EUROPEAN CENTRAL BANK

EUROSYSTEM

Disclaimer

These questions are part of the public consultation on a digital euro. Responses should be submitted exclusively via the dedicated questionnaire before 12 January 2021, 23:59 CET.

Your views on a digital euro

The European Central Bank (ECB) and the national central banks of the euro area are together assessing whether to introduce a digital euro.

A digital euro would be an electronic form of central bank money accessible to all citizens and firms – like banknotes, but in a digital form – to make their daily payments in a fast, easy, costless and secure way. A digital euro would be introduced alongside cash; it would not replace it.

As part of the ongoing assessment, we want to hear the views of the public and of all interested stakeholders on the benefits and challenges of issuing a digital euro and on its possible design.

The following questionnaire is divided into two parts. The first part is aimed at the general public, while the second is targeted primarily at experts from the financial industry, technology companies and academia. However, respondents are welcome to provide feedback on any of the questions. The questions include references to the pertinent sections of the Eurosystem Report on a digital euro, which include additional details for the interested reader.

After the consultation period closes, all comments will be published on the ECB's website. For details on how personal data and contributions will be handled, please see the privacy statement below.

User perspective

We want to find out how people in the euro area would use a digital euro. We also want to understand the ways in which a digital euro could complement the existing payment methods you use. Your responses would help us design a digital euro that meets the needs of a broad range of users.

No	Question

1	How would you rank, in order of importance, the features that a digital euro should offer? a. I want it to be a secure means of payment. b. I want to be able to use it throughout the euro area. c. I want my payments to remain a private matter. d. I want to use a digital euro without having to pay additional costs e. I want it to be easy to use. f. I want my transactions to be completed instantaneously. g. I want to be able to pay even when there is no internet or power connection. h. I want to be able to use it with my smartphone and at payment terminals i. I want it to take the form of a dedicated physical device.
1 subquestion	Do you have any further comments about the ranking that you have indicated above?
2	Do you envisage any challenges associated with a digital euro that would prevent you or others from using it? If so, what are they? First on the substitution between commercial bank deposits and the digital euro. It is possible that people will not understand the difference between the digital euro and the euro on their bank accounts and thus not see the value added of the digital euro. For that reason, it is not clear to what extent they would be incentivized to convert their bank deposits into digital euro accounts. This is especially true if the user interface for the digital euro was sub-par compared to (well established and fully integrated) bank smartphone apps and offerings of stablecoins like Diem (former Libra) that are integrated with much used apps like Facebook and Whatsapp. One way to incentivize people to understand the difference between the digital euro and the commercial bank account is to gradually reduce the deposit guarantee.

	The other substitution is between cash and the digital euro. Especially compared to cash it is uncertain to what extent socially vulnerable groups would be included in the digital euro network. Here, an important question is whether shops will continue to accept cash. The digital euro may speed up the decline in the use of cash for payments, and hence increase the relative cost of cash payments, further incentivizing shop owners to accept only digital payments. However, for reasons of financial inclusion, cash payments may still be needed for specific 'digital-illiterate' groups. Lastly, some users would decline to use digital euro as a matter of principle, fearing the overreach of governmental powers and the centralization and collection of payment data on the part of a public body. For these reasons the ECB should not presume the digital euro will be used by all eurocitizens. In designing the digital euro the ECB needs to make sure that it is attractive enough to use for payments, ideally making it the primary payments account where the income is coming in. Through clear communication the advantage of the digital euro should be well understood from the beginning.
3	What user features should be considered to ensure a digital euro is accessible for people of all ages, including those who do not have a bank account or have disabilities? For more information, please refer to Requirements 2 and 12 in the Eurosystem Report on a digital euro. You should be able to convert digital into physical euro and back at 1/1 rate. You can do this using chip-cards you can charge at any store with an ATM. People should be given an account at the ECB/national CB that they can debit and credit with that chipcard. There are two different issues related to exclusion from the digital payments system: digital illiteracy and general social exclusion. A person might be well integrated into society, but lack knowledge, skills and physical ability to manipulate technology due to their age or disability, for example. Conversely, a person might have the know-how to use technology, but be unable to, due to poverty, precarious living situation, etc. These groups often converge, making the access to digital payments even more fraught. For the physically disabled and elderly it is conceivable that a physical device, akin to banking authorization devices, would need to be created. These would be clearly and unambiguously designed to accommodate the widest possible range of disabilities, while being as simple to use as possible. There are already non-touchscreen mobile phone devices targeting the elderly and/or visually impaired, so these could be a first approximation for development.

4	There are two approaches we can take to make a digital euro work, one that requires intermediaries to process the payment and one that doesn't. If we design a digital euro that has no need for the central bank or an intermediary to be involved in the processing of every single payment, this means that using a digital euro would feel closer to cash payments, but in digital form – you would be able to use the digital euro even when not connected to the internet, and your privacy and personal data would be better protected. The other approach is to design a digital euro with intermediaries recording the transaction. This would work online and allow broader potential for additional services to be provided to citizens and businesses, creating innovation opportunities and possible synergies with existing services. For example, it could make it easier to integrate a digital euro into currently available electronic banking services and applications. From your perspective, which of the following do you find most appealing? (select one): a. a digital euro focused on privacy and the protection of personal data, which can be used offline; b. a digital euro with broader potential for additional services, allowing innovative features and other benefits for citizens and businesses; c. a combination of both. For more information, please refer to Sections 5.1.5 and 6.1 of the Eurosystem Report on a digital euro. c. a combination of both.
4 subquestion	Do you have any further comments regarding your answer to the question above? The key feature that is appealing is that the digital euro can function as commercial bank money but is in fact default risk free and not financing the asset side of a commercial business. Hence the digital euro should have the benefits of deposits account and cash. Furthermore, payment privacy, immediacy and the possibility of offline payment are very valuable and thus it would be desirable for the final design of the digital euro to possess these features. However, there are good reasons to believe some of these properties would be difficult to attain, especially relative to cash. For instance, due to various 'digital trails', true anonymity is very hard to accomplish in a transaction. More relevantly, it is an open question to what extent opaqueness of money trails is desirable, given the various anti money laundering regulations. Secondly, offline payments can be fraught with issues. Firstly, true, cash-like, permanent offline settlement might never be achievable, as payment accounts ultimately need to synchronize and the central bank needs to account for all its digital euro. Secondly, due to disruptions and outages, offline settlements might expose one or both parties to settlement risk, so that one or both parties might risk losing funds.

	Nevertheless, privacy and offline settlement are important features of a digital currency and will attract various groups of society (privacy-conscious, those with limited internet connectivity, etc.). On the other hand, while innovation and staying relevant in the face of market pressures is admirable, there are competing considerations that might offset these. For instance, any additional technological demands (in the shape of smart contracts, for example) breed complexity, which may not necessarily be desirable. Increased complexity entails increased possibility of failure and increased attack surface by malicious actors. Therefore, some trade-off exists between keeping pace with the market on the one side and stability and reliability on the other. That said, it might be optimal for the central banks to propose an equal playing field framework that would be extensible with different software modules and add-ons by the private sector. These would enable, but not force, complexity in the heart of the private system.

Financial, payment and technology professionals' perspective

We want to hear from experts working in the financial and technology industries so that we can assess how a digital euro could be provided safely and efficiently. We want to make sure that its design would not inadvertently constrain industry-led solutions aimed at providing additional features or services which might also benefit citizens. We would also like to understand what role you or your organisation could play in facilitating or encouraging the use of a digital euro as an effective complement to cash.

No	Question
5	What role do you see for banks, payment institutions and other commercial entities in providing a digital euro to end users? For more information, please refer to Sections 5.1.1 and 6 of the Eurosystem Report on a digital euro. The so-called one-tier system – whereby the central bank would directly provide the services to the public – has encountered some scepticism, not least from the central banks themselves. The reasoning is that providing the retail roles, such as designing bank cards and smartphone apps, directly communicating with users, offering direct technical support would be unusual for the central bank to perform. As commercial banks and other private players have a richer history of this kind of work with the public, the conclusion is that it should fall to them to provide these kinds of services. Therefore, some kind of a hybrid or a two-tier model would be preferable, according to them. However, the private (banking) sector has also proven to be unable to cover the population homogenously with their services. Better financial inclusion is one of the main reasons for introducing CBDC. With that in mind, even in the case of a two-tier/hybrid system, it might be preferable for the central banks themselves to provide some basic, fallback services for the groups traditionally unsuccessfully served by the private sector as well as to put a floor in the market with regard to the service level and access to the digital euro.

	We agree with the fact that the private sector should play a prominent role in facilitating the interface of the digital euro. More concretely, we find that the central bank should be as neutral a player as possible, providing a level (technological) playing field to the private actors. These could, in turn, administer the digital euro accounts located at the central banks, and build up on them various services and compete on them between themselves. There are two issues to consider here. One is that of competition. Banks could consider digital euro accounts as a competition to their own bank deposits and might act so as to disadvantage the former on account of the latter. Thus, strict regulation is needed to guarantee equal playing field between the digital euro and traditional bank accounts. Secondly, as mentioned, banks traditionally have a poor track record of including marginalized groups in their services. Therefore, central banks, to the extent it is feasible, should work on various outreach programs and on-boarding services to enable access to digital euro to the widest possible reaches of society or regulate private initiatives to be inclusive.
6	A digital euro may allow banks and other entities to offer additional services, on top of simple payments, which could benefit citizens and businesses. What services, functionalities or use cases do you think are feasible and should be considered when developing a digital euro? For more information, please refer to Section 6 of the Eurosystem Report on a digital euro. The first advantage of the digital euro would be quick, seamless and cheap cross-border money transfer (currency fees notwithstanding). Sending money abroad is currently slow, uncertain, and can be charged at indeterminate fees. This is especially true in case of remittances outside the EU borders. While cross-border transfers in the Eurozone are usually reliable and relatively fast, although still not always instantaneous, transfers outside of the Eurozone bear risk and uncertainty due to a network of correspondent banks charging opaque fees. One reason for this high mark-up is certainly the stringency of KYC regulation. Nevertheless, this does not explain all of the troubles with cross-border transfers. This unreliability lead to creation of a slew of private actors, often offering more competitive prices than offered by commercial banks, and at better terms. While cross-border transfers are fraught with regulatory challenges, digital euro (and potentially other currencies) could present a blank slate-opportunity to resolve this complexity. With better multilateral regulation and agreements, and technological harmonization, friction-free international money transfers could become a reality. Secondly, banks should keep digital euros separate from the rest of their balance sheet. This should safeguard one of the main attractions of the digital euro – its safety – barring any technical outages or cyber-attacks. Thirdly, banks should enable quick, direct person-to-person transfers (through QR codes or using Near Field Communication [NFC] chips), akin to cash.

	In general, banks should clearly distinguish their personal banks deposits against the digital euro accounts and be legally required not to disfavor the latter on account of the former. Lastly, one of the main everyday advantages of CBDC for everyday users would be ending the overreliance on various private actors. Today the market for online payments is saturated with private actors: Stripe, iDeal, Adyen, Mollie, PayPal/Venmo in Europe and US; Alipay and Wechat in China; some traditional actors like banks and Visa/Mastercard; as well as the proposed Libra/Diem stablecoin. Consumers could be given an alternative for relying on this patchwork of private providers in the form of a public, electronic payment system.
7	What requirements (licensing or other) should intermediaries fulfil in order to provide digital euro services to households and businesses? Please base your answer on the current regulatory regime in the European Union.
8	Which solutions are best suited to avoiding counterfeiting and technical mistakes, including by possible intermediaries, to ensure that the amount of digital euro held by users in their digital wallets matches the amount that has been issued by the central bank? For more information, please refer to Section 6.3 of the Eurosystem Report on a digital euro.
9	What technical solutions (back-end infrastructure and/or at device level) could best facilitate cash-like features (e.g. privacy, offline use and usability for vulnerable groups)? For more information, please refer to Requirement 2 in the Eurosystem Report on a digital euro. Offline use would help users with limited data connectivity, and could rely on QR codes and/or NFC chips (as is already the case in the Chinese pilot project). However, ultimately these devices will need to come online to synchronize the changes with the centralised ledger. This will prevent double-spending and data (i.e. money) loss. Furthermore, it is uncertain to what extent any digital service might be made truly private. Encryption is naturally a must, but two issues still emerge. Firstly, truly private/anonymous transactions might contradict the anti-money laundering regulation. Secondly, assumedly there will always be groups of users sceptical of digital payments for whom no level of digital privacy will be enough, and cash will always be preferable. Alternatively, a simple chipcard can be introduced that can hold up to say 100 euro digital and needs to be linked to a fingerprint or PIN-code to be used in transactions. To be (re)charged in stores with an ATM or teller machine from the holder's ECB/national bank account.

10	What should be done to ensure an appropriate degree of privacy and protection of personal data in the use of a digital euro, taking into account anti-money laundering requirements, and combating the financing of terrorism and tax evasion? For more information, please refer to Section 5.1.2 of the Eurosystem Report on a digital euro. One exception that can be made, and has been made, to anti-money laundering legislation in digital payments is small-scale prepaid payment cards that do not require prior identification. Designing these cards with built-in transaction limits (e.g. up to EUR 100), and selling them at retail stores, might be a way to offer a small amount of anonymity in digital payments for privacy-conscious users.
11	The central bank could use several instruments to manage the quantity of digital euro in circulation (such as quantity limits or tiered remuneration), ensuring that the transmission of monetary policy would not be affected by shifts of large amounts of commercial bank money to holdings of digital euro. What is your assessment of these and other alternatives from an economic perspective? *(Tiered remuneration is when a central bank sets a certain remuneration on holding balances of digital euro up to a predefined amount and a lower remuneration for digital euro holding balances above that amount.)* For more information, please refer to Sections 3, 5.1.3 and 5.1.8 of the Eurosystem Report on a digital euro. Fear of bank runs and general financial instability has been present in the literature from the very start of the CBDC debate. While earlier proposals for remedying this situation included putting hard caps on CBDC accounts, more nuanced methods, such as account tiering, emerged more recently. The reasoning offered in the literature is that putting caps on digital euro accounts could be counterproductive. Hitting these caps will slow down or fully prevent certain transaction, which could negatively impact the unimpeded flow of payments. Namely, without the properly defined fallback option, it is not clear what would happen with the tranche of the transaction that is above the legally mandated limit. Hard caps could impede the central banks' role of maintaining a fully functional payment system as they would interrupt the smooth functioning of the payment traffic. A paper by the Danmarks Nationalbank (Danish central bank) claims that: "A fixed quota per account holder would limit the number or size of payments, since the recipient's ceiling would have to be observed for a payment to take place. […] It is not expedient for the ceiling to be reached, so that the payment cannot take place." As most citizens also have a current and/or saving account at a commercial bank it would be possible to transfer excess funds automatically to that account. However, this way a link is created between the digital euro and deposits at commercial institutions that may not be preferred. Another option would be for the excess digital euros to be stored on a 'cash' account at the central bank that, like cash, does not pay any interest. An option that is very close to a tiering option.

	Moreover, caps and inaccessibility of funds might be politically sensitive during the times of crises, as was shown in the 2008 crisis when the deposit guarantee scheme was expanded. Tiering, on the other hand, has the advantage of keeping the payments running uninterrupted. A negative rate on the top tier could arguably discourage users from keeping too many digital euros on their account, keep them from using their central bank account as a store of value. On the other hand, tiering might have a trade-off with stability in case of a bank run: when fleeing to safety at least some users will be largely indifferent toward the punitive top tier interest rates. The possibility of large-scale transfer of funds from the bank deposits into the digital euro accounts does not offer only risks, but benefits as well. The idea is that commercial banks, knowing that they could lose deposits (*en masse*) at any given time, would pre-emptively strengthen their balance sheets. The digital euro could this way play a disciplinary role, forcing equity build-up and an overall increase in financial stability of the system.
12	What is the best way to ensure that tiered remuneration does not negatively affect the usability of a digital euro, including the possibility of using it offline? For more information, please refer to Section 5.1.8 of the Eurosystem Report on a digital euro.
13	If a digital euro were subject to holding balance limits, what would be the best way to allow incoming payments above that limit to be shifted automatically into the user's private money account (for example, a commercial bank account) without affecting the ease of making and receiving payments? For more information, please refer to Section 5.1.3 of the Eurosystem Report on a digital euro. As discussed, limiting payments and putting caps on digital accounts is taken with some scepticism among some central banks. Nevertheless, in certain cases introducing limits might be desirable or even necessary. This raises the question of what is to be done in the situation that a transfer to an account would exceed the pre-determined limit. One way to do this is to have a back-up private account designated as a requirement for opening a digital euro account. That way, any excess amount of money would directly be transferred to the private account and be properly indicated. This way the payment would not be blocked upon reaching a limit, promoting a smooth payment experience.

14	What would be the best way to integrate a digital euro into existing banking and payment solutions/products (e.g. online and mobile banking, merchant systems)? What potential challenges need to be considered in the design of the technology and standards for the digital euro? For more information, please refer to Section 6.2 of the Eurosystem Report on a digital euro. One of the main advantages of CBDC in the literature that it would serve as a fall-back option or an alternative to the purely private payment system. Furthermore, in order to be accepted and taken up by the consumers, it should have at least feature-parity with the existing private payment solutions. That entails easy-to-use smartphone apps/wallets, payment cards, clear and understandable web payment solutions, instantaneous and free peer-to-peer transfers, easy and quick web integration. On top of this, private parties should be allowed to build customized add-on services, improving functionality and competing between themselves. This integration between the digital euro accounts and the private payment providers poses an issue. If any of these services collapse (due to a power outage, cyber-attack, bankruptcy), how to guarantee users access to their funds? One option going forward would be having a backup smartphone app or web interface connected to the user's digital euro account. That way, even if a private payment providers' service is (temporarily) discontinued, users would have access to their money. To sum up: CBs will need to provide a part of the infrastructure themselves, however without completely doubling the effort of private parties. Here a balance needs to be struck.
15	What features should the digital euro have to facilitate cross-currency payments? For more information, please refer to Scenario 6 in Section 2.2 of the Eurosystem Report on a digital euro. As discussed, cross-border and cross-currency payments currently are often expensive, take much time, can be cumbersome for senders, and uncertain in terms of what the fees are and what the final transferred amount will be. Reliance on international correspondent banks that charge opaque service and exchange rate fees and slow transfer times are off-putting to many users, making them rely on other private solutions. Central bank digital currencies might offer remedies. Firstly, multi-lateral agreements would need to be made, harmonizing international legislation with regards to know-your-customer (KYC) rules. Secondly, technical integration

	would need to be executed in order to ensure full technical compatibility between the payment systems of various central banks. This harmonization and integration would hopefully enable quicker, more reliable, and cheaper cross-border and cross-currency transfers. While some cots would remain, such as exchange rate and KYC checks, relying on fewer intermediaries would arguably push the costs down.
16	Should the use of the digital euro outside the euro area be limited and, if so, how? For more information, please refer to Requirement 13 in Section 3 of the Eurosystem Report on a digital euro. The discussion about the use of the digital euro outside of the Eurozone is tightly coupled with the ambitions of the ECB to promote the euro as a global currency. Enabling non-Eurozone citizens to hold the digital euro might promote this ambition. However, some risks would also need to be taken into account. For instance, the international use of digital euros might strengthen the currency, negatively impacting Eurozone's exporting sectors. Furthermore, as the digital euro is more widespread globally, more countries and industries would rely on ECB's monetary policy, further complicating its task. Related to that, these outside agents would more acutely feel the knock-on effects of the economic circumstances in the Eurozone. Lastly, some less developed countries might be 'euroized', akin to the many currently dollarized countries in the world. The further question is the level of insight that the Eurozone central banks would have in these holdings and transactions. This is especially true if digital euro is envisioned to have cash-like properties with offline payment possibilities. In that case, Eurozone central banks could impose limits so as to prevent criminal uses of the digital euro, as cash euros are prominent for this use case. These could be in the shape of limitations on holdings, limitations on transactions or both. Geolocation services might be used to detect foreign activity in digital euro and impose these limitations.
17	Which software and hardware solutions (e.g. mobile phones, computers, smartcards, wearables) could be adapted for a digital euro? For more information, please refer to Section 6.2 of the Eurosystem Report on a digital euro.
18	What role can you or your organisation play in facilitating the appropriate design and uptake of a digital euro as an effective means of payment? Our organisations (universities) can help set up, monitor and analyse the data that come from experiments that are necessary to test designs and establish the various behavioural parameters that seriously affect the case for the digital euro.

	Such as the tendency of people to run their bank in times of trouble when an ECB alternative is available. And their tendency to move large sums into commercial banking at small interest differentials. As well as (help) build models that can predict how the monetary system would function under different parameter constellations. It seems that agent based models that can aggregate over large numbers of heterogeneous agents seem most appropriate for analysing the possible impacts of introducing a digital euro in one way or another.