



EUROPEAN CENTRAL BANK
EUROSYSTEM

Occasional Paper Series

Henk Esselink, Lola Hernández The use of cash by households
in the euro area

No 201 / November 2017

Disclaimer: This paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

Contents

Abstract	3
Executive summary	4
1 Introduction	6
2 Research method and sample	9
2.1 Research scope and research population	9
2.2 Sample	9
2.3 Research method	12
Box 1 Payment diary surveys in Germany and the Netherlands	13
2.4 Recruitment of respondents and data collection	13
2.5 Translation of survey material	14
2.6 Weighting and adjustments	14
3 Validation	16
4 Cash usage in the euro area	18
4.1 Relative use of payment instruments	18
4.2 Average value of transactions	20
4.3 Average number of transactions per person per day	22
4.4 Payment behaviour by demographic characteristics	22
4.5 Use of payment instruments by value range	24
5 Use of payment instruments by market segment and for recurrent payments	26
5.1 Market share of payment instruments by number of transactions	26
5.2 Market share of payment instruments by value of transactions	27
5.3 The use of cash for recurrent payments	28
6 Contactless payments in the euro area	30
7 Card ownership and card acceptance	32
7.1 Card ownership	32

7.2	Card acceptance	33
8	Amount of cash people carry	34
9	How people acquire cash	36
9.1	Cash withdrawal and replenishment by source	36
9.2	Regular income in cash	39
10	Cash as a store of value and use of high denomination banknotes	41
10.1	Cash as a store of value	41
10.2	Use of high denomination banknotes	43
11	Cash withdrawal habits and satisfaction with ATM services	46
11.1	Cash withdrawal habits by source	46
11.2	Satisfaction with ATM services	47
11.3	Satisfaction with ATM denominations	49
12	Payment preferences and other factors that influence consumers' payment choices	52
12.1	Payment preferences	52
12.2	Factors that influence respondents' choice of payment instrument	54
13	Concluding remarks	56
	References	57
Annex A	Definition of payment instruments	59
Annex B	Diary survey questionnaire: Study on the use of cash by households 2016	61
Annex C	Use of high denomination banknotes	67
	Abbreviations	69
	Acknowledgements	70

Abstract

Although euro banknotes and coins have been in circulation for fifteen years, not much is known about the actual use of cash by households. This paper presents an estimation of the number and value of cash transactions in all 19 euro area countries in 2016, based on survey results. It presents an extensive description of how euro area consumers pay at points of sale (POS). The aim of this study is to shed light on consumers' payment behaviour and in particular to improve the understanding of consumers' payment choices at POS, based on a large sample of countries. Therefore, it provides central banks and relevant payment system stakeholders with fundamental information for the development of their policies and strategic decisions that can contribute to improving the efficiency of the cash cycle and the payment system as a whole. Previous estimates of the value of cash usage by households in the euro area date from 2008. Since then some central banks have carried out their own research on cash usage. This paper is the first study to measure the transaction demand for cash in the euro area. The results show that in 2016 around 79% of all payments at POS were made with cash, 19% with cards and 2% with other payment instruments. In terms of value, the market share of main payment instruments was 54% for cash, 39% for cards and 7% for other instruments. However, results show substantial differences between euro area countries.

Keywords: payment behaviour, money demand, payment systems, cash, consumer choice.

JEL codes: E41, E58, D12, D14.

Executive summary

The European Central Bank (ECB) has conducted a comprehensive study to analyse the use of cash, cards and other payment instruments used at points of sale (POS) by euro area consumers in 2016.¹ This paper presents the results of the study, including an estimation of the number and value of payments made with cash and cards by consumers in the euro area during the period under consideration. The study also assesses the use of each payment instrument by consumers at the country level. The methodology is first discussed, and the main findings of the study are then reported.

The survey results show that in 2016 cash was the dominant payment instrument at POS. In terms of number, 79% of all transactions were carried out using cash, amounting to 54% of the total value of all payments. Cards were the second most frequently used payment instrument at POS; 19% of all transactions were settled using a payment card. In terms of value, this amounts to 39% of the total value paid at POS.

The use of cash and cards differs according to country, place of purchase, transaction value and consumers' demographic characteristics. In terms of number of transactions, cash was most used in the southern euro area countries, as well as in Germany, Austria and Slovenia, where 80% or more of POS transactions were conducted with cash. Cash was least used in the Netherlands, Estonia and Finland, where its share in the number of transactions ranged between 45% and 54%. In terms of value, the share of cash was highest in Greece, Cyprus and Malta (above 70%), while it was lowest in the Benelux countries, Estonia, France and Finland (at, or below, 33%). When looking at the demographic characteristics of euro area consumers, it can be concluded that men tend to use cash more often than women. Furthermore, consumers aged 40 and over use more cash than younger age groups, whereas cash usage appears to be relatively homogeneous across different levels of education.

Overall, the results put the use of cash relative to non-cash payment methods by consumers at POS into perspective, and indicate that the use of cash at POS is still widespread in most euro area countries. This seems to challenge the perception that cash is rapidly being replaced by cashless means of payment.

Indeed, as the results of this study show, when consumers are asked which means of payment they prefer, a larger share report to prefer cards rather than cash – despite the fact that they use cash more often. This contradiction may be explained by the fact that nearly two-thirds of the transactions conducted at POS in 2016 were

¹ By other payment instruments at POS we refer to the use of cheques, direct debit, credit transfers and mobile payments, among others. We have grouped them into one category given their relatively small market share compared with cash and cards. For a detailed definition of all payment instruments considered in the study, see Annex A. The use of virtual currencies was not within the scope of this study.

below €15. Moreover, two-thirds of all POS transactions took place in shops for purchases of day-to-day items, as well as in restaurants, bars and cafés. On the other hand, only 8% of all POS transactions were above €50, and only 14% were made in shops for durable goods or in petrol stations.

When asked about their payment behaviour, people mostly seem to remember the larger value payments which they make less regularly, and tend to forget how frequently they make low-value payments on a daily basis.

Access to payment cards does not seem to fully explain differences in payment behaviour, because on average access is high in all euro area countries. However, there seems to be a relationship between card acceptance (i.e. the perceived availability of card payment terminals) and cash usage. It can therefore be expected that in countries and market sectors where card acceptance is still low, cash usage may decrease once infrastructure for making card payments becomes more widely available.

Although the share of contactless payments in many countries is still low, the survey results suggest that the speed with which such payments have been embraced in some countries may mean that once payment cards and POS terminals are enabled with contactless technology on a wider scale, the share of contactless payments could increase significantly. Since contactless payments are typically relatively low value and 81% of all payments at POS are below €25, this could have a significant impact on the use of cash for smaller value payments, especially given that respondents who prefer cash and those who prefer cards both appear to place importance on the transaction speed of their preferred means of payment.

The study confirms that cash is not only used as a means of payment, but also as a store of value, with almost a quarter of consumers keeping some cash at home as a precautionary reserve. It also shows that more people than often thought use high denomination banknotes; almost 20% of respondents reported having a €200 or €500 banknote in their possession in the year before the survey was carried out.

1 Introduction

Keeping abreast of the latest cash usage trends is essential for both the Eurosystem and the relevant stakeholders of the payment system. National central banks are responsible for the issuance of banknotes and often for the distribution of coins in their respective countries. They require reliable statistics that allow them to compare the development of cash usage in the different countries of the euro area.

Nevertheless, to date there have been no reliable statistics on the number and value of cash transactions and there is limited information on the differences between euro area countries regarding the use of cash compared with other means of payment. With the increase in card payments and the rise of alternative payment methods, the future of cash is under discussion and the relevance of cash in society is being challenged.

However, without knowing exactly how people currently pay, these discussions have no solid basis and result in speculation rather than fact-based findings. Often, conclusions on payment behaviour in a certain country are drawn based on studies available on other countries, without knowing whether people exhibit similar payment behaviour in the country concerned. Moreover, data provided by certain retail chains or associations of retailers may not give accurate information on payment behaviour in general, as payment behaviour differs between market sectors. For example, people may pay in different ways depending on whether their purchase is made at a large supermarket chain or at a bakery.

Central banks have a strong interest in having accurate data on cash usage for discussions on the role of cash in society, as well as for the development of their policies and strategic decisions regarding the cash cycle and the efficiency of the payment system as a whole. For example, the costs of cash and counterfeiting statistics can be placed in perspective when the actual number of cash transactions is known. Furthermore, for the development of certain policies it is important to understand the determinants of cash usage, since this can be supply and/or demand driven.

The latest estimates on cash usage in the euro area date from 2008, when the value of cash transactions was estimated to amount to between €1,800 and €2,100 billion (ECB 2011). This estimate was based on a household survey, payment statistics and a company survey. The household survey involved 8,175 respondents from eight euro area countries – Belgium, Germany, Spain, France, Italy, Luxembourg, the Netherlands and Austria² – and was conducted between 18 September and 31 October 2008 by means of a questionnaire (i.e. no payment diary was used). The ECB's company survey on the use of cash was carried out in 2008 in the same countries as the household survey (except Luxembourg) and surveyed a sample of 3,052 small and medium-sized enterprises (SMEs).

² These eight countries issued 92% of all banknotes in the euro area in 2008. See ECB (2011).

In order to better understand the current developments in cash usage, the Eurosystem agreed in 2014 to conduct the survey on the use of cash by households (SUCH) in all euro area countries, except in Germany and the Netherlands, where the corresponding central banks have been carrying out similar payment diary surveys since 2008 and 2007, respectively. The latest available survey results from these countries are from 2014 for Germany and 2016 for the Netherlands. Even though the methodology used in the SUCH survey is similar to the methodologies used by the central banks of Germany and the Netherlands, the central banks in those countries preferred to continue using their own methodology in order to avoid deviating from their historical results. Nevertheless, to the extent possible, the results of those countries have been integrated to present the results for the whole euro area.³ The ECB's SUCH survey was conducted from October to November 2015 and from January to July 2016. It involved 65,281 respondents who kept a diary to write down all the payments and cash withdrawals or replenishments that they carried out during the course of a single day. In the specific case of Cyprus and Malta, respondents used three-day diaries. A total of 128,677 payments were reported. A subset of 28,099 respondents was also invited to complete a questionnaire in order to collect information on consumers' access to payment instruments, their payment behaviour and to analyse these results together with the reported transactions. The total number of survey participants for the whole euro area, including Germany and the Netherlands, was 92,080, reporting a total of 198,600 payments.

This paper reports on the main findings and conclusions of the SUCH survey. It presents an extensive description of how euro area consumers pay at POS. The aim of this study is to shed light on consumer payment behaviour in the euro area and in particular to improve the understanding of cash payment economics based on a large sample of households and countries. The paper is mainly descriptive in nature, does not aim to analyse differences in payment behaviour in depth and suggests opportunities for further research. It is hoped that, together with the unique underlying data, it will lead to future research on the use of cash and cashless means of payment.

The paper is organised as follows. Section 2 describes the research method and sample used and Section 3 describes the validation of the survey results. Section 4 presents the findings related to the use of cash and other payment instruments in the euro area. Specifically, it analyses the use of cash relative to other payment instruments in terms of number and value of payments, by transaction amount, and describes the impact of personal characteristics on consumers' choice of payment instrument. Section 5 analyses cash usage by market segment and the use of cash for recurrent payments. Section 6 describes the use of contactless payments and Section 7 presents the findings on card ownership and the acceptance of non-cash instruments. Section 8 is dedicated to the amount of cash euro area consumers carry in their wallet. Section 9 discusses how consumers obtain their cash and Section 10 presents the results on the use of cash as a store of value and the use of

³ Each time the euro area results of 19 countries are presented it should be taken into account that the results for Germany are from 2014 and that this country has a relatively high weight in the overall results of the euro area. For a more detailed description of the German survey see Bundesbank (2015) and for the Dutch survey see Jonker, Kosse and Hernandez (2012).

high denomination banknotes. Section 11 addresses consumers' cash withdrawal habits and their satisfaction with ATM services. Section 12 highlights consumers' payment preferences and other factors which determine consumers' payment choice. Section 13 concludes.

2 Research method and sample

2.1 Research scope and research population

The purpose of this study is to analyse the number and value of cash payments made in the euro area in 2016. In order to examine consumers' payment behaviour and the role played by cash, the study takes into account the use of cards and other payment instruments commonly used at POS, including cheques, direct debits, credit transfers and mobile payments. The study is limited to euro area residents aged 18 years and over and excludes payments made by consumers travelling outside of their place of residence, as well as payments made by tourists, other non-residents and payments between businesses. The study excludes payments carried out by respondents who are below 18 years old in all countries except the Netherlands, where payments by children from 12 years old were considered. The study includes information on payments carried out at POS, as well as those carried out between individuals, such as relatives and friends, charity donations or for home services (e.g. babysitting) which are referred to as person-to-person payments here. Recurrent payments (such as rent and utilities) are excluded from the study, unless they were paid at a POS.⁴ Internet payments (e.g. online shopping) were recorded in the payment diaries but are excluded from the analysis, as the objective of the study is to assess the attitudes towards and choice between cash and other payment methods; cash is usually not accepted to pay for remote payments. For the same reason, person-to-person payments were recorded, but not included in the results on the share of cash and non-cash means of payment at POS.⁵ It should be noted that the remainder of this chapter mainly describes the research method and sample of the survey on the use of cash by households carried out by the ECB in 17 euro area countries and does not describe the methods used in the German and Dutch study.

2.2 Sample

The field work was carried out by Kantar Public (Brussels) in three waves from October 2015 to July 2016. A total of 65,281 respondents participated in the diary survey, reporting 128,677 transactions in the euro area, excluding Germany and the Netherlands. The survey was carried out over eight months; 31% of interviews were held in 2015 and 69% in 2016 (see Table 1). Over two-thirds of interviews were carried out in October, November and February, which are considered to be fairly average months with respect to POS payments made by consumers. The total sample for the euro area – including data from Germany and the Netherlands – is of 92,080 respondents, reporting a total of 198,600 payments.

⁴ However, a question on recurrent payments was included in the survey questionnaire answered by a subset of respondents.

⁵ With the recent developments in instant payment solutions, the choice to use alternative means of payment rather than cash for person-to-person payments is expected to increase. Therefore, in future research on these payments may be included in the results.

Table 1

Distribution of the sample, per month

Country	Year 2015			Year 2016					Total
	October	November	December	January	February	May	June	July	
AT	2%	27%	3%	-	41%	19%	6%	1%	100%
BE	2%	26%	0%	-	39%	17%	12%	3%	100%
CY	33%	6%	0%	-	61%	0%	0%	0%	100%
EE	3%	23%	7%	-	38%	23%	6%	0%	100%
ES	2%	31%	0%	-	41%	22%	4%	0%	100%
FI	3%	13%	8%	5%	39%	13%	19%	0%	100%
FR	2%	28%	0%	-	38%	31%	1%	0%	100%
GR	2%	33%	0%	-	45%	4%	6%	9%	100%
IE	2%	28%	0%	-	37%	23%	5%	5%	100%
IT	2%	23%	6%	-	42%	14%	7%	5%	100%
LT	3%	22%	8%	-	38%	24%	5%	0%	100%
LU	4%	27%	0%	-	44%	23%	3%	0%	100%
LV	4%	23%	7%	-	38%	15%	2%	11%	100%
MT	21%	24%	0%	-	55%	0%	0%	0%	100%
PT	2%	24%	5%	-	42%	14%	13%	0%	100%
SI	3%	20%	9%	-	37%	9%	6%	17%	100%
SK	3%	22%	5%	-	39%	10%	5%	17%	100%
Sample euro area 17	3%	24%	4%	0%	40%	17%	7%	4%	100%

Sources: ECB.

For practical reasons it was not possible to ensure an equal number of interviews in all countries in each month. Furthermore, owing to the different dates of (public) holidays in various countries and because the interviews were not held in all months of the year, there could be some slight differences in the reported payment behaviour. Moreover, as December was excluded (some interviews were held in the first few days of December only in some countries), Christmas shopping was largely excluded from the survey results. For this reason, the exclusion of the larger value payments typically carried out in December may have an impact on the estimation of the number and value of payments in the year of the survey.

To ensure the reliability and representativeness of the findings, Kantar Public drew a sample of the population of each country from its internet panels, based on three demographic characteristics: gender, age and region of residence. Purposive sampling was used for the study. This is a non-random selection technique which aims to achieve a sample that is representative of a defined target population.⁶ The quotas set in each country reflected the census-based population characteristics in terms of gender, age and region of residence. The population figures used to set the quotas came from the most up-to-date Eurostat (2011) data available at the time the study was set up.

⁶ The most common purposive sampling ensures that a census-balanced sample is drawn to conform to the overall population statistics. The basic idea is that if a sample is representative of a population for which some characteristics are known, then the sample will also be representative of other survey variables.

In addition to the internet panels, respondents aged 55 and over were interviewed by telephone to compensate for the lower probability that those from this age group would participate in online panels. Furthermore, it was considered that those over 55 without internet access would be less likely to adopt new means of payment than those with internet access; they may thus have different payment behaviour from those who have internet access. Given the unavailability of internet panels in Cyprus and Malta, as well as the relatively low costs, all respondents in these countries were interviewed face-to-face.

For the purpose of the telephone and face-to-face sample, the basic sample design applied in the first stage was a multi-stage random (probability) one. As a second step, respondents from the telephone sample were selected on the basis of age and everyone under the age of 55 was excluded from this sample. Telephone respondents who agreed to participate were called again to complete the diary. In the case of the face-to-face sample, the recruitment process involved choosing households at random. Quotas were used to make sure that a sufficient number of respondents across gender, age and region of residence. An important feature of the survey design was that the overall sample sizes could not be determined in advance because the aim was to reach a certain number of recorded transactions per country, even though the average number of transactions per person per day for each country was unknown. Therefore, during the first wave of the study, a conservative estimate of an average of 1.35 transactions per person per day and a specific target for the total number of transactions was set for each country. The initial target was to reach approximately 10,000 transactions in Belgium, Greece, Spain, France, Italy, Austria, Portugal and Slovakia and Finland; approximately 7,500 transactions in Estonia, Ireland, Latvia, Lithuania and Slovenia; and approximately 5,000 transactions in Cyprus, Luxembourg and Malta. The results of the first wave showed that the number of transactions per person per day was higher than initially assumed. Therefore the sample sizes of the consecutive waves were recalculated and resulted in fewer interviews. Given that payment behaviour differs according to the day of the week, the interviews were distributed as evenly as possible over the course of the week.⁷

Education level categories were created based on the respondent's age when finishing full time education: still studying or no fulltime education, up to age 16 (low level of education, equivalent to secondary education), between 16 and 20 years old (medium level of education, equivalent to vocational education) and higher than 20 years old (high level of education, equivalent to university education).

⁷ The distribution of interviews by day of the week does not perfectly match the total number of each days of the week in the month considered in the survey (e.g. an over-representation of Thursdays over Saturdays). Therefore, it should be taken into consideration that this could have had an impact on the estimation of POS payments carried out by households.

2.3 Research method

Respondents were asked to write down all the payments made during a single day in all countries, except Cyprus and Malta, where three-day diary books were used. Respondents were not informed who had authorised the survey, in order to avoid influencing their behaviour. They were reminded to maintain the same behaviour as usual and encouraged to participate in the survey regardless of whether they had made any transactions. The choice of the duration of the diary survey is not unique to this study; it was set to allow the collection of diary data from telephone interviews and to minimise diary fatigue as described in Jonker and Kosse (2013). However, for certain categories of payments, such as occasional high-value payments for furniture, high-value electronics or cars, or for certain places of payment, such as hotels, one-day diaries have some shortcomings, as these payments may be under-recorded to some extent. These categories of payments and places of payment are typically characterised by higher card use. Because of their low frequency, they have limited influence on the number of payments, but may have some influence on the average value of payments and the value of card payments.

The study was structured in two parts: the payment diary and a survey questionnaire. All 65,281 respondents of the survey completed the payment diary, while a subset of 28,099 respondents also completed the questionnaire.⁸

The payment diary collected the relevant characteristics of all transactions, as well as cash withdrawals carried out by respondents during one single day. The data included information about the transaction value, the place of purchase (13 place categories, e.g. shop for day-to-day items, shop for durable goods, online shop, restaurants), the instrument of payment chosen (nine instrument categories)⁹, the amount of cash carried at the beginning of the survey day and the perceived acceptance of non-cash instruments in each place of purchase where a payment was made in cash. Data on cash withdrawals included information on the source of withdrawal (ATM, bank counter, cashback or other) and the value of withdrawals. Moreover, the data included information on the demographic characteristics of each diary respondent, such as gender, age and region of residence, along with information on education level, occupation, household size, frequency of internet use and family net income. The diary survey questions can be found in Annex B.

The survey questionnaire collected information on attitudes that may influence respondents' payment behaviour, such as payment preference, perceived convenience of particular payment instruments, perceived payment and withdrawal behaviour and information on consumers' views on different cash policies. Moreover, the questionnaire collected data on respondents' access to non-cash payment instruments, the use of cash for recurrent payments and information on the use of cash as a store of value.

⁸ Results from all 19 euro area countries are based on the answers of 92,080 respondents who participated in the diary survey and a subset of 32,907 respondents who completed the questionnaire.

⁹ The focus of this study is on the use of cash, cards (debit, credit or contactless) and other instruments used at POS, including cheques, direct debits, credit transfers and mobile payments, among others. For a detailed definition of each payment instrument, see Annex A.

Box 1

Payment diary surveys in Germany and the Netherlands

Payment diary surveys in Germany and the Netherlands have been carried out since 2008 and 2007, respectively. In both cases, the surveys consist of a diary and a questionnaire. In the case of Germany, a seven-day diary was used. The latest diary survey was carried out between May and July 2014 among 2,016 respondents who reported 19,823 transactions.

In the Netherlands, a one-day diary was used. The latest survey was conducted throughout 2016, with an equal number of respondents per month. A total of 24,783 respondents participated in the survey and reported 50,452 transactions.

2.4 Recruitment of respondents and data collection

For the ECB survey, a combination of web-based, telephone and face-to-face based methods were used for recruiting respondents and for collecting the questionnaire answers (see Table 2). The majority of the interviews were carried out online (54,377). There were 8,996 interviews conducted by telephone and 1,908 via face-to-face interviews. Table 2 presents the number of interviews conducted by month and interview mode.

Online respondents were recruited to participate in the study two days before the actual interview took place.¹⁰ During first contact, when respondents were asked to take part in the study, they were asked to record their payments for the following day, keeping track of all their transactions. Once they had agreed to take part, respondents were allowed a day in which to record all their transactions and were called to collect the information the next day. For example, respondents who were contacted on Monday were asked to record their transactions for Tuesday and were then contacted to complete the interview on Wednesday. They were allowed a 48-hour window from the time the link was sent to them to complete the survey. For the telephone and face-to-face¹¹ modes, the interview took place within two days of the day on which the transactions were recorded. For example, respondents contacted on Monday who recorded their transactions on Tuesday would be interviewed on Wednesday or Thursday.

¹⁰ Online respondents were sent invitations by email, along with the instructions for pre-recruitment.

¹¹ During the face-to-face interview, respondents were informed of the main objectives of the survey and were read the pre-recruitment instructions. Once potential respondents had agreed to participate in the study, they were given the printed three-day diary and asked to complete it each day. After the three-day period, they were contacted by the research company by telephone, which recorded all transactions.

Table 2

Distribution of interviews by month and interview mode

Month	Face-to-face	Online	Telephone	Total
2015				
October	518	0	1,669	2,187
November	278	15,543	0	15,821
December	0	2,532	0	2,532
2016				
January	0	232	0	232
February	1,112	17,949	7,327	26,388
May	0	10,933	0	10,933
June	0	4,291	0	4,291
July	0	2,897	0	2,897

Source: ECB.

2.5 Translation of survey material

The translation of all survey material was a crucial aspect in the study. Kantar Public was responsible for the whole translation process and used its own translation department to deliver the required quality. Once ready, the translated material was sent to the ECB, which sent it to its own translation department, as well as to a group of national central bank experts who served as advisers during the whole process of the study. An additional check of most translations was carried out by ECB staff from the countries involved in the study. During the translation process, emphasis was put on the use of terms that would be easily understood by the public. For example, “debit card” could not always be translated literally, as in many countries another term is used.

2.6 Weighting and adjustments

Given that the sample was not perfectly representative, sample weights were needed to correct the sampling bias inherent to online panels and purposive sampling.¹² The key variables used for the post-stratification adjustment were gender, age and region of residence. A further factor used in the adjustment of respondents aged 55 and over who were interviewed by telephone was the frequency of internet usage. This was used as a fourth weighting variable, nested

¹² All non-probability online panels have inherent and significant coverage errors, as even a relatively large national panel of one million members would only have about 2% of adult internet users enrolled at any given time (in France, for example). Another part of the bias comes from the fact that the response rate of non-probability online panels is not accurately known. DiSogra and Callegaro (2009) point out that there are currently no widely accepted metrics that can be used to accurately quantify or otherwise characterise the non-response that occurs at the recruitment stage of non-probability online panels. This is because the base (denominator) against which the number of people who joined the panel (numerator) can be compared is often unknown.

under age. The external information source was the most recent Eurobarometer survey containing the information available when the weighting targets were set.

The sample population was segmented into two groups:

- respondents aged 55 and over who were interviewed online and those in this age cohort interviewed by telephone who said they used the internet frequently (at least once a week);
- respondents aged 55 and over who are not frequent internet users (those who use the internet two or three times a month, less often, or never and those with no internet access).

The Eurobarometer survey shows that in all euro area countries, except in Luxembourg, the Netherlands and Finland, people aged 55 and over use the internet much less than those in the younger age cohorts. In Luxembourg, the Netherlands and Finland, they have an internet use pattern similar to the younger age cohorts.

3 Validation

In order to check whether the results from the survey were reasonable, an extensive validation of the data was carried out. For most countries, no alternative sources of information that could be used to validate the survey results were available, such as existing studies on retail payments or data from retail associations. The only country with an available recent payment study was Portugal, which was carried out by the Banco de Portugal. However, the scope of this study was different; it included not only POS payments, but all payments made by individuals.¹³ Furthermore, the Oesterreichische Nationalbank (2017) carried out a study on payment behaviour by households in 2015. The set-up was nearly the same as that of the SUCH, but instead of one-day diaries, three-day diaries were used. The results of the Oesterreichische Nationalbank study and the SUCH study appear to be very similar.

The only source available for all countries at the time of data validation was euro area payment statistics¹⁴ in the ECB's Statistical Data Warehouse (SDW), with data from 2015. Two main items of payment statistics were used from the SDW: i) the value of cash withdrawals, in order to validate the estimated value of cash payments; and ii) statistics on domestic card payments initiated at the POS,¹⁵ in order to validate the estimated number and value of card payments resulting from the survey. The euro area payment statistics do not report domestic card payments split by debit and credit card payments. For this reason, card payments have been validated as a whole. The validation of the German survey results has been excluded, as they refer to 2014 and have already been published.

When looking at the SDW data on cash withdrawals it should be considered that not all cash withdrawals are used for payments. A proportion of withdrawn cash is used by retailers as change and some cash is kept at home as a reserve. In addition, some of the cash withdrawn leaves the country and is spent abroad when consumers travel. The estimated value of cash payments resulting from the study equals roughly 93% of cash withdrawals in the SDW.¹⁶ Therefore, the estimated value of cash payments from the survey is, in general, a good indication of the actual use of cash at POS.¹⁷

¹³ In September 2015 the Banco de Portugal published its study "Use of instruments of payment in Portugal" based on one and three-day diary book data among respondents aged 18 to 74 years old, as well as person-to-person payments and other non-POS payments. However, it should be noted that the SUCH results include respondents aged 74 and over and focus on POS payments only.

¹⁴ These datasets are mainly collected on an annual basis according to Regulation ECB/2013/43 (regulation on payment statistics).

¹⁵ Using data on cards issued by resident payment service providers.

¹⁶ Excluding over-the-counter cash withdrawals from Luxemburg, Malta and Austria, which are not available in the SDW, and excluding cashback at retailers, available in some countries.

¹⁷ The estimated value of cash usage for Ireland, Italy and Lithuania is higher than the value of cash withdrawals reported in the SDW. Differences could be the result of variation in reporting methodologies and data quality issues. Moreover, in all these countries cashback is offered at retailers. In the case of Lithuania, the fieldwork of the SUCH coincided with the year of the adoption of the euro. This brought changes in the reporting of statistics, as well as temporary changes in how consumers use their money.

The validation of card payments shows that the survey results are, at euro area level and for the majority of the euro area countries, roughly in line with card payment data from the SDW. When comparing SDW data with the SUCH results, it should be considered that the characteristics of card payment data from the SDW do not fully match the characteristics of the survey data. The SDW includes card transactions made by persons under 18 years old and businesses, while the SUCH data only contain card payments from households and those aged 18 years and over. Moreover, the survey was conducted during only a few months of the year, and mostly excludes December. Since the number and value of transactions is higher in this month than the yearly average, and higher value payments are more frequently made by card, this may have led to an underestimation of the total value of card payments by extrapolating the SUCH results to the whole year. In addition, respondents may not have been able to distinguish between debit and credit cards and certain special-purpose cards, such as public transport cards or canteen cards, which are not recorded in the SDW as card payments. Furthermore, in some countries, such as Greece and Italy, there are still a considerable number of people below the age of 55 without internet access or who do not use the internet frequently. Thus, internet panels used in these countries do not include this part of the population. Since people with internet access are more likely to adopt new means of payment more quickly, card use in these countries may be overestimated in the SUCH results, to some extent. Finally, because of the introduction of capital controls in Greece in 2015 and the introduction of the euro in Lithuania in that same year, it is difficult to compare the relevant payment statistics data with the survey results.

However, it seems that these explanations do not fully explain the relatively large differences between the SUCH results and the SDW data for some countries, in particular for France, Italy, Slovakia and Finland in terms of the number of card transactions, and for France, Ireland, Portugal and Finland in terms of the value of card transactions. Chapter 4 describes the effect of using card data from the payment statistics in the SDW instead of the survey results for these countries. As shown, the resulting difference in the use of cash by applying the card data from the SDW is limited for most countries, especially if the differences in data characteristics between the SDW and the SUCH are taken into account. As an additional data quality check, a margin of error for the estimated number and value of card payments was calculated. Results showed that the estimated card payments from the SUCH moved within a narrow margin of error. Considering that survey results never provide a perfect representation of reality, and that the SDW may also have shortcomings and limitations, it can be concluded that the SUCH results are representative for the payment behaviour of euro area consumers of those aged 18 and over at the point of sale.

4 Cash usage in the euro area

4.1 Relative use of payment instruments

In 2016 euro area consumers made 163 billion payments by means of cash, payment cards or other payment instruments, amounting to more than €2,968 billion (see Table 3).¹⁸ The large majority of these payments were made in shops for day-to-day items, restaurants and petrol stations, as well as at street merchants and shops for durable goods. These payments are referred to as POS and account for 96% of all payments. The remaining 4% refers to payments between individuals, such as in-home services and giving money to relatives, friends, churches or other charity organisations.

Table 3
Number and value of payments in the euro area in 2016

Payment instrument	Number (billion transactions)	Value (billion EUR)	Average value
Cash	129	€ 1,653	€ 12.8
POS	124	€ 1,530	€ 12.4
P2P	6	€ 123	€ 21.1
Cards	30	€ 1,110	€ 36.9
Other	3	€ 205	€ 61.9
Total payments	163	€ 2,968	€ 18.2
POS	157	€ 2,845	€ 18.1

Source: ECB.

Notes: Online payments are not included in Table 3. Based on the diary survey results, the value of online payments in the euro area in 2016 amounted to €144 billion. The latter estimation excludes German results, owing to a lack of data availability, as well as standing orders for online recurrent payments, such as the monthly fee for an online music and entertainment service. The "Other" category includes payment instruments, such as cheques, direct debits, credit transfers, mobile payments or other instruments used by households at POS. Due to their low frequency of use, these instruments have been grouped in a single category.

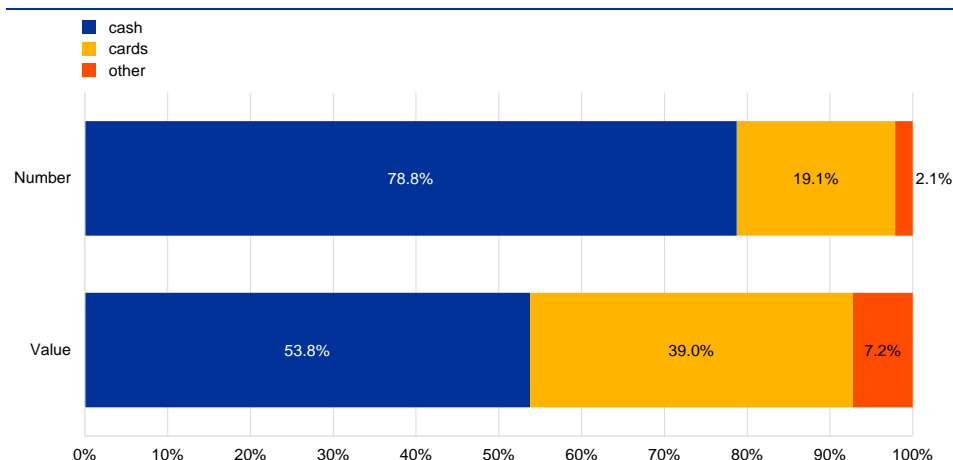
To pay for their POS purchases, euro area consumers made 124 billion cash payments, 30 billion card payments and 3 billion payments by means of other instruments, such as cheques, direct debit, credit transfers and mobile payments. Although cash was mainly used for low-value purchases, it was used four times more often than debit or credit cards, bringing the total value of cash payments above that of all card payments.

Survey results show that cash was dominant at the POS. In terms of number of transactions, 78.8% of purchases at the POS were paid using cash, 19.1% using cards and the remaining 2.1% was paid using various other payment instruments (see Chart 1). In terms of value, cash payments accounted for 53.8% of all POS payments, cards for 39% and other means of payment accounted for the remaining 7.2%.

¹⁸ Survey results extrapolated to a year for the total euro area population of 18 years and over (12 years and over in the case of the Netherlands).

Chart 1

Market share of payment instruments at points of sale



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.
Notes: Euro area results, adjusted for country size.

Comparing the use of cash per country, it can be concluded that cash was used most in southern euro area countries, as well as in Germany,¹⁹ Austria and Slovenia (resulting in country shares of 80% or above for all POS transactions; see Chart 2). The market share of cash was lower in Latvia, Lithuania, Slovakia and Ireland, ranging from 71% to 79%. Belgium, Luxembourg and France follow with a cash share ranging between 63% and 68%. The Netherlands, Estonia and Finland had the lowest shares, ranging between 45% and 54% of all payments at POS.²⁰

In terms of value of payments made at POS, in all countries the share of cash was much lower than in terms of number of payments. In Cyprus, Malta and Greece the share of cash in value of payments was the highest, ranging from 72% to 75%. In Lithuania, Slovakia, Austria, Spain, Italy and Slovenia the share ranged from 62% to 68%. In Ireland, Portugal, Latvia and Germany the share of cash in value of

¹⁹ It should be noted that the results for Germany are included separately and are taken from the Deutsche Bundesbank's 2014 cash payment survey. Taking into account the trends in Germany, it can be expected that the share of cash payments in Germany in 2016 was slightly lower than in 2014. Consequently, given the high weight of Germany in the overall results for the euro area, the overall share of cash in number and value in the euro area may be marginally lower in 2016. It should also be noted that some of the figures published in this paper differ slightly from those published by the Deutsche Bundesbank in 2014. This paper presents figures on the use of payment instruments at POS, while the Deutsche Bundesbank's report presents figures for all payments, including person-to-person and internet payments. As a result and as presented in Charts 2 and 3, the share of cash usage in this paper is 79.8% in terms of number and 54.6% in terms of value, while those published by the Deutsche Bundesbank in 2014 are 79.1% and 53.2% in terms of number and value of payments, respectively.

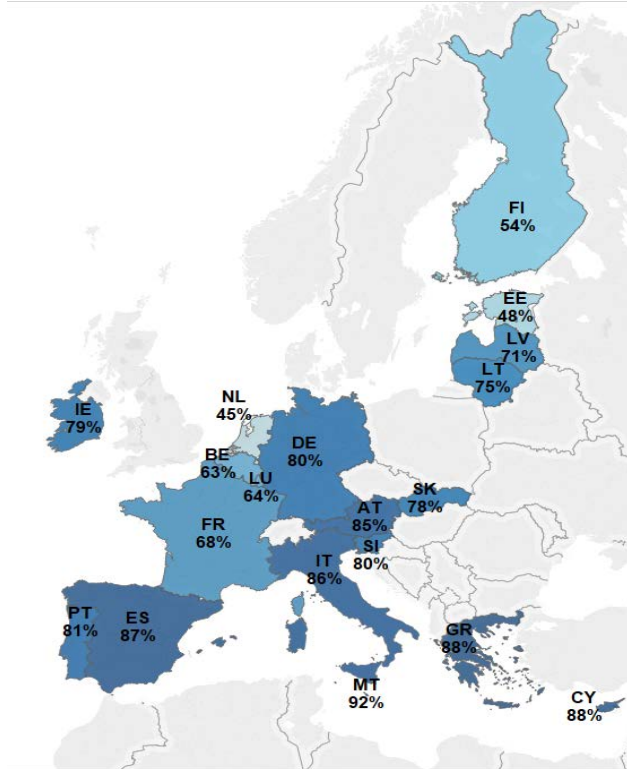
²⁰ As explained in Chapter 3, for some countries the survey results on card data deviate markedly from the card statistics in the SDW. Using the card data from the SDW instead of the survey results (noting all the caveats described in Chapter 3) would result in the following shares of cash payments in terms of number of total payments at POS: France 63%, Italy 91%, Slovakia 86% and Finland 42%, while the share of cash at POS for the euro area as a whole would remain at 79%.

payments was between 49% and 55%, while in the Benelux countries, France, Estonia and Finland the share ranged from 27% to 33%.²¹

Chart 2

Share of cash transactions per country at points of sale

(number of transactions)

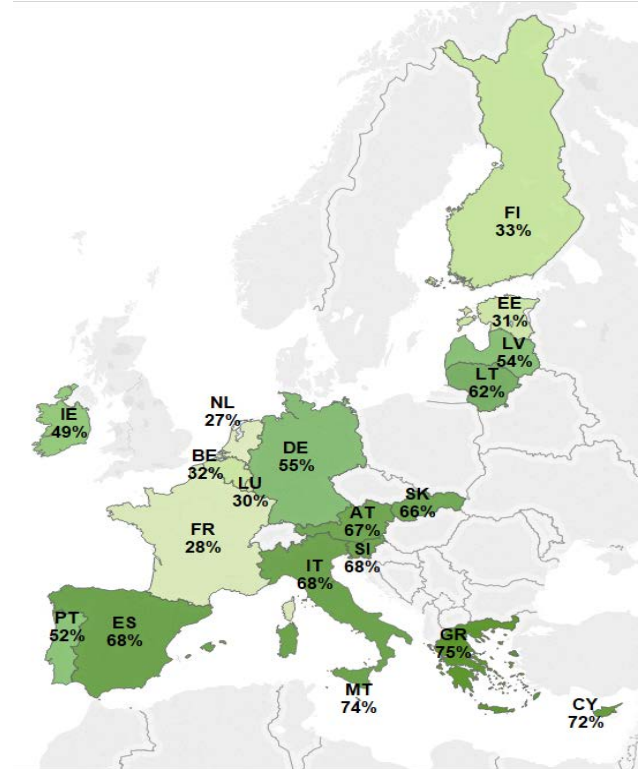


Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Chart 3

Share of cash transactions per country at points of sale

(value of transactions)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

4.2 Average value of transactions

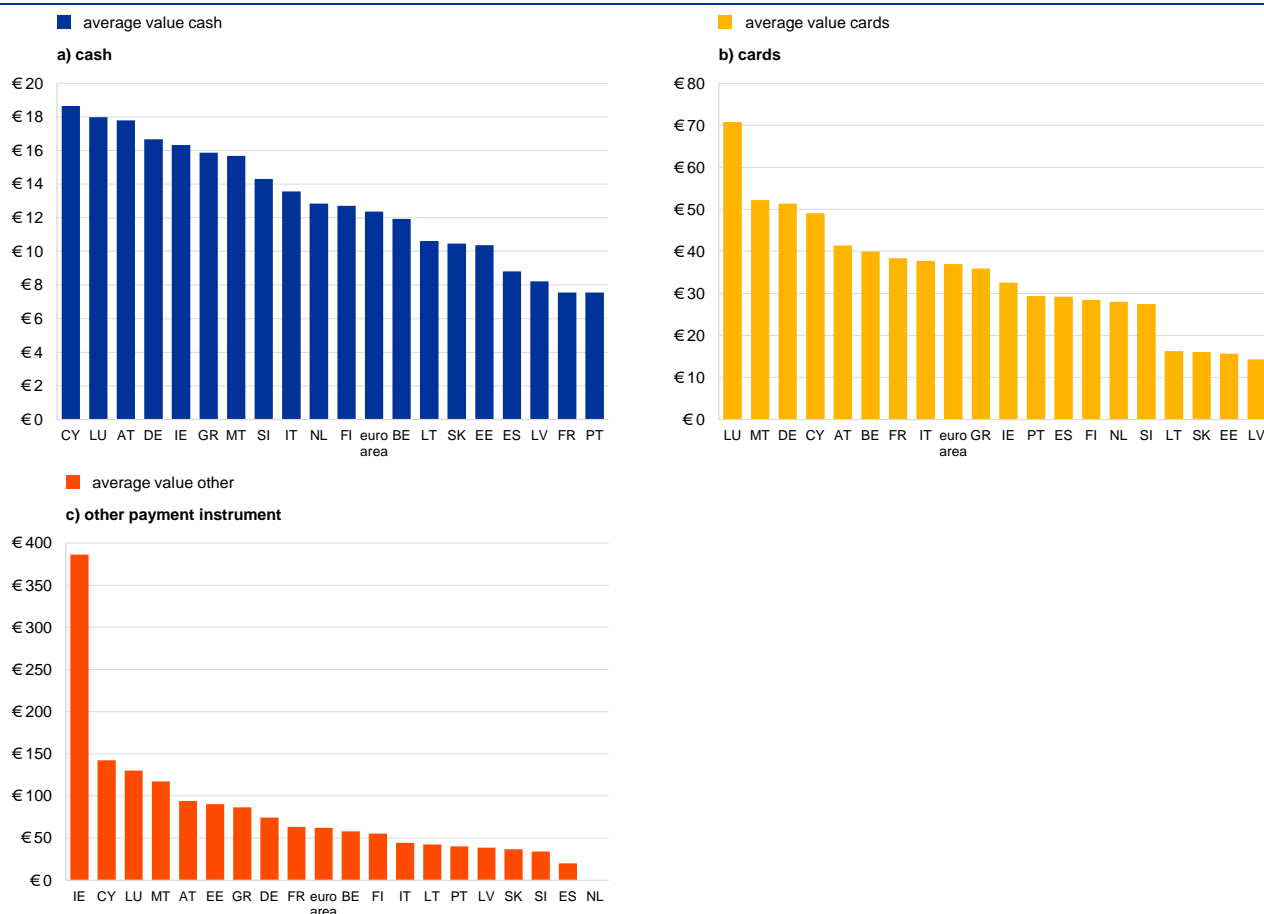
The different shares of cash in the total number and value of transactions at POS are also reflected in the average value of a cash transaction to some extent. On average in the euro area, the value of a cash transaction was €12.38. In terms of value of transactions, the average value of a cash transaction was the highest in Cyprus, Luxembourg and Austria where it ranged from €18.60 to €17.80 (see Chart 4a). This suggests that consumers in these countries use cash not only to pay low amounts but also relatively higher amounts. In contrast, the average cash transaction value was the lowest (below €10) in Spain, Latvia, France and Portugal where it ranged

²¹ As described in Chapter 3, also in terms of value the survey results deviate markedly from the card statistics in the SDW for some countries. Using the card data from the SDW instead of the survey results (noting all the caveats described in Chapter 3) would result in the following shares of the value of cash payments in total payments at POS: Ireland 41%, France 23%, Portugal 34% and Finland 23%. Applying the whole euro area 2015 SDW card data instead of the SUCH results, the share of cash in value of POS transactions would be 50%.

between €8.80 and €7.50, indicating that in these countries cash is mainly used for small payments.

Chart 4

Average value of a transaction at points of sale



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.
 Notes: The "other" category includes instruments such as cheques, direct debits and credit transfers.

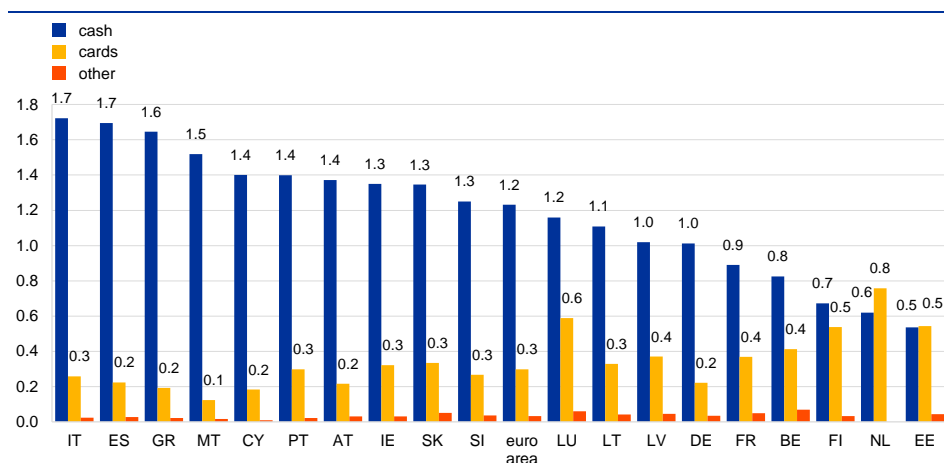
The average card transaction value was the highest in Luxembourg, Malta and Germany, where it ranged from €70.78 to €51.38 (see Chart 4b). In contrast, the average card transaction value in the euro area was the lowest in Slovakia, Estonia and Latvia where it ranged from €16.05 to €14.33, indicating that consumers in these countries use cards for relatively low-value payments.

Diary results suggest that cheques or credit transfers and direct debits are commonly used to pay for larger amounts, such as at hotels, certain service providers or at public authority offices. The average transaction value of these kinds of payments were therefore higher than those of cash and cards, the highest being in Ireland, Cyprus and Luxembourg, where they ranged from €387 to €130 (see Chart 4c).

4.3 Average number of transactions per person per day

In 2016 euro area consumers made 1.6 payments per day on average, which equals nearly 11 payments per week (see Chart 5). They used cash more frequently than other payment instruments, making on average 1.2 cash payments per day, i.e. almost nine per week. The second most frequently used payment methods were payment cards, which consumers used on average 0.3 times per day, i.e. 2.1 times per week. However, these are euro area averages, since payment behaviour varied from country to country. Italy, Spain and Greece were the countries where consumers made the highest number of cash payments per day, with 1.7 transactions per day, i.e. nearly 12 per week. On the other hand, consumers in the Netherlands, Luxembourg, Finland and Estonia made the highest number of card payments per person per day, with 0.8, 0.6 and 0.5 payments per day, respectively. This is equal to 5.3, 4.1 and 3.8 payments per week, respectively.

Chart 5
Average number of transactions per person per day, by instrument of payment



Source: Authors' calculation based on ECB, Deutsche Bundesbank and De Nederlandsche Bank data.

In 2016 the Netherlands was the only euro area country where consumers used payment cards more often than cash. They carried out 55% of all transactions using a payment card, while in Estonia consumers carried out an equal number of transactions by cash and card, on average.

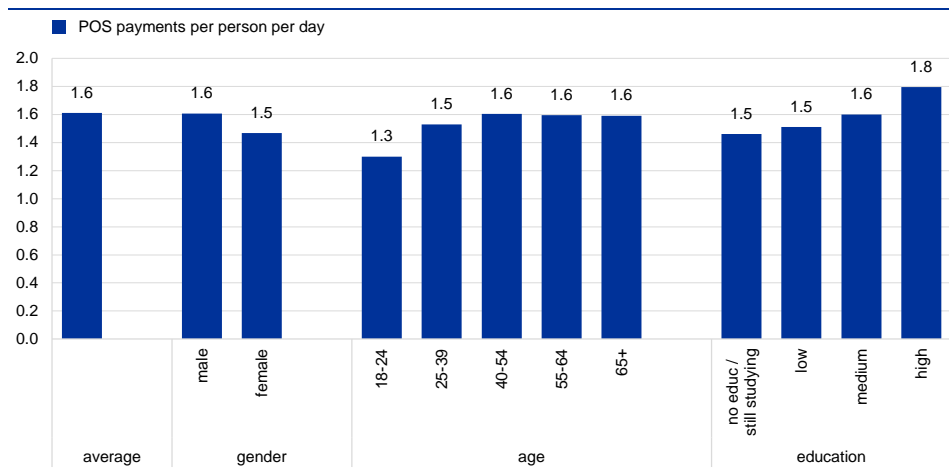
4.4 Payment behaviour by demographic characteristics

Payment behaviour differs not only by country, but also from person to person. In line with the literature on payments (see Whitesell, 1989; Boeschoten, 1998; Von Kalckreuth et al. 2009, Stavins, 2011), the survey results show that consumer characteristics, such as gender, age and level of education, appear to influence the choice for a particular payment instrument at POS. Chart 6 shows that male consumers aged between 40 and 64 and those with a high level of education carried out a larger number of daily payments than their counterparts. On average, they made between 1.6 and 1.8 payments each day at the POS using cash, cards or

other payment instruments, which corresponds to between 11 and 13 payments per week. In contrast, the number of daily payments was lower among women, young people and those who are still studying. These consumers made, on average, between 1.3 and 1.6 payments each day, corresponding to between 9 and 10 payments per week.

Chart 6

Average number of POS payments per person per day



Source: Authors' calculation based on ECB, Deutsche Bundesbank and De Nederlandsche Bank.

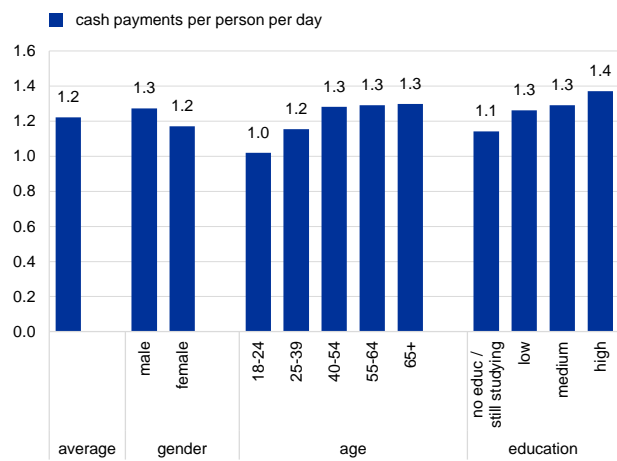
A similar phenomenon can be observed when analysing the demographic characteristics of cash users (see Chart 7). On average, euro area consumers made 1.2 cash payments per day, i.e. 8.4 per week. However, this varied by gender and age. Men and consumers aged between 40 and 64 were more likely to use cash. Younger consumers aged between 18 and 39 carried out fewer cash payments, namely from 1.1 to 1.3 daily payments respectively. When looking at the results by level of education, cash usage appears to be relatively homogenous among consumers with a low, medium or high education level.

The use of payment cards also tends to be relatively homogenous among women and men, as well as consumers aged over 25. However, results show that young people (18 to 24 years old) and those with a low level of education used payment cards the least (see Chart 8).²² They made on average 0.24 and 0.22 card payments per day respectively (i.e. around 1.6 per week), in contrast with the rest of the population, which made on average 0.3 payments per person per day (i.e. around 2.1 per week).

²² It should be taken into account that young people (18-24 years old) carried out the lowest number of payments per person per day, compared with the payment behaviour of consumers in older age groups (see Chart 6).

Chart 7**Average number of cash payments at POS**

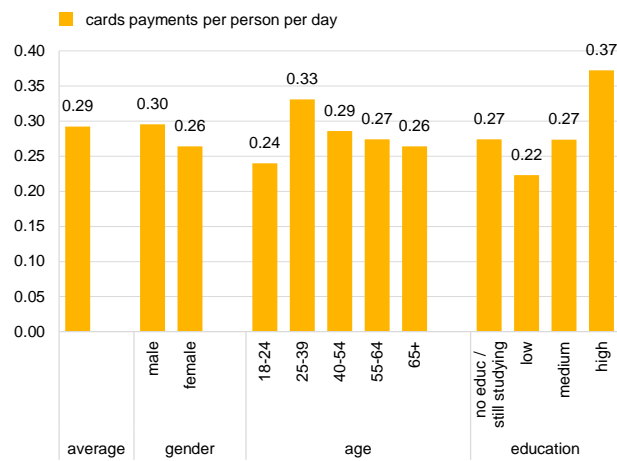
(per person per day)



Source: Authors' calculation based on ECB, Deutsche Bundesbank and De Nederlandsche Bank data.

Chart 8**Average number of card payments at POS**

(per person per day)



Source: Authors' calculation based on ECB, Deutsche Bundesbank and De Nederlandsche Bank data.

4.5 Use of payment instruments by value range

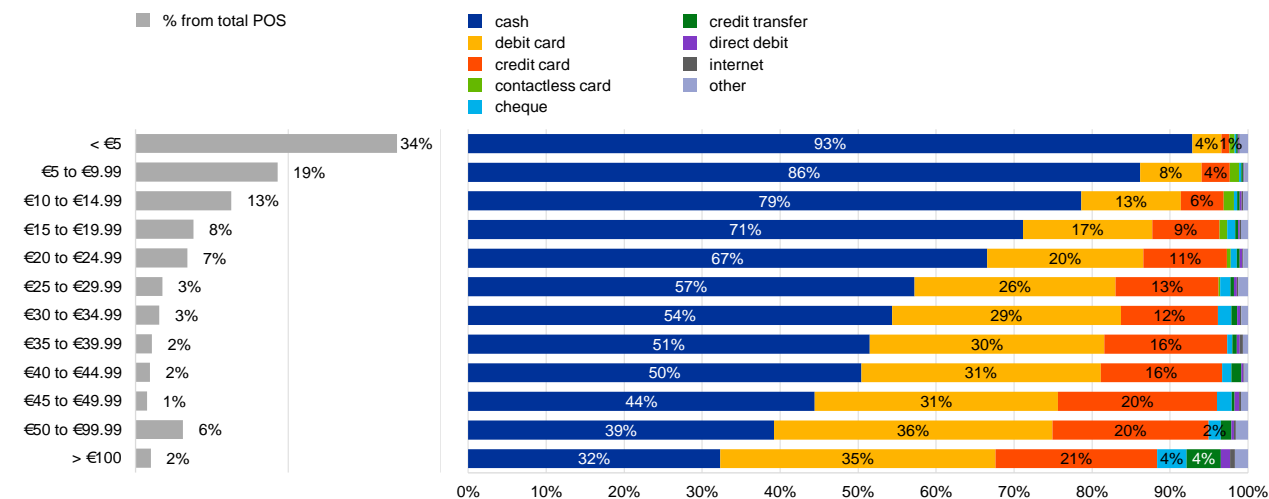
On a daily basis, consumers spent on average €18 every time they made a payment at POS using cash, cards or other means instruments. Most POS payments carried out by consumers involved lower transaction values; over a third of payments were lower than €5, and 65% were lower than €15. Conversely, only two in over 100 payments were worth more than €100.

In line with the literature (see Whitesell, 1989; Boeschoten, 1998; Klee, 2008; Von Kalckreuth et al., 2014 and Arango et. al 2017), consumers' instrument of choice is strongly influenced by the payment amount; cash is mainly used for low-value payments while cards are used for larger-value payments. This is confirmed by the survey results. Indeed, although absolute levels differed between countries, within each country the average value of a cash transaction was lower than the average value of a card transaction. Looking at the way consumers paid according to payment instrument and amount, cash was the instrument of choice for purchases under €45. These purchases accounted for 91% of all POS payments. Cards, on the other hand, were the most frequently used payment instrument for purchases above €45, which accounted for 9% of all POS payments. As can be expected, the higher the amount to be paid at the POS, the more likely it is that a consumer pays by card (see Chart 9).

Chart 9

Use of payment instruments at POS, by value range

(number of transactions)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Looking more closely at the payment amounts above €100, it is interesting to note that the use of cash remained relatively high. Almost a third of POS transactions with a value above €100 were paid with cash. However, it should be noted that the number of payments above €100 was relatively small; only 2% of recorded payments were above €100. For this reason, no reliable breakdown of the use of various payment instruments for value ranges above €100 can be provided.

Although the share of cash payments above €100 was small, in terms of value they amounted to 10% of the value of all cash payments at the POS in the euro area. The share of cash payments above €100 in the total value of cash payments at the POS was wide-ranging, from 3% in France or 5% in Belgium, to 21% in Ireland and Slovenia or 26% in Greece.

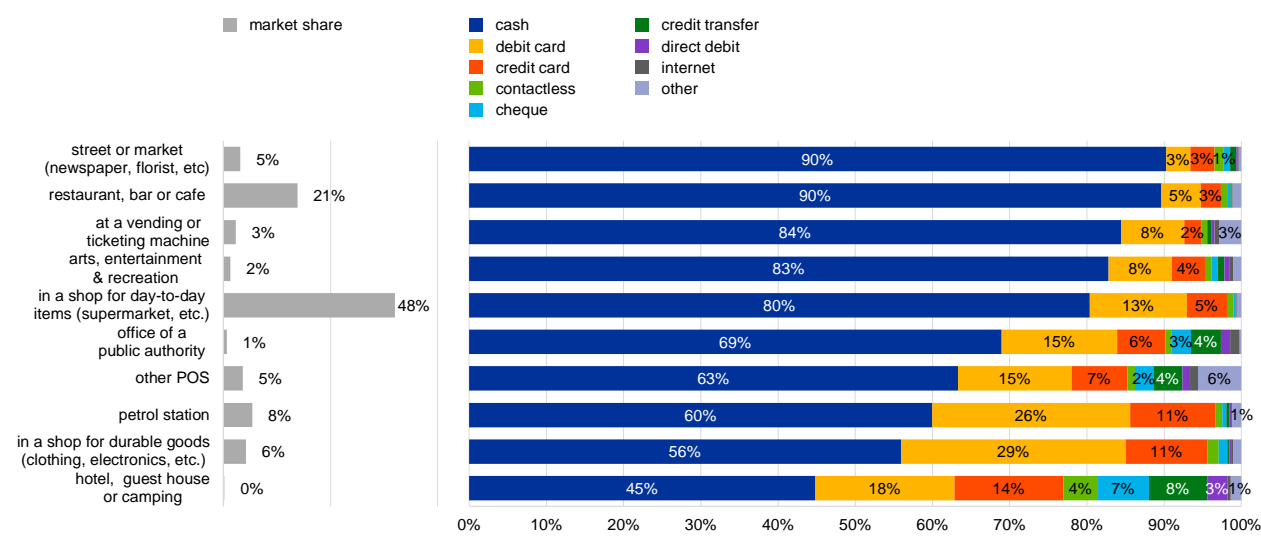
5 Use of payment instruments by market segment and for recurrent payments

5.1 Market share of payment instruments by number of transactions

Although on average euro area consumers paid in 2016 for almost 79% of their transactions using cash, this varied depending on the place of purchase. Cash was the most dominant payment instrument in a large majority of POS. It held a market share of payments of above 50% in all sectors, except in the accommodation sector (hotels, guesthouses and camping sites), where payment cards and other non-cash payment instruments were largely used. As shown in Chart 10, the share of cash usage was the highest at (i) street or market vendors and in restaurants and bars (both 90%), (ii) vending or ticketing machines (84%), (iii) in the entertainment and recreation sector (83%), and (iv) in shops for day-to-day items, such as supermarket or bakeries (80%). Cards were the second most frequently used payment instrument after cash. From all sectors, cards were most frequently used in shops for durable goods, petrol stations and in the accommodation sector where 41%, 38% and 37% of all payments were made by card, respectively. It may be surprising that 60% of payments in petrol stations were made in cash. However, it should be taken into account that people also buy cigarettes, newspapers, flowers and snacks at petrol stations, which are generally more-frequent, smaller-value payments.

Chart 10
Market share of the main payment instruments

(number of transactions)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Chart 10 also shows that by far most payments carried out by consumers at POS were made in shops for day-to-day items (48%) and in restaurants, bars and cafés

(21%). Furthermore, 8% of the number of payments was made at petrol stations and 6% in shops for durable goods. A total of 5% of all payments were made in “other” places. This is typically in the services sector, such as hairdressing, dry cleaning and plumbing services, the repair of cars and bicycles, or household and gardening services.

The fact that payments for durable goods in shops and payments in petrol stations made up only 14% of all POS payments compared with 69% in shops for day-to-day items and restaurants and bars, may explain to some extent why cash is used more than many people perceive it to be. Consumers are likely to remember how they pay for less-frequent, higher-value payments than for frequent, lower-value payments (see Jonker and Kosse, 2013). At the same time, it shows that if the infrastructure for card payments in shops for day-to-day items and in bars, restaurants and cafés is further built up, and contactless payments are facilitated, the share of cash usage in terms of number and value of payments could decrease substantially. However, an increase in card payments in sectors such as entertainment and recreation, hotels and vending machines – which together accounted for 5% of all POS payments – would have a limited impact on the total share of cash used at POS.

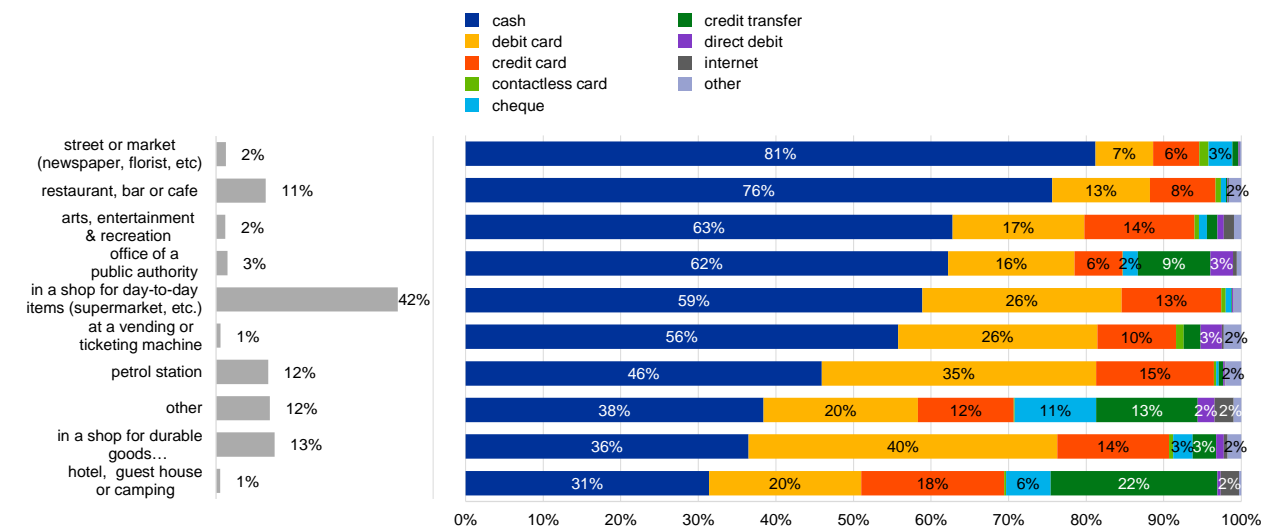
5.2 Market share of payment instruments by value of transactions

In 2016 the use of cash was not only dominant in the number of transactions, but also in terms of value of payments, although to a lesser extent. The share of cash was the highest at street or market vendors (81%) and in restaurants, bars and cafés (76%; see Chart 11). Furthermore, cash payments accounted for 59% of the total value paid at shops for day-to-day items. This is significant, given that 42% of the turnover of all POS payments was concentrated in this sector. The share of cash in terms of value was below 50% in four sectors, namely petrol stations, shops for durable goods, the accommodation sector, as well as in the “other” sector, which includes all services. In all these sectors, card payments were the most dominant means of payment in value terms. The highest share of card payments was in shops for durable goods, where 55% of the total turnover was paid using cards, followed by petrol stations (51%), and the accommodation sector (38%). It is interesting to note that credit transfers and cheques played a relatively important role in the accommodation sector, the “other” sector (typically services) and at offices of public authorities. As a credit transfer is a remote payment instrument, these transactions are most likely understood to be transactions in which a respondent has agreed with a payee at a POS (e.g. hotel or municipal administration) that the transaction could be made by credit transfer.

Chart 11

Market share of main payment instruments

(value of transactions)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Examining the share of each market segment in the total turnover, it appears that – similar to the number of payments – shops for day-to-day items dominate the payments made at POS. On average, 42% of all turnover at POS in the euro area was made in shops for day-to-day items. The market segments with the second highest turnover were shops for durable goods, closely followed by petrol stations and the “other” sector. Although the average value of a transaction at restaurants, bars or cafés was lower than, for example, in shops for durable goods, given the large number of transactions, this sector still held 11% of all turnover at POS in the euro area. These results also highlight the economic importance of these sectors and the relevance of various means of payment in these sectors.

5.3 The use of cash for recurrent payments

The “other” sector in Charts 10 and 11 includes, for some countries, payments made at a POS, which in other countries would typically be made by remote payment methods such as credit transfers or direct debits. These are mainly recurrent payments, such as rent, utilities, telephone subscriptions and insurance, but also payments for the home delivery of oil or gas, or medical services. As no breakdown was required in the diary survey, respondents were asked in a separate questionnaire whether they pay for any of these types of recurrent payments using cash. As seen in Chart 12, in some countries it is not unusual to pay these recurrent expenses in cash. On average, in the euro area (excluding Germany²³) 6% of the rent was said to be paid in cash, with 26% of all rent in Greece said to be paid in

²³ It can be expected that since most recurrent payments in Germany are known to be made by direct debit or credit transfer, the euro area average would be lower if the results from Germany were included.

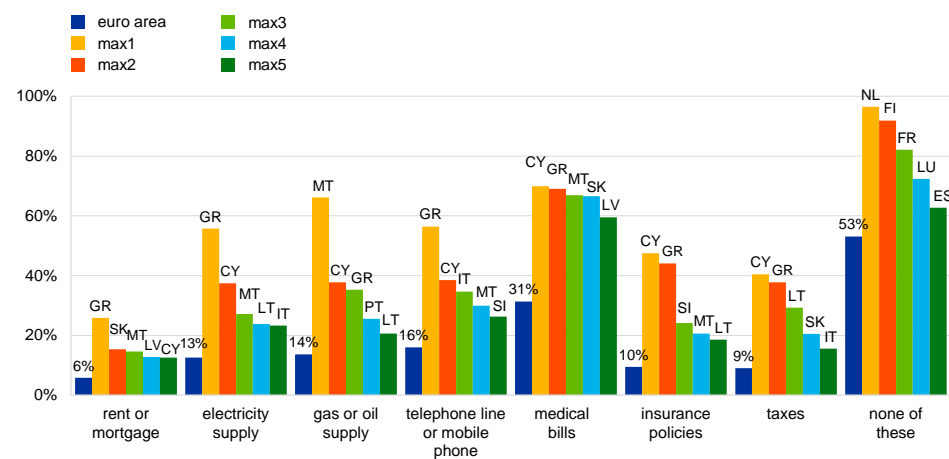
cash, and around 15% in Slovakia and Malta. In addition, utility bills were frequently paid in cash in several countries. For example, 56% of the respondents in Greece and nearly 25% of those in Italy said they paid their electricity bill in cash. Also, 9% of respondents indicated that they paid their taxes mainly in cash and 10% stated that they paid their insurance mainly in cash. Furthermore, on average almost one out of three respondents indicated that they paid their medical bills mainly in cash. Chart 12 also shows large differences in payment behaviour, since in many other countries hardly any of these recurrent payments, or payments for medical services, were said to be paid in cash. In general it can be concluded that in countries where the share of cash in overall payments is high, recurrent payments are made more often in cash.

Chart 12

Use of cash for recurrent payments (number of respondents)

Question: which of the following expenses do you mainly pay in cash?

(based on 30,871 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.

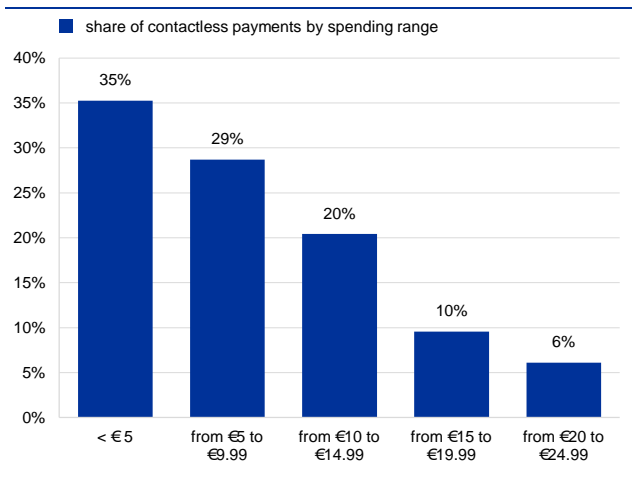
Notes: Label max1 to 5 indicate the top 5 countries holding the highest shares of responses per sector category.

6 Contactless payments in the euro area

In recent years contactless payments have become widely available in many euro area countries, albeit at different paces, depending on the roll-out of contactless-enabled cards and terminals. With contactless technology one can pay with a debit card, credit card or a device (such as smart phone) by holding the card or device within a few centimetres of a payment terminal enabled with near field communication (NFC) technology. Normally no personal identification number (PIN) is required for payments amounting up to €25, while for payments above that threshold amount, a PIN code is needed.²⁴ For the purpose of this paper only those contactless transactions have been considered for which no PIN is required. If respondents indicated that they had paid amounts above €25 by means of contactless payments, they were not considered as contactless payments, but as “normal” card payments.

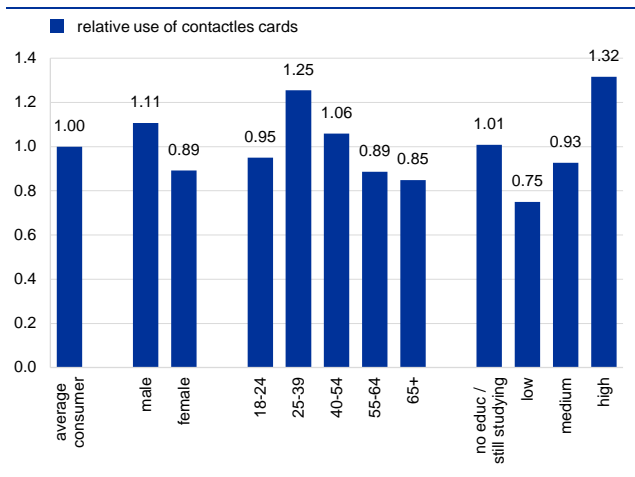
In 2016, approximately 1% of all payments at the POS consisted of contactless payments amounting up to €25. Up to 35% of these payments were for amounts lower than €5 and up to 65% of them for amounts lower than €10 (Chart 13). The study results suggest that the adoption of contactless payments depends on gender, age and level of education. Chart 14 presents the results on the use of contactless payments by demographic groups, comparing each group to the average euro area consumer which is presented as 1.00 in this Chart.

Chart 13
Use of contactless payment cards up to €25 in the euro area by spending range



Sources: ECB and De Nederlandsche Bank.

Chart 14
Relative use of contactless payment cards up to €25 by demographic characteristics



Source: ECB.

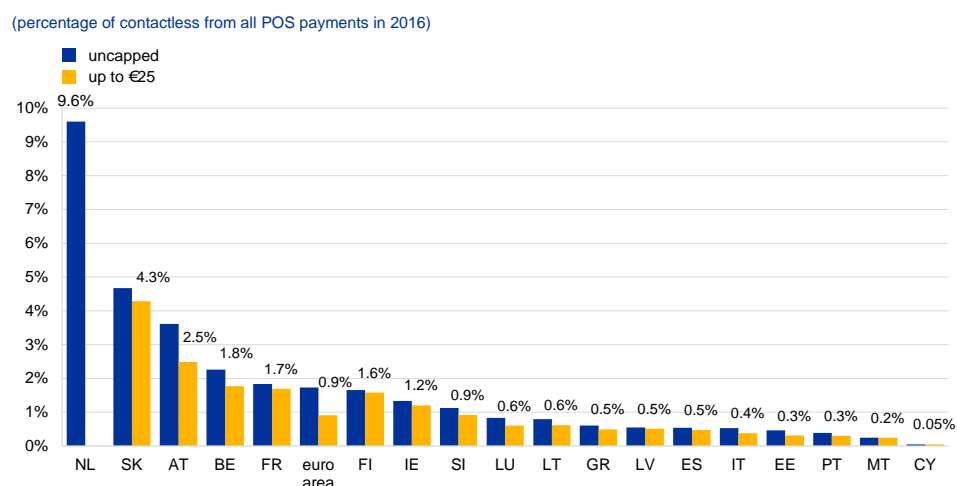
On average men made around 11% more contactless payments than euro area consumers as a whole. Age and education appear to play a larger role than gender

²⁴ In a few countries other thresholds apply. For example, in France, the current threshold is €20 and it is being considered to be raised to €30.

in explaining the different use of contactless technology. Compared with the average consumer, adults between 25 and 39 years of age and those with a high level of education made relatively more contactless payments.

When comparing the use of contactless payments between countries, the results show that consumers in the Netherlands stood out with up to 10% of all POS transactions in 2016 being paid using contactless cards. The Slovaks and the Austrians followed with a share of 4.3% and 2.5%, respectively, of contactless POS transactions (Chart 15). As previously mentioned, this paper focuses on the analysis of contactless payments up to €25; nevertheless, in order to understand the extent to which contactless cards are used, results on the total number of contactless payments irrespective of their value were also examined. As shown in Chart 15, the average share of contactless payments in the euro area would increase from 0.9% to 1.7% if all contactless payments, irrespective of their value, were considered. Moreover, it should be noted that results from the Netherlands are based on figures for the whole of 2016, while those from other countries are based on figures up to July 2016. In view of the rapid uptake of contactless payments in some countries in recent years, it is possible that in the second half of 2016, the use of contactless payments in these countries could have been higher than in the first half of 2016. Furthermore, since in many countries the roll-out of payment cards and payment terminals with contactless functionality is ongoing, the results do not necessarily reflect differences in payment behaviour but also reflect differences in the possibility of paying contactless in these countries. In any case, considering that in 2016 81% of POS transactions were below €25, there appears to be a large market potential for contactless payments once the infrastructure is fully rolled out.

Chart 15
Use of contactless payment cards in the euro area by country



Sources: ECB and De Nederlandsche Bank.
Notes: Data labels refer to contactless payments up to €25. The share of contactless payments in the Netherlands is based on official bank statistics as reported by De Nederlandsche Bank and the Dutch Payment Association (DPA) (see Jonker et al 2016) and presents data from the whole of 2016. The rest of estimations are based on the SUCH diary survey, which was carried out up until to July 2016. Data from Austria is in line with statistics published in September 2016 by Payment Services Austria.

7 Card ownership and card acceptance

7.1 Card ownership

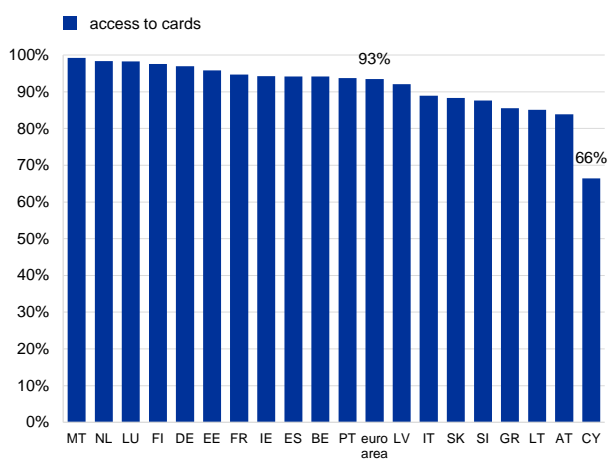
The vast majority of euro area consumers (93%) owned or had access to a payment card²⁵ in 2016 (see Chart 16). The lowest level of card dissemination can be observed in Cyprus where only 66% of the Cypriot adult population said that they owned or had access to a payment card. In general, one can conclude that card ownership seems to have little explanatory value in the general payment behaviour in a certain country. But since a payment card does not necessarily need to be used for card transactions and can be solely used for cash withdrawals from ATMs, this is not surprising.

Chart 17 presents the evidence on card ownership disaggregated by demographic characteristics of consumers. Results show that card use was especially low among 18-24 year olds and consumers with a low level of education. This shows that there are clearly factors that affect the propagation of payment cards. Overall, it can be concluded that ownership of cards does not seem to differ much by gender, age or level of education. However, results might differ when making a distinction between debit and credit cards. As discussed in Bagnall et al. (2016), credit card ownership varies more by age, income and educational group.

Chart 16

Ownership of payment cards

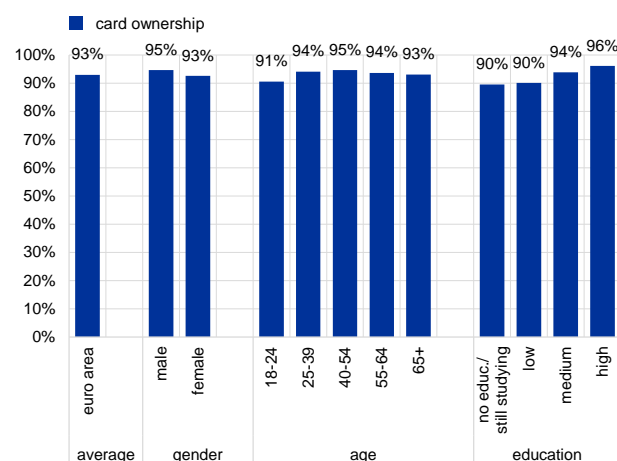
Question: Which of the following payment methods do you have access to (debit or credit cards)?



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.
Notes: Payment card is defined as either a debit or a credit card. Authors' calculations based on the diary and questionnaire surveys.

Chart 17

Card ownership by demographic characteristics



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

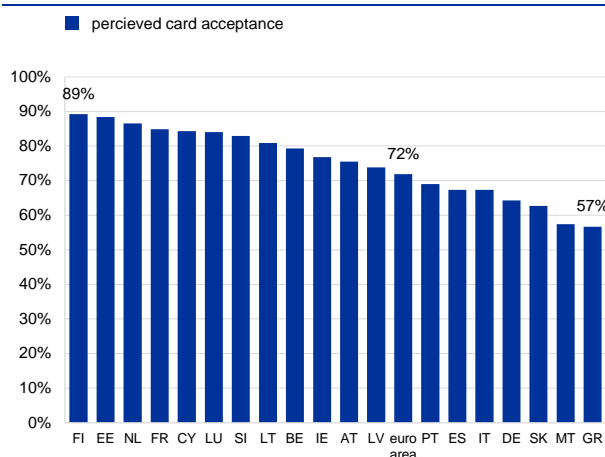
²⁵ Access to a payment card could mean that partners in one household share one payment card.

7.2 Card acceptance

Consumers' choice of payment is not only determined by their characteristics or preferences but also by whether cash and cashless forms of payments are accepted at the different POS they visit. Survey respondents were therefore asked to record whether a transaction could have been made in cashless form in cases where they made a payment in cash. Results show that euro area consumers had the option to pay with card or another cashless method in just under three out of four times when making a payment at a POS (Chart 18).

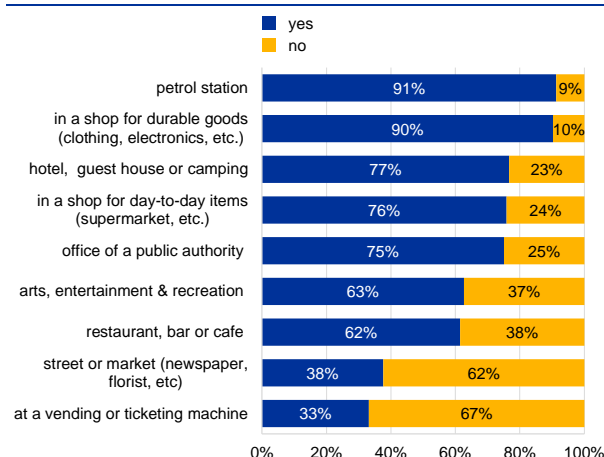
There appears to be a correlation between cash usage and card acceptance. Cash usage was generally high in countries with a low share of card acceptance, while it was generally low in countries with a high share of card acceptance. From this it could be concluded that when the infrastructure for cashless payments is further developed in countries with lower card acceptance, cash usage may reduce. Cyprus appears to be an exception with both a relatively high perceived card acceptance and high cash usage.

Chart 18
Perceived card acceptance



Source: Authors' calculations based on diary survey results from the ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Chart 19
Perceived card acceptance, by place of purchase



Source: ECB.

The sector or place of purchase seems to play a key role in the analysis of card acceptance and card usage. In four sectors the share of card acceptance was below the euro area average (72%) (see Chart 19). These sectors are recreation and entertainment, restaurants and bars, street or market vendors and vending machines, which together accounted for nearly one-third of all POS transactions²⁶. Purchases in at least three of these sectors are typically low-value payments carried out frequently on a daily or weekly basis, i.e. a coffee in a café, buying a newspaper on the street or cigarettes from a vending machine. Therefore, the low share of card acceptance in sectors where transactions are frequent and typically low-value might help explain why in some countries the share of cash usage is relatively high in spite of having a high share of card acceptance.

²⁶ Market share of each sector in terms of number of transactions: art and entertainment (2%), restaurants and bars (21%), street or market vendors (5%) and vending machines (3%) (see Chart 10).

8 Amount of cash people carry

Based on literature findings, it has been shown that the amount of cash people carry in their pockets is a key determinant of their use of cash (Alvarez and Lippi (2017), Arango et al. (2016); Eschelbach and Schmidt (2013); Bouhdaoui and Bounie (2012)). Therefore, respondents were asked to register the amount of cash they had in their wallet at the beginning of the survey day.

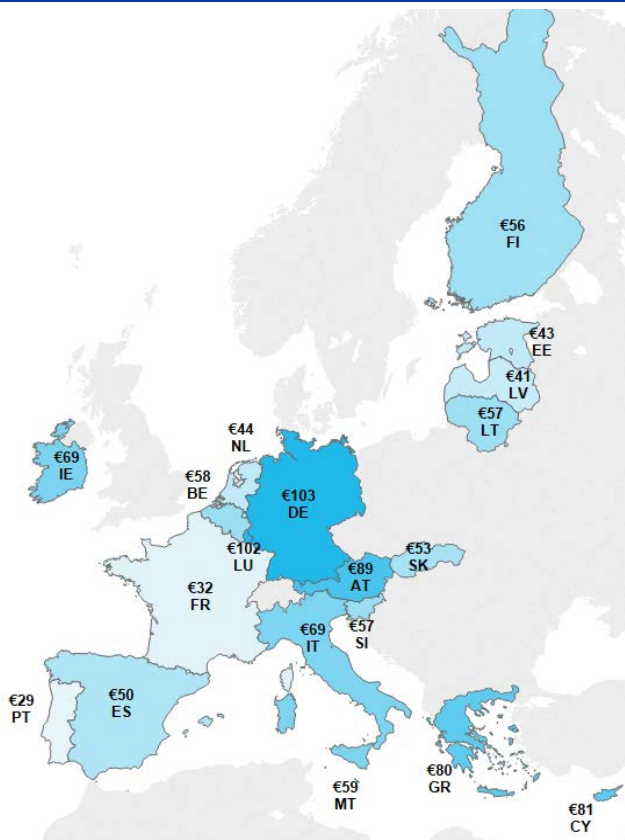
In 2016 euro area consumers carried on average €65 in their wallet. Germans carried on average the most (€103) in their pockets, followed by the Luxembourgers (€102) and the Austrians (€89) (see Chart 20). On the other hand, the Portuguese carried, on average, the least (€29), followed by the French (€32) and the Latvians (€41).

There were not only significant variations between countries, but also between the different population groups. Several empirical studies have shown the relationship between consumers' demographic characteristics and the level of cash holdings and cash usage (Boeschoten, 1998; Stavins, 2001; Von Kalckreuth et al., 2014; Jonker et al. 2012). The SUCH results support this relationship. Results show that gender and age played an important role in the amount of cash people carried with them (see Chart 21). Men carried on average €12 more than women. Moreover, the amount of cash carried by consumers increased sharply with their age. Consumers in the oldest age cohort carried up to €43 more than those in the youngest age cohort. Results at the euro area level do not provide evidence that the amount consumers have in their wallets increases with the level of education. Only consumers who had not completed a full-time education programme or those who were still studying, clearly carried less than those with a low, medium or high level of education.

It is difficult to find a single explanation for the differences in the amount of cash euro area consumers hold in their wallets. In some countries the level of cash holdings seems to correspond with the share of cash in the value of payments, but in other countries no such relation can be found. In general, there are likely to be several factors that determine how much cash people carry in their wallets, in particular their withdrawal behaviour, which is described in the next chapter. Perceived card acceptance also plays a role, as well as access to alternative means of payment or the feeling of security from carrying large amounts of cash may play a role. The relation between the amount people carry with them and other factors that influence this could be further analysed in future research.

Chart 20

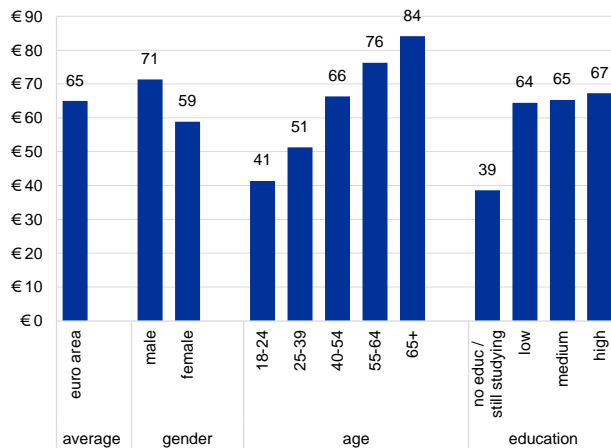
Average amount of cash in wallet



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank

Chart 21

Average amount of cash in wallet (in EUR)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank

9 How people acquire cash

9.1 Cash withdrawal and replenishment by source

Respondents were also asked to write down any cash withdrawals from an ATM or bank counter during the day of the diary survey or any other cash obtained from other sources, such as from cash reserves at home.²⁷ 17% reported having withdrawn cash or obtained cash from other sources during the day of the diary survey. As shown in Chart 22, in most cases respondents obtained their cash from an ATM (39%) or received it from other people such as family, friends or colleagues (19%). In 14% of the cases, respondents used cash reserves kept at home. Typically this could be when part of the cash withdrawn from an ATM or a bank counter is put aside and the wallet is gradually replenished with the cash reserves at home.

In 6% of cases, consumers obtained their cash via cashback in a shop.²⁸ This is the same result as for bank counter cash withdrawals (6%). Survey respondents also reported having obtained their cash from other sources in 7% of cases.

It is surprising to see that although ATMs were most frequently used to obtain cash, consumers often obtained part of their cash via other channels, even though the original source of the cash, received via family or friends or obtained from cash reserves at home, must have originally been withdrawn from an ATM or bank counter. An interesting observation is that on average euro area consumers used cashback as frequently as bank counters for withdrawals even though cashback is only offered in a limited number of countries and, in most countries, only by a limited number of retailers.²⁹ However, as shown below, the average amount of cash withdrawals obtained via cashback were considerably lower than for withdrawals at bank counters.

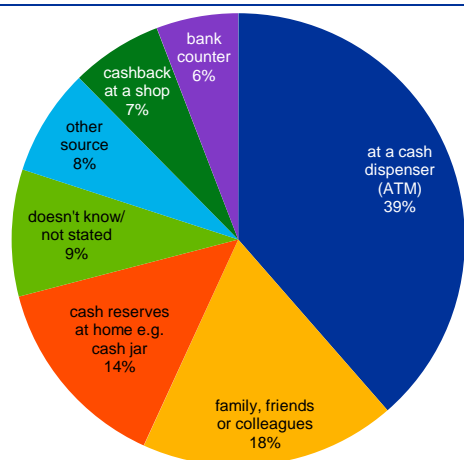
²⁷ The diary survey considered the following sources of withdrawals: ATM, bank counter, cashback, cash reserves at home, from friends or family, or other non-specified source of withdrawal. It excluded cash received as change after a purchase.

²⁸ Cashback is a transaction in which a card holder asks a retailer to add an amount to the total purchase paid by debit or credit card in order to receive that amount in cash along with the purchase. In 2016 cashback was offered in Belgium, Germany, Estonia, Ireland, Greece, Lithuania, the Netherlands, Austria, Portugal, Slovakia and Finland. In some of these countries it is offered only on a very limited scale.

²⁹ However, if these results from the diary are compared with the results from the questionnaire about the frequency of the use of cashback in Chapter 11, it could also be the case that some respondents did not fully understand what cashback is and interpreted it as receiving normal change for their cash purchases in shops. This seems to a small extent to be the case, as some respondents filled in that they had received cashback in countries where cashback is not known to be offered.

Chart 22

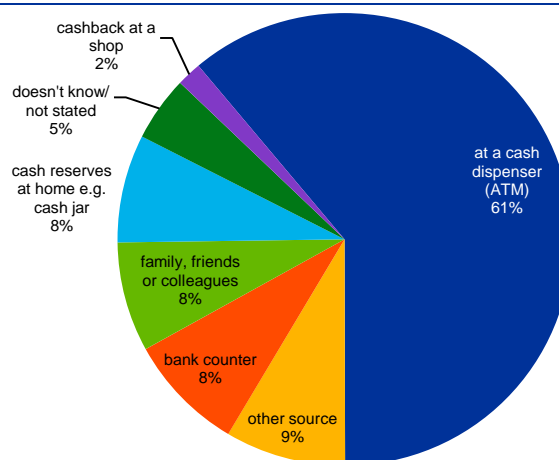
Source of cash withdrawals or replenishments: number



Sources: ECB and De Nederlandsche Bank.

Chart 23

Source of cash withdrawals or replenishments: value



Sources: ECB and De Nederlandsche Bank.

When looking at the distribution of the value of cash withdrawals by source, results demonstrate that ATMs were by far the most important source of cash (61%), while on average 8% was withdrawn from bank counters and only 2% was obtained via cashback (see Chart 23). On average 17% of the value of consumers' cash replenishments were obtained from private persons and cash reserves kept at home. Considering all sources combined, the results show that consumers added cash to their wallets 1.2 times per week (see Chart 24), with an average value of €62. The average amount of cash added to wallets differed widely between countries.

The highest average amount withdrawn or replenished was in Luxembourg with €129, followed by Germany with €109 and Cyprus with €81 (see Chart 25). The lowest average amounts withdrawn or replenished were in Belgium (€27), France (€29), Portugal and Latvia (both €36).

Chart 24

Number of cash withdrawals or replenishments per person per week

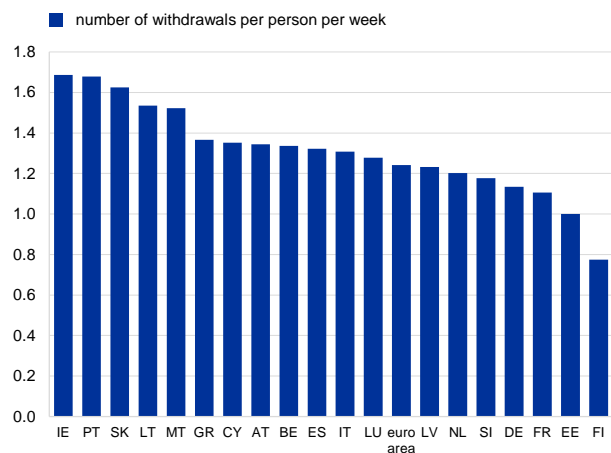
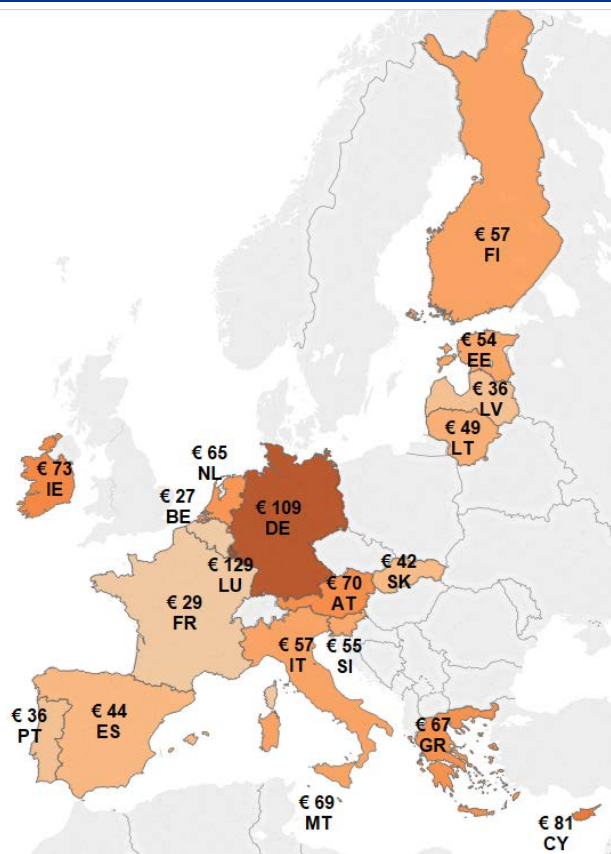


Chart 25

Average amount of cash withdrawals or replenishments (in EUR)



Source: Authors' calculation based on ECB, Deutsche Bundesbank and De Nederlandsche Bank data.
 Note: Sources of cash withdrawals or receipts considered in the survey were: bank counter, ATM, cash received from family, friends or colleagues, cash reserves at home or other source.

Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank

Table 4

Number and average value of cash withdrawals or cash replenishments in the euro area, by source

	Average number per person per week	Average number per person per month	Average number per person per year	Average amount (in EUR)
Bank counter	0.1	0.3	3.8	€124
At a cash dispenser (ATM)	0.5	2.2	26.6	€73
Cash back at a shop	0.1	0.4	4.4	€15
cash reserves at home	0.2	0.8	9.5	€29
Family, friends or colleagues	0.2	1.1	13.0	€25
Other	0.1	0.4	0.0	€63

Sources: Authors' calculations based on ECB and De Nederlandsche Bank data.
 Notes: German figures are not available at the level presented in Table 4. These estimates differ from the ECB's Statistical Data Warehouse, according to which the average value of an ATM withdrawal was €127 in 2015.

In line with the literature (Arango et al. 2016), differences in the average withdrawal amount can be explained by the level of cash usage in each country as well as by the characteristics of the payment infrastructure, e.g. withdrawal costs and the

availability of ATMs. Nevertheless, as is the case for the average amount held in wallets, some exceptions can be observed, such as the Netherlands, Estonia and Finland, which had the lowest shares of cash usage in terms of the number and value of payments, while the average amount replenished was relatively high (€65 in the Netherlands, €54 in Estonia and €57 in Finland). At the same time the average withdrawal amounts in Spain and Slovakia were relatively low (€44 and €42), while their share of the value of cash in total payments at POS was relatively high.

Results on cash withdrawals indicate that consumers' behaviour differs for each source of withdrawal. In 2016 euro area consumers went to an ATM approximately 2.2 times per month, withdrawing €73 on average (see Table 4). They received cash from relatives or friends on average 1.1 times per month. These refer to person-to-person gifts and receipts and were worth on average €25. Consumers went to a bank counter approximately just once every quarter (3.8 times per year) and withdrew on average €124. In those countries where cashback is offered, on average consumers requested cashback approximately 4.4 times a year, for small amounts worth on average €15. However, these are euro area averages, as consumers' withdrawal behaviour differed quite strongly between countries.

Since at the outset of the survey it was assumed that irregularly high value withdrawals were not likely to have been captured in the diaries, separate questions on withdrawal behaviour were asked in the questionnaire. These results are further discussed in Chapter 11.

9.2 Regular income in cash

Apart from the usual sources of cash, survey respondents may have received cash payments as part of their income. They could have reported it as "other" sources of cash replenishments as presented in Charts 22 and 23. Therefore, survey respondents were asked in the questionnaire to report whether they receive any regular income in cash.

Chart 26 shows that the vast majority of euro area consumers (84%) did not receive any regular income in cash. Nevertheless, on average, 16% of consumers received at least a quarter of their regular income in cash. Roughly half of this 16% actually received more than half of their income in cash.³⁰

Results for most countries indicate a relationship between cash usage and receiving income in cash. The share of respondents who reported having received regular income in cash was the highest (above average) in the countries which held the highest share of cash usage at POS, and vice versa.

Countries with the lowest share of respondents who reported having received income in cash were those where the shares of cash usage were also among the lowest. However, there were some exceptions, like Malta and Austria where the

³⁰ Figures exclude results from Germany due to lack of data availability.

share of respondents who said they receive income in cash was below the euro area average, but cash usage in these countries was among the highest in the euro area.

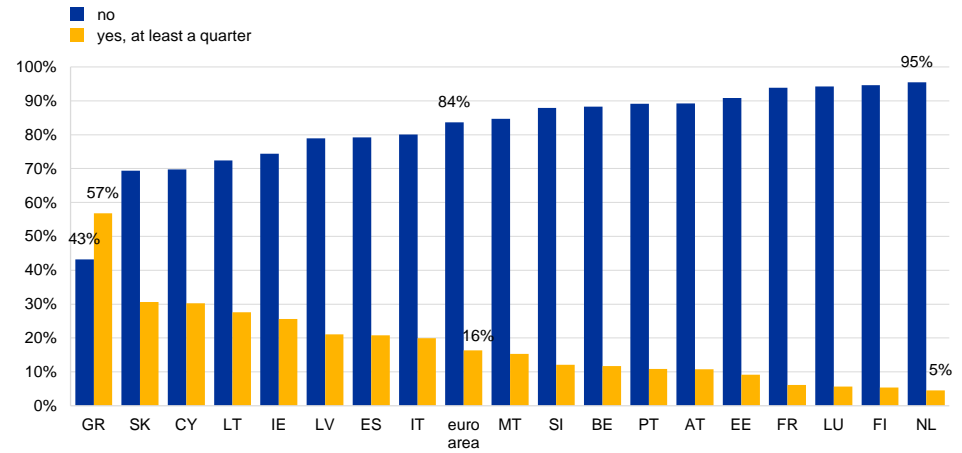
Chart 26

Do you receive regular income in cash?

Question: How much of your regular income do you receive in cash?

This might include regular wages, salaries, pensions, scholarships, alimonies, allowances, income from self-employment, property, etc.?

(based on 30,871 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.
Note: No available figures from Germany.

10 Cash as a store of value and use of high denomination banknotes

10.1 Cash as a store of value

People do not only hold cash for their purchases, but they also keep cash as a store of value. The ECB estimated that in 2008 around one-third of the value of euro banknotes in circulation was held as a store of value in the euro area (ECB, 2011). Considering that since 2008 the amount of euro banknotes in circulation has grown faster than private consumption and taking the low interest rate environment into account, it can be expected that this share has grown even further.

Survey respondents were therefore asked whether they keep any precautionary cash reserves and to give an indication of the amounts they keep outside of bank accounts. Since it was expected that not all respondents would be willing to share the exact amount of cash they hold as savings, the intention of the questionnaire was not to measure how much respondents keep as a store of value. The objective was mainly to underline the relevance of cash, not only as means of payment, but also as a store of value.

It must be noted that people may keep amounts of cash for other reasons than for daily purchases or for use as a precautionary reserve. For example, people may withdraw a large amount of cash from an ATM or at a bank counter and put only part of that cash in their wallets and keep the rest at home as cash reserves with which they can gradually replenish their wallet. This category of cash holdings may not be covered entirely by the payment diary or questionnaire, depending on how the respondents interpreted the question about storing cash as a precautionary reserve or alternative way of saving.

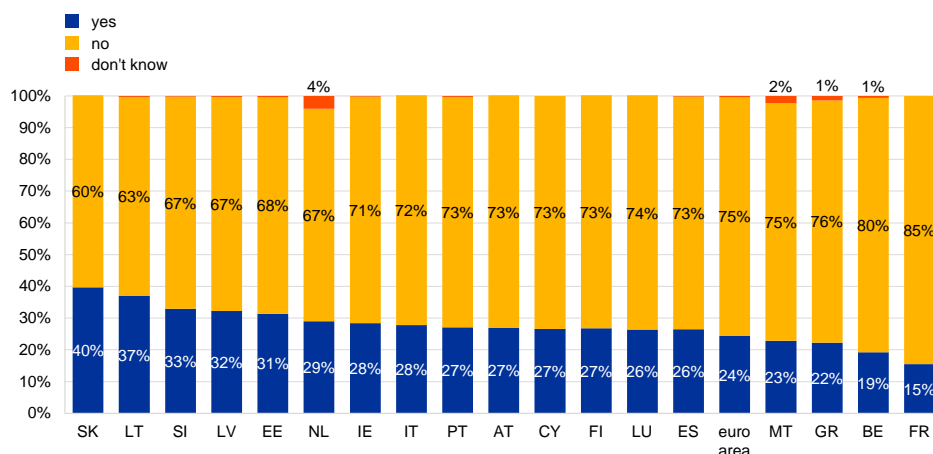
On average in 2016, 24% of respondents said that they had saved cash outside a bank account as a precautionary reserve (Chart 27). The countries in which most respondents answered that they kept cash as a reserve were Slovakia and Lithuania, where respectively 40% and 37% of the respondents said that they kept cash as a precautionary reserve. Elsewhere, no more than one-third of respondents said that they put cash aside as a reserve. The lowest share of respondents who said that they kept cash aside could be observed for Belgium (19%) and France (15%). Despite the banking crisis in Greece, as a result of which cash withdrawals increased significantly, on average only 22% of Greek respondents said that they kept cash as a precautionary reserve.

Chart 27

Precautionary cash reserves, by country

Question: Some people like to keep cash outside a bank account as precautionary reserves or as an alternative way of saving. Do you personally keep an extra amount of cash at home or at a safe place e.g. safety deposit box?

(percentages; based on 30,871 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.

Notes: German results excluded given lack of data availability. NL category "Won't tell" is merged with SUCH category "Don't know".

Out of those who responded that they put cash aside, 23% kept up to €100, 22% stored between €101 and €250 and 19% stored between €251 and €500. In general it appears that the proportion of respondents who save larger sums of money decreases as those sums of money increase. Only 9% of the respondents put between €1,001 and €5,000 aside and 2% kept more than €5,000 at home or in a safety deposit box. A relatively small proportion of the respondents who reported keeping cash at home or in a safety deposit box (10%) refused to say how much cash they save in this way. It should be taken into account that these estimates may underestimate the use of cash as a store of value given that not all survey respondents may have disclosed information. Nevertheless, these results indicate that people do use cash as a store of value.

There are variations at country level as some countries had larger proportions of respondents who saved lower amounts of money outside bank accounts and others had larger proportions of those who saved higher sums of money. However, there is no clearly interpretable pattern to these differences.

The two countries with the highest share of respondents who stored over €1,000 were Slovenia (23%) and Lithuania (20%), (see Table 5). These countries had also among the highest share of respondents who reported keeping cash as a reserve. Moreover, in Austria (19%) and Greece (18%) a relatively large proportion of consumers put more than €1,000 aside, however the overall share of those who stored cash was not among the highest.

Table 5**Precautionary cash reserves by value ranges, by country**

Question: Could you please provide an approximate amount of cash that you keep outside a bank account as a precautionary reserve or as an alternative way of saving?

(percentages, based on 7,611 respondents from the euro area)

Country	< €100	€100 to €250	€251 to €500	€501 to €1000	Total < €1000	Total > €1000	Refusal
Euro area	23%	22%	19%	15%	78%	12%	10%
AT	14%	22%	20%	14%	70%	18%	12%
BE	20%	25%	26%	12%	82%	9%	8%
CY	31%	34%	11%	8%	84%	4%	12%
EE	19%	24%	15%	13%	72%	14%	14%
GR	15%	18%	16%	20%	69%	18%	14%
ES	17%	20%	21%	17%	75%	15%	10%
FI	20%	25%	19%	14%	79%	12%	10%
FR	30%	22%	17%	11%	80%	12%	8%
IE	20%	26%	21%	17%	83%	8%	9%
IT	17%	23%	22%	19%	82%	10%	8%
LT	16%	16%	18%	14%	64%	20%	16%
LU	13%	18%	27%	15%	73%	15%	11%
LV	20%	20%	17%	15%	72%	13%	16%
MT	20%	25%	29%	13%	87%	3%	10%
NL	36%	21%	13%	7%	77%	4%	19%
PT	32%	23%	16%	9%	80%	7%	13%
SI	15%	16%	17%	13%	60%	23%	17%
SK	27%	20%	20%	14%	80%	9%	11%

Sources: ECB and De Nederlandsche Bank.

Note: German results excluded given lack of data availability.

10.2 Use of high denomination banknotes

It is often claimed that high denominations³¹ are hardly ever used for regular transactions and that an average citizen rarely encounters these denominations, since they are supposedly not needed or used by ordinary citizens. For the purpose of better understanding the use of cash and the actual use of high denomination banknotes by households, survey respondents were asked if in the year preceding the survey they had had a €200 or €500 banknote in their possession and if so, how they obtained it and what they did with it. In line with the survey question regarding precautionary cash reserves, the intention behind this question was to gain an insight into the actual use of high denomination banknotes rather than to measure their use.

Results show that in the year prior the survey, 19% of euro area consumers had a €200 or €500 euro banknote in their possession. This is a lower share than in 2008 when an ECB survey with exactly the same question was carried out among eight

³¹ For the purpose of this survey high denominations were defined as the €200 and €500 banknotes.

euro area countries.³² At that time 25% of the respondents in these eight countries reported having had a high denomination in their possession more than once a year (ECB, 2011).³³

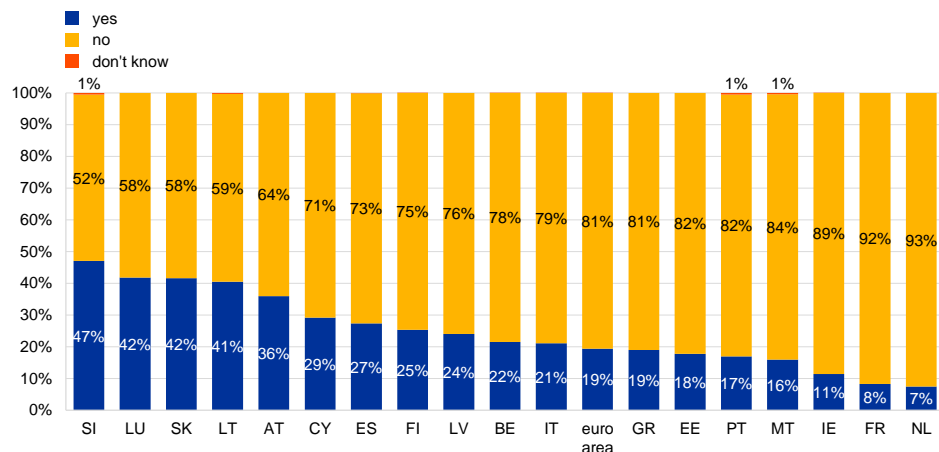
The countries where at least one-third of the respondents answered that they had a high-value banknote were Slovenia (47%), Luxembourg and Slovakia (both 42%) as well as Lithuania (41%) and Austria (36%) (see Chart 28). The lowest proportions can be seen in the Netherlands (7%), France (8%) and Ireland (11%).

Compared with the 2008 survey results the shares of those who had a €200 or €500 banknote in their possession remained nearly the same for France, the Netherlands and Austria. In these three countries the share dropped by 1 percentage point only. The share in Spain was 6 percentage points lower than in 2008, but the share dropped significantly in Belgium and Italy, by 13 percentage points and 18 percentage points respectively.

Chart 28
Use of high denomination banknotes

Question: In the last 12 months, have you had a EUR 200/EUR 500 banknote in your possession?

(percentages, based on 23,544 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.
Note: This question is not comparable with the German questionnaire.

When asked how they obtained a high denomination euro banknote, 47% of respondents said they obtained it from a bank counter or withdrew it from an ATM, 17% received it as a gift, 16% received it from another person after a private sale of a good or a service and 15% as part of their salary or income (Chart 29). Looking at the demographic characteristics of those who had a €200 or €500 in their possession (Chart C.1 in the annex), it appears that a slightly greater proportion of men (53%) than women (49%) obtained the high denomination note from a bank. An equal share of men and women received it as part of their salary (15%), while women

³² The 2008 survey was carried out in Belgium, Germany, Spain, France, Italy, Luxembourg, the Netherlands and Austria.

³³ No results are available for Germany for this question in the 2016 survey.

(21%) were far more likely to have received it as a gift than men (13%). The share of those who received it as gift is relatively large (26%) in the age group 18-24. By far the most important source of a high denomination euro banknote for all occupational groups was from a bank. Nevertheless, compared to other occupational groups, a larger share of manual workers received a €200 or €500 as part of their income (23%) or for the private sale of a good or service (18%).

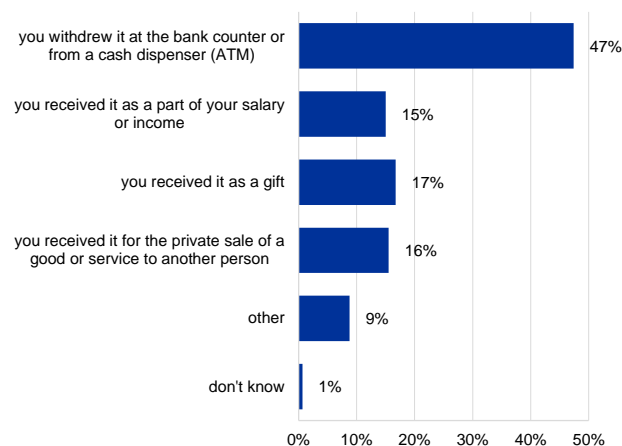
The majority of the respondents used high denominations to purchase something in a shop (40%) or from a private person (12%), while 28% reported having deposited them at a bank or exchanged them for smaller denominations (see Chart 30). Another 11% used them as a gift, while 10% decided to save them. Chart C.2 in the annex shows that 40% of men and 45% of women surveyed said that they used high denominations for shop purchases. Compared with other occupational groups, a relatively high share of self-employed respondents said they had deposited the high denominations with a bank.

Chart 29

Source of high denomination banknotes

Question: How did the €200/€500 banknote come into your possession?

(euro area average in percentages – multiple answers possible; based on 4,462 respondents from the euro area)



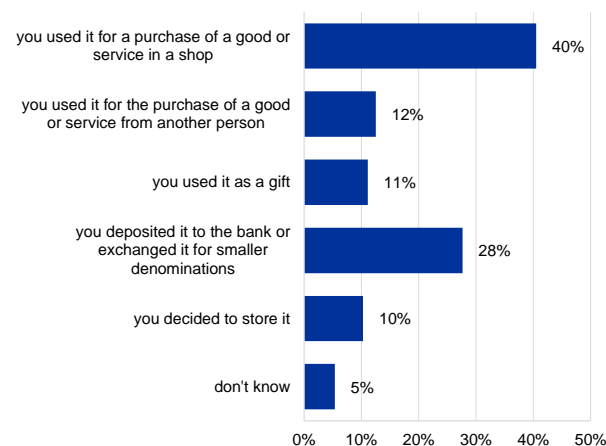
Sources: ECB and De Nederlandsche Bank.
Note: This question is not comparable for Germany.

Chart 30

Use of high denomination banknotes by households

Question: What did you do with it?

(euro area average in percentages – multiple answers possible; based on 4,462 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.
Note: This question is not comparable for Germany.

The answers on the use of high denominations do not explain the large share of the high denominations in circulation. However, since on average almost one out of five respondents responded having had high denomination banknotes in their possession, the survey results do at least refute the claims that ordinary citizens do not use these banknotes or that they hardly ever come into people's hands via regular channels such as banks' counters.

11 Cash withdrawal habits and satisfaction with ATM services

Respondents were asked a series of questions about the frequency with which they use different methods of cash withdrawal and the amounts they usually withdraw. Contrary to the diary results, in which respondents recorded the actual withdrawals (see Chapter 9), this chapter discusses the withdrawal behaviour observed in the questionnaire results. The reasons for these questions were two-fold. As explained in Chapter 9 it was already expected at the outset of the survey that one-day diaries would not be able to fully capture the less frequent or one-off cash withdrawals, which are often of a higher value. It was expected that the questionnaire could better reflect these types of withdrawals. Furthermore, the purpose of these questions was to provide more insight into cash withdrawal habits in the euro area and to compare consumers' actual behaviour reported in the diary with how they perceive they usually behave, as reported in the questionnaire. The questionnaire results therefore highlight perceptions or desired behaviour. Together, the results can help us obtain a better understanding of the frequency and value of cash withdrawals during 2016 and better explain the relationship between cash withdrawals and cash usage.

All respondents were asked how often they think they typically withdraw cash from a cash dispenser (ATM), bank counter or via cashback at a shop. Respondents were also asked about their experiences using ATM facilities. Specifically, they were asked how easy it is for them to get to an ATM or bank when they need to withdraw cash, whether and to what extent they have to pay a charge when withdrawing cash from an ATM and whether or not they are satisfied with the different denominations available at ATMs.

11.1 Cash withdrawal habits by source

The results from the questionnaire about general payment behaviour confirm the payment diary results that ATMs are the most important source of cash. A majority of respondents in most euro area countries said they frequently use ATMs to withdraw cash. 36% of the respondents said they make cash withdrawals from an ATM at least once a week and another 36% said two or three times per month (Chart 31). Only 10% indicated that they hardly ever or never use ATMs.

Although the diary results show that respondents used bank's counters much less often than ATMs to withdraw cash, 20% of respondents answered that they go to the bank to withdraw cash at least two to three times per month. At the same time, however, almost half of them responded that they never go to the bank for cash.

In the countries where cashback is offered – which were included in the sample – two-thirds of respondents said that they never use this service, while 12% stated that they use it at least 2-3 times per month.

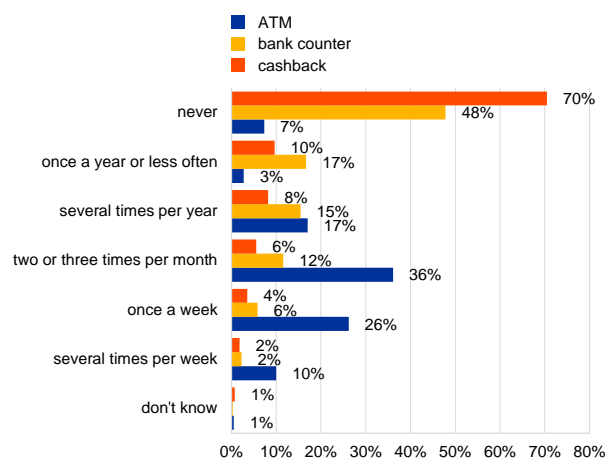
In line with the expectations and the diary results presented in Chapter 9, Chart 32 shows that respondents typically withdraw higher amounts from bank counters than from ATMs. 36% of respondents who reported to withdraw cash from the bank counter said that they typically withdraw €200 or above from bank counters. Interestingly, a non-negligible 15% of respondents typically withdraw €500 or more. At the same time, only 17% of respondents who said to use ATMs reported that they typically withdraw more than €200 from an ATM, while 39% said they typically withdraw less than €50. Only very few people said they do not have a typical withdrawal amount, indicating that a very large majority have established withdrawal habits.

Chart 31

Frequency of cash withdrawals by source

Question: How often do you typically withdraw cash from a cash dispenser (ATM), bank counter or via cashback?

(euro area averages in percentages – EA17; based on 28,099 respondents from the euro area)



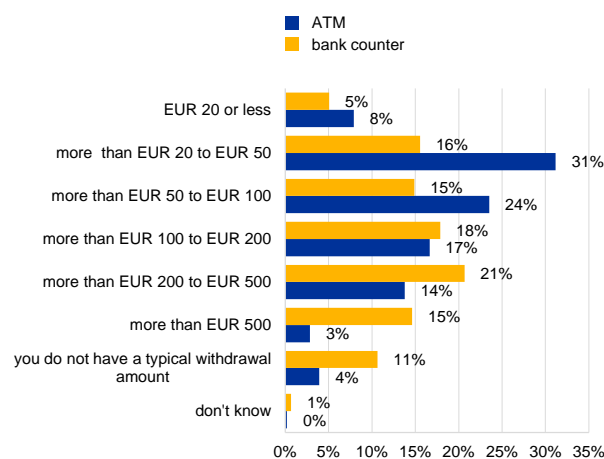
Source: ECB.

Chart 32

Average withdrawal amount

Question: What is the typical amount you withdraw from a cash dispenser (ATM) and the bank counter?

(euro area averages in percentages – EA17; based on 25,104 respondents for category ATM and 9,881 for category Bank counter)



Source: ECB.

11.2 Satisfaction with ATM services

Survey respondents were asked how easy or difficult it is for them to access an ATM when they need to and if they have to pay a fee when withdrawing cash. Euro area consumers appear to be satisfied with the availability of ATMs. The large majority of them (94%) reported that it is easy or very easy for them to find an ATM or bank when they need to (Chart 33). Only a minority (4%) reported that it is fairly difficult, and very few (1%) said that it is very difficult. It is interesting to note that despite the fact that there are large differences in the number of ATMs per inhabitant in each country – varying from over 1,000 ATMs per 1 million inhabitants in Spain, Luxembourg, Austria and Portugal, to around 400 per 1 million inhabitants in Lithuania, the Netherlands and Finland³⁴ – the survey results show that euro area

³⁴ Figures from the ECB Statistical Data Warehouse (year 2015).

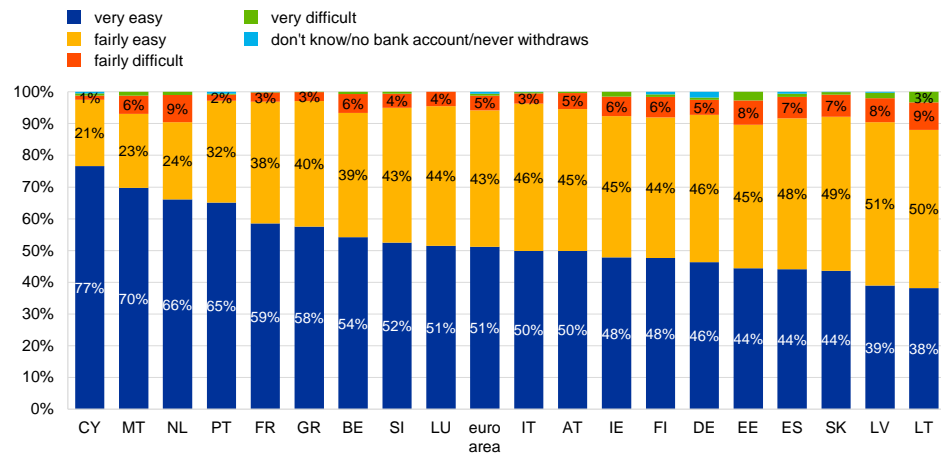
consumers are generally satisfied with the access they have to cash via ATM services.

Chart 33

Access to ATMs or banks for withdrawals

Question: Thinking about a typical situation where you need to withdraw cash, how easy or difficult is it to get to an ATM or bank?

(percentages; based on 23,173 respondents from the euro area)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Note: Category "no bank account/never withdraw" from the German survey has been merged with the category "don't know" category from the SUCH.

Table 6 presents the results on the cost of withdrawing cash when using a debit card as perceived by respondents.³⁵ 60% of the respondents said that they never have to pay a fee for withdrawing cash at ATMs, whereas 26% indicated that they sometimes have to pay a fee for using certain ATMs or for making a certain number of withdrawals. Only 6% responded that they pay a fee every time they withdraw money.

In some countries, for example in Germany, cash withdrawals are free when using the ATM network of the bank which issues the debit card. In other countries, for example Slovakia, most consumers are entitled to a specific number of withdrawals free of charge and only face a fee when they surpass this limited number of withdrawals. Therefore it should be considered that the survey results shed light on cash withdrawals fees as perceived by respondents based on their personal choices. It may be the case that respondents who always comply with the conditions established by their bank in order to obtain free withdrawals, report to never having to pay a fee. Nevertheless, this does not mean that cash withdrawals are always free of charge. In 12 countries, a majority of respondents said that they never pay a fee when withdrawing cash; however this varied from 53% in Italy to 81% in Malta. In Slovenia and Slovakia, less than one-third of respondents responded that they never have to pay a fee.

³⁵ It may still be the case that consumers faced a withdrawal fee when using a credit card; however, this question was not included in the questionnaire.

Table 6**Cash withdrawal fees**

Question: Which of the following applies for a cash withdrawal from a cash dispenser (ATM) when using a debit card in your country?

(percentages; based on 18,678 respondents from the euro area)

Country	You always pay a fee per withdrawal	You sometimes pay a fee at ATMs	You never pay a fee for withdrawing cash at ATMs	You do not know what fees you pay for withdrawals	Don't know
Euro area	6%	26%	60%	7%	0%
MT	3%	9%	81%	3%	4%
PT	2%	4%	75%	17%	2%
ES	3%	21%	74%	2%	0%
CY	8%	7%	70%	11%	5%
FR	3%	29%	62%	6%	0%
EE	5%	18%	61%	16%	1%
GR	4%	26%	60%	9%	1%
AT	10%	11%	59%	21%	0%
FI	4%	17%	58%	19%	1%
BE	7%	16%	57%	20%	0%
LV	2%	31%	55%	12%	1%
IT	10%	35%	53%	3%	0%
IE	27%	19%	38%	14%	1%
LT	15%	25%	37%	23%	0%
LU	5%	48%	36%	10%	1%
SI	13%	44%	31%	12%	1%
SK	20%	43%	27%	9%	0%

Source: ECB.

Notes: Dutch residents do not pay any withdrawal fees irrespective of the ATM bank network they use. For this reason, this question was not included in the Dutch questionnaire. German results excluded given lack of data availability.

In six euro area countries 10% or more of the respondents answered that they always have to pay a fee per withdrawal. Ireland stands out as a country with a particularly high proportion of respondents (27%) who claimed they always have to pay a fee. The proportion of those who reported to always pay a fee is also rather high in Slovakia (20%). It is interesting to note that despite the relatively high share of respondents who said they must pay a withdrawal fee, Ireland had the second highest frequency of ATM withdrawals per person, even though the average amount of withdrawals was also relatively high. However, the cost-free alternative of asking for cashback in a shop when paying with card was also most frequently used in Ireland. Furthermore, there seems to be no clear relation between people sometimes or always having to pay for cash withdrawals and the cash use in those countries. However, in order to draw firm conclusions on the frequency of use of ATMs, further analysis of withdrawal fees and the use of cash would be needed.

11.3 Satisfaction with ATM denominations

On average 56% of respondents in the euro area said that they are satisfied with the different denominations available at ATMs (Chart 34). However, the level of

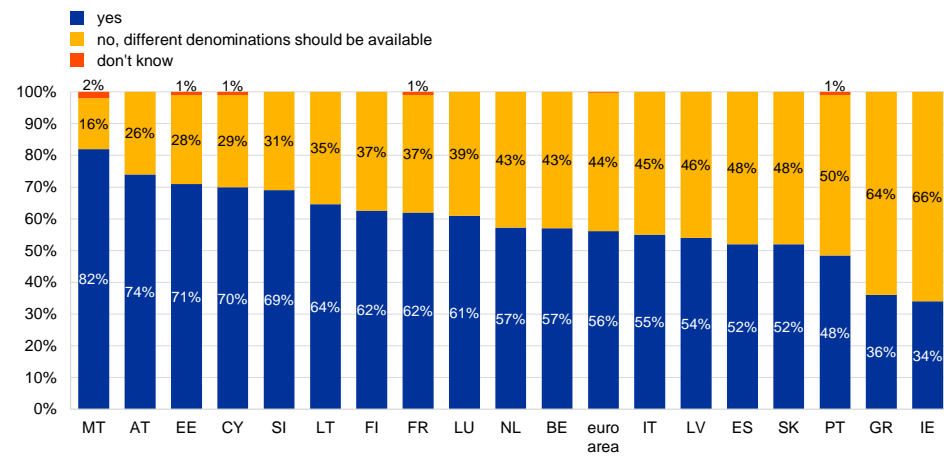
satisfaction decreases by denomination. It seems that people particularly want to see a greater supply of low denominations in ATMs. Around a quarter of respondents said that €5 and €10 banknotes are not always available in ATMs. Only a relatively small percentage (4%) said that they are dissatisfied with the availability of €100 banknotes (Chart 35).

Chart 34

Consumer satisfaction with banknote denominations available at ATMs

Question: Are you satisfied or not with the different denominations available at cash dispensers (ATMs)

(percentages; multiple answers possible; based on 21,137 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.

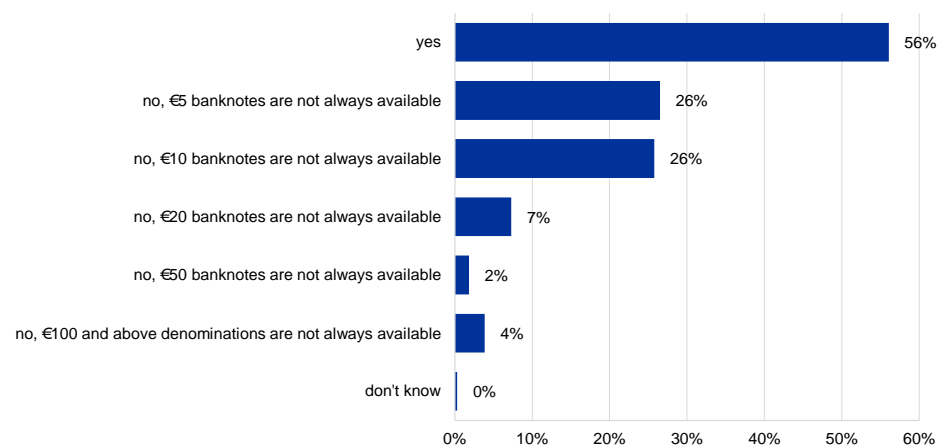
Once again, country-level differences are substantial. In 14 countries, a majority of respondents reported being satisfied with the different denominations available at ATMs; however, this varied from 52% of respondents in Spain and Slovakia to 82% in Malta. At the other extreme, just 36% of the respondents in Greece and 34% in Ireland said they are satisfied with the denominations available.

Chart 35

Consumer satisfaction with banknote denominations available at ATMs

Question: Are you satisfied or not with the different denominations available at cash dispensers (ATMs)

(percentages; multiple answers possible; based on 21,137 respondents from the euro area)



Sources: ECB and De Nederlandsche Bank.

12 Payment preferences and other factors that influence consumers' payment choices

12.1 Payment preferences

Euro area consumers have a number of payment instruments at their disposal for their daily purchases. In order to better understand consumers' payment instrument preferences, respondents were asked which payment instrument they would prefer to use if they had the choice.

On average 43% of respondents in the euro area said they would prefer to pay by card or by another non-cash method of payment if given the choice, while only 32% would choose to pay in cash (Chart 36). A quarter of the respondents reported having no preferred method of payment. These results are in contrast with the actual use of cash and non-cash methods presented in earlier chapters, which show that 79% of all POS payments were carried out using cash.

It could be argued that consumers are often obliged to pay in cash given a lack of choice, for example when a retailer does not accept cards. Nevertheless, as we have seen in Chapter 7, in 72% of cases euro area consumers did have the option of choosing between cash and non-cash payment methods. Therefore, it may be the case that they think they use cash less often than they do in reality, or that there may be other reasons which influence them to choose cash even when they prefer alternative means of payment and these alternatives are available. In this respect, Van der Crujisen, et al. (2017) find that in the case of the Netherlands, payment habits play a significant role in explaining the discrepancy between how consumers prefer to pay and how they actually pay.

Looking at the survey results on preferences per country, it appears that Cyprus is the only country where the majority of consumers said that they prefer to pay with cash if they are free to choose between cash and cashless means of payment. Furthermore, in addition to Cyprus, in Austria, Malta, Ireland, Greece and Spain a larger share of respondents stated that they prefer using cash over cashless means of payment. The situation in Germany is not fully comparable as the options for answering the question were slightly different (see note in Chart 36). However, considering that only 33% of respondents said they clearly prefer cash, it is likely that if the question were asked in the same way in Germany, a larger share would have answered that they prefer cashless means of payments over cash. In spite of the differences in terms of magnitude, consumers' preference for cash and cashless means of payment appear to have a strong relation with the actual payment behaviour in the respective countries. Generally it can be said that in countries where consumers have a stronger preference for cash, the share of cash in payments at POS is also high compared to other countries; while in countries where

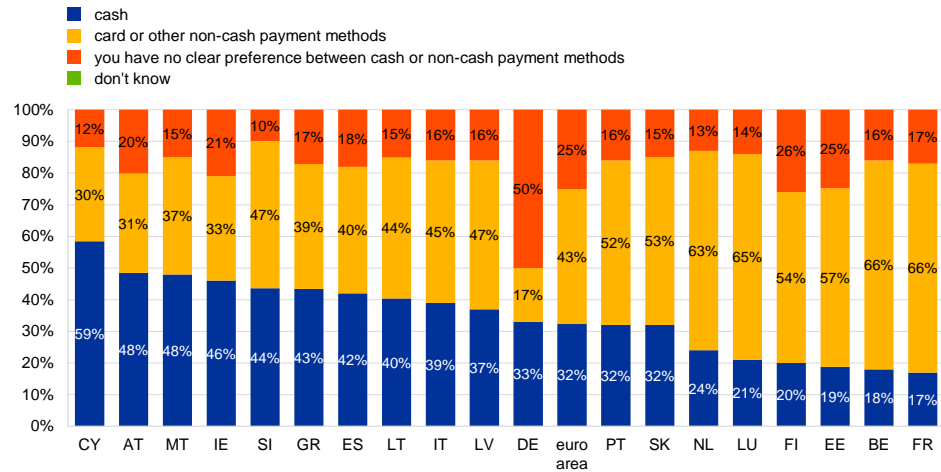
consumers have a stronger preference for cashless means of payment, the share of cash in payments at POS is lower.

Chart 36

Consumers preferred payment instrument by country

Question: Assuming you were offered various payment methods in a shop, what would be your preferred payment method? (%)

(percentages; based on 42,957 respondents from the euro area)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Notes: In the German survey of 2014 the question was: "Let's assume you have the choice between various payment options when shopping. How would you pay for your purchases?", and the categories were: "Cash only", "Predominantly cashless means of payment" and "Either cash or with a cashless means of payment, depending on the shopping situation". The latter category has been allocated to "You have no clear preference between cash or non-cash payment methods".

The literature suggests that consumers' perceived payment characteristics play a role in their choice of payment instrument (Hernandez, et al. 2017). Therefore, in order to better understand the reasons behind consumers' payment choices, respondents were asked which advantages they identify when using their preferred payment method. Chart 37 shows that the top three perceived advantages of using cash reported by the respondents who said to prefer cash are that it gives a clear overview of expenses (42%), it is widely accepted (38%) and it is fast (32%). The fact that cash is "anonymous" is only a reason to prefer its use for a limited number of respondents (13%).

On the other hand, the top three advantages of using cards mentioned by respondents who said to prefer cards are that card payments are easy (40%), fast (35%) and that it is not necessary to check the amount of cash in your wallet (33%) (Chart 38).

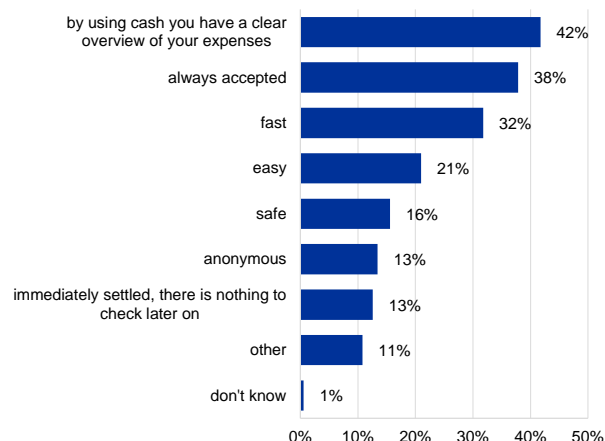
Survey results thus show that characteristics such as acceptance, speed and budgetary features of payment instruments are indeed aspects that consumers deem important and that they may influence their choice of payment instrument.

Chart 37

Reasons to prefer cash

Question: For you personally, what are the two most important advantages of cash for payments? Cash payments are ...

(euro area average in percentages; maximum two answers possible; based on 8,374 respondents from the euro area)



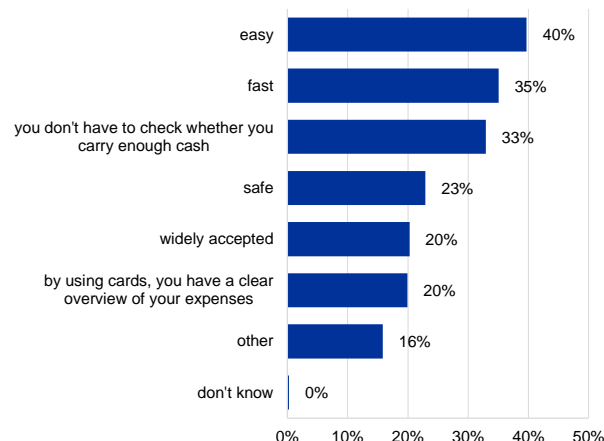
Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Chart 38

Reasons to prefer cards

Question: For you personally, what are the two most important advantages of cards for payments? Card payments are ...

(euro area average in percentages; maximum two answers possible; based on 12,634 respondents from the euro area)



Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

12.2 Factors that influence respondents' choice of payment instrument

Consumers' payment preferences say something about consumers' attitude towards payment methods. However, they are not the only aspect that may influence the decision to pay with cash or a cashless means of payment. Specific circumstances at the time of the payment may also play a role. The literature suggests that the amount of cash in consumers' wallets and the amount to be paid are key determinants of consumers' payment choices (Whitesell, 1989; Bounie and François, 2006; Bouhdaoui, Y. and Bounie, D. (2012)). Therefore, survey respondents were asked about the factors which influence their choice of payment instrument at the moment of payment.

The survey results confirm the literature, since the large majority of respondents said they base their choice of payment method on the amount to be paid and the amount of cash they have in their wallets (56%, see Table 7). Other factors such as the costs associated with the use of cards (e.g. surcharges), card benefits (e.g. miles or points), or the preference of the seller are clearly less important factors in their decision to use payment cards.

The relation between payment behaviour, payment preferences and specific circumstances at the time of the payment could be investigated further based on the results of the survey. As seen in Chapter 4, consumers made on average 1.2 cash transactions per day of an average amount of €12. Chapter 8 showed that the average amount consumers had in their wallets was €65, and Chapter 9 described that consumers added cash to their wallets 1.2 times per week, with an average

value of €62. These results may indicate a relationship between cash holdings, transaction size and the choice of payment. At the same time these factors, in turn, may also be influenced by other factors such as the ease of access to ATMs, withdrawal fees and the availability of certain denominations in ATMs, etc. In other words, there is a whole array of factors which may help to explain why consumers make the choice to pay with cash or a cashless means of payment.

Table 7

Factors which influence consumers' choice of payment instrument

Question: Which of the following influences your decision to pay with cash or card or other non-cash payment methods?

(percentages; multiple answers possible; based on 24,561 respondents from the euro area)

Country	The amount to be paid	The amount of cash you have with you	The costs associated with the use of cards or cash	The benefits associated with the use of cards or cash (e.g. miles, saving points etc.)	It depends on what the seller prefers as payment method	Other	Don't know
Euro area	56%	56%	14%	16%	15%	14%	1%
AT	55%	63%	14%	14%	14%	9%	2%
BE	59%	50%	23%	23%	21%	4%	0
CY	54%	75%	11%	10%	11%	3%	4%
EE	37%	49%	17%	30%	31%	6%	3%
ES	58%	51%	18%	20%	15%	3%	4%
FI	57%	62%	14%	25%	14%	6%	1%
FR	67%	55%	8%	16%	17%	2%	1%
GR	43%	47%	20%	34%	10%	7%	4%
IE	50%	63%	19%	15%	16%	4%	1%
IT	52%	43%	13%	14%	17%	7%	1%
LT	33%	47%	17%	21%	17%	15%	2%
LU	72%	52%	12%	17%	12%	3%	1%
LV	36%	52%	10%	29%	22%	9%	4%
MT	50%	43%	7%	6%	19%	8%	3%
PT	54%	47%	11%	12%	14%	9%	3%
SI	48%	56%	15%	17%	7%	7%	3%
SK	37%	47%	10%	23%	21%	8%	3%
NL	36%	46%	15%	31%	11%	9%	0%
DE	60%	74%	16%	9%	12%	41%	0%

Sources: ECB, Deutsche Bundesbank and De Nederlandsche Bank.

Note: The category "Other" includes more categories for Germany such as: "My decision depends on the store I am shopping at"; "I choose the means of payment that will delay the payment from being debited from my current account for as long as possible"; "I make a spontaneous gut decision for a means of payment".

13 Concluding remarks

The European Central Bank conducted a comprehensive study to analyse the use of cash and cashless payment instruments by euro area consumers at the point-of-sale (POS) in the euro area in 2016. This study shows that in 2016 cash was the dominant payment instrument at different POS. In terms of number, 79% of all transactions were carried out using cash; this amounts to 54% of the total value of all payments. Despite numerous articles claiming a cashless society is imminent, it appears that the use of cash at POS is still robust in most euro area countries.

This is the first study on the use of cash, cards and other payment instruments by households that applies a harmonised methodology to analyse consumers' payment behaviour in the euro area. It provides an objective measure of the use of cash and other payment instruments at POS in the euro area with emphasis on households' daily payments, which tend to be small and often overlooked. The results give insight into the differences in payment choices in the 19 euro area countries. For most of these countries, it is the first time they have had estimations on the use of cash. The study collected a rich data set with information on consumers' payment choices, preferences and opinions on different cash policies. This paper is a first step in analysing the data. Its objective is to present the estimation of the number and the value of cash payments relative to cards and other payment instruments. It presents findings which support the estimated shares of cash and card payments at POS in order to better understand consumers' payment behaviour. At this stage of the analysis, this paper does not make use of regression analysis to shed light on the determinants of consumers' payment choices. Further research should be done to analyse, for example, whether there is a relation between cash withdrawal behaviour, the cash people have in their wallets, the availability of payment terminals and cash usage. This data set can be used as a basis for further research to improve our understanding on consumers' payment behaviour.

References

- Alvarez, F. and Lippi, F. (2017), “Cash Burns: An Inventory Model with a Cash-Credit Choice”, *Journal of Monetary Economics*, Vol. 90, pp. 99-112.
- Arango, C., Bouhdaoui, Y., Bounie, D., Eschelbach, M. and Hernandez, L., “Cash remains top-of-wallet! International evidence from payment diaries”, *Economic Modelling*, forthcoming, 2017.
- Bagnall, J., Bounie, D., Huynh, K. P., Kosse, A., Schmidt, T. and Schuh, S. (2016), “[Consumer cash usage: A cross-country comparison with payment diary survey data](#)”, *International Journal of Central Banking*, Vol. 12, No 4, pp. 1-61, December.
- Boeschoten, W. C. (1998): “Cash Management, Payment Patterns and the Demand for Money,” *De Economist*, Vol. 146, No 1, pp. 117-142, April.
- Bouhdaoui, Y. and Bounie, D. (2012), “Modeling the Share of Cash Payments in the Economy: An Application to France”, *International Journal of Central Banking*, December, Vol. 8, No 4, pp. 175-195.
- van der Cruijssen, C. A. B., Hernandez, L. and Jonker N. (2017), “In love with the debit card but still married to cash”, *Applied Economics*, Vol. 49, No 30, pp. 2989-3004, November.
- van der Cruijssen, C. and Plooij, M. (2017), “Drivers of payment patterns at the point of sale: stable or not?”, *Contemporary Economic Policy*, July.
- Deutsche Bundesbank (2015), “Payment Behaviour in Germany in 2014”, September.
- DiSogra, C. and Callegaro, M. (2009), “Computing response rates for probability-based web panels”, Joint Statistical Meetings, Section on Survey Research Methods.
- European Central Bank (2011), “The use of euro banknotes – results of two surveys among households and firms”, *Monthly Bulletin*, April.
- Eschelbach, M. and Schmidt, T. (2013), “Precautionary motives in the short-term cash management – evidence from German POS transactions”, Discussion Paper, No 38/2013, Deutsche Bundesbank.
- Hernandez, L., Jonker, N. and Kosse, A. (2017), “Cash versus Debit Card: The Role of Budget Control”, *Journal of Consumers Affairs*, Vol. 51, pp. 91-112.
- Hernandez L., Jonker, N. and Kosse, A. (2012), “Cash Usage in the Netherlands: How much, Where, When, Who and Whenever One Wants?”, Occasional studies, De Nederlandsche Bank.
- Hernandez, L. and Zwaan, P. (2016), “[Point-of-sale payments in 2015](#)”, De Nederlandsche Bank.

Jonker, N. and Zwaan, P. (2016), "[Point-of-sale payments in 2016](#)", De Nederlandsche Bank.

Jonker, N. and Kosse, A. (2013), "Estimating Cash Usage: The Impact of Survey Design on Research Outcomes", *De Economist*, Vol. 161, pp. 19-44.

Klee, E. (2008): "How People Pay: Evidence from Grocery Store Data," *Journal of Monetary Economics*, Vol. 55, No 3, pp. 526-541.

Rusu, C. and Stix, H. (2017), "Cash and card payments – recent results of the Austrian payment diary survey", *Monetary Policy and the Economy*, Q1/17.

Stavins, J. (2001), "Effect of Consumer Characteristics on the Use of Payment Instruments", *New England Economic Review*, Issue 3, pp. 19-31.

Von Kalckreuth, U., Schmidt, T. and Stix, H. (2014), "Choosing and using payment instruments: evidence from German microdata", *Empirical Economics*, Springer, Vol. 46, No 3, pp. 1019-1055, May.

Whitesell, W.C. (1989), "The Demand for Currency versus Debitable Accounts", *Journal of Money, Credit, and Banking*, Vol. 21, No 2, pp. 246-251.

Annex A

Definition of payment instruments

This paper considers all payment instruments commonly used to pay for the purchase of a good or a service at POS. In order to put the use of cash relative to cards and other payment instruments commonly used at POS into perspective, this paper also takes into account the use of some payment instruments which are considered as remote payment methods (e.g. credit transfers), providing they have been used to pay for a purchase obtained at POS.

The definition of payment instruments considered in this paper does not necessarily follow the technical definition used for official statistics. Although survey respondents were given clear instructions and guidance, and in some cases examples of specific payment instruments, it is always possible that responses are affected by perception.

Cashback: a transaction in which the cardholder receives cash at a POS terminal in combination with a card payment transaction for goods or services.

Cash payment: a payment carried out using banknotes or coins.

Card payment: a payment carried out with either a debit or a credit card as perceived and reported by respondents. In the case of Germany, reported debit card payments also include payments carried out using the electronic direct debit scheme ("Elektronisches Lastschriftverfahren").

Contactless payment: a payment carried out with either a debit or credit card or a mobile phone enabled with contactless technology. With contactless technology it is possible to make a payment by holding the card or device within a few centimetres of a payment terminal enabled with near field communication (NFC) technology. Normally, for payments amounting up to €25 no PIN needs to be provided, while for payments above this threshold amount, a PIN code is needed. Contactless payments are considered in this paper as card payments. However, for the analysis of contactless payments a distinction is made between contactless payments below €25, for which a PIN is usually not required, and those above €25 for which a PIN is usually required. The objective of this study is to analyse the use of contactless cards for low-value payments in relation to cash and other (non-contactless) card payments. Therefore, for the purpose of this paper, only payments up to €25 for which no PIN is required have been considered in the analysis of contactless payments.

Cheque: a written order from one party, i.e. the drawer, to another, i.e. the drawee, which is normally a credit institution, requiring the drawee to pay a specified sum on demand to the drawer or to a third party specified by the drawer. It should be noted that respondents may not have been aware of the difference between cheques and vouchers, such as restaurant or gift vouchers, which in some countries are also

called cheques. In this paper the results for cheques may therefore also include vouchers.

Direct debit: a payment instrument for the debiting of a payer's payment account whereby a payment transaction is initiated by the payee on the basis of authorisation given by the payer. For the purpose of this paper, only direct debits to pay a purchase at the POS, as reported by the survey respondent, are considered.

Credit transfer: a payment instrument allowing a payer to instruct the institution with which its account is held to transfer funds to a beneficiary. For the purpose of this paper only credit transfers to pay a purchase at the POS, as reported by the survey respondent, are considered.

Internet or mobile payment methods: for example, PayPal or a mobile App for parking³⁶.

Other instrument: any other unspecified payment instrument.

³⁶ Although an internet or mobile payment on the basis of a card scheme is officially a card payment, it was decided to include this instrument as a separate category, as when shopping, consumers may not be aware of the difference between a payment scheme and the type of payment device or method used.

Annex B

Diary survey questionnaire: Study on the use of cash by households 2016

Q1. How much cash did you have e.g. in your wallet, purse or pockets at the beginning of [INSERT DAY]?

EUR ____ ____ . ____ ____

Don't know/Refuse

Q2a. How much cash, if any, did you add to this amount during the day?

This might include withdrawing cash, but also any cash amount like salary, reimbursement, gift, payment etc.

If you added cash more than once during the day, please report the amount you added the FIRST TIME.

EUR ____ ____ . ____ ____

You did not add any cash

Don't know/Refuse

Q3a. Where did you get the EUR [insert amount from Q2a]?

1. Bank counter
2. A cash dispenser (ATM)
3. Cash back using a card at the supermarket, shop or gas station
4. Your cash reserves e.g. cash jar or cash reserves at home
5. Family, friends or colleagues
6. Other source
7. Don't know

Q2b. How much MORE cash, excluding the EUR [insert amount from q2a] you mentioned, if any, did you add during the day?

EUR ____ ____ . ____ ____

You did not add any MORE cash

Don't know

Q3b. Where did you get the EUR [insert amount from Q2b]?

1. Bank counter
2. A cash dispenser (ATM)
3. Cash back using a card at the supermarket, shop or gas station
4. Your cash reserves e.g. cash jar or cash reserves at home
5. Family, friends or colleagues
6. Other source
7. Don't know

Q4. From the cash you had available, how much, if any, did you take out from your wallet, purse or pockets and put aside, e.g. in cash jar or as cash reserves at home, during the day?

EUR _____. ____

You did not put any cash aside

Don't know

When contacted, you had been asked to record your payments and spending for [INSERT DAY], not considering payments that are automatically debited from your account.

The following questions will be about payments made in cash or by any other payment method on [INSERT DAY].

Please do not forget to report the small payments for food items or drinks, tips at restaurants or bars, donations, pocket money for children or use of public toilets etc.

Q5a. If you made any payments what was the amount of the first one?

EUR _____. ____

You did not make any payments on [INSERT DAY]

Don't know

Q6a. Where was the payment made?

1. In a shop for day-to-day items (supermarket, bakery, pharmacy, tobacconist etc.)
2. In a shop for durable goods (clothing, toys, electronics, furniture, car dealer etc.)
3. At a petrol station

4. On the street or at a market (newspaper, florist or ice cream stall)
5. In a restaurant, bar, cafe
6. In a hotel, guest house, camping
7. At an office of a public authority (taxes, fines, fees for documents)
8. At a venue for arts, entertainment and recreation (museum, theatre, swimming pool, amusement park)
9. At a vending or ticketing machine
10. At home for household services (cleaning, baby-sitting, home tutoring, gardening, pizza delivery)
11. To a person or a charity (gifts, pocket money, flea market, church, street artist)
12. On the internet (online shopping)
13. Other
14. Don't know

Q7a. Which method did you use to make the payment?

1. [NOT ASKED IF q6a=12] Cash
2. Debit card
3. Credit card
4. [NOT ASKED IF q6a=10 or q6a=11 or q6a=12] Contactless payment method via card or mobile phone
5. [NOT ASKED IF q6a=9] Cheque
6. Credit transfer (also via home banking)
7. Direct debit
8. Internet or mobile payment methods such as PayPal or Mobile App for parking
9. Other
10. Don't know

ASK Q8a IF "PAID WITH CASH"

Q8a. Were other payment methods, such as cards or cheques accepted?

1. Yes
2. No

3. Don't know

Q5b. If you made a second payment what was the amount?

EUR ____ ____ . ____ ____

You did not make any more payments on [INSERT DAY]

Don't know

Q6b. Where was the payment made?

1. In a shop for day-to-day items (supermarket, bakery, pharmacy, tobacconist etc.)
2. In a shop for durable goods (clothing, toys, electronics, furniture, car dealer etc.)
3. At a petrol station
4. On the street or market (newspaper, florist or ice cream stall)
5. In a restaurant, bar, cafe
6. In a hotel, guest house, camping
7. At an office of a public authority (taxes, fines, fees for documents)
8. At a venue for arts, entertainment and recreation (museum, theatre, swimming pool, amusement park)
9. At a vending or ticketing machine
10. At home for household services (cleaning, baby-sitting, home tutoring, gardening, pizza delivery)
11. To a person or a charity (gifts, pocket money, flea market, church, street artist)
12. On the internet (online shopping)
13. Other
14. Don't know

Q7b. Which method did you use to make the payment?

1. NOT ASKED IF q6a=12] Cash
2. Debit card
3. Credit card
4. [NOT ASKED IF q6a=10 or q6a=11 or q6a=12] Contactless payment method via card or mobile phone

5. [NOT ASKED IF q6a=9] Cheque
6. Credit transfer (also via home banking)
7. Direct debit
8. Internet or mobile payment methods such as PayPal or Mobile App for parking
9. Other
10. Don't know

ASK Q8b IF "PAID WITH CASH":

Q8b. Were other payment methods accepted at the point of sale or by the recipient?

1. Yes
2. No
3. Don't know

Q9a. You reported [NUMBER OF PAYMENTS] payment(s) and at least one occasion where you added cash. When did you add or withdraw cash for the first time during the day? Was it ...

1. Before the first payment
2. After the first payment
3. After the second payment
4. After the third payment
5. After the fourth payment
6. After the fifth payment
7. After the sixth payment
8. After the seventh payment
9. After the eighth payment
10. Don't know

ASK Q9b IF "ADDED MORE CASH"

Q9b. When did you add or withdraw cash for the second time during the day? Was it ...

1. Before the first payment
2. After the first payment

3. After the second payment
4. After the third payment
5. After the fourth payment
6. After the fifth payment
7. After the sixth payment
8. After the seventh payment
9. After the eighth payment
10. Don't know

Q10. To summarise, at the beginning of the day you had EUR [insert amount from q1a]

You withdrew or added [insert amount from q2a+Q2b]

You spent [insert amount from Q5a + Q5b+Q5N] in cash [if code q7a/q7b]

You put aside [insert amount from q4]

Can you please confirm that at the end of the day you had [calculate amount = Q1 – all payments done in cash + all cash replenishments – amount of cash put aside]?

1. Yes, exactly
2. Yes, but differs by a few cents
3. Yes, but differs by a few euros
4. No, at the end of the day you had [INSERT AMOUNT]
5. Don't know

Annex C

Use of high denomination banknotes

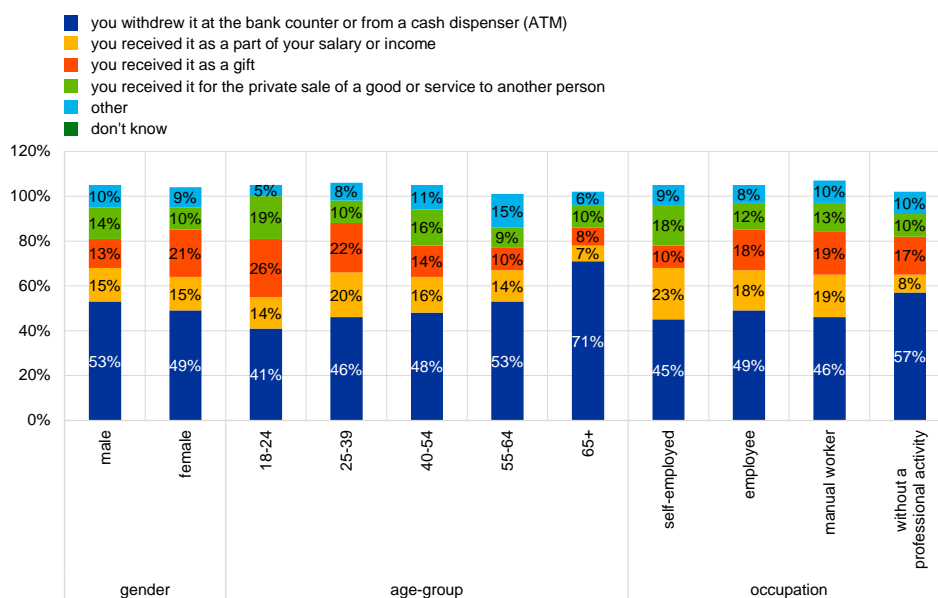
Charts in this annex present the demographic characteristics of respondents who reported having had a €200 or €500 banknote in their possession. Chart C.1 and C.2 present information referring to the way respondents obtained and used these banknotes.

Chart C.1

Source of high denomination banknotes

Question: How did the EUR200/EUR 500 banknote come into your possession?

(percentages; multiple answers possible; based on 4,255 respondents from the euro area)



Source: ECB.

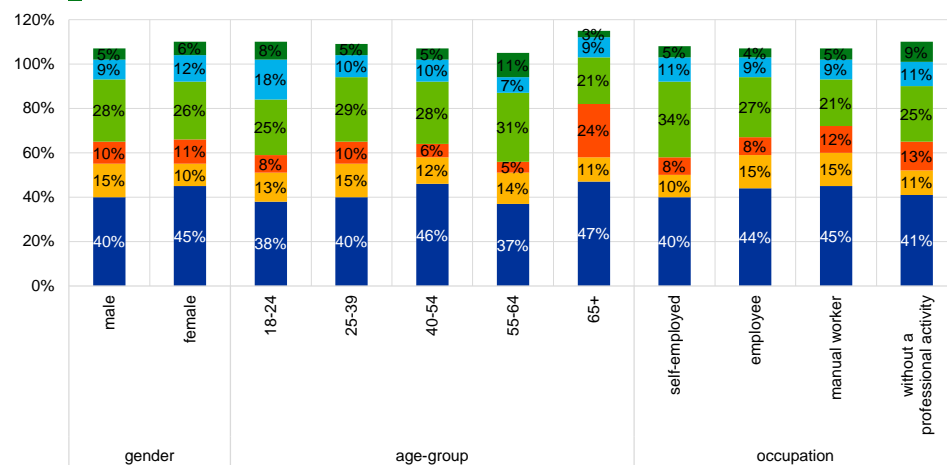
Chart C.2

Use of high denomination banknotes by households

Question: What did/do you do with it?

(percentages; multiple answers possible; based on 4,255 respondents from the euro area)

- you used it for a purchase of a good or service in a shop
- you used it for the purchase of a good or service from another person
- you used it as a gift
- you deposited it to the bank or exchanged it for smaller denominations
- you decided to store it
- don't know



Source: ECB.

Abbreviations

Countries

BE	Belgium	HR	Croatia	PL	Poland
BG	Bulgaria	IT	Italy	PT	Portugal
CZ	Czech Republic	CY	Cyprus	RO	Romania
DK	Denmark	LV	Latvia	SI	Slovenia
DE	Germany	LT	Lithuania	SK	Slovakia
EE	Estonia	LU	Luxembourg	FI	Finland
IE	Ireland	HU	Hungary	SE	Sweden
GR	Greece	MT	Malta	UK	United Kingdom
ES	Spain	NL	Netherlands	US	United States
FR	France	AT	Austria		

In accordance with EU practice, the EU Member States are listed in this report using the alphabetical order of the country names in the national languages.

Others

BIS	Bank for International Settlements	GDP	gross domestic product
CPI	Consumer Price Index	HICP	Harmonised Index of Consumer Prices
DG ECFIN	Directorate General for Economic and Financial Affairs, European Commission	i.i.p.	international investment position
ECB	European Central Bank	ILO	International Labour Organization
EDP	excessive deficit procedure	IMF	International Monetary Fund
EER	effective exchange rate	MFI	monetary financial institution
EMI	European Monetary Institute	MIP	macroeconomic imbalance procedure
EMU	Economic and Monetary Union	NCB	national central bank
ERM	exchange rate mechanism	OECD	Organisation for Economic Co-operation and Development
ESA 95	European System of Accounts 1995	SSM	Single Supervisory Mechanism
ESCB	European System of Central Banks	TSCG	Treaty on Stability, Coordination and Governance in the Economic and Monetary Union
ESRB	European Systemic Risk Board		
EU	European Union		
EUR	euro		

Conventions used in the tables

"-" data do not exist/data are not applicable

"," data are not yet available

Acknowledgements

We would like to thank all members who participated in the ad hoc task force for the study on the use of cash by households, either for part of or for the whole duration of this project, for their valuable input: Sonia Guinea (Banco de España), Heike Wörlen and Martina Eschelbach (Deutsche Bundesbank), Enda Palazzeschi and Emmanuelle Poltronacci (Banque de France), Nicole Jonker (De Nederlandsche Bank), Christiane Dorfmeister and Andrea Pölbauer (Oesterreichische National Bank), Monika Hartmann and Guillaume Osier (European Central Bank). We thank Nadya Jahn (European Central Bank) for coordinating the phase in which the survey set-up was finalised and the first survey results became available. We also thank the Deutsche Bundesbank and De Nederlandsche Bank as well as the Dutch Payments Association for allowing us to use their survey results, and in particular Susann Sieber (Deutsche Bundesbank) for providing us with the German results in the right format. This study has benefited from the expertise and comments of many experts. In particular we would like to mention Sébastien Pérez-Duarte, Hanna Häkkinen and Rosa Brave (all European Central Bank) for their expertise in statistics and the Statistical Data Warehouse; Helmut Stix (Oesterreichische National Bank) for his expertise during the set-up of the study as well as Kari Takala (Bank of Finland), Wiebe Ruttenberg and Björn Fischer (European Central Bank) for their general comments. We would like to especially thank Giulia Vattuone and Elisabetta Maria Saini for providing excellent research assistance and for their significant contributions to the data analysis and presentation of the results. We also thank staff from Kantar Public, in particular Tanja Kimova, Aleksandra Wilczynska and Christopher Hanley, for their advice and support from throughout this study.

Henk Esselink

European Central Bank, Frankfurt am Main, Germany; email: henk.esselink@ecb.europa.eu

Lola Hernández

European Central Bank, Frankfurt am Main, Germany; email: lola.hernandez@ecb.europa.eu

© European Central Bank, 2017

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

All rights reserved. Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the ECB or the authors.

This paper can be downloaded without charge from www.ecb.europa.eu, from the [Social Science Research Network electronic library](#) or from [RePEc: Research Papers in Economics](#). Information on all of the papers published in the ECB Occasional Paper Series can be found on the [ECB's website](#).

ISSN	1725-6534 (pdf)	DOI	10.2866/377081 (pdf)
ISBN	978-92-899-2863-2 (pdf)	EU catalogue No	QB-AQ-17-021-EN-N (pdf)