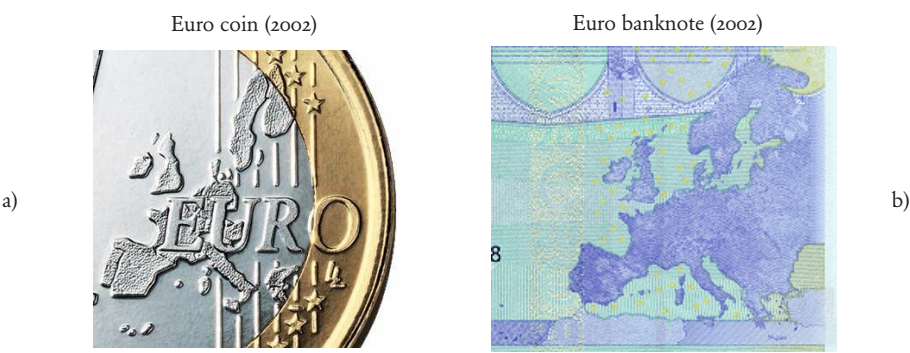
For people living in Antiquity the Alps represented a far greater geographical barrier than the Mediterranean Sea (or ‘Roman Lake’). The sea served to unite people

Figure Aro.20



The Roman Empire reached its greatest territorial extent in the year 116. Ships were the main transport vehicle and therefore the centre was the Mediterranean Sea. No point in Western Europe is further than 350 km from the sea, a distance which is doubled in Central Europe and reaches 1,100 km for the Russian plains [50].

Figure Aro.21



Different maps of Europe on the euro coins and banknotes.

- a) Only the 15 EU countries are depicted on this one euro coin. It is hard to recognise the map of Europe without Norway and the Balkan countries.
- b) Map of Europe on euro banknotes (2002). The Canary Islands on the coins are situated in the Mediterranean see. On the euro banknotes the Greek islands are printed extra solid. The bridge runs from east to west; from Europe to the USA.

Figure A10.22



Map of Europe adapted in 2007; no longer borders between the countries. The 2007 coins show a part of Russia, but not of Africa. Iceland is also not included. In both coin designs the Canary Islands are not in their correct location.

and civilisations, rather than to divide them. The divide between north and south seemed in these days a more significant one than that between east and west, as is illustrated by the map shown in figure A10.20, which is not a map of Europe. When the Roman Empire split into its eastern and western parts in 385 the new border ran more or less through the Balkans. In Britain and in countries such as Sweden and Norway, for instance, Europe is referred to as ‘the Continent’. Europe is also often divided along an East-West

Figure A10.23



Map of the Eurosystem (source: ECB website, 2011).

Table A10.2

THEME	SUB-THEME	PUBLIC SECURITY FEATURES EUR 50						
1. Feel, look, tilt	Look at, look through,	FEEL		LOOK			TILT	
		1.Tactile relief	2.Nail scratch	3.Water-mark	4.Sec. thread	5.See-through	6.OVI Reverse	7.Holo-gram
				Look through	Look-through	Look through		
2. Euro	Word euro				○			○
	Value 50			○	●	●	●	○
	Text BCE ECB etc.	●						
	€ symbol							○
3. EU symbols, Europe today	Flag							
	Ring of stars							
	Anthem							
	Motto ‘unity by diversity’							
	Europe day							
	Map							
4. Ages & Styles	Renaissance							
5. Openness to others	Window & gates			●				●
6. Bridges linking people	Bridge							
7. No main theme				*				

Overview of the communication matrix of the public security features in the euro 50.
● = dominant theme(s) ○ = second theme * = ISARD

axis and/or a North-South axis. The North-West European ‘quadrant’ seems to be dominant in the European identity.

Multiple interpretable borders

These multi-interpretable borders of Europe followed the designers of the euro coins and banknotes. There is not much consistency between the maps of Europe on the coins (figure A10.21a) and on the banknotes (figure A10.21b) as was reported by De Heij in 2007 [126]. Europe is represented on the one and two euro coins as the EU countries including their borders contrary to the euro banknotes, which

show an overall map of Europe in line with the map used by the Council of Europe (Europe-47). The map of the old civilisation around the Mediterranean Sea is more recognisable on the banknotes than on the coins.

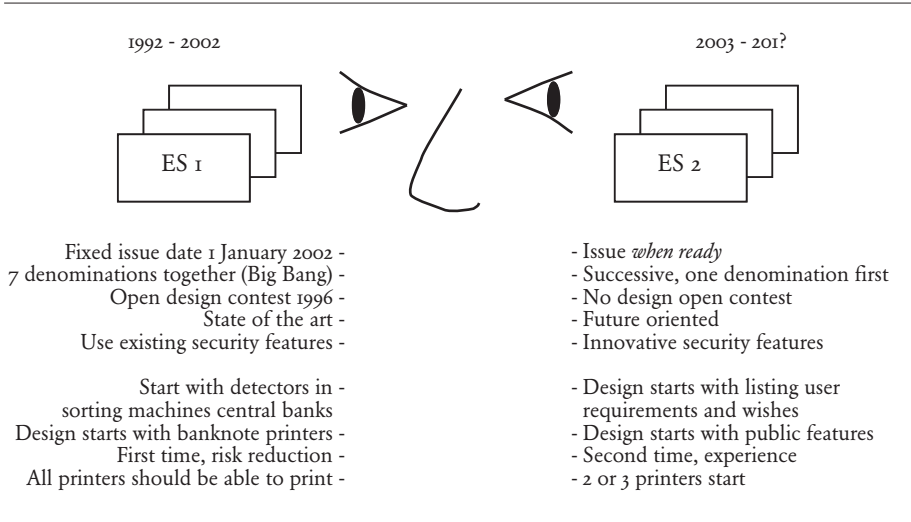
Map on coins changed within 5 years

The maps on the coins were changed within five years from their first issuance. New euro coin designs were issued in 2007, this time including new member states such as Malta and Cyprus, but also showing Norway, which is not a member of the EU. Adding Norway was necessary to create a more recognisable map of Europe as shown in figure A10.22b and to prevent unwanted associations of Sweden-Finland with man's genitals.

A10.7 European identity within euro banknotes

The graphical elements contributing to a European identity are discussed above. How and where are these identity elements used on the eurobanknotes? Table A10.2 presents an overview of the communication themes used in the ES1/50; in total 6 themes/mottoes are used for the euro banknotes. The conclusion must be that the communication themes of the euro are too complex and should be reduced for future euro banknote designs.

Figure A10.24



Description of the design policy of the euro series 2 (ES 2) compared to the first series (ES 1).

Future euro banknotes

As stated on many occasions, the ES2 notes will have a more user-oriented approach and will receive new security features. The focus of the ECB was on the differences between the first and the second series (figure A10.24).

Appendix II

Examples of artists using the identity of banknotes

Artists borrow the identity of banknotes for their graphic work in different ways. They are inspired by the different aspects like design, amount and/or the idea of money. This appendix provides an impression:

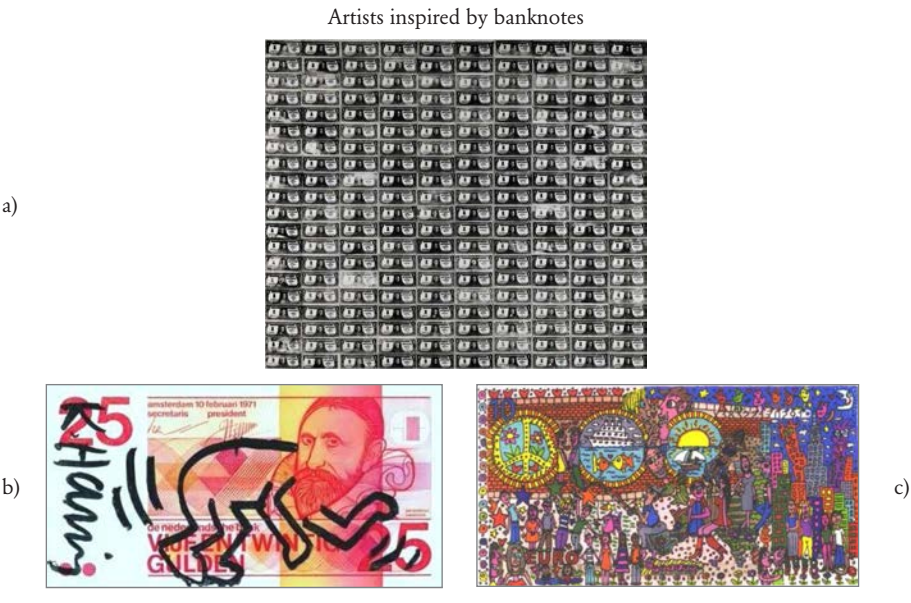
- AII.1 Artists using banknotes
- AII.2 Artists inspired by value
- AII.3 Artists inspired by the idea of banknotes

AII.1 Artists using banknotes

Andy Warhol (1928-1987) is probably one of the first modern artists inspired by the appearance of money. In 1962 he printed on canvas his '200 one dollar notes' (figure AII.1a). Warhol made also several works using the dollar symbol \$. Two other graphic artists inspired by banknotes are Keith Haring (1958-1990) and James Rizzi (1950-2011). Both used real banknotes as the carrier of for their graphic work (figure AII.1b and c).

Real banknotes are also the starting point for the work of Mark Wagner (1976). Wagner uses only one US-dollar banknotes in his collages (figure AII.2). And Won Park, another American artist, is master in folding US-dollar banknotes and is called the 'money folder'. His work reminds of origami, the traditional Japanese art of paper folding. Using only one piece of paper the goal is to create an object using geometric folds and crease patterns preferably without the use of gluing or cutting the paper (figure AII.3). Folding dollar banknotes has been popular for a longer time. In the first years of the new millennium people showed how a 20 dollar banknote could be folded unveiling the name OSAMA (a terrorist). In 2005 Duy Nguyen published a book on folding airplanes from one dollar banknotes with the title 'Another Way to Throw Your Money Away' [III]. And on YouTube several movies appeared in 2008 how to fold shirts from euro banknotes.

Figure AII.1



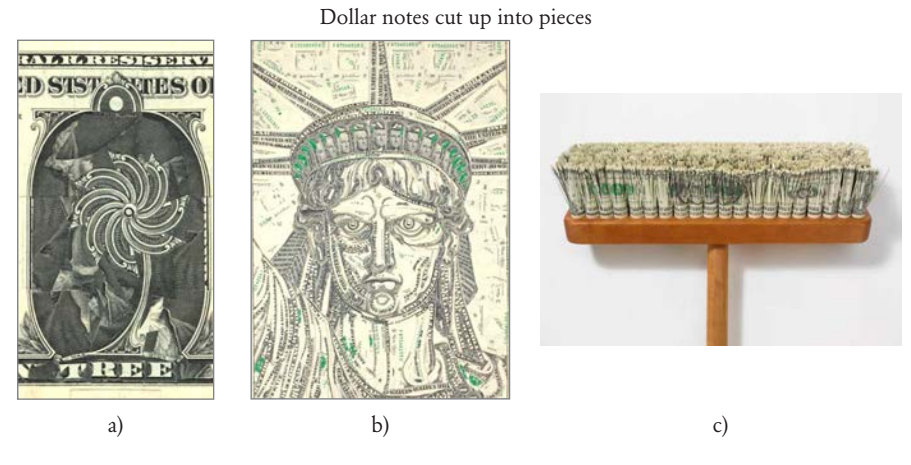
Three examples of artists inspired by banknotes.

a) Andy Warhol: ‘200 One Dollar Bills’ (1962). Silkscreen on canvas.

b) Keith Haring signed this 25 guilder banknote (around 1990).

c) James Rizzie, ‘Inflation can’t touch this’, reverse of a real euro 10 banknote filled with love, friends, fishes and sunset. Signed, dated and numbered (350 pieces) (2008).

Figure AII.2



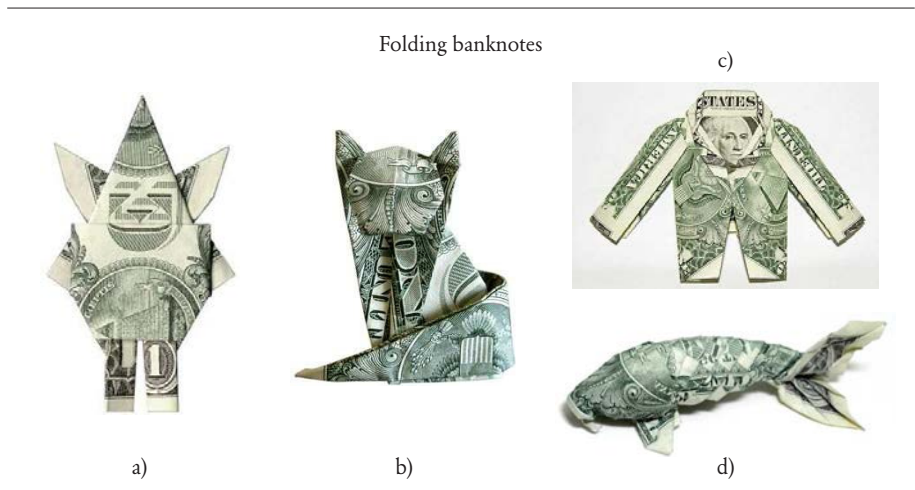
Three objects by Mark Wagner, all made of one USD notes.

a) Tree.

b) Statue of Liberty.

c) Broom.

Figure An.3



Four examples of the work of 'money folder' Won Park.

- a) One dollar man (2008).
- b) One dollar cat (2008).
- c) One dollar koi (2009).
- d) Two dollar jacket (2009).

An.2 Artists inspired by value

Big amounts of cash have always evoked strong emotions. An example well-known is Scrooge Duck diving into his pool of money (figure An.4a). Scrooge Duck became a symbol for money and bankers (figure An.4b) and was originally created in 1947 as Scrooge McDuck by Carl Barks (1901-2000) who was working for Disney Studios.

Figure An.4



Symbol for large amounts of money: Scrooge Duck, the greedy uncle of Donald Duck.

- a) Scrooge Duck diving in his swimming pool full of money (year unknown, probably around 1995).
- b) Scrooge Duck depicted on a test banknote by Ascom (around 2000).

Figure A11.5



Artists using shredded notes.

- a) Sculpture by Jan Wolkers at DNB's office, a gift by Joh. Enschedé, representing the transition from the guilder to the euro. The bottom part contains 10.000 shredded NLG 10 banknotes (1997).
- b) A monumental pile of shredded Greek Cypriot Pounds by Christodoulos Panayiotou. The maximum amount the artist was able to acquire when Greek Cyprus adopted the euro in 2008.

Two artist prepared a sculpture on the occasion of the transition to the euro. The Dutch writer and sculptor Jan Wolkers (1925-2007) used 10,000 shredded 10 guilder banknotes (figure A11.5a). The Cypriote artist Christodoulos Panayiotou (1978) created a monumental pile of shredded Greek Cypriot Pounds, the totality of which the artist was able to acquire when Greek Cyprus adopted the euro in 2008 (figure A11.5b).

A11.3 Artists inspired by the idea of banknotes

People like to draw fantasy maps of non-existing islands or countries. Others are more inspired by imaginary banknotes. Artists like to create their own banknotes too. One of the first challenging the concept of paper money is the American artist J.S.G. Boggs or Steve Litzner (1955). Boggs makes drawings of existing banknotes from all over the world and offers people a conscious choice to accept art instead of money (figure A11.6). Boggs 'spent' over USD 250,000 of his hand-drawn bills by persuading merchants to accept his personalised renditions of legal tender in exchange for their goods or services, complete with receipts and even proper change. Boggs views these transactions as a type of performance art, but the authorities often view them with suspicion. Boggs is not a counterfeiter, since he does not have the intention to issue his drawings for real banknotes. His drawings are always one sided and he is honest in his offer. The work of Boggs is raising all sorts of truly fundamental questions: what is it what we value in art, or, for that matter, in money? How can we place trust in anything as confoundedly insubstantial as paper

Figure AII.6



J.S.G. Boggs money. Boggs drawings are always one-side.

- a) Swiss variant on CHF 100 with portrait Boggs (1988).
- b) Variant on one US dollar banknote. Text: 'In Us We Trust' and 'Fun' (1995).

money? Still Boggs was put in prison for a short time, responding on one of his notes with 'Give me a fair trial' [68].

'In art we trust, all others pay cash' and 'This is a piece of paper worth absolutely nothing, but beautiful' are texts by the Dutch artist Dadara or Daniel Rozenberg (1969) used on his banknote paintings. Using such mottos Dadara refers to early banknotes (see appendix A1, section A1.10 on mottos). Dadara is triggered by the concept of money and challenges the idea of a bank. Just a piece of paper is one of his themes, just as the amount (figure AII.7a).

Figure AII.8 provides some examples of printed imaginary banknotes. One of the most successful is are the Antarctica banknotes. First issued in 1996 (figure 2.21) and

Figure AII.7



Banknotes by Dadara.

- a) 'One million' banknote (2011).
- b) Transformoney 2.0 banknote (2012).

Figure AII.8



Four examples of imaginary banknotes.
a) Central bank of Landreth, 50 Units (1999).
b) Fantasy note Antartica, one dollar (2007).
c) Moon Republic, one unit (2009).
d) Fantasy note, 1000 Koron (2003).

followed by upgrades in 1999 and 2001. A complete new designed series was issued in 2007, this time printed on a polymer substrate (figure AII.8b).

Spirit money

Placing a coin under the tongue of the departed is an example of an object to supply the dead with things they might need in the hereafter. Spirit money is a special group of imaginary banknotes to be used in the afterlife and is mainly practiced by Chinese and several East Asian cultures. There are three main types of spirit money: cash, silver and gold. Joss Prayer Papers are the best known form of spirit money, also known as ghost money, to ensure the spirit of the deceased enjoys many good

Figure A11.9



Four examples of spirit banknotes.

- a) Josh Paper printed on gold foil, Taiwan, (20th century).
- b) Hell Bank Note, China (year unknown).
- c) Hell Bank Note, China (year unknown).
- d) Hell Bank Note, China, mimicking US currency and using the portrait of John F. Kennedy.

things in the afterlife. Joss Paper is traditionally made from coarse bamboo paper, which feels handmade, although rice paper is also used. Traditional Joss Papers are cut into individual squares or rectangles and are decorated with seals, stamps, engraved designs or other motifs (figure A11.9a). More contemporary or westernized varieties of Joss Paper include Hell Bank Notes, paper credit cards and cheques. The Hell Banknotes are made to be burned, tossed in the air during the funeral procession or are left on the grave of the deceased. The notes come in a huge variety of denominations: everything from one cent up to billions of dollars. Common on the faces of all Hell Banknotes is the image of the Emperor of the Afterworld: the Lord of Hell, once a living Chinese Emperor (figure A11.9b and c). As a reward for his great leadership, he earned the right to reign over the Afterworld. He is shown wearing a beard and a flat-topped hat with beads hanging from the front and reverse. The reverse of the notes vary. They will depict a pavilion or pagoda, with tiled roofs. On some variants names are printed like 'The Hell Bank Corporation' or 'The Sky and Earth Corporation Limited'. Sometimes the notes are made to mimic US currency (figure A11.9d).

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