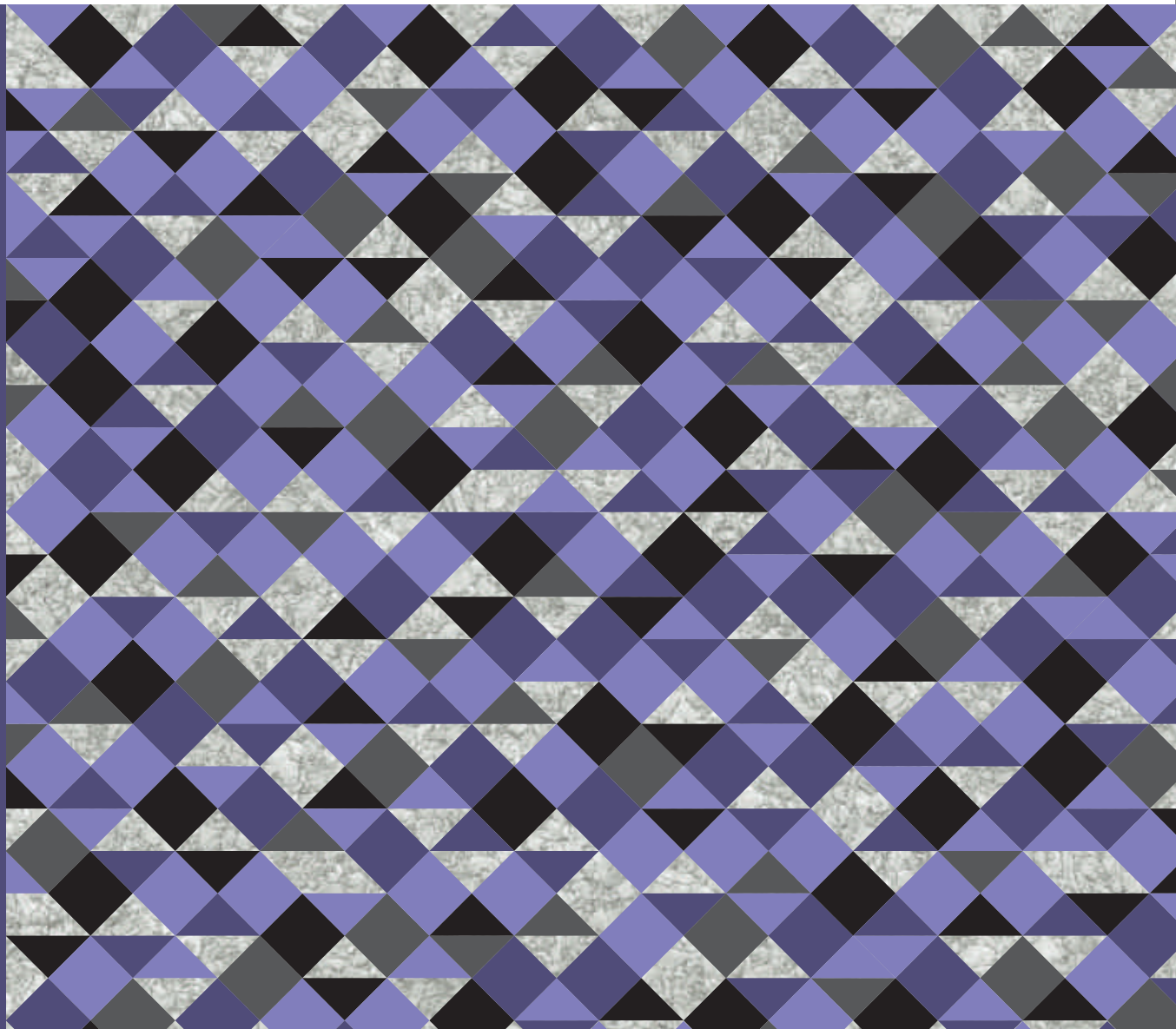


# Report on Cash Issuance 2015



BANCO DE PORTUGAL  
EUROSYSTEM





# Report on Cash Issuance

2015



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## Executive summary

Banco de Portugal publishes for the first time the *Report on Cash Issuance*. This report, which will be released on an annual basis, addresses the Bank's activities related to cash issuance and presents the most relevant indicators on:

- Banknote production ([Chapter I.1.1.](#));
- Putting banknotes and coins into circulation ([Chapter I.2.](#));
- Control of the authenticity and fitness of banknotes and coins ([Chapter I.3.](#));
- Other cash issuance-related activities, such as the withdrawal from circulation of escudo banknotes, the Bank's cash services, the analysis of cash-related complaints, and training and communication initiatives ([Chapter II](#)).

In addition, the most relevant European and national regulations in this field are released ([Chapter III.1.](#)).

*The Report on Cash Issuance* thus brings together all relevant information on cash issuance-related activities, which to date was published in the (monthly) *Statistical Bulletin*, the (biannual) *Bulletin on Banknotes and Coins*, and the (annual) *Activities and Financial Statements*.

### Cash issuance in 2015

In 2015 Banco de Portugal complied with its responsibilities regarding the decentralised production of euro banknotes by delivering 132 million banknotes printed at Valora (Box 2. Valora S.A., the Portuguese printing works) to the Eurosystem. In addition to producing €5 and €20 banknotes, it participated for the first time in a pilot production of the €50 banknote of the 'Europa' series.

Developments in cash circulation in the euro area were positive last year: the total value of banknotes and coins in circulation grew by 6.6 and 4.0 per cent respectively. The issuance of the €50 banknote, the most used in payments, increased by 11.8 per cent.

In Portugal the value of net banknote issuance continued to decline, reaching -€10 billion

(Box 3. Why do some banknotes have negative 'circulation?'). There was an increase in the demand for higher-value denominations (€50 to €500) that was, however, more than offset by the influx of banknotes (mainly €50) from other Member States, chiefly due to tourism.

Demand for the most used denominations in Portugal (€5 to €20) increased, in a context of low economic growth. The Portuguese continued to prefer the €20 banknote, which accounted for 81 per cent of the net value issued of €5 to €20 denominations.

The recirculation of coins was reinforced among operators. Changes in rules governing cash deposits with Banco de Portugal contributed to this.

A survey undertaken by Banco de Portugal of the Portuguese population in 2015 confirmed the important role that cash continues to play in the economy. Although it is not the instrument used for paying higher amounts, it is the most used in frequent and small amount transactions (70 per cent of payment operations). It is the payment instrument with the most widespread use and is commonly considered to be safe, convenient and fast.

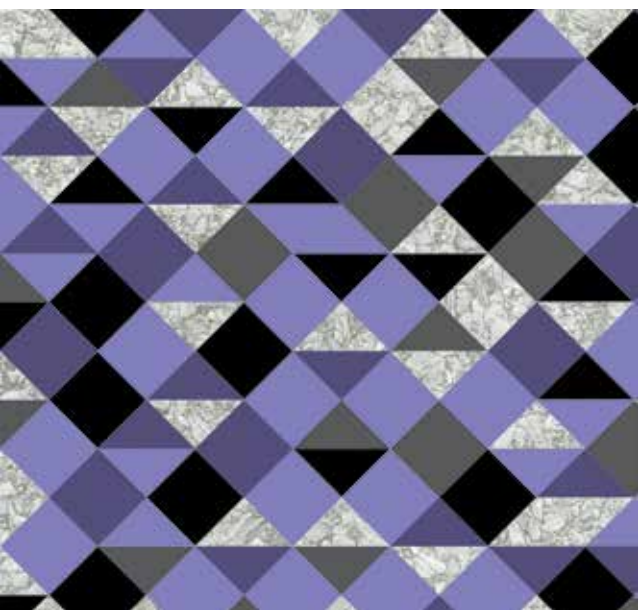
To safeguard confidence in cash, in 2015 Banco de Portugal checked the fitness and authenticity of 641 million banknotes and 48 million coins. However, an increasing number of external entities (especially credit institutions and cash in transit companies) ensure cash sorting. In 2015 these entities processed 4.8 times more banknotes and 38.6 times more coins than the central bank, which required of Banco de Portugal a greater effort to monitor and check compliance with the applicable rules and criteria, common to the euro area.

In 2015 around 8,600 counterfeit banknotes and 3,400 counterfeit coins were withdrawn from circulation. The share of counterfeits seized in Portugal in comparison to the euro area (1 per cent in banknotes, 2 per cent in coins) was again lower than Banco de Portugal's share of the European Central Bank's capital.

To fight counterfeiting, Banco de Portugal provided training to around 19,000 professionals and over 12,000 other learners. To prepare the launch of the €20 banknote of the 'Europa' series, and jointly with the initiatives promoted by the Eurosystem, the Bank hosted a national information campaign with the collaboration of the security forces (the National Republican Guard (GNR) and the Public Security Police (PSP)) to reach the population groups most vulnerable to attempted scams.

Still as regards the launch of the €20 banknote of the 'Europa' series, Banco de Portugal encouraged the different economic agents to adapt cash machines on a timely basis.





# I Cash issuance in 2015

1. Cash production
2. Putting cash into circulation
3. Monitoring the authenticity and fitness of cash



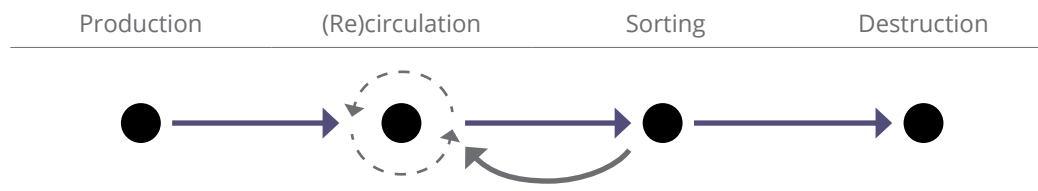
**Cash issuance**

The act of putting cash [banknotes and coins] into circulation; the act of creating responsibility for accepting cash in payments or exchanges.

In a broad sense, it encompasses all stages of the lifecycle of banknotes and coins, from production to destruction.

**Cash**

Banknotes and coins; money.



## 1. Cash production

Banco de Portugal, in its capacity as a euro area central bank, is the institution responsible for banknote production in Portugal. Since the introduction of the euro, banknote production has been awarded to Valora S. A., a company fully owned by Banco de Portugal.

Annually, Banco de Portugal, like every other national central banks of the euro area, guarantees the production of a low number of denominations, in a quantity corresponding to a share in the Eurosystem's total production.

This decentralised production model ensures a more efficient production process and greater uniformity in banknote fitness. Exchanging the different denominations produced among national central banks makes it possible to build up stocks that meet each Member State's banknote needs.

The production of coins is the responsibility of Imprensa Nacional – Casa da Moeda (the Portuguese Mint), on behalf of the State, which is the legal issuer.

### BOX 1 | Coin production and issuance in Portugal

In the euro area, Member States are generally the legal coin issuers. In Portugal the legal issuer is the State,<sup>1</sup> through the Directorate General of Treasury and Finance.

Banco de Portugal is the physical issuer, given that it is responsible for putting coins into circulation through its cash offices.

Imprensa Nacional – Casa da Moeda (the Portuguese Mint) is the entity responsible for producing (minting) coins.

Banco de Portugal submits the annual order of circulation coins to Imprensa Nacional – Casa da Moeda based on anticipated needs that cannot be met by stocks.

In parallel, the central bank issues an opinion on the annual numismatic plan of commemorative and collector coins. Within the approved limits, Banco de Portugal requests commemorative and

collector coins to Imprensa Nacional – Casa da Moeda according to the needs shown by credit institutions and individuals.

The circuit of coin as a payment means starts when Banco de Portugal receives the coins delivered by Imprensa Nacional – Casa da Moeda. At that moment:

- The coins received are considered issued, *i.e.* they become legal tender and can be used to pay debts and make payments;
- The respective face value is credited to the Directorate General of Treasury and Finance, and Banco de Portugal receives immediate ownership.

In this context, every coin credited (paid) to the legal issuer is considered ‘issued’, regardless of its location at a given moment: stock at Banco de Portugal or in circulation (the latter including the currency in credit institutions or sold at Imprensa Nacional – Casa da Moeda).

### 1.1. Banknote production

In 2015 Banco de Portugal was responsible for the production of three denominations of the second series of euro banknotes (‘Europa’ series), totalling 132 million banknotes. Valora S.A. (Box 2) produced 81 million €5 banknotes and 29 million €20 banknotes<sup>2</sup> and also completed the pilot production<sup>3</sup> of 22 million €50 banknotes.

In the same period, Banco de Portugal delivered to other central banks 260 million banknotes belonging to the first series, of the €100, €50 and €20 denominations, and received from other central banks 178 million banknotes of the second series, of the €20 and €10 denominations.

### BOX 2 | Valora S. A., the Portuguese printing works

On 20 April 1999 the Board of Directors of Banco de Portugal, in partnership with the British printing works De La Rue, decided to set up Valora S.A., with the purpose of producing euro banknotes, putting an end to the traditional process of purchasing them from private printing works.

This decision allowed Banco de Portugal to guarantee that its share of euro banknotes would be printed wholly in national territory, which had never been the case with the escudo production.

At the end of 2007 the partnership was ended by agreement between the shareholders, and Banco de Portugal now fully holds the capital of Valora.

The production of the new series of euro banknotes, the ‘Europa’ series, of high complexity and technical requirements, obliged Banco de Portugal to expand Valora’s facilities and purchase new printing equipment.

Valora is recognised in the Eurosystem for the high quality of the banknotes it produces and its security conditions.

## 2. Putting cash into circulation

In Portugal, Banco de Portugal is responsible for putting euro banknotes and coins into circulation. For this reason, the central bank also performs other related tasks:

- (i) Settles asymmetries between supply and demand by supplying the requested cash and accepting deposits, in liaison with credit institutions and cash in transit companies;
- (ii) Ensures the replacement of cash no longer fit for circulation;
- (iii) Monitors the authenticity and fitness of cash in circulation;
- (iv) Contributes to the withdrawal from circulation of counterfeits via its counterfeit analysis centre and collaboration with the criminal police and other cash professionals.

### 2.1. Banknotes put into circulation

#### 2.1.1. Net banknote issuance

##### **Net banknote issuance**

The difference between all banknote outflows from and inflows to a euro area central bank, or, as a whole, since the introduction of the euro (2002). The term used by Banco de Portugal with the same meaning is 'banknotes put into circulation'.

At the end of 2015 almost 19 billion banknotes were in circulation in the euro area, corresponding to approximately €1 trillion.<sup>4</sup> The value of banknotes in circulation rose by 6.6 per cent from the previous year.

The use of euro banknotes, mainly of greater value, as a reserve and transaction currency outside the euro area is frequently stated as the cause for the growing demand. The past 10 years have been marked by sharp pressure, particularly noticeable in 2008 (at the outset of the international financial crisis) and to a lesser extent from 2011 onwards (coinciding with financial bailouts in the euro area). In 2015 these developments intensified with the Greek crisis.

Net issuance of the most used banknote in payments in the euro area, the €50 banknote, grew the most last year (11.8 per cent). This seems to have been compounded by increased withdrawals in home countries by tourists travelling to Greece, where cash withdrawals were subject to restrictions.

Net banknote issuance in Portugal in terms of value continued to decline, reaching - €10 billion. From mid-2010 onwards the accumulated value of banknote inflows was always higher than the accumulated value of banknote outflows from Banco de Portugal. This can be accounted for by the external origin of part of the banknotes deposited with Banco de Portugal, especially those with greater face value, which are introduced in Portugal mainly via tourism (Box 3. Why do some banknotes have negative 'circulation?').

Banknotes with the highest value lead to negative net issuance. The €50 banknote contributes the most to this result, as it is favoured in the euro area and is brought to the country by foreign tourists at a high rate. Similarly, €200 and €100 banknotes also arrive in Portugal in a greater quantity than demand is able to absorb each year and thus have to be deposited with Banco de Portugal. With regard to the €500 banknote, which is associated more with its store of value function, only in three of the past 10 years (from 2012 to 2014) did it show negative net issuance, reaching a virtually nil balance at the end of 2015.

Lower-value banknotes showed a contrasting behaviour, i.e. the net issuance of these banknotes was positive. In this case, banknotes put into circulation by Banco de Portugal always exceed banknotes withdrawn, which mirrors a greater demand for these banknotes. This preference is usually associated with the country's economic growth and with the habit of paying with banknotes.

The €20 banknote, which in 2015 accounted for 81 per cent of net issuance of the group of lower-value banknotes, played an extremely important role in Portugal. In fact, it is considered

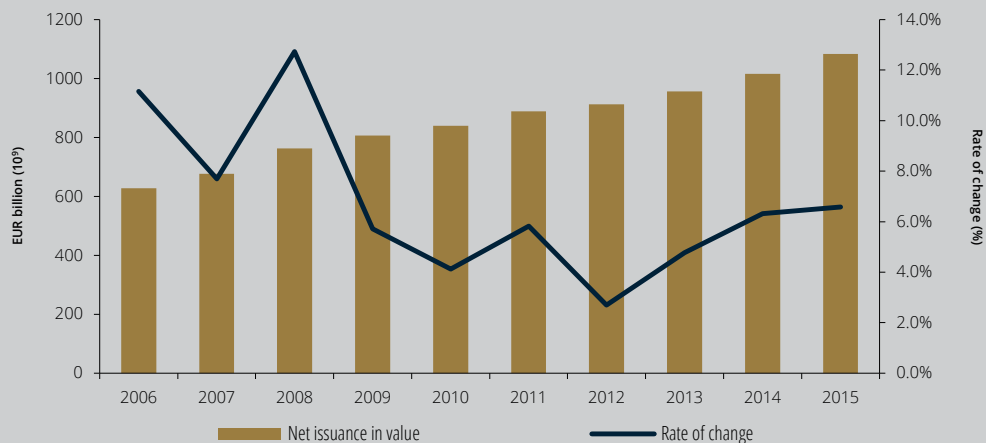
the standard banknote of the Portuguese monetary system, being the most used in payments.

The €10 banknote is the second most sought-after banknote, totalling in the past year 16 per cent of the net issuance of lower-value banknotes. It is more requested than the €5 banknote, as it corresponds to the minimum withdrawal from ATMs.

The €5 banknote is especially used for change and low-value payments, which may account for

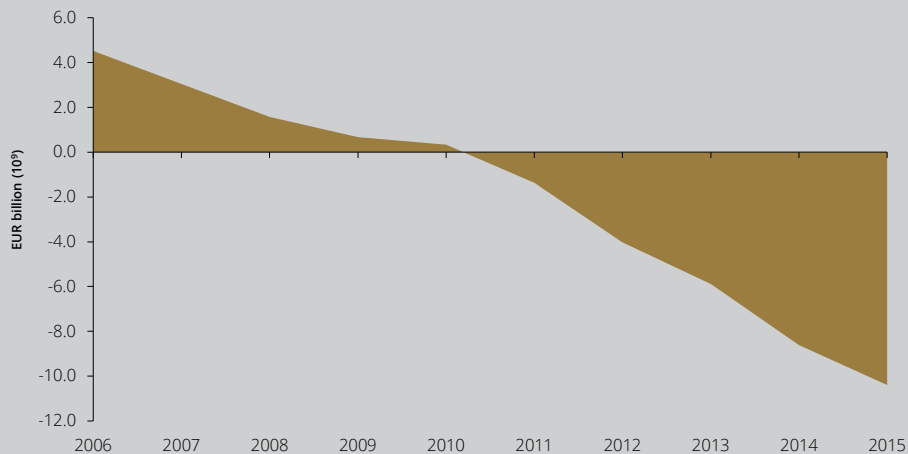
the increasingly less important role it plays in the group of banknotes (3 per cent in 2015). The balance in circulation of these three denominations as a whole grew in 2015 at a rate of around 5 per cent, *i.e.* increasing considerably from the previous year (2 per cent).

**Chart 1 •**  
Net issuance  
(circulation) of  
banknotes in the  
euro area

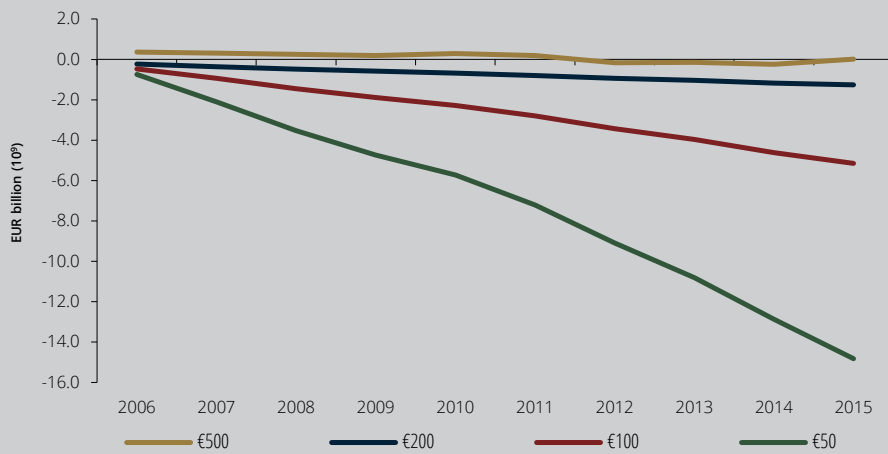


Source: ECB.

**Chart 2 •**  
Net issuance of  
banknotes in  
Portugal

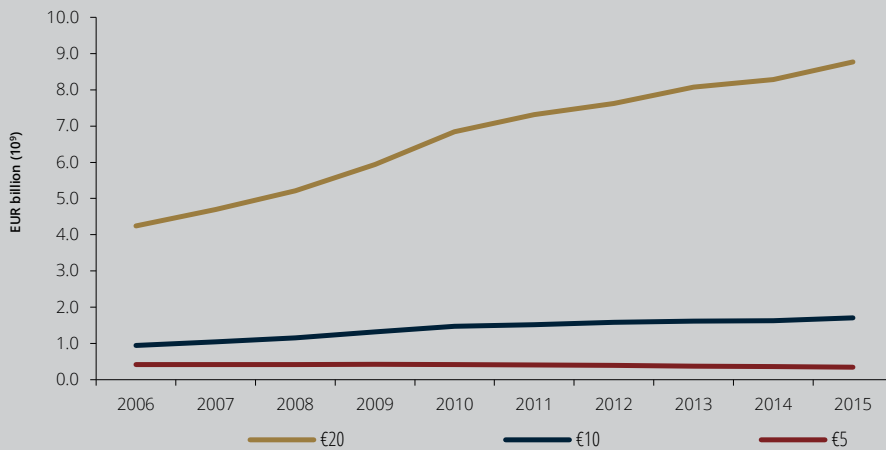


Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.1.



**Chart 3 •**  
Net issuance  
of banknotes in  
Portugal – €500  
to €50

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.1.



**Chart 4 •**  
Net issuance  
of banknotes in  
Portugal – €20  
to €5

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.1.

### BOX 3 | Why do some banknotes have negative 'circulation'?

Prior to the euro, and although part of the banknotes issued by a central bank could be held abroad, it was possible to calculate the quantity and value of banknotes in circulation, given that all banknote inflows to a central bank had been issued by it in the past.

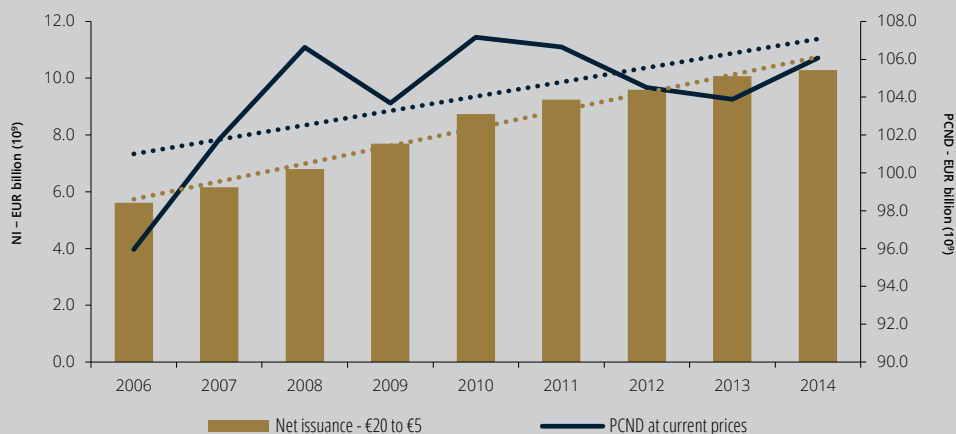
The situation of euro area countries is now quite different. The free movement of persons, goods and capital has as a practical consequence that the banknotes issued by a country's central bank may be in circulation in another country and be delivered to the latter's central bank. For this reason, it is not possible to know how many banknotes are circulating in each euro area country, but only what the balance is between outflows from and inflows to the central bank, *i.e.* the 'net issuance'. This term should be used when referring to these countries individually.

Negative net issuance results, in cumulative terms, from a higher value of banknote inflows to a central bank than outflows. It emerges, in one or more denominations, in the countries of destination of banknotes' migratory movements, such as Portugal. An inflow of banknotes issued in other countries may occur, *e.g.* in payments of day-to-day transactions in border areas or made by tourists. This seems to be the main reason for the downward trend of cash issuance in Portugal, which has become more marked in the past few years, in line with growth in tourism revenue.

As can be seen in Charts 5 and 6, cash issuance in Portugal is quite different depending on the groups of denominations.

In a scenario of negative net issuance and a somewhat unstable economic and financial environment, as has been the Portuguese case in the past five years, it is not easy to prove the factors thought to influence this indicator. The country's economic growth, as measured by GDP, is not seen as decisive, even when the analysis is limited to the group of banknotes most used by the Portuguese. When the comparison is limited to private consumption of non-durables, there seems to be a relationship. In fact, €5 to €20 denominations are used in lower-value transactions, which include the purchase of fast or non-durable consumer goods. Although consumption of

**Chart 5 • Net issuance (NI) of €20 to €5 banknotes and private consumption of non-durables (PCND) – Portugal**



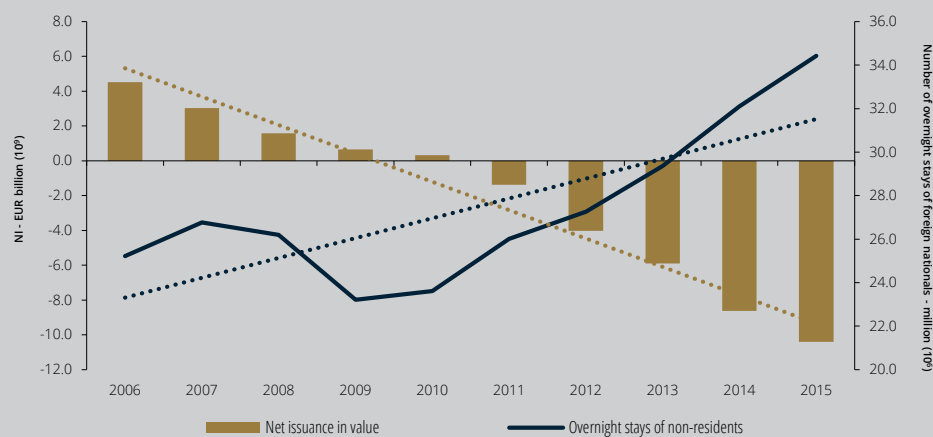
Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.1.



such goods ranged between 2006 and 2014 and the net issuance of €5 to €20 banknotes grew moderately albeit continuously in the same period, both variables followed an upward trend.

There is a relationship between net issuance of banknotes and the inflow of banknotes from other countries, which can be verified by the origin of banknotes circulating in Portugal. The relationship between the two is contrary: the value of the former declines as the latter increases. This is observed when comparing net issuance with non-resident tourism in Portugal (number of overnight stays). The analysis is valid considering the important role played by higher-value banknotes, despite the fluctuations in the tourism indicator between 2008 and 2011.

**Chart 6 • Net issuance (NI) of banknotes and tourism – Portugal**



Source: Banco de Portugal, see *Statistical Bulletin* – Tables I.1.1 and H.1.17.

### 2.1.2. Withdrawal of banknotes at Banco de Portugal

The total value of banknotes withdrawn at Banco de Portugal in 2015 remained virtually unchanged from 2014, at €10.7 billion.

The withdrawal of banknotes at Banco de Portugal by cash in transit companies on behalf of credit institutions is the main component of outflows from the central bank.<sup>5</sup>

The distribution of banknote withdrawals over the year is determined by a greater or lower demand by users. Therefore, the higher concentration of withdrawals occurs near school or work holiday periods, in ascending order: Christmas, summer and Easter. In 2015 the

value recorded in each of these ‘peaks’ was always higher than in the previous year. The seasonal pattern of banknote withdrawals at the central bank is not exclusive to Portugal, also being recorded in the monthly trend of circulation at euro area level.<sup>6</sup>

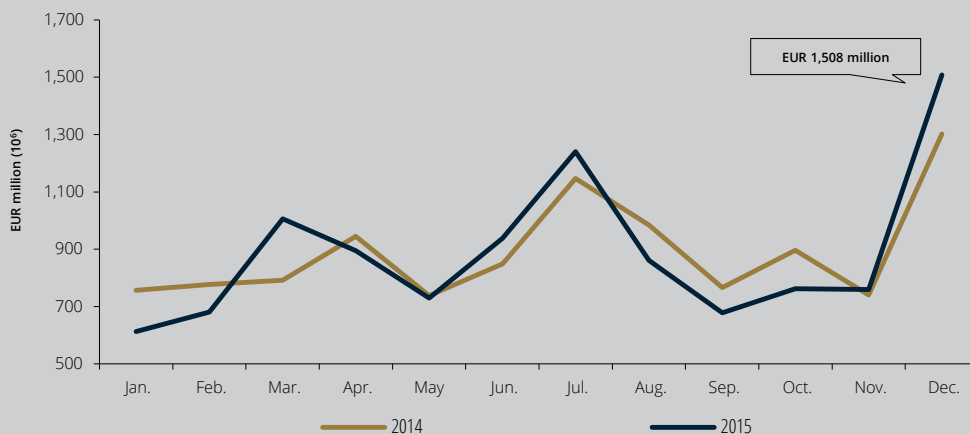
In 2015, €10,672 million was withdrawn, corresponding to 622 million banknotes. In terms of value, the change from the previous year was minimal, resulting from a reduction in the denominations that circulate the most in Portugal – €20 and €10 – offset by an increase in the others.<sup>7</sup> This seems to have been due to a combination of factors, such as a need for renewal of banknotes in circulation, greater demand for higher denominations, possibly due to the banking system’s current environment, and the

reinforcement of banknote surplus exchanges among credit institutions, particularly those that circulate in greater quantity.

The breakdown by denomination of banknotes withdrawn at Banco de Portugal naturally reflects a greater use of lower-value denominations – €20, €10 and €5. In fact, 80 per cent of

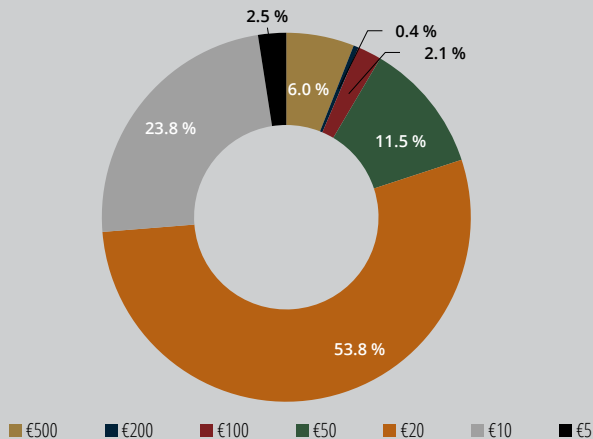
the value withdrawn concerns this group, with little over half the total for the €20 banknote and a low share for the €5 banknote. The €200 banknote was least used by the Portuguese, thus playing a minor role.

**Chart 7 •**  
Banknote  
withdrawals  
at Banco  
de Portugal



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.4.

**Chart 8 •**  
Breakdown by  
denomination of the  
value of banknotes  
withdrawn | 2015



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.4.

**Table 1 • Banknote withdrawals at Banco de Portugal | U: milion (10<sup>6</sup>)**

Denomination (€)	2014		2015		Change (%)
	No.	Value	No.	Value	Value
500	0.9	437.0	1.3	635.6	45,5%
200	0.1	29.0	0.2	47.2	62,9%
100	1.8	184.1	2.2	224.9	22,2%
50	22.4	1,118.5	24.5	1,222.6	9,3%
20	297.5	5,950.9	286.9	5,738.3	-3,6%
10	271.5	2,714.8	254.1	2,540.9	-6,4%
5	51.9	259.4	52.6	262.9	1,3%
<b>Total</b>	<b>646.1</b>	<b>10,693.7</b>	<b>621.8</b>	<b>10,672.4</b>	<b>-0,2%</b>

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.4.

### 2.1.3. Banknote deposits at Banco de Portugal

The total value of banknotes deposited at Banco de Portugal in 2015 declined by 7.3 per cent from the previous year, i.e. €976 million less.

Similarly to withdrawals, banknote deposits at Banco de Portugal are made by cash in transit companies on behalf of credit institutions and are the main component of inflows to the central bank.<sup>8</sup>

Banknote deposits are distributed over the year in line with withdrawals, i.e. the periods of greater banknote inflows to Banco de Portugal immediately follow greater outflow periods

(seasonal pattern). This is accounted for by a need to relieve credit institutions from excess banknotes originating in a greater number of transactions in holiday periods. In 2015 the value of monthly deposits was almost always lower than in the previous year.

In 2015, €12,445 million was deposited, corresponding to 637 million banknotes. Compared to 2014, the overall change in value resulted from an almost broadly based reduction per denomination. This seems to have resulted from lower recourse to the central bank for placement of surpluses, against a greater redistribution among operators.

**Table 2 • Banknote deposits at Banco de Portugal | U: milion (10<sup>6</sup>)**

Denomination (€)	2014		2015		Change (%)
	No.	Value	No.	Value	Value
500	1.1	541.9	0.8	387.9	-28,4%
200	0.8	165.8	0.7	140.2	-15,5%
100	8.3	825.9	7.7	766.9	-7,1%
50	63.5	3,176.8	63.3	3,163.5	-0,4%
20	286.5	5,729.9	262.3	5,245.1	-8,5%
10	269.9	2,699.1	246.0	2,459.6	-8,9%
5	56.3	281.3	56.3	281.6	0,1%
<b>Total</b>	<b>686.4</b>	<b>13,420.8</b>	<b>637.0</b>	<b>12,444.7</b>	<b>-7,3%</b>

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.3.

The breakdown by denomination of banknotes deposited at Banco de Portugal partly followed the structure of withdrawals. However, lower-value denominations (€20, €10 and €5) accounted for a lower share (64 per cent). The €50 banknote played a relevant role, accounting

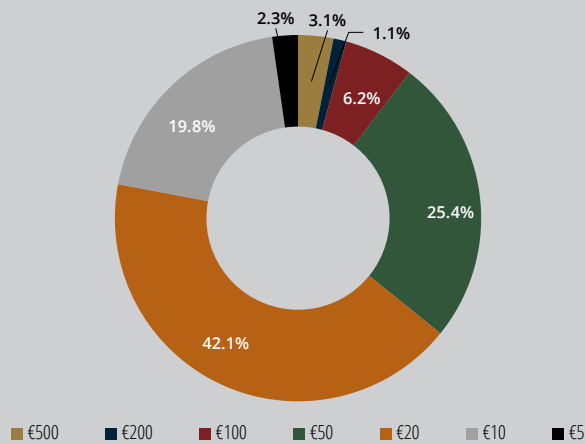
for a quarter of the total value deposited. This denomination, which is the benchmark for use in the euro area, arrives at the central bank in this proportion mainly due to foreign tourism in Portugal.

**Chart 9 •**  
Banknote deposits at Banco de Portugal



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.3.

**Chart 10 •**  
Breakdown by denomination of the value of banknotes deposited | 2015



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.3.

#### BOX 4 | The use of cash by the Portuguese

In 2015, with the collaboration of a specialised company, Banco de Portugal developed a study aiming to obtain information on the costs and benefits for consumers of using retail payment instruments: cash, cheque, debit card, credit card, pre-paid card, direct debits, and credit transfers. This study complements previous studies focusing on the banking system and retailers.

To know the habits and behaviours of the Portuguese population, 800 face-to-face interviews were conducted in mainland Portugal and the islands of individuals aged 18-74. The assessment of consumers based on responses to surveys was complemented with the recording of 6,000 payment diaries.

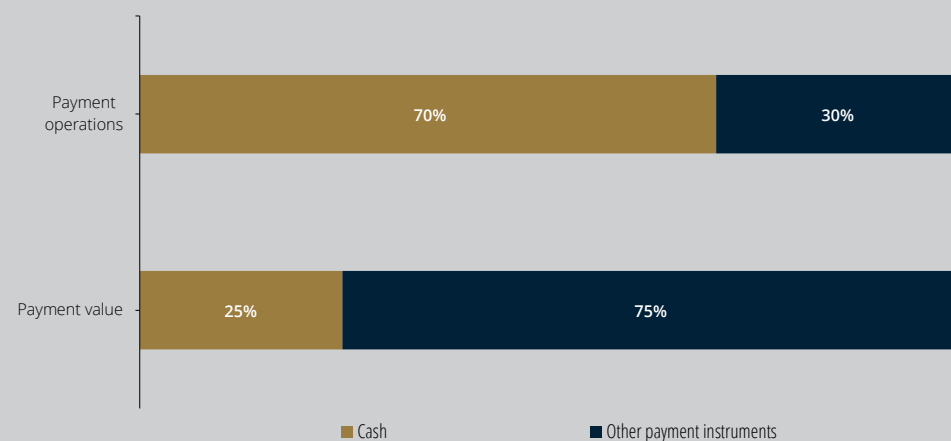
In spite of the differences in scope, methodology and method of computation of the final results, data obtained in 2015 may be to a large extent compared with the results of previous work. The first conclusion is that cash maintains its relative importance compared with the other means of payment.

In fact, all respondents use cash. Banknotes and coins are more used relatively: in Alentejo and in the North; by men, especially those aged 18-24 and 55 and over; by men living alone. Out of all payment instruments, cash is the most used in low-value transactions, and the first option for most people. On average, whoever uses money carries little over €30 in their wallet. Only 4 per cent of the respondents are not in the habit of always carrying banknotes or coins: budget control and fear of theft are reported as the main reasons for not carrying banknotes and coins more often.

The payment diary shows that on average the Portuguese make 52.3 payments per month, 36.7 of which in cash, which corresponds to a utilisation rate of 70 per cent. Cash is the favourite instrument, especially in payments made more frequently (food and hygiene) and up to €10. For this reason, it accounts for only 25 per cent of the whole value paid.

The Portuguese do not seem to have a precise knowledge of the costs associated with the use of payment instruments. With regard to cash and operations such as withdrawals or deposits over the counter, respondents believe that they have no costs or are not aware of them.

Chart 11 • Relative frequency of cash use



The image Portuguese consumers have of payment instruments influences their preference as points of sale considerably. Cash is assessed rather positively: safety, convenience and swiftness are some of the most valued attributes by consumers.

Most of the respondents using high-value banknotes (€50 and over) reported difficulties in using them, especially due to the lack of change available in retailers, and security issues. No problem was reported by a third of the respondents, simply because they do not use these banknotes.

When questioned on whether the type of banknote available at ATMs met their needs,<sup>9</sup> 51 per cent of respondents said yes, 44 per cent would like to have more €5 banknotes and 7 per cent higher-value banknotes. Overall, the amounts available meet the needs of most users, both the maximum (77 per cent) and the minimum (62 per cent). Nevertheless, 35 per cent of respondents considered that the minimum amount (€10) should be reduced,<sup>10</sup> while 20 per cent stated that the maximum amount (€200 per operation and €400 daily) should be raised.

Few always check the authenticity of the banknotes they receive (7 per cent in the case of banknotes received as change and 5 per cent for banknotes withdrawn over the counter or at ATMs) and many believe they have never received a counterfeit banknote (72 per cent) or never questioned it (26 per cent). Approximately half of those interviewed do not check the authenticity of banknotes received as change, especially when they are withdrawn over the counter or at ATMs (67 per cent). This behaviour is largely due to the fact that most people are not aware of what should be checked and trust the entities in question and the monetary system itself.

Only 5 per cent of respondents were or admitted having been the target of fraud or theft with payment instruments, especially involving cash, in the preceding 12 months.

## 2.2. Coins put into circulation

### 2.2.1. Net issuance of coins

#### Net issuance of coins

The difference between coin outflows and inflows at a euro area central bank or as a whole since the introduction of the euro (2002). Banco de Portugal also uses the term 'coins put into circulation', which has the same meaning.

At the end of 2015, 116 billion circulation coins<sup>11</sup> were circulating in the euro area, equivalent to approximately €26 billion. For the second consecutive year, the value of coins in circulation increased at a greater pace, recording a rate of change of 4.0 per cent. The decisive contribution was made by the €2 denomination, which accounted for 43 per cent of the total value put into circulation and grew by 5.3 per cent from the previous year.

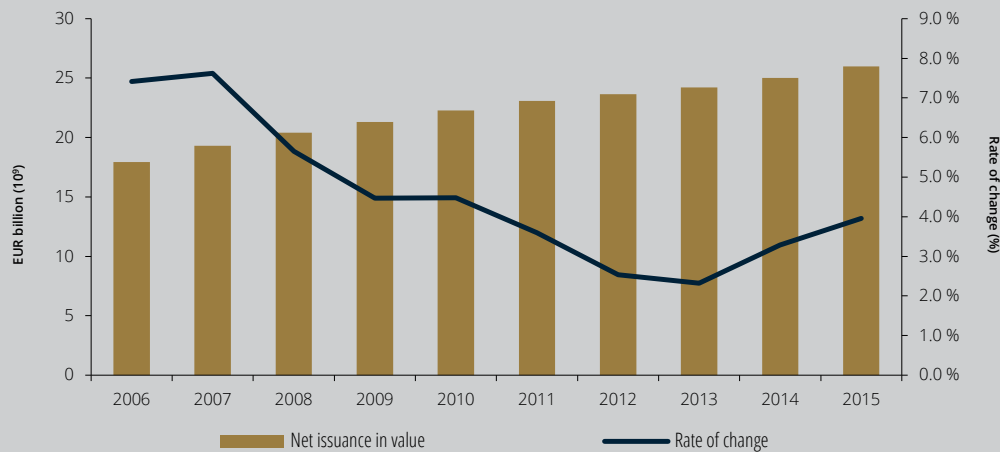
Contrary to banknotes, net issuance of coins in Portugal is positive and has been growing on an ongoing basis. At the end of the year it reached around €517 million, increasing by 5 per cent from the previous year and recovering to the growth levels seen up to and including 2009.

The trend of net issuance in value shows that in most cases it has always been necessary to put more coins of all denominations into circulation than the respective inflows to the central bank. The €2 coin is the exception, with net issuance falling in the last 10 years. This behaviour was due to the strong migration of this denomination to the country, jointly with lesser use by the public. By contrast, users prefer the €1 denomination, which has therefore been growing year after year and reinforcing its weight in denominations as a whole.

Given that circulation coins are mainly used for change and small payments, the pressure of demand by Portuguese users is expected to continue. This has been the case with €1 and lower denominations, which are quite in demand for payments in large supermarkets, small businesses and vending machines. Changes in pricing in these business areas largely determine the higher or lower demand for some denominations over time. In addition, in the case of 1 and 2 cent coins, a substantial share is presumed not to

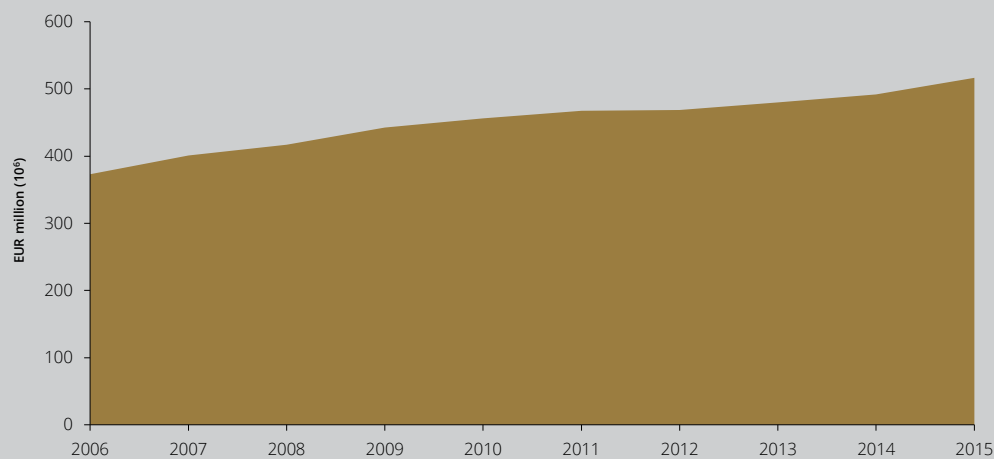
circulate again (forgotten or kept due to high processing costs) and hence needs to be replaced.

Jointly with circulation coins, Banco de Portugal also controls the collector coins it puts into circulation. At the end of 2015, net issuance<sup>12</sup> of this type of coin stood at €88 million, corresponding to around 14 million coins, with face values from 25 cents to €10. In the last 10 years the value of collector coins in circulation grew by 1.7 per cent.



**Chart 12 •**  
Net issuance  
(circulation)  
of coins in the  
euro area

Source: ECB.



**Chart 13 •**  
Net issuance of  
coins in Portugal

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.1.

### 2.2.2. Withdrawal of coins at Banco de Portugal

In 2015 the total value of coins withdrawn at Banco de Portugal declined by 9.6 per cent from the previous year.

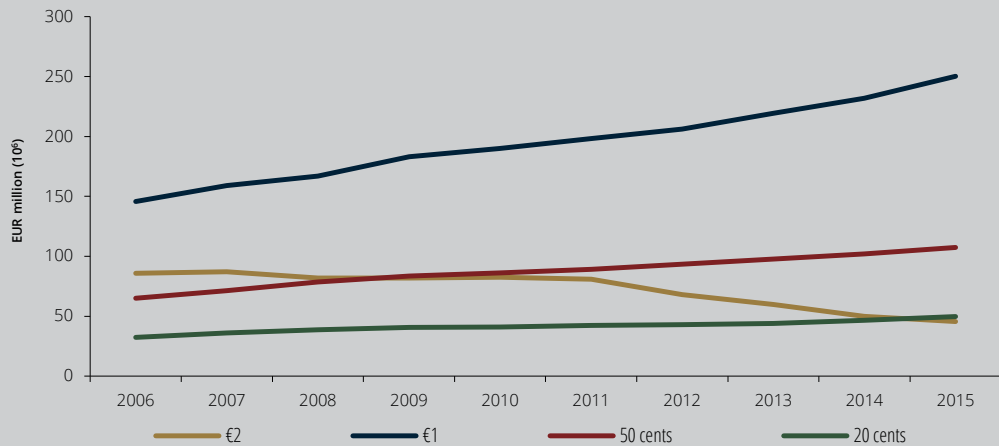
The withdrawal of coins at Banco de Portugal, similarly to banknotes, is made by cash in transit companies on behalf of credit institutions and is the main component of outflows from the central bank.<sup>13</sup>

Monthly withdrawals of coins at Banco de Portugal do not have a defined pattern: they are

higher during the summer, but there are no peaks at Christmas or Easter.

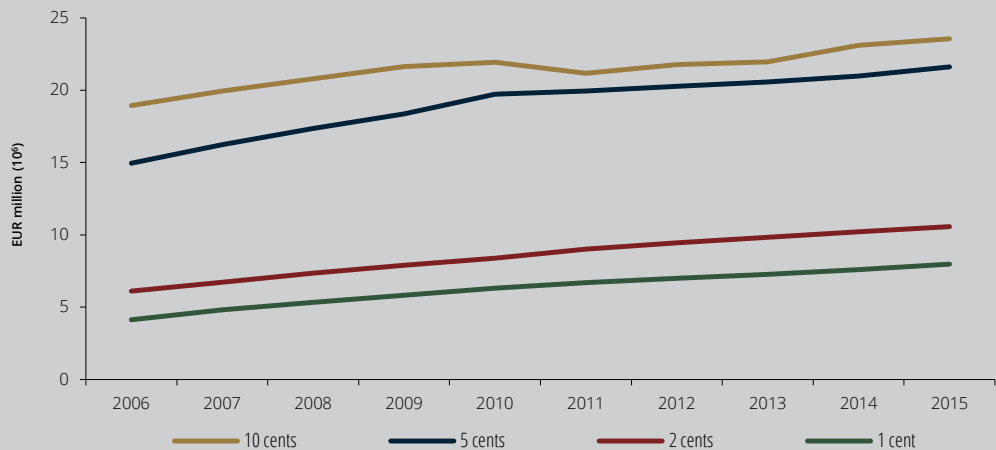
Last year around €41 million was withdrawn, corresponding to 140 million coins. Although the overall change was negative in value, two denominations grew by around 12 per cent (20 and 5 cents). The reduction in withdrawals seems to have been due to an increase in coin surplus exchanges among credit institutions, associated with the change in the rules governing cash deposits with Banco de Portugal.

**Chart 14 •**  
Net issuance  
of coins  
in Portugal –  
€2 to 20 cents



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.1.

**Chart 15 •**  
Net issuance  
of coins in  
Portugal –  
10 cents to 1 cent



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.1.



**Table 3 • Coin withdrawals at Banco de Portugal | U: million (10<sup>6</sup>)**

Denomination (€)	2014		2015		Change (%)
	No.	Value	No.	Value	Value
2.00	2.01	4.01	1.96	3.93	-2.1%
1.00	24.18	24.18	22.29	22.29	-7.8%
0.50	21.82	10.91	17.57	8.78	-19.5%
0.20	14.77	2.95	16.53	3.31	11.9%
0.10	13.68	1.37	8.34	0.83	-39.0%
0.05	11.57	0.58	12.90	0.65	11.6%
0.02	24.41	0.49	19.97	0.40	-18.2%
0.01	38.52	0.39	39.91	0.40	3.6%
<b>Total</b>	<b>150.96</b>	<b>44.88</b>	<b>139.48</b>	<b>40.59</b>	<b>-9.6%</b>

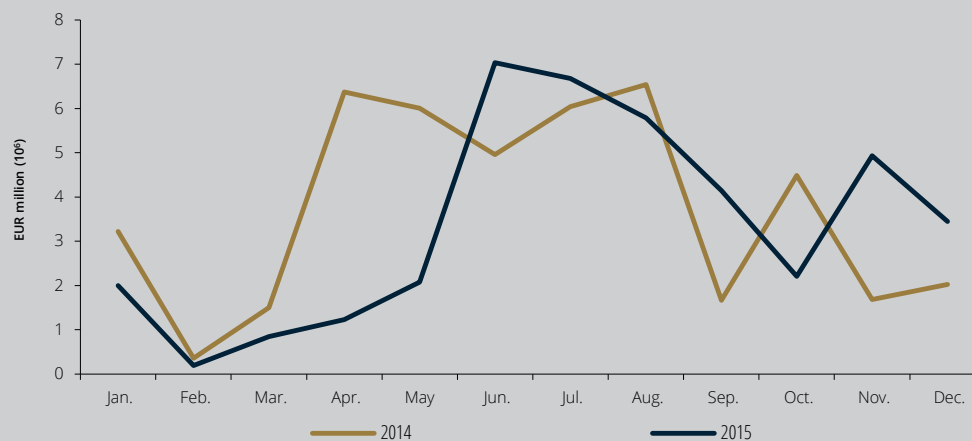
Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.4.

Approximately three quarters of the value of coins withdrawn last year concerned €1 and 50 cent denominations, with the former accounting for half. The highest value coin – €2 – only ranked third, its share only slightly above the 20 cent coin. In spite of their minor role in terms of value, lower-value denominations as a whole, *i.e.* 1 to 5 cents, corresponded to withdrawals of approximately 73 million coins (more than half the total).

### 2.2.3. Coin deposits with Banco de Portugal

In 2015 the total value of coins deposited with Banco de Portugal declined by 40.9 per cent, much more than withdrawals.

As with withdrawals, coin deposits with the central bank are made by cash in transit companies on behalf of credit institutions and are the main component of inflows to the central bank.<sup>14</sup>



**Chart 16 •**  
Withdrawal  
of coins at Banco  
de Portugal

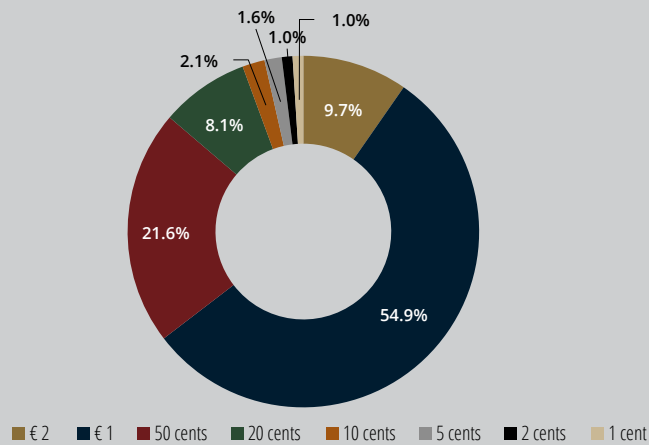
Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.4.

Along the same line as withdrawals, coin deposits over the two years observed were not distributed regularly or markedly depending on the season. The significant break in the value deposited from one year to the next and its uneven monthly distribution were related, on the one hand, to a change in the conditions of deposit with the central bank applied as of the last quarter of 2014,<sup>15</sup> and on the other,

with the intensification of surplus exchanges among credit institutions.

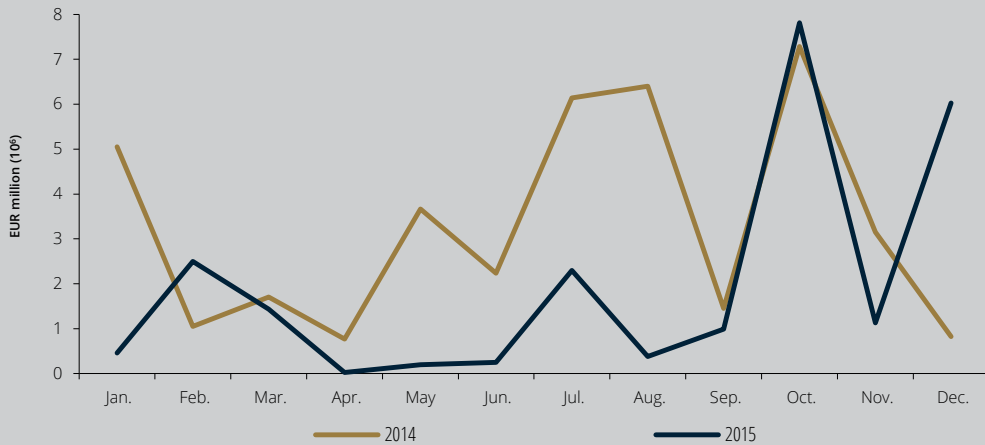
Compared with the previous year, €16 million less were deposited, corresponding to 24 million fewer coins. This decline was mainly contributed to by higher value denominations (€2, €1 and 50 cents). 1 and 2 cent coins practically did not return to the central bank.

**Chart 17 •**  
Breakdown by denomination of the value of coins withdrawn | 2015



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.4.

**Chart 18 •**  
Coin deposits with Banco de Portugal



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.3.

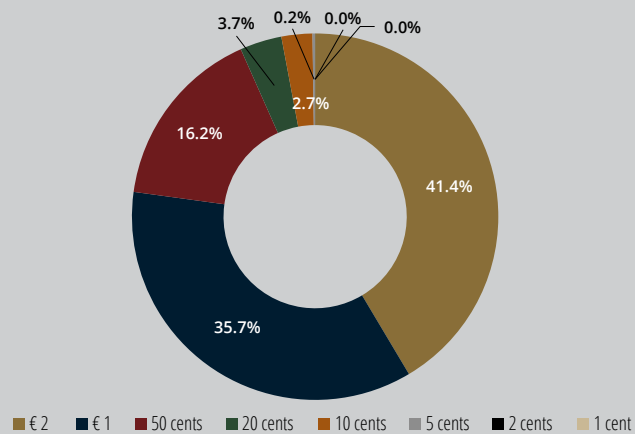
**Table 4 • Coin deposits with Banco de Portugal | U: million (10<sup>6</sup>)**

Denomination (€)	2014		2015		Change (%)
	No.	Value	No.	Value	Value
2.00	8.15	16.30	4.86	9.73	-40.3%
1.00	14.97	14.97	8.39	8.39	-44.0%
0.50	14.27	7.14	7.60	3.80	-46.8%
0.20	2.83	0.57	4.34	0.87	53.1%
0.10	4.34	0.43	6.40	0.64	47.3%
0.05	3.83	0.19	1.05	0.05	-72.5%
0.02	3.56	0.07	0.06	0.00	-98.2%
0.01	4.35	0.04	0.04	0.00	-99.0%
<b>Total</b>	<b>56.32</b>	<b>39.72</b>	<b>32.75</b>	<b>23.48</b>	<b>-40.9%</b>

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.3.

In spite of the significant fall, the group of 50 cents, €1 and €2 denominations continued to account for the highest share of the value deposited (93 per cent), equivalent to 64 per cent of the total quantity returned to Banco de Portugal.

For more data on banknotes and coins put into circulation, please visit Banco de Portugal's website  
[BPstat | Statistics online](#)



**Chart 19 •**  
Breakdown  
by denomination  
of the value  
of coins  
deposited  
| 2015

Source: Banco de Portugal, see *Statistical Bulletin* – Table I.2.3.

### BOX 5 | Where were the coins circulating in the country minted?

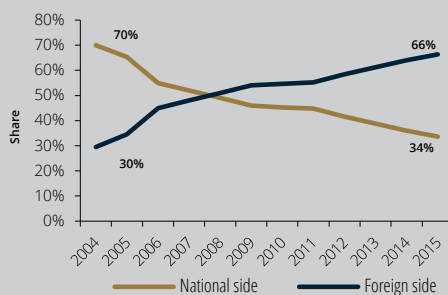
The mobility of euro banknotes and coins due to citizens and professionals, in conjunction with payment habits in a common growing space, has led to imbalances in a number of Member States and in certain denominations.

In the case of coins, these imbalances assumed an increased importance given their effect on a Member State's income. In these countries, like Portugal, which receive a considerable number of coins from other euro area countries, the overall gain the State obtains from issuance is reduced. For example, in Portugal no €2 coin has been minted since 2006 (except for commemorative coins), given the quantity coming from other Member States.

Aiming to understand the migration of coins into Portugal and supply data to assess the impact of this phenomenon, Banco de Portugal conducts an annual study allowing it to identify the country where the coins found in circulation are minted. It is based on a sample of coins of all denominations received from the public, collected from some of the Bank's cash offices.

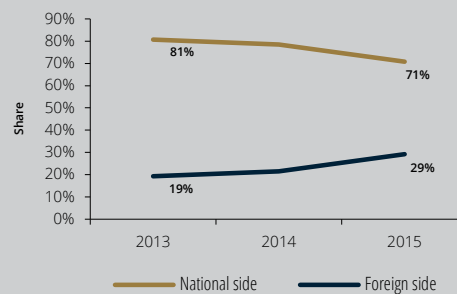
The study for 2015 confirmed the upward trend of coins with a foreign side, which accounted for 52 per cent of all coins analysed. There was a greater difference in the group of 10 cents – €2 denominations: 66 per cent of the analysed coins had a foreign side. Individually, the higher value coins (€2) recorded the higher share of foreign sides: 87 per cent. The most representative nationalities in these coins were, in descending order, the German, the Spanish and the French; the Portuguese only ranked fourth. Only in the group of the three lowest denominations, from 1 to 5 cents,<sup>16</sup> was the national side more frequent (71 per cent).

**Chart 20 • Composition of the sample – €2 to 10 cent coins**



Source: Banco de Portugal.

**Chart 21 • Composition of the sample – 5 to 1 cent coins**



Source: Banco de Portugal.

### 3. Monitoring the authenticity and fitness of cash

Public confidence in the use of cash depends on the perception of the legitimacy of the banknotes and coins received in payments or exchange. For this reason, monitoring the authenticity and fitness of cash in circulation is one of the central banks' operational areas that involves the most human and material resources. It is mainly divided into two areas: cash sorting, targeted at withdrawing cash from circulation that is not authentic or of insufficient quality to be recirculated (unfit);<sup>17</sup> combating forgery and counterfeiting, by using and releasing techniques to detect false or counterfeit banknotes and coins, managing information on counterfeits detected in the euro area and cooperating with other professional cash handlers and police authorities.

#### **Sorting (concept adapted to Banco de Portugal's activity)**

Separating authentic/suspect cash; separating (authentic) fit/unfit cash.

#### **Processing**

Checking or controlling the authenticity and fitness of cash using machines.

#### **Counterfeiting**

Fraudulent reproduction or imitation.

#### **Forgery**

Fraudulent adulteration or imitation.

In Portugal the cash sorting function observes the criteria set out for the euro area and is in line with a mixed model where both Banco de Portugal and qualified market operators operate.

Banco de Portugal has average and high-speed banknote processing machines able to identify and separate banknotes suspected of being counterfeit and unfit banknotes. Regardless of potentially being processed by other entities (credit institutions or cash in transit companies), all banknotes delivered to the central bank are checked, it being the only entity authorised to destroy banknotes considered unfit.

In parallel, Banco de Portugal sorts the coins it receives from the public and credit institutions through specific machines capable of identifying and separating coins suspected of being counterfeit and authentic coins that are degraded and, as such, unfit for recirculation. The destruction of unfit coins is not conducted by the central bank, but by the Portuguese Mint.

Compliance with the rules and criteria established by cash handlers is monitored by Banco de Portugal in two ways: directly (on site monitoring) at the entities' branch offices and operational centres by inspection teams; indirectly (off site monitoring) by analysing the information collected and data that are regularly submitted to Banco de Portugal.

The banknote sorting activity is mostly carried out by cash in transit companies and credit institutions.<sup>18</sup> At the end of last year 61 per cent of total entities used machines with simultaneous authenticity and fitness control functionalities.

The four cash in transit companies operating in Portugal are the main entities responsible for the sorting of coins. Taking into account the features of the machines and the number of operational cash centres (11), cash in transit companies present the best conditions for this activity.

In addition to controlling the professional cash handlers' duty to retain counterfeit banknotes and coins, Banco de Portugal also analyses<sup>19</sup> and registers counterfeits.

#### **3.1. Sorting by Banco de Portugal**

##### **3.1.1. Processed banknotes**

Last year, the central bank destroyed 180 million banknotes of all denominations for not being of sufficient quality to return to circulation.

In 2015 Banco de Portugal processed 641 million banknotes received from the public and

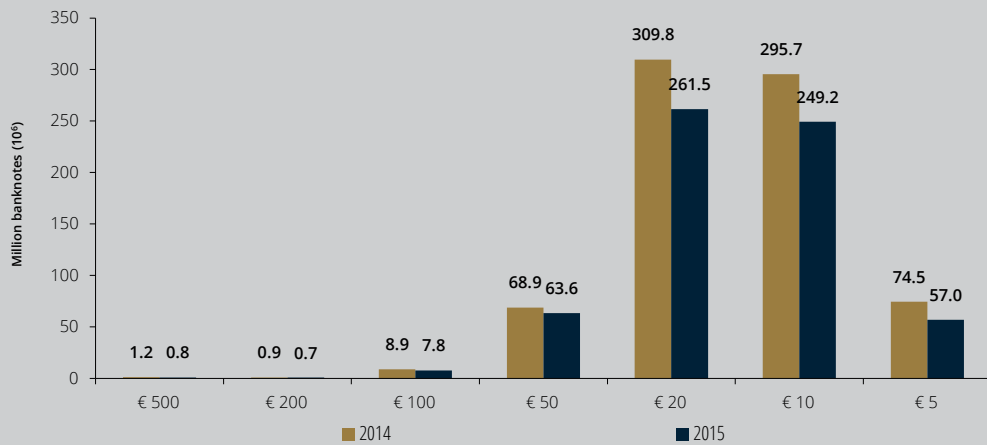
credit institutions through its partner cash in transit companies. Compared with the previous year this activity declined by 16 per cent, which appears to have been due to the reinforcement of banknote recirculation<sup>20</sup> by cash handlers (mainly credit institutions and cash in transit companies).

As a result of the processing, around 180 million banknotes were classified as unfit and destroyed. The structure by denomination of these banknotes naturally reflects the intensive use of the lower value banknotes.

The overall destruction rate of processed banknotes stood at 28 per cent. By denomination,

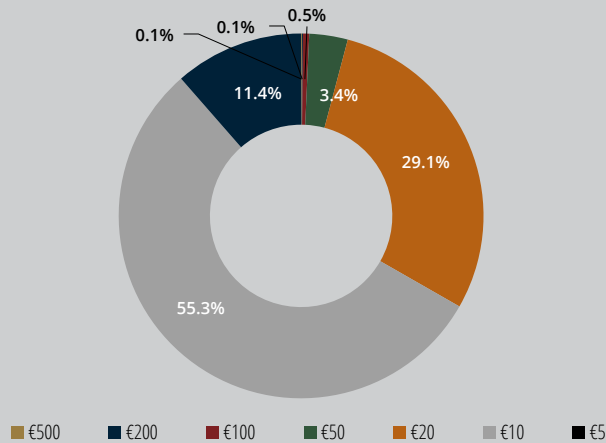
rates were quite varied: relatively high for €500 and €200 banknotes, which are less requested but remain in circulation longer; moderate in intermediate denominations, €100 to €20, as a consequence of greater inflows to the central bank and, mainly in the case of the latter, a frequent renewal with new banknotes (through withdrawals, for replacement of destroyed banknotes); and high in the two lowest denominations, €10 and €5, due to the larger-scale delivery of very used banknotes of the first series after the introduction into circulation of the second series banknotes succeeding them.

**Chart 22 •**  
Banknotes processed by Banco de Portugal  
| By denomination



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.5.

**Chart 23 •**  
Breakdown by denomination of the quantity of unfit banknotes  
| 2015



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.5.

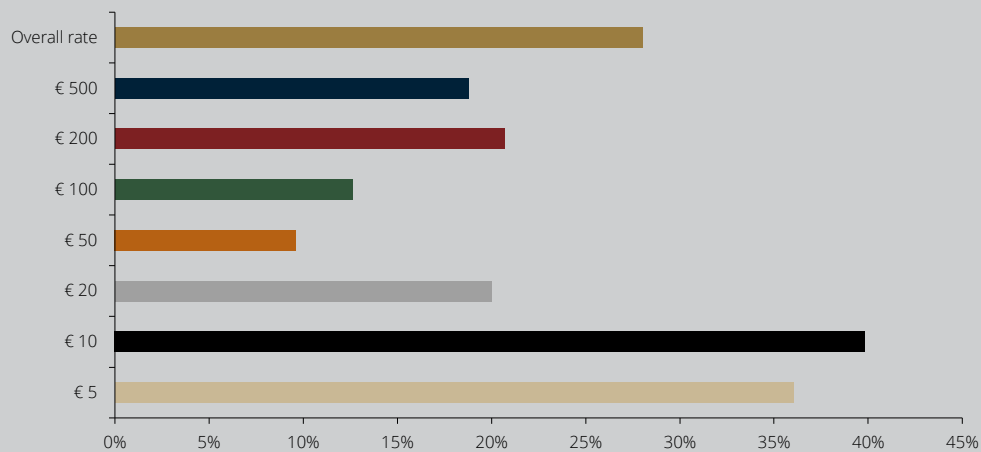
### 3.1.2. Processed coins

In 2015 Banco de Portugal processed 48 million coins, *i.e.* 35 million fewer than in 2014.

Total coins processed by Banco de Portugal declined considerably from the previous year (by 42 per cent), which was fully accounted for by a reduction in the quantity deposited.

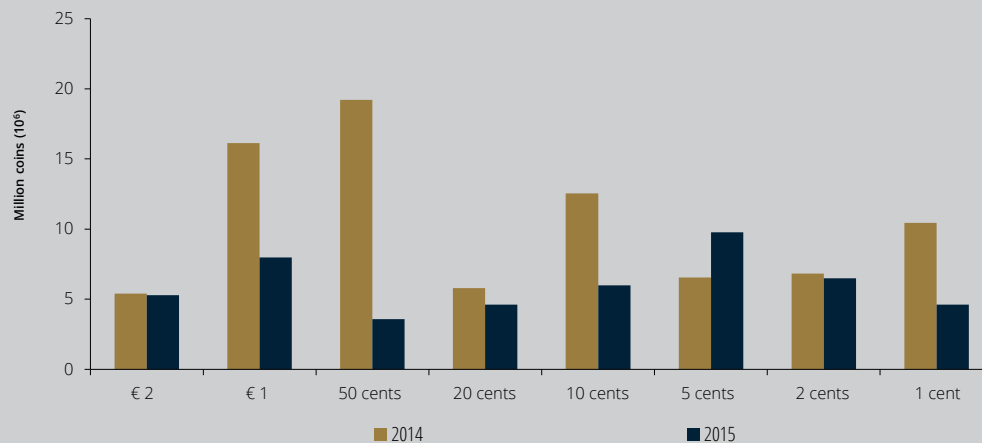
Of total processed coins, only 280,000 were rejected for not being of sufficient quality. Rejected coins are distributed quite evenly across all denominations, although the highest share is concentrated in the lower values.

Given the greater durability of coins, the overall rejection rate computed in processing was below 1 per cent, as usual.



Source: Banco de Portugal.

**Chart 24 •**  
Destruction rate of processed banknotes  
| 2015



Source: Banco de Portugal.

**Chart 25 •**  
Coins processed by Banco de Portugal  
| By denomination

## 3.2. Sorting by other entities

### 3.2.1. Processed banknotes

#### **Recirculation (of banknotes)**

The action, by cash handlers, of putting back into circulation, directly or indirectly, euro banknotes that they have received, either from the public as payment or as a deposit in a bank account, or from another cash handler. (Decision ECB/2010/14, Article 2.3)

In order to be put back into circulation, banknotes received must be previously controlled, automatically or manually, as regards their authenticity and fitness. This control is carried out by Banco de Portugal and banknote handlers. Data on banknote processing through approved machines<sup>21</sup> are part of the cash handlers' required reporting to the central bank.

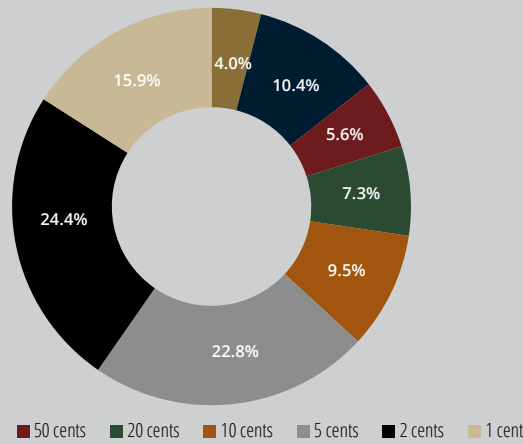
In 2015 entities recirculating cash in Portugal processed 3,094 million banknotes, *i.e.* 4.8 times more banknotes than Banco de Portugal. Around 58 per cent were processed by cash in transit companies.

Entities recirculating cash considered 163 million banknotes as unfit to return to circulation, corresponding to an overall rejection rate of 5 per cent.

To monitor and check the procedures of the entities involved in cash recirculation, Banco de Portugal conducted 675 inspections (on site monitoring). The number of inspections took into account the scale of operation and the volume of cash processed and the weight in the banking system in terms of number of branch offices. This activity involved around 50 inspectors from Banco de Portugal's 11 inspection units established in various parts of the country, which allowed for full coverage of the Portuguese territory.

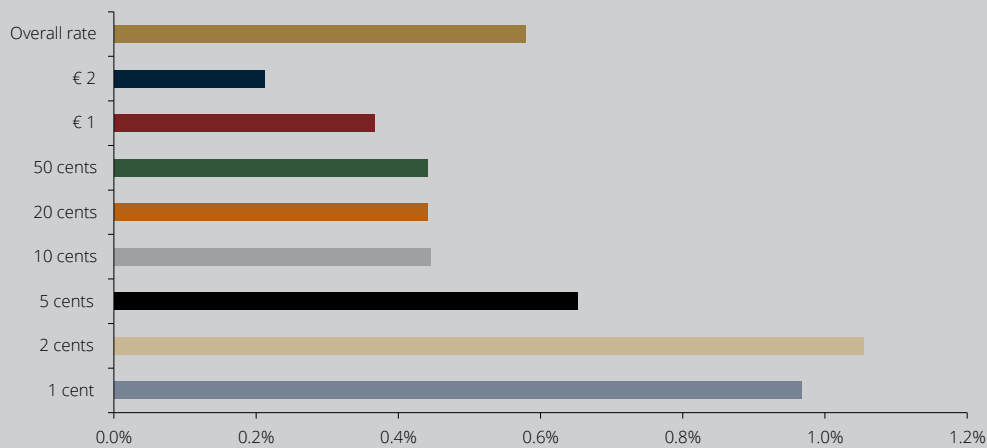
One of the purposes of inspections is to check that the machines used for recirculation are operating smoothly. In 2015, 10.2 per cent of customer-operated machines and 17.1 per cent of staff-operated machines were tested.





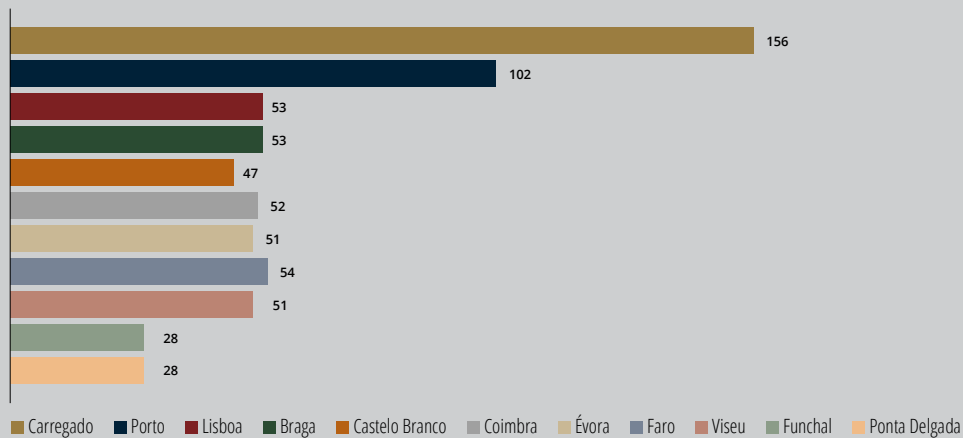
**Chart 26 •**  
Breakdown by denomination of the quantity of unfit coins | 2015

Source: Banco de Portugal.



**Chart 27 •**  
Rejection rate of unfit coins | 2015

Source: Banco de Portugal.



**Chart 28 •**  
Inspections by unit | 2015

Source: Banco de Portugal.

## BOX 6 | The banknote recirculation model in Portugal

### The entities

Banknote recirculation is carried out by credit institutions, cash in transit companies, *bureaux de change*, and payment institutions.

### The machines

There are two categories of machine that play a relevant role in this activity:

- **Banknote handling machines**, equipped for authenticity (all of them) and fitness checking (only some).

They are divided into customer-operated machines and staff-operated machines. These machines are tested by euro area central banks and may be put into operation for cash recirculation if they are listed on the ECB's website. The listed machines are detailed by a set of information identifying them unequivocally: manufacturer, machine name, hardware, and software version. Machines are organised by type, according to their functionalities.

As far as customer-operated machines are concerned, other important functionalities are deposits with immediate checking (banknote by banknote), cash-out and traceability of the user account.

Machines that dispense banknotes to the public can only be loaded with banknotes from the central bank or that have been processed by machines capable of authenticity and fitness checking.

- **Cash dispensers**. These machines allow the public to cash out banknotes loaded into them by professional cash handlers (previously processed or new banknotes). Contrary to the previous machines, these are not tested by national central banks, nor listed on the ECB's website. In Portugal only ATMs fall into this category.

In addition, the ECB publishes for information purposes, a list of devices tested by national central banks so as to help users interested in choosing a machine that detects suspect counterfeit banknotes. These machines support professional cash handlers in the detection of suspect banknotes, but they do not separate them from the authentic ones.

### Operational cash centres

Cash in transit companies have cash centres where the volumes of banknotes collected from their customers (credit institutions, retailers, transport companies, etc.) are processed in similar conditions to those ensured by Banco de Portugal, and subsequently recirculated or delivered to the central bank.

### Branch offices

Most branches of credit institutions have at least one machine of any of the above-mentioned categories.

### Training

Staff members of professional cash handlers are required to attend training courses on knowledge of banknotes, with a view to being awarded certification. This training is valid for three years and must be renewed before the end of that period. Only certified staff are qualified to manually check the authenticity and fitness of banknotes that are to be recirculated (in this case only over the counter).

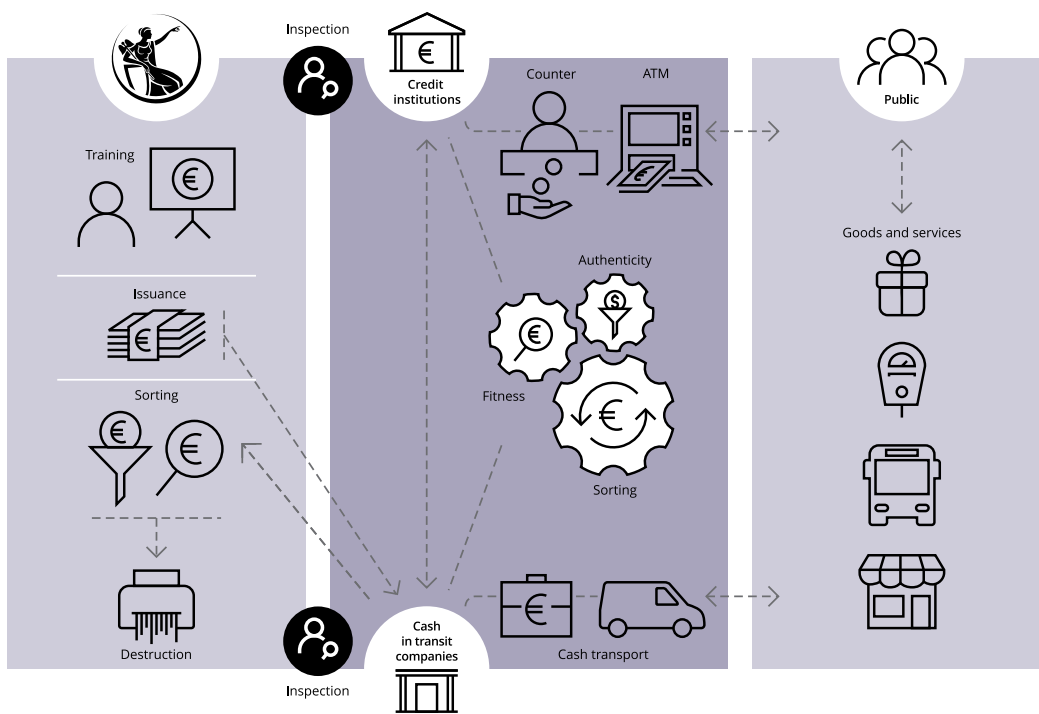
## Inspections

To ensure compliance with the rules and procedures set out for the euro area, Banco de Portugal performs inspections of the entities' sites. In particular, it verifies:

- The smooth functioning of operations with banknotes over the counter/at cash centres;
- The correct operation of banknote handling machines in terms of the identification and separation of banknotes (authenticity and fitness);
- In the case of customer-operated machines, the origin of the banknotes dispensed, the traceability of the user account in the case of counterfeit or suspect counterfeit banknotes, as well as those that were not unequivocally classified when deposited.

## Reporting to Banco de Portugal

The entities are required to report to Banco de Portugal: at all times and whenever there are changes, information on the machines they use, training or renewal of training of their staff members and the operational model implemented at each location (branch office or cash centre); on a biannual basis, the use of said machines with reference to the end of the period, and the respective data on banknote processing and dispensing. In addition to being an issue to be reported to the ECB, part of this information is instrumental for planning inspections.



## BOX 7 | The fitness of banknotes in circulation

The Eurosystem<sup>22</sup> conducts an annual study to assess the fitness of banknotes in circulation.

The methodology adopted in the 2015 issue was similar to that of previous years and included (i) the collection of a sample of 10,000 €5 to €100 banknotes in each euro area country, (ii) the technical analysis of samples by the central banks of Spain and the Netherlands, based on the reference criteria and requirements defined by the ECB and (iii) the comparison of results obtained by denomination with the respective reference value.

**Table 5 • Share of banknotes considered unfit**

Denomination (€)	Context	2010	2011	2012	2013	2014	2015
100	Eurosystem	7.0%	5.0%	5.7%	6.7%	5.9%	4.5%
	Portugal	<b>7.0%</b>	<b>6.8%</b>	<b>7.8%</b>	<b>9.3%</b>	<b>10.3%</b>	<b>6.7%</b>
50	Eurosystem	4.0%	3.0%	4.2%	4.7%	5.5%	5.4%
	Portugal	<b>6.0%</b>	<b>3.5%</b>	<b>5.1%</b>	<b>5.9%</b>	<b>20.7%</b>	<b>8.0%</b>
20	Eurosystem	5.0%	3.0%	4.0%	4.7%	8.6%	6.1%
	Portugal	<b>3.0%</b>	<b>0.8%</b>	<b>1.3%</b>	<b>2.3%</b>	<b>7.0%</b>	<b>3.9%</b>
10	Eurosystem	7.0%	6.0%	5.2%	7.1%	9.3%	4.9%
	Portugal	<b>2.0%</b>	<b>1.2%</b>	<b>1.1%</b>	<b>2.2%</b>	<b>7.3%</b>	<b>2.9%</b>
5	Eurosystem	18.0%	14.0%	16.1%	14.7%	10.0%	13.1%
	Portugal	<b>11.0%</b>	<b>8.1%</b>	<b>15.5%</b>	<b>10.3%</b>	<b>36.4%</b>	<b>23.5%</b>

Source: ECB.

The overall results of the technical analysis of the banknotes sampled by the Eurosystem's central banks showed a decline vis-à-vis 2014 of the share of banknotes considered unfit in circulation. This shows an improvement in the quality of banknotes in circulation. The increment in the quality of the €10 banknote is due to the entry into circulation of the 'Europa' series banknote in September 2014, and the consequent replacement of the first series banknote. By contrast, the €5 banknote recorded a slight deterioration of its fitness in circulation, consistent with the waning of the positive impact caused by the introduction of the 'Europa' series banknote in May 2013.

The results obtained from the technical analysis of samples are also compared by resorting to benchmarks defined for each denomination based on the average and standard deviation.

**Table 6 • Benchmark target for 2015**

Denomination (€)	Benchmark target	Acceptance margin	Benchmark limits
100	6%	+/- 3%	3% a 9%
50	6%	+/- 3%	3% a 9%
20	9%	+/- 4%	5% a 13%
10	9%	+/- 7%	2% a 16%
5	13%	+/- 8%	5% a 21%

Source: ECB.

This comparison shows a contrasting evolution of occurrences outside the benchmark limits vis-à-vis 2014, with a decline in occurrences above the upper limit (i.e. with poor quality) and an increase in occurrences below the lower limit (i.e. with very good quality).

Portugal recorded a significant improvement in the quality of banknotes in circulation for all denominations, with results for €10, €50 and €100 banknotes within the defined limits.

Although the share of unfit €5 banknotes in circulation declined sharply from 2014, it continued above the defined benchmark. A possible explanation is the type of use of these banknotes, which may cause them to be very degraded.

However, in 2015 the quality of the €20 banknote in circulation was above the benchmark defined by the ECB. This is accounted for by a higher than usual new/circulated banknote ratio being put into circulation as part of the preparation for the entry into circulation of the new banknote of the second series, which coincided with the period of sample collection for the study.

The broadly based improvement in results on the fitness of euro banknotes in circulation in Portugal is accounted for by the reformulation of the sampling method adopted by Banco de Portugal, since there were no changes in the criteria and requirements set out by the ECB or the sorting policy applied. In previous issues of this study, this sampling was taken from the deposits made at Banco de Portugal, which ceased to be representative of the condition of banknotes in circulation, arising from changes in the lifecycle of cash in Portugal.<sup>23</sup> The reformulation of the sampling method adopted by Banco de Portugal for the 2015 study – by direct request to cash in transit companies of banknotes received from retailers, with no processing – made it possible to obtain more reliable results than in previous exercises, better reflecting the quality of banknotes in circulation in Portugal.

### 3.2.2. Processed coins

#### Authentication of euro coins

The process of verifying that euro coins are authentic and fit for circulation.

[Regulation (EU) No 1210/2010 of the European Parliament and of the Council, Article 2 (a)]

The principle that all cash received by any entities that intend to put it back into circulation has to be authenticated, *i.e.* its authenticity must be checked, is also applied to coins.

Similarly to banknotes, the features and properties that allow them to continue to be used also have to be checked, and likewise all suspect counterfeit coins should be detected and withdrawn. For that, professionals handling coins must be trained, and the handling machines used must have been tested and approved.<sup>24</sup> Data on coin processing are part of the institutions' mandatory reporting to the central bank.<sup>25</sup>

In 2015, according to the data reported, 1,866 million coins were processed in cash in transit

companies' cash centres. The rejection rate of processed coins stood at 0.02 per cent: only 321,000 coins were considered unfit. Cash in transit companies processed 38.6 times more coins than Banco de Portugal, due to the fact that the central bank mostly receives coins already processed ready for cash-out as well as unfit coins.

## 3.3. Fight against counterfeiting

### 3.3.1. Counterfeit banknotes

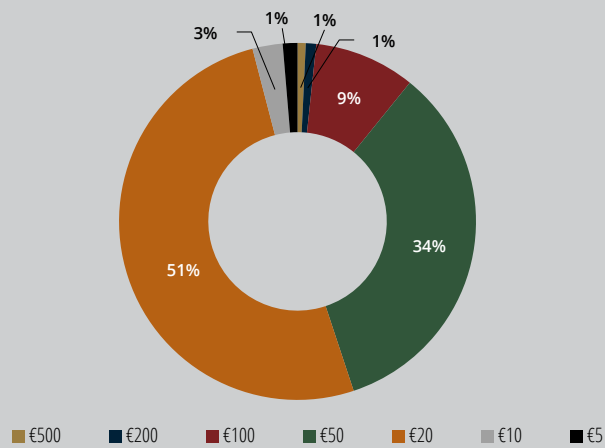
The €20 banknote was the most counterfeited in 2015, both in the euro area and in Portugal.

In 2015, in the euro area, around 884,000 counterfeit banknotes were withdrawn from circulation,<sup>26</sup> which accounted for 8 per cent growth from the previous year. Counterfeits seized accounted for a very small member compared with total authentic banknotes in circulation. Peripheral denominations – €500, €200 and €5 – were the least counterfeit.

In Portugal 8588 counterfeit banknotes of all denominations were withdrawn from circulation. This number accounted for 1 per cent of total counterfeit banknotes seized in the euro area.

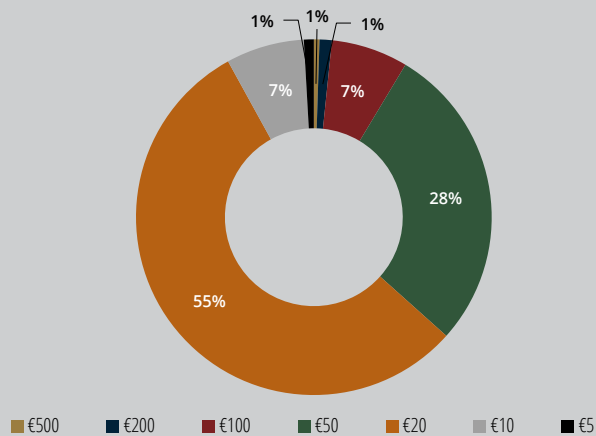
Similarly to the euro area, intermediate denominations, i.e. €20 and €50, were the preferred target of counterfeiters.

**Chart 29 •**  
Breakdown by denomination of counterfeit banknotes withdrawn from circulation in the euro area | 2015



Source: ECB.

**Chart 30 •**  
Breakdown by denomination of counterfeit banknotes withdrawn from circulation in Portugal | 2015



Source: Banco de Portugal, see *Statistical Bulletin* – Table I.1.6.

## BOX 8 | How do I know when a banknote is 'fake'?

A fake or counterfeit banknote cannot be exchanged for an authentic banknote. Hence, whoever accepts such a banknote as if it were authentic cannot recover his/her money. For this reason, it is important to be able to recognise the authenticity of banknotes when receiving them.

Most counterfeits seized can be identified without resorting to any machines or devices. One must:

- compare the suspect counterfeit banknote with one known to be authentic;
- check the existence and behaviour of the security features, by feeling, looking and tilting the banknote (the 'FEEL – LOOK – TILT' method).

Let us take a look at an example of banknote from the 'Europa' series:



### THE EUROPA SERIES €20: SECURITY FEATURES

#### Easy to check

The Europa series, like the first series of euro banknotes, is easy to check using the "FEEL, LOOK and TILT" method.



#### 1 FEEL

**Feel of the paper** – Feel the banknote. It is crisp and firm.

**Raised print** – Feel the short raised lines on the left and right edges of the banknote. The main image, the lettering and the large value numeral also feel thicker.



#### 2 LOOK

**Portrait watermark** – Look at the banknote against the light. A portrait of Europa, the value and the main image become visible.

**Portrait window in the hologram** – Against the light, the window near the top of the hologram becomes transparent and reveals a portrait of Europa on both sides of the note.



#### 3 TILT

**Emerald number** – This shiny number displays an effect of the light that moves up and down. The number also changes colour from emerald green to deep blue.

**Hologram** – The silvery stripe reveals the value, the main motif and the € symbol.

**Portrait window in the hologram** – The window near the top of the hologram shows a portrait of Europa. When the banknote is tilted, the window also shows rainbow-coloured lines around the value numeral. On the back, rainbow-coloured value numerals appear in the window.

In case of doubt, Banco de Portugal provides information on how to act:

<https://www.bportugal.pt/notas-contrafacao>

### 3.3.2. Counterfeit coins

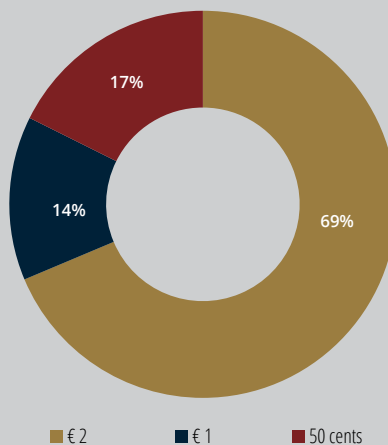
Overall, there were fewer counterfeit coins seized than banknotes, both in the euro area and in Portugal.

In the euro area around 156,000 50 cent to €2 counterfeit coins<sup>27,28</sup> were withdrawn from circulation in 2015, *i.e.* 10 per cent less than in the previous year. Seized counterfeits accounted for a very small share of the total number of authentic coins in circulation.

In Portugal 3,424 counterfeit coins were withdrawn from circulation. The €2 coin was the most counterfeited.

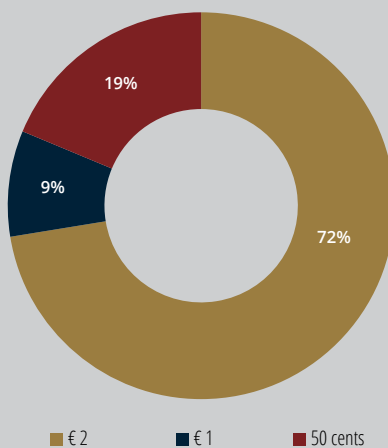
The number of coins seized in Portugal corresponded to 2 per cent of that seized in the euro area. The breakdown by denomination of counterfeit coins seized in Portugal was similar to the euro area's.

**Chart 31 •**  
Breakdown by denomination of counterfeit coins withdrawn from circulation in the euro area | 2015



Source: ECB.

**Chart 32 •**  
Breakdown by denomination of counterfeit coins withdrawn from circulation in Portugal | 2015



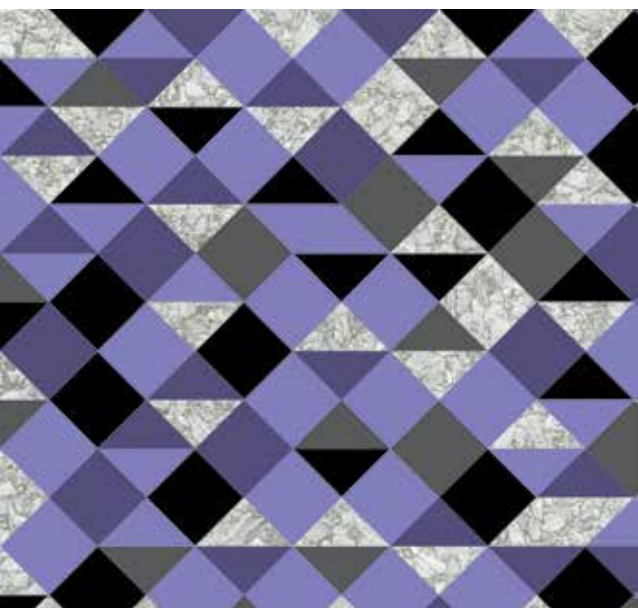
Source: Banco de Portugal.



## Notes

1. Pursuant to Decree-Law No. 246/2007 of 26 June 2007 governing the issuance, minting, putting into circulation, and trading of coins.
2. Denomination that entered into circulation on 25 November 2015.
3. This stage of a denomination's development project, in which Portugal participated for the first time, jointly with a few other euro area printers, makes it possible to validate the applicability of the technical specification for large-scale production. Given the quality of the results, €50 banknotes resulting from the pilot production might be put into circulation.
4. *I.e.* 10<sup>12</sup> euros. The ECB estimates that around a quarter of this value is being used in non-euro area countries.
5. Despite playing a less relevant role, outflows from the central bank also occur at cash offices, for example, when the public exchanges banknotes and/or coins.
6. As seen, for example, in Chart 27 on the theme in the *ECB's 2015 Annual Report*.
7. This behaviour contrasted with the previous year's, when there was a broadly based decline in withdrawals.
8. Although playing a less relevant role than outflows, inflows to the central bank also occur at cash offices, for example, when the public exchanges banknotes and/or coins.
9. Multiple choice question.
10. Until January 2005 the minimum withdrawal at ATMs was €5.
11. For use in payments. Commemorative coins are included.
12. This case refers to circulation at national level, since collector coins are only legal tender in the issuing country.
13. Outflows from the central bank also occur at cash offices, *e.g.* when members of the public exchange banknotes and/or coins.
14. Similarly to outflows, inflows to the central bank also occur at cash offices, *e.g.* when the public exchanges banknotes and/or coins.
15. Requirements for depositing coins processed beforehand (ready to circulate again) and packaging in accordance with the rule set out by Banco de Portugal.
16. Denominations included in the sample only as of 2013.
17. Authentic banknotes or coins that do not have the usual features and properties may become difficult to handle or use and generally raise doubts as to their authenticity.
18. Banco de Portugal's monitoring also covers bureaux de change and payment institutions.
19. A responsibility it shares with the Criminal Police.
20. See section I.3.2.1 and Box 6.
21. Published on the ECB's website as valid for banknote recirculation.
22. ECB and euro area national central banks.
23. From October 2014 onwards, banknotes were deposited at Banco de Portugal with no separation by quality (for processing, processed fit and processed unfit), which prevents the sample from covering only unprocessed banknotes (banknotes as collected from customers).
24. At the time of their purchase, they must be included in the list of machines published on the European Commission's website.
25. Also includes information on the training of professionals and their machines.
26. See the 'Counterfeit Monitoring System' (CMS) database, the ECB's information system on counterfeiting, as at 14 March 2016. Information made available by the CMS may have changes compared with previous periods.
27. See CMS on 3 March 2016.
28. Given that there were almost no occurrences for the denominations below 50 cents, they have not been included.





## II Other activities

1. Withdrawal of escudo banknotes
2. Provision of services to the community and to professionals
3. Communication



## 1. Withdrawal of escudo banknotes

The launch into circulation of euro banknotes on 1 January 2002 led to the start of the withdrawal of banknotes of the previous national currency, the escudo. After two months of dual circulation, escudo banknotes could no longer be used and accepted in payments (*i.e.* they ceased to be legal tender and lost discharging power). However, it would still be possible, for a period of 20 years counting from the date of their withdrawal from circulation, to exchange escudo banknotes for euro banknotes at Banco de Portugal's cash offices. By the end of May 2002, 95 per cent of the total value of escudo banknotes in circulation as at 31 December 2001 had been withdrawn.

In 2015, 74,694 escudo banknotes of all denominations were exchanged, totalling approximately €1.2 million. At the end of the year, the public still held around 19.6 million banknotes, corresponding to €155.8 million. A third of the value of the escudo banknotes not returned to the central bank was of the 5,000\$00 denomination.

Escudo banknotes still not expired, *i.e.* that may still be exchanged for euros, will no longer be exchanged after the dates presented in Table 7. Hence, escudo banknotes have to be submitted for exchange up to the business day prior to their date of expiry.

**Table 7 • Date of expiry of escudo banknotes**

Denomination	Plate	Date of expiry
10,000\$	1	01/01/2018
	2	01/03/2022
5,000\$	2/2A	01/01/2018
	3	01/03/2022
2,000\$	1	01/01/2018
	2	01/03/2022
1,000\$	12	01/01/2018
	13	01/03/2022
500\$	12	01/05/2018
	13	01/03/2022

Source: Banco de Portugal.

For more information on the exchange of escudo banknotes, please visit Banco de Portugal's website or the Bank Customer Website.

<https://www.bportugal.pt/en/page/exchange-coins-and-banknotes>

<http://clientebancario.bportugal.pt/pt-PT/NotaseMoedas/NotaseMoedasNacionais/Paginas/Escudo.aspx>

## 2. Provision of services to the community and to professionals

### 2.1. Cash services

Through its network of cash offices, Banco de Portugal provides a series of cash-related services to the public. It exchanges banknotes and circulation coins, sells commemorative and collector coins with regular finishing, exchanges escudo banknotes that have not expired and, within the deadline for that purpose, exchanges national banknotes of countries that have since joined the euro. Under certain conditions, it also exchanges damaged or mutilated banknotes and banknotes ink stained by anti-theft devices installed in ATMs.

In 2015 Banco de Portugal served 172,462 customers in relation to these services.

### 2.2. Complaints

Banco de Portugal is responsible for responding to bank customer complaints on various subjects, including cash. These complaints can be submitted to the Bank directly or forwarded to it, if they are filed in a credit institution's complaints book.

As far as cash is concerned, in 2015 Banco de Portugal analysed and closed 489 complaints: 10 with signs of infraction,<sup>1</sup> 311 where the institution at stake solved the case, 162 with no signs of infraction, and 6 with other outcomes.

### 2.3. Training

Within the scope of its cash issuance responsibilities, Banco de Portugal fosters public knowledge of banknotes and coins with the main aim of greater protection against counterfeits. Therefore, it has been running a training and information programme for several years adapted to various audiences, focusing on the security features and elements of banknotes and coins, the good practices to adopt when using cash, and the means to check their authenticity.

As regards face-to-face training, the courses held by the bank are targeted at two groups with different needs: professional cash handlers in credit institutions and cash in transit companies; and security forces, schools, retailers, and the general public.

With regard to distance training through an electronic platform (e-learning),<sup>2</sup> the courses organised by the Bank are mainly targeted at professional cash handlers. Once successfully completed, they guarantee qualification for the manual control of the authenticity and fitness of banknotes and coins.

In 2015 the Bank held 434 face-to-face training courses throughout Portugal, with 12,357 participants. 18,924 professionals received training via the e-learning platform.

## BOX 9 | Banco de Portugal and on-line training

In light of the challenge to train, over a short period of time, more than 20,000 professional cash handlers, Banco de Portugal chose on-line training.

In 2008 the Bank developed a course on the knowledge of euro banknotes to accredit banking sector professionals to check the authenticity and fitness of banknotes. This course was subsequently extended to all cash handlers and in 2011 a course on the knowledge of euro coins was developed.

Distance training guarantees that the same knowledge is passed on as face-to-face training, with recourse to interactive videos and interim questionnaires to test knowledge gained. To be qualified for their activity, the staff of professional cash handlers have to complete the course with a classification of at least 80 per cent.

Content is available on Banco de Portugal's website.

[E-learning on euro banknotes](#)

[E-learning on euro coins](#)

The content of the Portuguese course on the knowledge of euro banknotes has been adopted by the European Central Bank and other euro area central banks as part of the information addressed to professional cash handlers. It is published in the main EU languages on the ECB's website on the new euro banknotes.

Example: website in English

<http://www.new-euro-banknotes.eu/>

> Cash handlers > Knowledge of banknotes

<http://www.new-euro-banknotes.eu/Euro-Banknotes/KNOWLEDGE-OF-BANKNOTES/KNOWLEDGE-OF-BANKNOTES>



### 3. Communication

With regard to cash issuance, the main communication initiative promoted in the past few years in the euro area was the information campaign preparing the launch of the banknotes of the second euro series ('Europa' series). In addition to participating in the Eurosystem's campaign, Banco de Portugal has developed nationwide campaigns, bringing together the presentation of the new banknotes with the prevention of situations that might cause financial losses to citizens.

In 2015, on the occasion of the launch of the €20 banknote of the 'Europa' series, Banco de Portugal divided the campaign into various media: generalist TV channels, with the broadcasting of a commercial produced by the ECB, and participation in shows targeted at identified

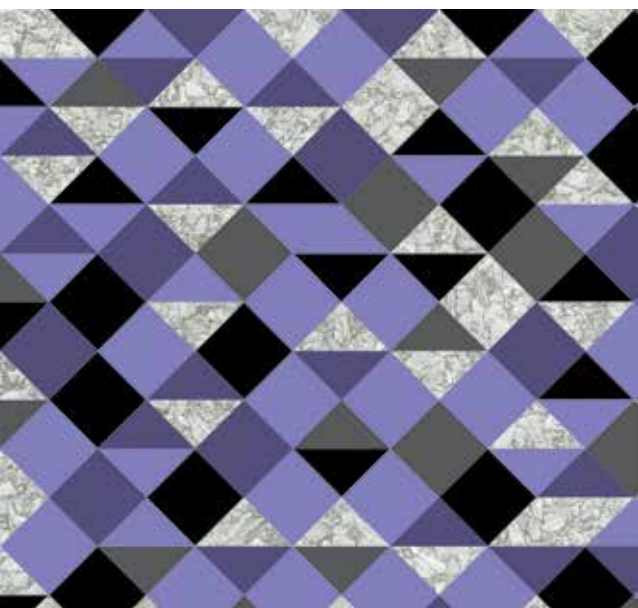
priority audiences; ATMs; through the GNR and the PSP police forces, with the distribution of materials and support in their initiatives with the population, particularly those living in more remote areas and the elderly; in the central bank itself, through a press conference and various local initiatives carried out by the network of agencies.

The partnership developed with the GNR, in addition to the distribution of information material, included the training of that institution's trainers. Due to the nature of its programmes with isolated populations and small retailers, this security force has been instrumental in preventing scams and disseminating information in these small businesses.

#### Notes

1. The complaint process is closed. In this case, an investigation process starts for the application of possible legal sanctions.
2. The content is available on Banco de Portugal's website: [E-learning on euro banknotes](#); [E-learning on euro coins](#).





### III

## Annexes

1. Regulations published in the European Union and Portugal
2. Publications



# 1. Regulations published in the European Union and Portugal

Relevant acts published in 2015:

## European Union

- Decision (EU) 2015/2330 of the European Central Bank of 4 December 2015 amending Decision ECB/2014/53 on the approval of the volume of coin issuance in 2015 (ECB/2015/41);
- Decision (EU) 2015/2331 of the European Central Bank of 4 December 2015 on the approval of the volume of coin issuance in 2016 (ECB/2015/42);
- Decision (EU) 2015/2332 of the European Central Bank of 4 December 2015 on the procedural framework for the approval of the volume of euro coin issuance (ECB/2015/43);
- Communication from the Commission on copyright protection of the common face design of the euro coins: updated list of designated authorities (2015/C 115/01).

## Portugal

- Decree-Law No. 235/2015 of 14 October 2015 – Lays down the new legal system governing Imprensa Nacional – Casa da Moeda, S. A. (INCM – the Portuguese Mint) and revokes the following: Decree-Law No. 333/81 of 7 December 1981, as amended by Decree-Laws No. 479/82 of 23 December 1982, No. 406/93 of 14 December 1993, No. 33/98 of 18 February 1998, and No. 138/98 of 16 May 1998; Decree-Law No. 170/99 of 19 May 1999;
- Executive Order No. 11/2015 of 20 January 2015 – Authorises the INCM, within the scope of the numismatic plan for 2015, to mint and trade five collector coins:
  - One coin named ‘70 Anos de Paz na Europa’, integrated in the ‘Europa’ series, preceded by Notice of Banco de Portugal No. 3155/2015 of 27 February 2015 on the putting into circulation of said coin.

- One coin named ‘Colchas de Castelo Branco’, integrated in the ‘Etnografia Portuguesa’ series, preceded by Notice of Banco de Portugal No. 9432/2015 of 12 August 2015 on the putting into circulation of said coin.
- One coin named ‘Fado’, commemorating its classification by UNESCO as immaterial heritage, preceded by Notice of Banco de Portugal No. 1606/2015 of 22 January 2015 on the putting into circulation of said coin.
- One coin named ‘D. Isabel’, integrated in the ‘Rainhas da Europa’ series, preceded by Notice of Banco de Portugal No. 5479/2015 of 30 April 2015 on the putting into circulation of said coin.
- One coin named ‘Viriato’, integrated in the ‘Ibero-Americana’ series, preceded by Notice of Banco de Portugal No. 3934/2015 of 18– March 2015 on the putting into circulation of said coin.
- Executive Order No. 12/2015 of 20 January 2015 – Authorises the INCM to mint in 2015 two commemorative issues of the €2 circulation coin:
  - One coin named ‘150.º Aniversário da Cruz Vermelha Portuguesa’, preceded by Notice of Banco de Portugal No. 3934/2015 of 18 March 2015 on the putting into circulation of said coin;
  - One coin named ‘500 Anos do Primeiro Contacto de Portugal com Timor’, preceded by Notice of Banco de Portugal No. 6588/2015 of 15 June 2015 on the putting into circulation of said coin.
- Executive Order No. 118/2015 of 30 April 2015 – Authorises the INCM, within the scope of the numismatic plan for 2015, to mint and trade the collector coin named ‘O Clima é Connosco’, integrated in the ‘Uma Moeda Uma Causa’ series, preceded by Notice of Banco de Portugal No. 12814/2015 of

- 3 November 2015 on the putting into circulation of said coin;
- Executive Order No. 286/2015 of 16 September 2015 – Authorises the INCM, within the scope of the numismatic plan for 2015, to mint and trade the collector coin named ‘40 Anos do Provedor de Justiça’, preceded by Notice of Banco de Portugal No. 13845/2015 of 27 November 2015 on the putting into circulation of said coin;
  - Executive Order No. 305/2015 of 23 September 2015 – Authorises the INCM to mint in 2015 a commemorative issue of the €2 circulation coin named ‘30 anos da bandeira da União Europeia’, preceded by Notice of Banco de Portugal No. 13845/2015 of 27 November 2015 on the putting into circulation of said coin;
  - Executive Order No. 361/2015 of 15 October 2015 – Authorises the INCM, within the scope of the numismatic plan for 2015, to mint and trade the collector coin named ‘Jogos Olímpicos Rio 2016 – A Preparação dos Jogos’, preceded by Notice of Banco de Portugal No. 12541/2015 of 28 October 2015 on the putting into circulation of said coin;
  - Circular Letter No. 1/2015/DET of 14 January 2015, and No. 4/2015/DET of 12 November 2015 – Information on the recirculation of banknotes and coins by cash in transit companies.

Relevant acts published before 2015:

#### European Union

- Council Regulation (EC) No. 974/98 of 3 May 1998 on the introduction of the euro;
- Council Regulation (EC) No. 1338/2001 of 28 June 2001 laying down measures necessary for the protection of the euro against counterfeiting;
- Council Regulation (EC) No. 1339/2001 of 28 June 2001 extending the effects of Regulation (EC) No. 1338/2001 laying down measures necessary for the protection of the euro against counterfeiting to those Member States which have not adopted the euro as their single currency;

- Council Regulation (EC) No. 2182/2004 of 6 December 2004 concerning medals and tokens similar to euro coins;
- Council Regulation (EC) No. 44/2009 of 18 December 2008 amending Regulation (EC) No. 1338/2001 laying down measures necessary for the protection of the euro against counterfeiting;
- Regulation (EU) No. 1210/2010 of the European Parliament and of the Council of 15 December 2010 concerning authentication of euro coins and handling of euro coins unfit for circulation;
- Regulation (EU) No. 651/2012 of the European Parliament and of the Council of 4 July 2012 on the issuance of euro coins;
- Council Regulation (EU) No. 729/2014 of 24 June 2014 on denominations and technical specifications of euro coins intended for circulation;
- Decision of the European Central Bank of 16 September 2010 on the authenticity and fitness checking and recirculation of euro banknotes (ECB/2010/14);
- Decision of the European Central Bank of 7 September 2012 amending Decision ECB/2010/14 on the authenticity and fitness checking and recirculation of euro banknotes (ECB/2012/19);
- Decision of the ECB of 19 April 2013 on the denominations, specifications, reproduction, exchange and withdrawal of euro banknotes (ECB/2013/10).

#### Portugal

- Lei No. 5/98 of 31 January 1998 – Organic Law of Banco de Portugal, as amended by the following: Decree-Law No. 118/2001 of 17 April 2001, Decree-Law No. 50/2004 of 10 March 2004, Decree-Law No. 39/2007 of 20 February 2007, Decree-Law No. 31-A/2012 of 10 February 2012, Decree-Law No. 142/2013 of 18 October 2013, Law No. 23-A/2015 of 26 March 2015, and Law No. 39/2015 of 25 May 2015;
- Decree-Law No. 184/2007 of 10 May 2007 – Governs the recirculation of euro coins by all professional cash handlers;

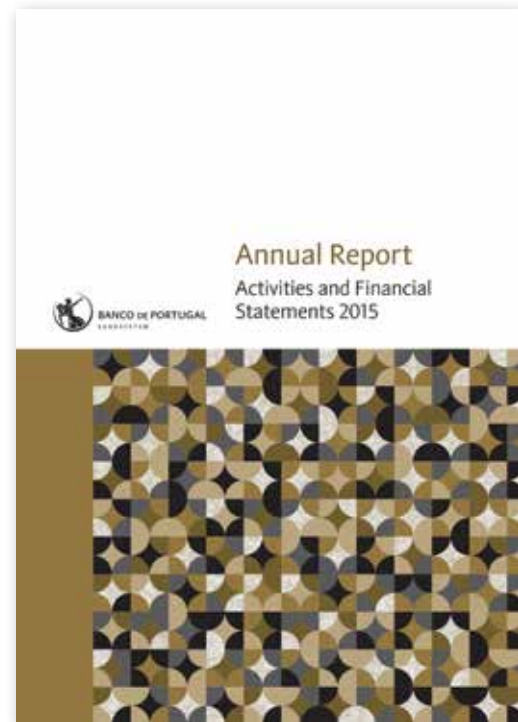
- Decree-Law No. 195/2007 of 15 May 2007 – Governs the recirculation of euro banknotes by all professional cash handlers;
- Decree-Law No. 246/2007 of 26 June 2007 – Governs the issuance, minting, putting into circulation, and trading of coins in those aspects that are not regulated by Community rules;
- Instruction of Banco de Portugal No. 14/2009 of 15 October 2009 – Monitoring by Banco de Portugal of the recirculation of euro banknotes and coins;
- Instruction of Banco de Portugal No. 1/2011 of 15 February 2011 – Use of Intelligent Banknote Neutralisation Systems (IBNS) and exchange of damaged euro banknotes in the wake of these systems' operation;
- Instruction of Banco de Portugal No. 5/2012 of 15 February 2012 – Reporting of information on the authentication of euro coins and the handling of euro coins unfit for circulation;
- Instruction of Banco de Portugal No. 35/2012 of 15 October 2012 – Qualification of professionals within the scope of recirculation of euro banknotes or coins;
- Instruction of Banco de Portugal No. 36/2012 of 15 October 2012 – Amends Instruction of Banco de Portugal No. 14/2009 of 15 October 2009 on Banco de Portugal's monitoring of the recirculation of euro banknotes and coins;
- Instruction of Banco de Portugal No. 38/2012 of 15 October 2012 – Compliance with the duty to retain counterfeit, false or suspect banknotes and coins;
- Instruction of Banco de Portugal No. 31/2013 of 15 January 2013 – Amends Instruction of Banco de Portugal No. 5/2012 of 15 February 2012 on the reporting of information on the authentication of euro coins and the handling of euro coins unfit for circulation;
- Instruction of Banco de Portugal No. 9/2014 of 16 June 2014 – Reporting of information on authenticity and fitness checking and the recirculation of euro banknotes;
- Instruction of Banco de Portugal No. 15/2014 of 18 August 2014 – Decentralised deposits and withdrawals of euro banknotes and coins;
- Instruction of Banco de Portugal No. 16/2014 of 18 August 2014 – Deposits and withdrawals of euro banknotes at Banco de Portugal;
- Instruction of Banco de Portugal No. 17/2014 of 18 August 2014 – Deposits and withdrawals of euro circulation coins at Banco de Portugal;
- Circular Letter No. 18/2007/DET of 6 June 2007 – Legal framework governing the recirculation of euro banknotes in Portugal – Credit institutions;
- Circular Letter No. 8/2008/DET of 23 January 2008 – Legal framework governing the recirculation of euro coins in Portugal;
- Circular Letter No. 36/2008/DET of 28 April 2008 – Cash exchange operations over the counter;
- Circular Letter No. 47/2008/DET of 24 June 2008 – Provision to credit institutions of an e-learning course on 'Knowledge of euro banknotes' via the Portuguese Banking Training Institute's platform, WebBANCA;
- Circular Letter No. 1/2010/DET of 4 January 2010 – Information on the process of implementation by cash in transit companies of rules regarding the recirculation of euro banknotes;
- Circular Letter No. 1/2012/DET of 20 January 2012 – Information on the recirculation of euro banknotes by cash in transit companies;
- Circular Letter No. 4/2014/DET of 27 March 2014 – Information on the recirculation of euro banknotes and coins by cash in transit companies;
- Circular Letter No. 8/2014/DET of 7 August 2014 – Information on the recirculation de euro banknotes and coins by cash in transit companies.

## 2. Publications

- Activities and Financial Statements

Annual report describing the activities and presenting Banco de Portugal's balance sheet and annual accounts. The activities, "Functions as monetary authority" chapter, include a section on cash issuance, with the main events and results for the year.

<https://www.bportugal.pt/en/publications/banco-de-portugal/all/112>



- Statistics – *Statistical Bulletin* and BPstat online

Statistics on cash issuance are published in the Statistical Bulletin of Banco de Portugal, chapter I. They may be consulted, exported and printed at BPstat statistics online.

BPstat | Estatísticas online

<https://www.bportugal.pt/en/publications/banco-de-portugal/all/123>



- Bulletin on Banknotes and Coins

Biannual publication (April/October) targeted mainly at professionals. It addresses current themes and presents useful general information.

<https://www.bportugal.pt/publications/banco-de-portugal/all/286>



- Banco de Portugal Booklet No 8

Part of a collection addressing various themes related to Banco de Portugal's activities, Booklet No 8 provides information on the framework and knowledge of banknotes and coins and releases good practices in their use.

<https://www.bportugal.pt/publications/banco-de-portugal/all/131>









