

## What do households in Germany think about the digital euro? First results from surveys and interviews

*Central banks around the world are looking into concepts for various forms of central bank digital currency (CBDC). Their investigations are progressing at different speeds and are motivated by different reasons. While some central banks are, for now, just analysing the need for CBDC and its potential benefits and drawbacks, others have already begun developing initial prototypes. CBDC would be another form of money, alongside cash and wholesale central bank deposits, that is issued by a central bank and would represent a direct liability against it. Most of the projects being run by central banks are geared towards a CBDC intended for use by households, firms and other non-banks. The Eurosystem is also discussing and exploring the possible issuance of CBDC for the euro area – the digital euro.*

*A digital euro would add another option to the choice of payment methods available in the euro area. It should therefore be designed in such a way as to meet the needs of the general public. This poses a whole series of questions which are of interest not least in light of the investigation phase now under way. What do individuals currently think of a possible digital euro? What needs could it satisfy? Could it really be designed as a type of digital cash? Or might it be more of a rival for the traditional cashless payment instruments? And what factors could ultimately shape its acceptance and use by consumers?*

*With these questions in mind, this article considers the relationship between cash, cashless payment instruments and a possible digital euro from the consumer perspective. By drawing on a representative public survey and research interviews, the investigation delivers some first insights into households' attitudes towards a digital euro. One thing which becomes clear is that the discussion surrounding CBDC has not yet taken root among the general public. The findings also suggest that consumers do not regard a digital euro as a blanket substitute for cash, but instead see its potential as lying more in the context of cashless payment instruments. There are possible novel features which could render a digital euro especially attractive in comparison to private means of payment.*

## The digital euro as a potential new means of payment

*Many central banks are exploring the possibility of CBDC for the general public*

Central banks around the world have been looking into the concept of CBDC for a number of years now. The majority are focusing first on conceptual research, experimentation or proof-of-concept studies.<sup>1</sup> To date, only a handful of central banks have taken CBDC forward into a pilot phase or are working towards issuing one in the very near future. The ongoing investigations centre more around assessing the potential benefits and drawbacks of a CBDC. Most of the projects being run by central banks are geared towards a central bank digital currency intended primarily for use by households. This CBDC would constitute a third variant of central bank money alongside cash and wholesale central bank deposits.

*Eurosystem launches digital euro project*

October 2020 saw the Eurosystem publish a report on the possible issuance of a CBDC for the euro area.<sup>2</sup> The report considers scenarios which could warrant the issuance of such a digital euro. Some of the aspects discussed include the digital euro's role as a catalyst for digitalisation, a response to a possible spread of other non-euro-denominated digital currencies and private stablecoins, and in the context of a potential further decline in the use of cash. On 14 July 2021, the Governing Council of the European Central Bank decided to launch the investigation phase of a digital euro project. The idea is to investigate the conditions that would need to be in place if a digital euro were to be introduced. The decision as to whether a digital euro will actually be introduced will not be made until the conclusion of the two-year investigation phase, however. The time is to be spent, in particular, assessing and exploring the functional design and distribution of a possible digital euro, its economic ramifications as well as any amendments to the EU legislative framework which might be needed.<sup>3</sup>

*Digital euro a response to declining cash usage?*

The possibility that the use of cash as a means of payment may wane further is one of a number of considerations playing into the discus-

sion surrounding a digital euro.<sup>4</sup> Cash use in payments in Germany has indeed recorded another steep decline during the pandemic. While around 74% of point-of-sale payments<sup>5</sup> by households in Germany were still settled using cash in 2017, that figure had dropped to around just 60% in 2020.<sup>6</sup> The fact that, during the pandemic, consumers were unable to shop and travel as they normally would and also had to adapt how they spent their leisure time could possibly account for some of this decline. Over the course of 2020, many of the settings where people might traditionally use banknotes and coins – retail, restaurants and fairs, for instance – were either partially or entirely closed off to consumers. However, more granular analyses show that the proportion of cash-settled transactions was lower across almost all expenditure types, meaning that we have to assume that there was a lower inclination towards using cash overall.<sup>7</sup> It is not yet clear how the use of cash as a means of payment will evolve once the pandemic is over.

The declining use of cash as a means of payment could induce increasing dependence on private sector payment solutions. And even if Germany's cash payments infrastructure is still in smooth working order, waning cash use could see constraints arise in future:<sup>8</sup> declining cash use tends to push up the unit costs per cash transaction at ATMs and the point of sale. Commercial considerations could then drive credit institutions to respond by paring back their offering of cash services and merchants might restrict their acceptance of cash. If this were to happen, the public could end up being forced to switch to alternative modes of payment in individual cases, including when shop-

<sup>1</sup> See Boar and Wehrli (2021).

<sup>2</sup> See European Central Bank (2020).

<sup>3</sup> See European Central Bank (2021a).

<sup>4</sup> See European Central Bank (2020), Mancini-Griffoli et al. (2018), Auer and Böhme (2020) and Wadsworth (2018).

<sup>5</sup> This predominantly means payments at shop checkouts, plus other payment situations encountered by households such as payments to individuals and online purchases.

<sup>6</sup> See Deutsche Bundesbank (2018, 2021a).

<sup>7</sup> See Deutsche Bundesbank (2018, 2021a).

<sup>8</sup> See Deutsche Bundesbank (2020a).

ping in person. For a digital euro to be a response to this challenge, it would need to meet the requirements that the public have of a means of payment in a similar way to cash.

At the moment, cash is the only way for households and other non-banks to hold central bank money. A digital euro would give these holders an additional, digital form of central bank money, which would probably share some of the characteristics of both cash and cashless payment instruments.

The extent to which a digital euro manages to gain a foothold is ultimately up to the potential users. This is why investigations into the user perspective are needed, in order to gain an idea of the market penetration that a digital euro might be expected to achieve in the payments space and to better understand the potential repercussions of its introduction for existing cashless and cash payment instruments. The present article seeks to do this by analysing the features of cash, cashless payment instruments and a possible digital euro on the basis of consumer research surveys.<sup>9</sup>

## Expected features of forms of money and means of payment

The existing body of research on payment behaviour shows that consumers take account of a host of different factors when evaluating forms of money and means of payment.<sup>10</sup> Generally speaking, individuals take a utility-maximising approach when making decisions about holding and using different forms of money and payment instruments – that is to say, they use them in the way that best matches their needs. And when doing so, they take account of the associated costs and risks. This utility-driven analysis is particularly prevalent in respect of the payment and store of value functions. The relative weighting accorded to individual criteria, as well as the evaluation of the extent to which a given payment instrument

satisfies a particular criterion, will vary according to the subjective perception of the user.

Studies by the Bundesbank into the assessment of payment instruments suggest that, for consumers, protection against loss, a clear overview of spending, ease of use and familiarity as well as the maintenance of privacy are among the most important factors when judging different forms of money. In consumers' eyes, cash fulfils almost all of these criteria particularly well. Only in terms of protection against financial loss do debit cards rate even more highly.<sup>11</sup> And these judgements are also reflected in actual cash use. Despite the decline in cash use during the coronavirus pandemic, cash remains the most frequently used option for day-to-day payments, accounting for 60% of transactions.<sup>12</sup> Demand for cash as a store of value is also high in Germany. According to the results of a Bundesbank survey, in 2018, individuals in Germany kept an average of around €1,364 in cash at home or in a safe deposit box (besides the cash in their wallets).<sup>13</sup> The distribution of these amounts among the population was extremely uneven and highly concentrated. Older people, higher earners and self-employed people held the largest cash reserves on average. Half of the respondents hoarded €200 or less in cash (median). In particular, concerns about the security and reliability of technical systems appear to play a role in cash hoarding behaviour. The growth in demand for cash during the coronavirus pandemic also underscores the importance of cash as a store of value (see the box on pp. 69 f.).

*Cash safeguards privacy and provides a clear overview of spending*

*User perspective central to the discussion around a digital euro*

*When choosing a means of payment, utility factors are weighed up against costs and risks*

<sup>9</sup> The article focuses exclusively on the retail variant of a digital euro, which would see a digital euro being made available to households and firms. The discussion in the euro area surrounding a digital euro has now crystallised around this variant.

<sup>10</sup> See Deutsche Bundesbank (2021a, 2018, 2015, 2012, 2009), Swiss National Bank (2018) and Rusu and Stix (2017). The descriptions used in the text follow the conceptual framework to compare different forms of money formulated by Mancini-Griffoli et al. (2018).

<sup>11</sup> See Deutsche Bundesbank (2018).

<sup>12</sup> See Deutsche Bundesbank (2021a).

<sup>13</sup> See Deutsche Bundesbank (2020b).

*Cashless payment instruments sometimes linked to additional services*

Cashless payment instruments are mainly based on commercial bank deposits (book money) and – similarly to cash – are characterised by ease and comfort of use as well as speed and security. Examples include the girocard and the card products offered by international card systems, credit transfers and e-payment schemes.<sup>14</sup> By comparison with cash, using cashless payment instruments saves time and potential fees charged for withdrawal. Furthermore, it is almost impossible to pay with anything other than cashless payment instruments in e-commerce transactions. In some cases, provision and use of these means of payment is also associated with the offer of additional services, such as loans. Meanwhile, the need for innovative cashless payment methods, such as via a mobile phone, remains low at present, according to consumers. Many people still regard mobile payments as too insecure or too complicated.<sup>15</sup> Cashless forms of money are also the key players when it comes to the store of value function: the vast majority of financial assets in Germany are held in the form of bank deposits.

*Crypto tokens unattractive as a means of payment and store of value*

Talk has recently been turning to crypto tokens, meaning units of value which are available only in digital format and are based on encryption technology (cryptography). In comparison to cash and cashless payment instruments based on book money, crypto tokens do much worse at serving as a means of payment and store of value.<sup>16</sup> Low acceptance, the lengthy transaction processing times and the need to have some technical know-how represent the major barriers to their use as a means of payment.<sup>17</sup> With respect to their suitability as a store of value, meanwhile, the large fluctuations in value are problematic.

## The digital euro from a consumer perspective – empirical research by the Bundesbank

Which factors in terms of utility and costs would consumers associate with a digital euro?

And how might the benefits and costs attached to a digital euro compare with those of cash and commercial bank book money? Is the concept of a digital euro already familiar among parts of the population? To answer these questions, the first step, in April 2021, was to carry out a representative opinion poll as part of the Bundesbank Online Panel Households survey (see the box on pp. 71 ff.). The results revealed that the term “digital euro” was still largely unknown among the general public at the time of the survey. Study participants were asked whether they had ever heard or read anything about the digital euro prior to the survey. Only 23% of respondents said they had. The low familiarity with the digital euro could be one of the reasons why the vast majority of interviewees were still sceptical about the prospect of one being introduced. In April 2021, just 13% of those asked were in favour of a digital euro being introduced, though among those with some prior knowledge approval was almost twice as high, at 22%. Attitudes and perceptions surrounding the digital euro could yet evolve as time goes by and the general public becomes more informed.

The current lack of familiarity with the digital euro concept makes conducting quantitative surveys on the topic challenging. A digital euro would be a technological innovation whose exact design – assuming it is introduced – has also not yet been specified. The prior knowledge and opinions needed for a survey on the digital euro can therefore not be readily assumed to exist among study participants. So as to nevertheless gain deeper insights into the criteria that might guide consumers’ decisions regarding the future use of a digital euro, a qualitative approach in the form of guided interviews was selected. A particular advantage of this method is that study participants can be introduced to the concept of the digital euro step by step. Qualitative interviews work with

*Digital euro still relatively unknown among the general public*

*Qualitative approaches can provide more in-depth insights into consumer perspectives on a digital euro*

<sup>14</sup> See Deutsche Bundesbank (2015).

<sup>15</sup> See Deutsche Bundesbank (2021a).

<sup>16</sup> See European Central Bank (2019).

<sup>17</sup> See Deutsche Bundesbank (2021c).

## Demand for cash as a store of value during the coronavirus crisis

In total, the Bundesbank issued banknotes worth approximately €70 billion net in 2020, while net issuance in 2019 was slightly lower, at around €60 billion. A considerable portion of banknote demand, namely €21 billion, was concentrated at the beginning of the coronavirus crisis in March 2020 (see the chart below). There is evidence to suggest that the higher demand for banknotes can be attributed, in part, to domestic households' motive to use cash as a store of value.<sup>1</sup>

In order to better gauge how this has influenced banknote demand since the beginning of the coronavirus crisis in March 2020, participants of the Bundesbank Online Panel Households (BOP-HH)<sup>2</sup> were, in February 2021, surveyed about the reserves they held in cash form. 44% of participants stated that they hold cash reserves. It was striking that the percentage of those questioned holding cash reserves declined with age: whereas 51% of respondents under 30 years of age held cash reserves, this was the case for only 38% of those aged 65 and older. One potential explanation could be that younger people hold small cash reserves in terms of value, which cannot be regarded as cash hoarding in the strict sense, but as a back-up emergency cash reserve to finance consumption. By contrast, the relatively smaller number of cash reserves held by people aged 65 and upwards

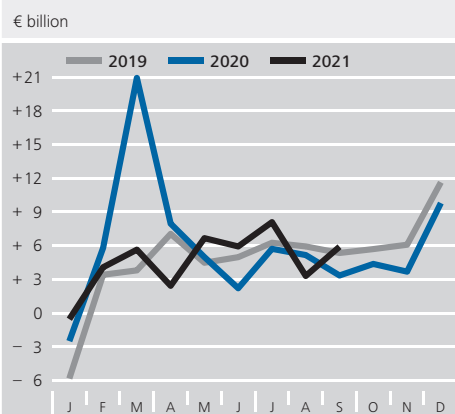
could suggest that they are using up existing cash reserves at a later stage in life.

In a second step, respondents who affirmed having cash reserves were asked to specify how these reserves had changed since March 2020 (see results in the chart on p. 70). The increase in cash reserves was attributable, in particular, to younger persons under 30 years of age (37%) and those with a net household income of more than €6,000 (45%). One possible motive for this increase could be that younger people feared being unable to access their usual cash withdrawal points during a lockdown combined with otherwise small cash reserves in terms of value. Looking at people with a high net household income, their larger freely disposable income in combination with fewer local consumption options could be one reason for higher cash holdings. Further factors, for instance the "custody fees" credit institutions demand on large transferable deposits, can likewise not be ruled out as possible explanations.

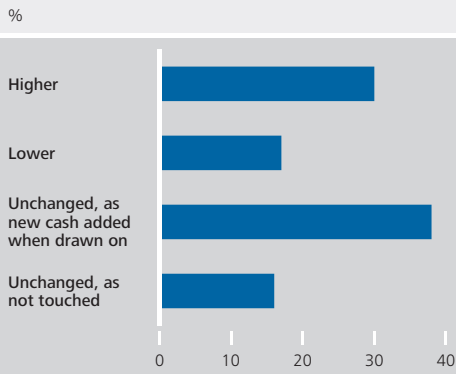
<sup>1</sup> In a telephone survey conducted in April 2020, one-quarter of those questioned stated that they had changed their payment behaviour since the beginning of the coronavirus crisis, with 90% saying that they used cash less frequently, see Deutsche Bundesbank (2020c). Elevated demand for banknotes in March 2020 is consequently unlikely to be attributable to direct demand for cash for transaction purposes.

<sup>2</sup> For more information on the BOP-HH, see Beckmann and Schmidt (2020) and Deutsche Bundesbank (2021b).

The Bundesbank's monthly net banknote issuance



### Cash reserves since the beginning of the coronavirus crisis\*



\* Data for people holding cash (1,029 in total). Question: "Has your cash reserve changed since the beginning of the coronavirus pandemic in March 2020?"  
 Deutsche Bundesbank

By contrast, roughly one-sixth of those surveyed stated having lower cash reserves, something that was particularly pronounced for those with a lower household income. This could be attributable primarily to a drop in income as a result of the crisis, for

instance due to short-time work, meaning that existing cash reserves were utilised for spending. More than half of respondents, namely 54%, said that the level of their cash reserves had not changed. It is striking here that less than one-third of this group stated not having touched the cash reserve at all, while approximately 70% said they made active use of it. In this last subset, cash reserves therefore appear not to constitute cash hoarding in the stricter sense but rather outsourced wallet holdings that are used for transaction purposes.

Overall, the results reaffirm the assumption that households' store-of-value motives were a significant factor in demand for banknotes during the coronavirus crisis. This can likely be explained, in particular, by the function of cash as a crisis-resistant and default-proof means of payment and store of value that can be used at any time.

open-ended questions, giving interviewees the chance to express themselves in their own words. The dialogue is not structured completely by the interviewer and their questions; rather, it is partly shaped by the input of the interviewee. The idea is to gain a detailed and in-depth handle on the interviewees' individual perspectives instead of just taking a superficial look.<sup>18</sup>

as comprehensively as possible. The participants were selected to represent the broadest range possible in terms of current payment behaviour, affinity to cash and cashless means of payment as well as attitudes towards digitalisation and experience with digital payment methods. Attention was also paid to the age and gender profile of the sample when selecting interviewees.

*40 qualitative guided interviews carried out in spring 2021*

With the assistance of forsa, a market and public opinion research institute, a total of 40 interviews were carried out with people in Germany between 11 March 2021 and 13 April 2021.<sup>19</sup> The interviews lasted an average of 45 to 60 minutes. The target group for the study were people who had taken part in the 2020 study on payment behaviour and had given their consent to an in-depth follow-up survey.<sup>20</sup> While the sample size is typically small for qualitative surveys, a heterogeneous mix of participants was deliberately chosen so as to capture consumer perceptions around the digital euro

All of the recorded conversations were transcribed verbatim. The interviews were processed using Mayring's qualitative content analysis.<sup>21</sup> On the basis of a research question,

<sup>18</sup> For more information, see, inter alia, Döring and Bortz (2016).

<sup>19</sup> Due to the coronavirus pandemic, the interviews were generally conducted via video. The interviewers shared their screen with the respondents as a way of providing information on the digital euro. Five interviews were carried out over the telephone as the interviewees did not have internet access. These people received the material by post in advance.

<sup>20</sup> See Deutsche Bundesbank (2021a).

<sup>21</sup> See Mayring (1991).

## Bundesbank household survey on the digital euro

Every month, the Bundesbank Online Panel Households (BOP-HH) surveys households in Germany on their economic expectations and behaviour.<sup>1</sup> Survey participants are aged 16 or over, live in Germany and have access to the internet. Between 16 and 27 April 2021, the panel included questions on the digital euro. To begin, the 2,718 respondents were shown the following explanatory text:

“A digital euro would be an electronic form of central bank money. Central bank money is money that can only be created by the central bank. Today, central bank money mainly exists in the form of cash, which the central bank brings into circulation. A digital euro would enable everyone to pay in cashless form with central bank money.

A digital euro is not the same as a crypto-asset, such as bitcoin. A digital euro would be protected and regulated by the European Central Bank. It would also be default-free as a central bank can never go bankrupt. Crypto-assets have so far been issued and traded without any state oversight. This

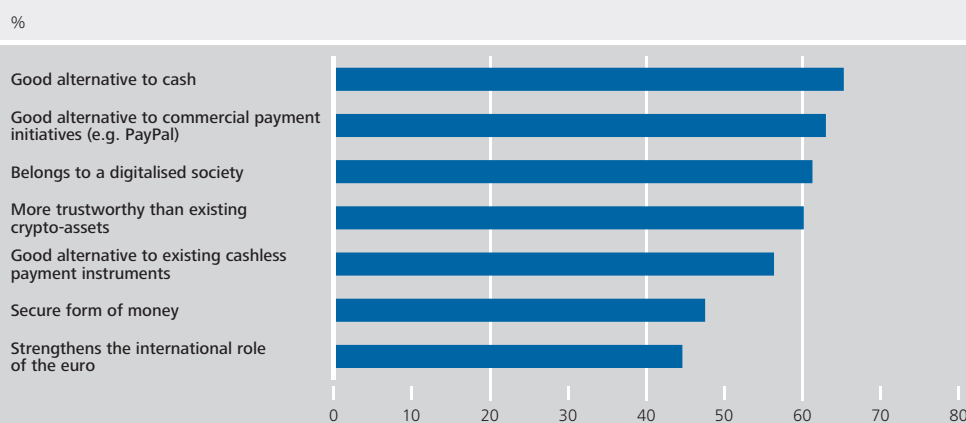
means that there is no institution ensuring their values remain stable and, as a result, crypto-assets – unlike digital euro – may be subject to sharp, unexplained fluctuations in value.”

Next, participants were asked questions about their prior knowledge of and opinion on the digital euro.

The survey revealed that the digital euro was still largely unknown to the general public at the time of the survey. Only 23% of respondents said that they had already heard or read anything about the digital euro before taking the survey. 60% reported that while they had not heard or read anything about the digital euro, they had heard or read about crypto tokens. By contrast, 17% had no knowledge of either term. Surveys on the digital euro are thus still being constrained by a relative lack of prior knowledge, which means that public

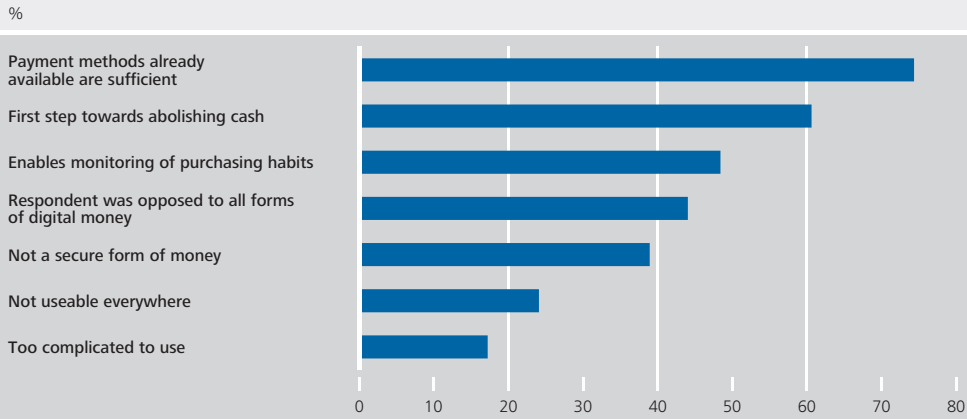
<sup>1</sup> For more information on the BOP-HH, see Beckmann and Schmidt (2020) and Deutsche Bundesbank (2021b).

### Benefits of the digital euro\*



\* Responses from survey participants who were generally or definitely in favour of introducing a digital euro (total: 364). Question: “For what reasons would you be in favour of implementing a digital euro?” Multiple responses possible.  
 Deutsche Bundesbank

### Drawbacks of the digital euro\*



\* Responses from survey participants who were generally or definitely not in favour of introducing a digital euro (total: 1,512). Question: "For what reasons would you not be in favour of implementing a digital euro?" Multiple responses possible.  
 Deutsche Bundesbank

opinion is probably not yet fully formed. The survey provides a representative snapshot of the digital euro at the time of the survey. Over time, and as the general public becomes more informed, attitudes and perceptions surrounding the digital euro may yet change.

Assuming the participants had read and understood the introductory explanatory text, they were then asked for their opinion on the digital euro. The table below shows that around 13% of respondents were in favour of introducing a digital euro and that more than half (56%) were not. Roughly one-third were undecided. The introduction of a digital euro was more popular among respondents who had already heard of or read about the digital euro, at around 22%.

Acceptance of the digital euro might still evolve with the passage of time and increasing awareness among households. In a repeat of this survey at the end of July, the proportion of respondents who said they had previously heard of or read about the digital euro had already gone up to 44%. Awareness levels appear to have increased following the decision of the Governing Council of the European Central Bank (ECB) to launch the digital euro project.

65% of those in favour of a digital euro saw it as a good alternative to cash and 63% saw it as a good alternative to commercial payment initiatives (see the chart on p. 71). In addition, around 61% of those in favour felt a digital euro belonged to a digitalised society. By contrast, the respondents who

### Opinion on the digital euro\*

Question: "To what extent would you be in favour of implementing a digital euro?"

| Response                 | %  |
|--------------------------|----|
| Definitely not in favour | 33 |
| Generally not in favour  | 22 |
| Undecided                | 30 |
| Generally in favour      | 11 |
| Definitely in favour     | 2  |
| Don't know               | 1  |
| No answer                | 0  |

\* Source: All respondents.  
 Deutsche Bundesbank



### Use of the digital euro\*

Question: "Which of the following statements regarding the use of a digital euro applies to you?"

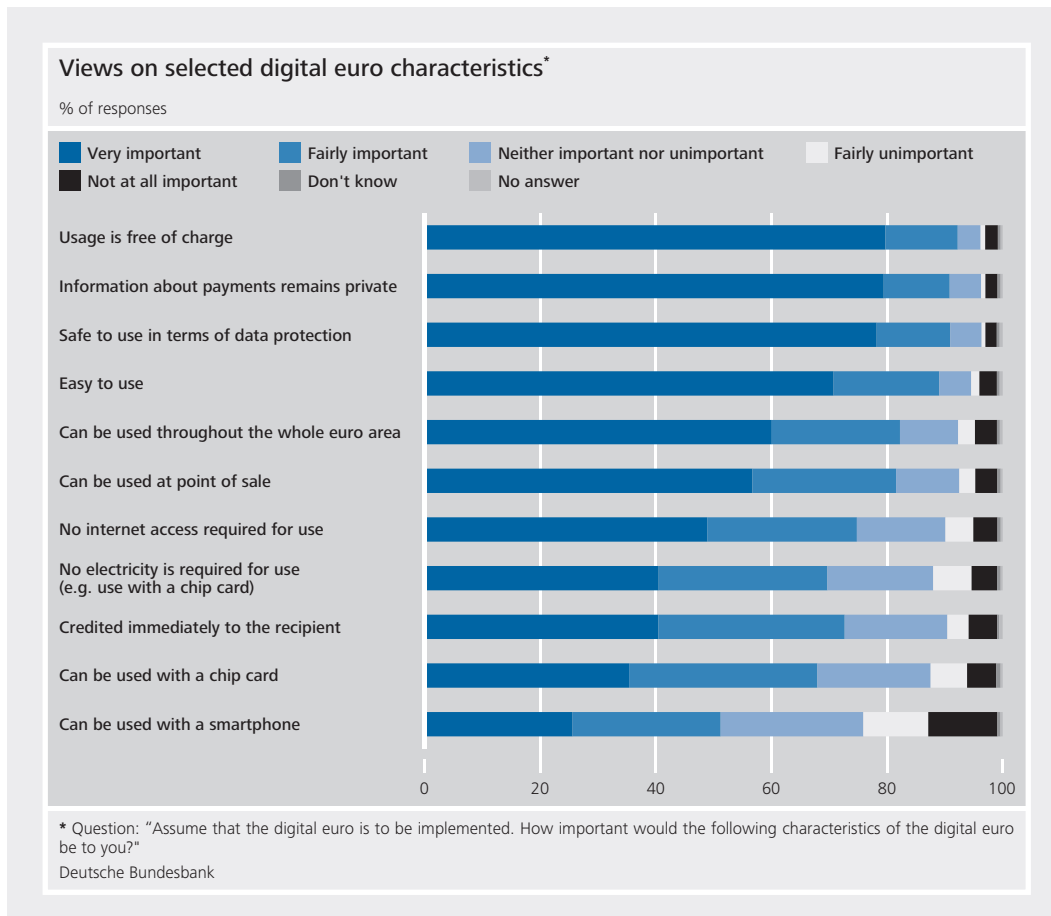
| Response   | %  |
|--|----|
| I cannot imagine using digital euro at all.                        | 60 |
| I can generally imagine using digital euro.                        | 31 |
| I can generally imagine using both digital euro and crypto-assets. | 9  |
| Don't know   | 0  |
| No answer  | 0  |

\* Source: All respondents.  
 Deutsche Bundesbank

were not in favour of introducing a digital euro reported that the existing payment instruments were sufficient (see the chart on p. 72). Therefore, the additional benefits that a digital euro offers over existing payment instruments need to be clearly communicated for a launch to be a success. In addition, 61% of those not in favour feared that the digital euro would be the first step towards abolishing cash. This indicates that the general public is not yet entirely reassured that the digital euro would merely complement cash, not replace it.

40% of all respondents could generally imagine using a digital euro in the future (see the above table). Here again, the proportion is slightly higher (47%) among respondents who had already heard of or read about the digital euro. Last of all, respondents rated the importance of the characteristics a digital euro might have. For them, it was particularly important for a digital euro to be free of charge, keep their payment information private and protect their data (see the results in the chart on p. 74).<sup>2</sup>

<sup>2</sup> There is some overlap between these results and those of the ECB's non-representative public consultation on the digital euro, which was launched on 12 October 2020 and ran until 12 January 2021. Roughly 8,200 responses were received in total, with most respondents (94%) identifying themselves as citizens and the remainder being professionals, including banks, payment service providers, merchants and tech companies. The ECB public consultation found that what both the general public and professionals want most from a digital euro is privacy (43%), followed by security (18%), usability across the euro area (11%), the absence of additional costs (9%) and offline use (8%); see European Central Bank (2021b).



this method aims to derive meaning from the answers through data-driven step-by-step coding.<sup>22</sup> Unlike quantitative research, qualitative analysis does not strive to determine the statistical significance of the findings. Qualitative content analysis allows the systematic decoding of the content of texts and is an established method within the field of qualitative research.<sup>23</sup>

## Qualitative survey on the digital euro – interview guideline and theoretical structure

*Interview guideline contains extensive explanations about potential digital euro*

The qualitative interviews were based on an interview guideline that comprised extensive explanations about the concept of a digital euro as well as a structured list of open-ended questions for the participants.<sup>24</sup> These questions had been determined prior to the survey based on the possible features of the digital

euro and earlier surveys on the acceptance of payment instruments.<sup>25</sup> A step-by-step explanatory approach was used to introduce participants to the idea of a digital euro (see the chart on p. 75). Furthermore, given the highly abstract nature of this topic, a variety of symbols and illustrations were used to bring the subject matter to life (see the chart on p. 77). As the interviews progressed, the feedback provided confirmed the finding from the representative opinion poll that the vast majority of participants had not yet heard of the digital euro or CBDC at the time of the survey. Study participants were therefore asked during the interviews to describe the digital euro in their own words. That way, the interviewers could check throughout the interview whether participants had properly understood the explan-

<sup>22</sup> See Döring and Bortz (2016).

<sup>23</sup> See Flick et al. (2005).

<sup>24</sup> See Döring and Bortz (2016).

<sup>25</sup> See Deutsche Bundesbank (2021a, 2018, 2015, 2012, 2009).

ations. Furthermore, the open-ended questions encouraged participants to express their opinions and attitudes regarding the characteristics of a digital euro, as presented to them during the survey.

*Presentation of digital euro based on Eurosystem report*

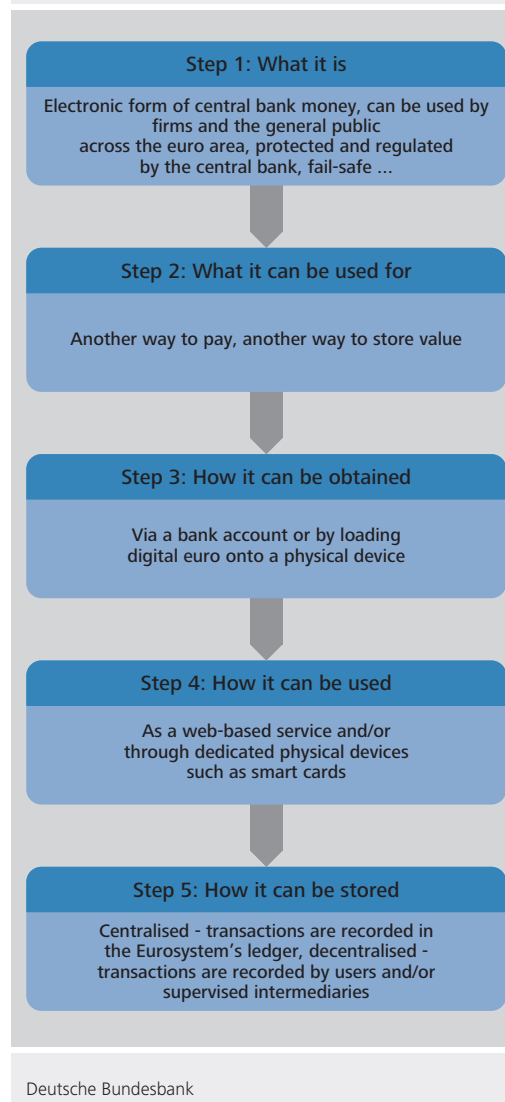
The presentation of the digital euro in the interviews was based on the Eurosystem’s Report on a digital euro from October 2020.<sup>26</sup> At the time the qualitative survey was conducted, this report was the Eurosystem’s most important and comprehensive publicly available publication on the potential characteristics and design of a digital euro. The following section presents the key aspects of the explanations on the digital euro, as contained in the interview guideline, and derives hypotheses from each of them for the purpose of analysing the interviews.

## Step 1: What it is

A digital euro was presented to the respondents as a new form of central bank money as follows:

“Generally speaking, central bank money is money that can only be created by the central bank. Central bank money nowadays comprises the cash in circulation and wholesale central bank deposits. Central bank money is considered to be fail-safe as a central bank cannot default. This money is not the same as book money, which comprises all the sight deposits held with commercial banks. Deposits held with commercial banks up to €100,000 per customer and bank are protected by the statutory deposit guarantee scheme. To date, households have only been able to access cash and book money, but not electronic central bank money. A digital euro would be an electronic form of central bank money and would complement the supply of cash, not replace it. However, a digital euro has so far only existed in the preliminary considerations and technical experiments of the Eurosystem. The European Central Bank, the Bundesbank and the other national central banks in the euro area are con-

### Step-by-step approach to explain the concept of a “digital euro”



sidering whether to introduce a digital euro, which could potentially be used by both individuals and firms across the euro area. A digital euro would be protected and regulated by the central bank and would also be fail-safe.”

Based on the definition of a digital euro presented to the respondents, it can be assumed that the intended use of the digital euro will determine how far consumers see its attribute as central bank money and thus as fail-safe as beneficial. In all likelihood, the fail-safe feature will probably play a fairly minor role when it

*Consideration: fail-safe feature of little relevance when selecting means of payment in stable financial systems*

<sup>26</sup> See European Central Bank (2020).

comes to selecting a means of payment. In stable financial systems and in consideration of the statutory deposit guarantee scheme, a fail-safe form of money should not have any visible benefit over book money for consumers. This feature is likely to be viewed as more attractive in the context of storing value during times of crisis. Indeed, being fail-safe is a feature that clearly sets cash apart, particularly in times of crisis when people are looking for a safe and reliable form of money.

## Step 2: What it can be used for

After the general definition and key features of a digital euro were outlined, its potential uses were explained in more detail:

“A digital euro would offer broader potential for additional services than cash.<sup>27</sup> For instance, a digital euro could be used in situations where people do not wish to, or are unable to, pay with cash. It would also provide an alternative to other cashless payment instruments at the point of sale, in e-commerce as well as between individuals. At the same time, a digital euro would establish a basis for the digital economy of the future. It could also potentially be conferred legal tender status.<sup>28</sup> In practice, this might mean that a digital euro would be usable in any place and under all conditions.”

*Consideration: broad acceptance could favour use of a digital euro*

Euro banknotes and coins are legal tender in the euro area. Furthermore, since people in the euro area prefer to pay smaller amounts in cash, it is vital for the payment system that cash is universally accepted as legal tender, not least because it enables people without access to electronic payment instruments to participate in economic life. Retailers and other businesses are not allowed to refuse cash payments, except where both parties have agreed beforehand to use a different means of payment. If a digital euro were legal tender as well, consumers would likely consider its widespread usability as a particular benefit.

## Step 3: How it can be obtained

In a third step, the respondents were presented with different ways of obtaining digital euro:

“One conceivable way of obtaining digital euro would be to exchange book money via a bank account; another would be to load and unload digital euro, for example in exchange for cash at physical loading devices<sup>29</sup>” (the end-user access and usability solutions offered by a digital euro are also visualised in the chart on p. 77).

Based on the ways of obtaining digital euro presented to the respondents, it can be assumed that the convenience of each way of obtaining the digital euro will determine how far consumers consider it to be beneficial. Thus, obtaining digital euro via a physical loading device could be considered less attractive if the physical loading device infrastructure were not satisfactorily expanded, if long distances had to be travelled to reach devices, or if frequent trips to loading devices were required because of limits on the amount of digital euro that can be held. By contrast, obtaining digital euro via a bank account – a way which is perceived as easy and convenient – could favour the use of digital euro.

*Consideration: obtaining digital euro conveniently and easily key for use*

## Step 4: How it can be used

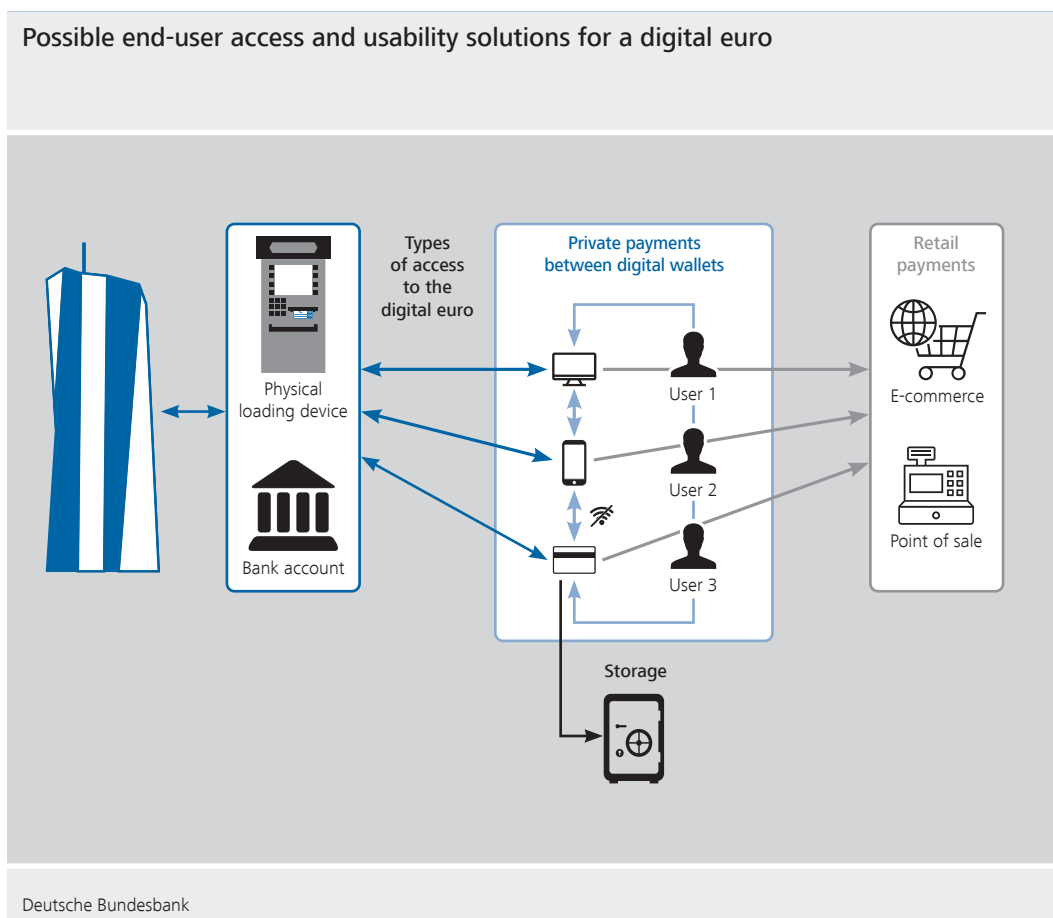
Respondents were presented with two possible ways of using a digital euro that could also be combined:

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<sup>27</sup> The article does not examine the use of a wholesale variant of the digital euro. In a wholesale variant of the digital euro, the central bank would issue a digital euro only to a limited set of users, ideally to commercial banks. Furthermore, this article does not specify a potential use case of a digital euro for programmable payments. These are payments where the timing, amount and/or type of transfer are determined by pre-specified conditions rather than ad hoc during the payment process. Programmable payments include, for instance, machine-to-machine payments where devices (on behalf of their owners) automatically settle and pay for services with each other.

<sup>28</sup> See European Central Bank (2020).

<sup>29</sup> Comparable to today's ATMs.



“First, they could be transferred using a web-based service (possibly involving an app). In this case, a broad range of devices could be used, such as computers, smartphones or smart watches. A digital euro could also be transferred between devices over long distances. Second, they could be transferred directly from one physical device to another. To do this, the payer and payee would need to have specific compatible physical devices which can store digital euro. One such device could be a smartcard that is used at the point of sale or held up to a smartphone to transfer money. The devices could be paired contactlessly for the transfer, which would mean that a payment could also be initiated without an internet connection.”

while using digital euro stored on a smartcard closely resembles traditional card payments. By its very definition, digital euro cannot recreate the touch and feel of physical cash, however. Another key feature of cash is that it can be used to make offline payments. This characteristic could be replicated by a digital euro if device-to-device transfers were made possible.<sup>30</sup>

### Step 5: How it can be stored

Respondents were presented with two approaches for storing and transferring a digital euro:

“A centralised approach would see digital euro being recorded in the central bank’s ledger. Transfers between accounts would always be made via the central bank. However, payments

*Consideration: use of digital euro might have more resemblance to cashless payment instruments*

Both ways of using the digital euro presented in the interviews are particularly similar to the ways cashless payment instruments are used. Respondents could associate using digital euro via an app with using mobile payment methods,

<sup>30</sup> See European Central Bank (2020).

could be initiated via a commercial bank's app or that of another supervised intermediary, for example. A decentralised approach could involve digital euro being recorded directly on a physical device, for instance on a payment card, mobile phone or other smart device. The central bank or commercial banks, or suitably authorised service providers, would not be involved in the verification of every single payment. A combination of the centralised and decentralised approach would also be generally possible."

*Consideration: both centralised and decentralised approaches could deliver benefits for consumers*

In the final application of a digital euro, consumers will probably barely notice whether a digital euro is based on centralised or decentralised infrastructure, to begin with. Even so, there are differences between the two approaches that could have a bearing on how consumers see a digital euro. Transactions using traditional cashless payment instruments, such as credit transfers, currently take place centrally and therefore require the involvement of intermediaries. A functioning payment system requires a certain degree of trust in intermediaries; however, intermediaries can also be a source of uncertainty.<sup>31</sup> By contrast, transactions in decentralised infrastructures are settled without the involvement of third parties. For people who have little trust in the existing payment service providers, then, a digital euro designed as a decentralised means of payment will probably constitute an attractive alternative to the traditional cashless payment instruments. At the same time, a decentralised digital euro could more closely resemble cash than a centralised variant in terms of its properties, as cash can also be transferred without intermediary involvement. But even where it is stored centrally, a digital euro would probably offer consumers some advantages over cashless payment instruments because the central bank would be the intermediary, not a private payment service provider.

## Additional features

To conclude the interviews, additional key features of a digital euro were discussed with respondents:

*Fully anonymous use of digital euro probably not possible*

"Differing degrees of anonymity would be conceivable when using a digital euro. However, in order to effectively prevent misuse for criminal purposes, such as money laundering and terrorism financing, complete anonymity is probably unlikely.<sup>32</sup> It is nevertheless conceivable that device-to-device transfers up to a certain amount would not be traceable. Data protection when using a digital euro should be in line with the current standards and guaranteed using state-of-the-art technological resources. It thus already looks like a digital euro could offer a greater degree of privacy than some cashless payment methods, but not as much as cash.

A digital euro should be easily accessible for everyone – including individuals who currently do not participate in the financial system – in order to ensure it can be used by the greatest possible number of households. The use of a digital euro would generally be free of charge for individuals. Ideally, it would only take a few seconds for the payee to be credited with digital euro on an account or physical device."

Lastly, respondents were asked for their views on the holding limit for a digital euro under debate in the Eurosystem (e.g. €3,000),<sup>33</sup> but were not given details about the background behind the limit. The idea behind a holding limit of this kind is to mainly limit a digital euro to its function as a means of payment and to make it unattractive as a form of investment. Cash and book money should therefore remain in demand as a store of value.

*Consideration: digital euro should probably represent an additional payment option and not a form of investment*

<sup>31</sup> See Deutsche Bundesbank (2021c).  
<sup>32</sup> See European Central Bank (2020).  
<sup>33</sup> See Bindseil and Panetta (2020).

## Results of the qualitative survey on the digital euro

### Significance of the central bank money feature

*Central bank money feature barely a factor in perception of cash*

The fact that the digital euro would be a form of central bank money and therefore a fail-safe means of payment appears not to be a key advantage over the traditional payment instruments for the majority of participants in the qualitative study. The vast majority of respondents are unfamiliar with the term “central bank money”. Study participants also reported that the central bank money feature has hardly any practical relevance in daily life. This feature is barely given any consideration when choosing a means of payment and therefore also does not influence payment behaviour. Furthermore, most respondents said it was new and surprising to learn that cash is the only way for individuals to access central bank money.

*Fail-safe feature only an abstract advantage for consumers*

Unlike book money, central bank money is, by definition, a fail-safe form of money. However, the interviews revealed that, for most respondents, the fail-safe feature of the digital euro plays only a minor role in daily life. How much importance respondents attached to the fail-safe feature varies in particular according to their current wealth level. Some respondents perceived book money to be just as fail-safe as central bank money as long as the value of existing investments remains below the amount of €100,000 protected under the statutory deposit protection scheme. Overall, the fail-safe feature of a digital euro presented is therefore no more than an abstract advantage for study participants.

### Attitude towards digitalisation

*Both a positive attitude towards digitalisation ...*

Participants’ attitude towards a digital euro is largely shaped by their view of digitalisation in general. Respondents are generally more open to a digital euro if they think digitalisation will deliver more advantages and opportunities

than disadvantages and risks in the future. In particular, people with an optimistic and hopeful outlook on the future functionalities and capabilities of digitalisation tend to have a greater affinity towards the digital euro. For these respondents, a digital euro is an essential and innate part of a digitalised society, with some even viewing it as a necessary and, in part, overdue step towards a digital future.

By contrast, the qualitative investigation found that respondents with pessimistic or sceptical views on digitalisation tend to reject a digital euro. Some respondents also said they fear a loss of control. For them, transactions with a digital euro would be far too transparent, increasing their concerns that more details about their lives will be laid bare. Respondents who see digitalisation more as a source of drawbacks and risks than benefits and opportunities in the future are sceptical about a digital euro; moreover, they also suspect hidden pitfalls, such as surveillance, loss of control over their personal data, restrictions in use or other drawbacks. Another concern some study participants mentioned in this regard is that they might lose track of their finances if they have a second account for everyday transactions, in particular if they are using three forms of money in parallel – a digital euro, cash and book money.

### Current payment behaviour and behaviour routines

Respondents’ previous behaviour generally has a bearing on their attitudes towards using technological innovations, and the payments landscape is proving to be no exception. The interviews conducted with the participants reveal that their previous payment behaviour has an impact on their attitudes towards the digital euro.

Study participants who are generally open to cashless and, in particular, digital payment methods have a more positive and open atti-

*... and experience in using cashless payment instruments promote open attitude towards digital euro*

tude towards a digital euro. Having an affinity with digital payment instruments, then, makes it easier to approach a digital euro. Some respondents see key parallels between the various ways of using a digital euro, such as with a smartcard or online with a PC, laptop or smartphone, and the use of traditional payment instruments. This means the respondents would need no additional knowledge to use a digital euro. Clearly, the more experienced study participants are in using cashless payment methods, the more open they are to using a digital euro. Furthermore, previous experience with mobile payments, familiarity with the use of e-payment schemes and a basic understanding of crypto tokens increase respondents' willingness to use a digital euro to a particularly strong extent. Another interesting observation is that especially committed users of cashless payment instruments see little appeal in the possibility of using a digital euro with a smartcard. This group of respondents already appears to consider the use of traditional payment cards (as used nowadays for payments with commercial bank deposits) outdated – unlike the use of mobile devices, which they see as becoming increasingly important.

*Strong support for cash in digital world, too*

For committed cash users – that is, respondents who mainly use cash to pay – the step towards using a digital euro is clearly a larger one. Study participants who use cash more than cashless payment methods are more concerned and uncertain about the prospect of another cashless form of money. Specifically, some of them said they do not trust the technical functionality and expressed fears about security risks and misuse of data. There were also some who stressed that their existing payment routine is working fine at the moment, which was why they do not feel any direct psychological pressure that might motivate them to switch to using a new form of money. Committed cash users, furthermore, display deeply entrenched behaviour routines which are not expected to change much.

Individuals who to this day still pay for everyday purchases almost exclusively in cash are a long way from using a digital euro. They do not see it as an alternative to cash, nor do they regard the use of a smartcard as a replacement for the touch and feel of physical banknotes and coins. Users of cashless payment instruments, on the other hand, see the website- or app-based use of a digital euro in particular as a further refinement of mobile payments. The results of the investigation therefore suggest that a digital euro would not be a close substitute for cash from the consumer perspective.

*Digital euro not a replacement for cash*

## Assessment of other digital euro features

According to the respondents, the most important characteristics of a digital euro include free and simple use, privacy, security with regard to data protection and universal usability. The representative online survey makes the same findings (see the box on pp. 71 ff.). These requirements relate to both how transactions are carried out with a digital euro and the manner in which users obtain digital euro.

The majority of respondents in the qualitative study expect a digital euro to meet much the same security requirements as those already placed on traditional cashless payment instruments. These notably include avoiding possible incorrect bookings and the loss or misuse of the payment medium and thus of transaction data. Most of the respondents made a point of saying that they do not want full anonymity, however. On the contrary, some stressed that the central bank, in its capacity as a trusted intermediary, should indeed be allowed to inspect transactions in the event of an unexpected incident (e.g. incorrect credit transfer or fraud). In addition, multiple respondents emphasised that the central bank presumably pursues different interests than private payment service providers. For many respondents, then, a digital euro represents an opportunity to pre-

*Trustworthiness of central bank would foster security of a digital euro*



vent private sector players from using personal data for commercial purposes.

*Different expectations for digital euro services*

The vast majority of respondents furthermore expect a digital euro to be easily accessible and universal. Opinions differ as to which of the ways to use a digital euro discussed above, be it in the form of a smartcard or a smartphone app, will guarantee easy access. Experienced users of cashless payment instruments in particular reported that using a digital euro via a website or app, as described above, and with the possible end-user devices would be convenient. The surveyed cash users, on the other hand, felt that the smartcard would offer the best potential for use. Although a smartcard is not directly associated with cash in spite of its physical form, respondents see it as a lower hurdle than using a website or app.

*Digital euro offers great potential in context of e-commerce*

Respondents also expect to be able to use a digital euro in as many situations as possible. Many study respondents see the greatest potential in the context of e-commerce, where there have often been calls for a payment option which allows control over personal data to be maintained in order to prevent private providers having access to user data for commercial purposes. Only a small number of respondents find that the possibility of being able to use a digital euro also for payments to private persons or in situations where cash is typically used (e.g. weekly market) has an edge over existing payment methods.

*Offline use generally welcome but not essential*

The possibility of using a digital euro without an active internet connection is viewed positively by the majority of respondents. However, it is clear that respondents associate an offline functionality not with cash but with the existing cashless payment instruments. This is perceived as a potential advantage particularly in situations in which respondents have already experienced internet connectivity issues in the past when settling a cashless payment. Even so, a number of respondents expressed concerns about how far the offline use of a digital euro can be aligned with privacy consider-

ations. As a result, most respondents view offline use of a digital euro as a welcome feature, but not one that is essential in the future.

## Use as a store of value

Some respondents can indeed imagine converting larger amounts of cash or bank deposits into digital euro. These credit balances of digital euro would be held either for precautionary reasons or as a store of value or as reserves, eliminating the need to frequently convert book money into digital euro. However, the holding limits for a digital euro currently being discussed would discourage most respondents from using a digital euro in this way. For some respondents, a digital euro's function as a means of payment is clearly its predominant feature, while the low or zero remuneration it would probably offer makes it unattractive compared with other forms of investment.

*Digital euro not an attractive store of value for most respondents*

However, some respondents also view the holding limit of €3,000 that is currently under discussion as a barrier to using a digital euro as a means of payment. Higher earners, in particular, say this amount is too low to cover their day-to-day spending. Keeping a mental account of transactions in commercial bank deposit accounts and central bank money accounts, on the other hand, is described as complicated and inconvenient. Only lower earners do not regard the potential €3,000 holding limit as a hindrance for shifting the amount they use for day-to-day transactions into digital euro.

*Holding limit would also constrain use as a payment instrument*

## Conclusion

This article considers the relationship between cash, cashless payment instruments and a possible digital euro from the point of view of the consumer. In particular, it investigates the needs of the general public when choosing a payment method and illuminates the factors

*Impact of a possible digital euro?*

driving and impeding acceptance of a digital euro. Overall, there are still many questions surrounding the design of a digital euro. The studies carried out underscore how important it is to factor consumer opinion into future discussions on the potential features of a digital euro.

The analysis of the potential features of a digital euro shows that some of the user requirements for cash and pre-existing cashless payment instruments apply equally to a digital euro. The most important features of a digital euro include free and simple use, privacy, security with regard to data protection and universal usability. A digital euro is recognised as offering great potential with regard to data protection in particular. Individuals place great trust in the central bank when it comes to their data being handled transparently and securely. Particularly in the context of e-commerce, the ability to avoid private payment service providers is regarded as a major feature of the digital euro. By contrast, the fact that a digital euro is central bank money, and thus its key feature as a fail-safe means of payment, has little relevance for many people's daily lives. Furthermore, people's existing payment behaviour, behaviour routines and general attitude towards digitalisation have a major bearing on preferences with regard to a digital euro. In particular, committed cash users tend to be more sceptical about the digital euro. A digital euro is unlikely to be able to offer the same level of privacy as cash, which is why fears of surveillance, excessive data transparency and, more generally, data misuse are major drivers of the scepticism prevailing in this group.

The interviewees see a digital euro more as a form of money that will complement cash than replace it outright. This reinforces the Eurosystem's intention to offer the digital euro alongside and not instead of cash, should a decision be taken to launch it. A digital euro would be a new supplementary payment instrument with proprietary features, which would be offered alongside cash and traditional cashless payment instruments. Its usability would be more universal than physical currency, meaning that users would also be able to pay with central bank-issued money in a digital setting, counterbalancing a growing reliance on private payment systems. From a user perspective, a digital euro could offer a useful complement to cash but could not replace it in this respect. Very much in keeping with this approach, the Eurosystem cash strategy<sup>34</sup> adopted by the Governing Council of the European Central Bank aims to ensure that euro banknotes and coins will continue to be available and generally accepted as a means of payment and store of value in the future. Thus, for cash to be able to carry on performing its role in society, access to cash – be it via ATMs or from other sources – must be guaranteed and cash must remain widely accepted and usable as a means of payment. The general public will then be free to choose between cash, cashless payment instruments and perhaps also a digital euro in the future.

*Digital euro  
seen as comple-  
menting cash,  
not replacing it*

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<sup>34</sup> See European Central Bank (2021c) and Deutsche Bundesbank (2021d).

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