EUROPEAN CENTRAL BANK

EUROSYSTEM

Fit of the digital euro in the payment ecosystem

Report on the dedicated Euro Retail Payments Board (ERPB) technical workstream

October 2025

Contents

1 Executive summary

The “Fit of the digital euro in the payment ecosystem” workstream was launched to explore the benefits and potential challenges of introducing the digital euro into the current and future payment landscape.

Transparency and collaboration with stakeholders are a cornerstone of the digital euro project. The Eurosystem has engaged market stakeholders closely from the start through Euro Retail Payments Board (ERPB) technical sessions on digital euro. With the knowledge of market experts and practitioners, from both the supply and demand side of the retail payments market, the European Central Bank (ECB) is convinced that it will be able to design a digital euro that addresses and balances the needs and preferences of its different stakeholders.

Not all market stakeholders reached consensus on the topics and arguments proposed by the ECB that were discussed during the technical sessions. There were also disagreements between the different stakeholder groups themselves. This document reflects the ECB’s perspective throughout and specifically highlights diverging opinions from stakeholder groups where they were raised. As it was not possible to incorporate all comments into this document, the ECB has prioritised the most significant ones. All original feedback provided by stakeholders can be found in the annex section of this report: Written feedback provided by market stakeholders.

A fundamental policy objective of the digital euro is to serve as a “digital banknote” – essentially a digital version of cash – that will complement the existing payment landscape, co-existing with both cash and private sector solutions. This objective makes the digital euro’s “fit in the payment ecosystem” a key topic for policymakers, lawmakers and market stakeholders alike. The ECB therefore engaged extensively with market stakeholders from the third quarter of 2024 to the third quarter of 2025 under the umbrella of the “fit of the digital euro in the payment ecosystem” workstream through the ERPB technical sessions on the digital euro. This engagement was tailored to each group of ERPB stakeholders: (i) bank and non-bank payment service providers (PSPs), (ii) merchants, and (iii) consumers, involving twelve associations and more than thirty participants.[1]

This report focuses on the outcomes of this work, on how the digital euro fits into the payment ecosystem and on how it can co-exist with private sector solutions and cash. It also summarises the themes discussed during the sessions, points out potential benefits and challenges identified with stakeholders, and recommends topics for further public-private collaboration to maximise benefits and mitigate risks. Some of these topics lie fully within the remit of the Eurosystem, while for others the report might provide input for the co-legislators to take into consideration. For all recommendations, the key policy objectives of a digital euro have been considered.

The Eurosystem believes that the digital euro offers potential advantages, which have been acknowledged by all market stakeholders, albeit with differing levels of consensus and support. While merchants and consumers

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1 A complete list of associations can be found in the Annex – ERPB association participants in the fit in the payment ecosystem workstream.

generally perceive significant benefits, provided certain requirements are met, the banking sector has expressed more doubts regarding its advantages. The following advantages stand out:

- The digital euro presents an opportunity to enhance competitiveness in the European payment landscape by strengthening the negotiation position of European PSP and merchants. PSPs highlighted that such benefits might be limited.
- By making use of open digital euro standards, PSPs and account-to-account (A2A) schemes can voluntarily integrate the digital euro into their payment solutions and/or co-badge it on physical cards, mitigating the risk of disintermediation for domestic and regional card schemes.
- The digital euro would establish a "common acceptance layer" for A2A payments, facilitating seamless transactions across point-of-sale (POS) and e-commerce platforms. This integration would enable European payment solutions to expand their reach across the euro area without the need for proprietary acceptance networks.

Also, the full reach achieved through mandatory acceptance of the digital euro could increase the rate of return on investments in innovative products and services, as outlined in the parallel work on the innovation potential embedded in the digital euro.

Market stakeholders have emphasised that certain requirements need to be fulfilled in order to ensure the digital euro reaches its full potential (as outlined throughout this document), and in particular have emphasised the importance of the digital euro co-existing seamlessly with existing solutions in the European payment landscape.

To ensure this seamless integration, both the Eurosystem and market stakeholders have stressed the importance of implementing the digital euro in the most cost-effective manner possible, also assessing the room for optimising the current design without reducing its scope and use cases. To achieve this, it was agreed that the optimal approach would be to leverage existing standards and solutions to the greatest extent feasible, as already explored by the Rulebook Development Group (RDG). Additionally, a phased roll-out of functionalities would enable costs and resources to be spread over time while focusing on essential use cases first, ensuring broad adoption. Finally, a joint roadmap for the digital euro should be established, agreeing on which functionalities or use cases to include during its roll-out. Alongside the continued development of current or emerging (pan-) European solutions, this would offer the most cost-efficient path forward for all market stakeholders.

This report serves as both the conclusion of the dedicated engagement stream and the foundation for future, mutually beneficial collaboration after the publication of this report. Such collaboration should now focus on agreeing on concrete measures to maximise potential benefits and addressing the risks identified in this report.

The measures already identified in collaboration with stakeholders during the workstream focus on establishing how the digital euro will co-exist with private sector European card and A2A schemes, taking advantage of existing infrastructure and utilising the work of the Rulebook Development Group (RDG) to ensure maximum cost efficiency. An analysis is also needed to guarantee a fair distribution of liabilities and compensation between PSPs and end users. Further collaboration with stakeholders will be carried out to detail the characteristics of the offline functionality of the digital euro, as well as its fraud risk management framework.

The ECB intends to continue its joint work with the ERPB. However, considering the nature of the proposed follow-up activities and the resource constraints faced by merchant and consumer representatives, certain tasks may be carried out separately with PSPs. The outcomes of this work will then be reported back at joint ERPB sessions for further discussion and alignment.

2 Background, objectives and structure of the report

Background and objectives

In October 2024, the ECB initiated a dedicated market engagement stream on the digital euro's fit in the payment ecosystem through the ERPB. This engagement stream built on the extensive engagement efforts made during both the investigation phase (October 2021-October 2023) and the first half of the preparation phase (November 2023-October 2024). One of its key objectives was to assess how the digital euro could support European payment service providers (PSPs), merchants and consumers.[2] To address all related aspects, a total of eight technical sessions were held, specifically tailored to PSPs, merchants and consumers, as well as a dedicated two-day in-person concluding workshop involving all stakeholders.

The technical sessions held between November 2024 and April 2025 addressed PSP-centric topics on the three core themes of "competition", "synergies" and "business model", with additional input from merchants and consumers.

The primary objective of the "**competition**" theme was to analyse the potential impact of the digital euro on the strategic relevance of EU PSPs in comparison with global and local/regional players. Topics addressed under this theme included how the digital euro could enhance the bargaining power of EU PSPs by offering a fully accepted alternative scheme without scheme or processing fees, increase overall payment volumes, and standardise the European front-end acceptance infrastructure. Particular attention was given to the co-existence of the digital euro with domestic and regional card and A2A schemes.

The "**synergies**" theme focused on identifying factors that could maximise cost efficiency across the full value chain. Strong synergies between the digital euro and the European payment ecosystem could arise specifically from the creation and adoption of open European acceptance standards, and from facilitating interoperability with existing European payment solutions.

The "**business model**" theme aimed to assess the impact of the digital euro on the business models of EU PSPs. Several key factors were analysed under this theme, including minimising potential investment and maintenance efforts, the compensation model and potential remedies to perceived risks and unintended consequences, "open funding" (subject to co-legislators' decisions), and the business opportunities for intermediaries to offer value added services.

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2 European Central Bank (2024), "Fit of the digital euro in the payment ecosystem" – agenda item 2.

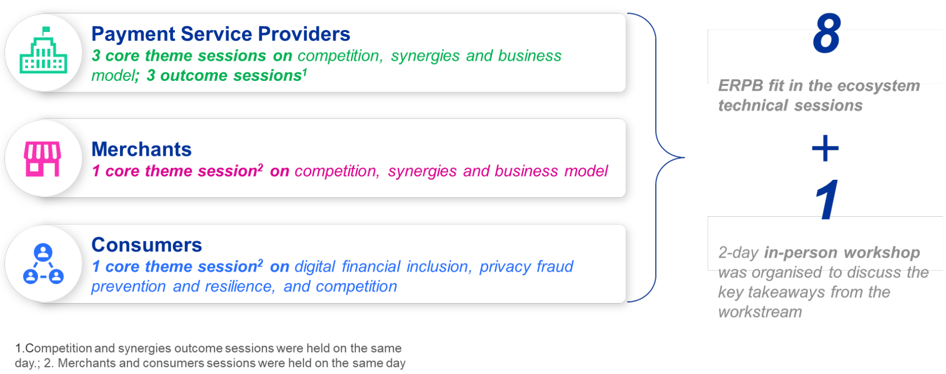
In addition to ongoing work within the ERPB sessions, the ECB's engagement with PSPs included four days of non-ERPB technical workshops focused on PSP-specific topics (e.g. calibration of holding limit).

Two separate sets of topics with stronger emphasis on merchants and consumers were also discussed, with additional input from PSPs. The discussions tailored to end users were initiated during the ERPB technical session on the digital euro in April 2025.

For merchants, the same three core themes were explored as for PSPs – "competition", "synergies", and "business model" – with a focus on the benefits and risks that these dimensions could offer to merchants. For consumers, the discussions centred on the themes of "digital financial inclusion", "privacy, fraud prevention and resilience" and "competition".

In addition to ongoing work within the ERPB sessions, the ECB's merchant and consumer stakeholder engagement included high-level non-ERPB meetings with merchants attended by Executive Board member Piero Cipollone, as well as a technical workshop focused on merchant and consumer-specific topics.

Figure 1
Engagement with market stakeholders on fit in the payment ecosystem



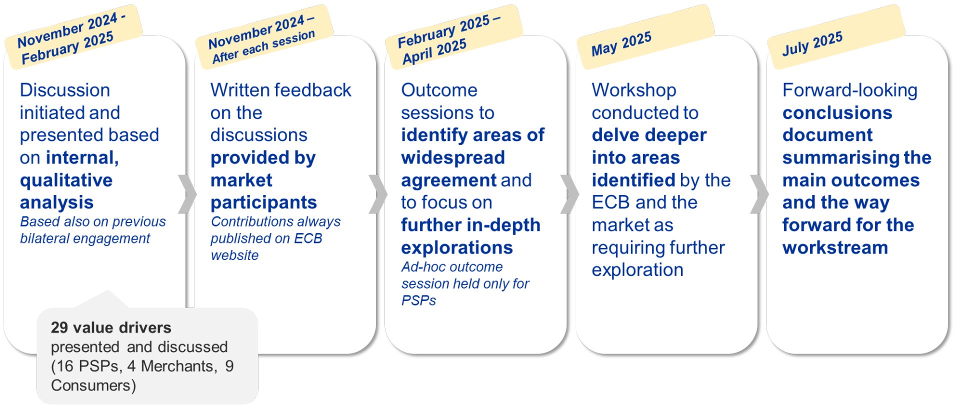
Each session was structured around a presentation[3] **outlining the ECB's value proposition and describing 29 suggested value drivers**[4]**. All presentations were shared in advance to stimulate discussion and encourage active participation.** Participants were invited to share their own suggestions and viewpoints and respond to the ECB's value drivers. Following each session, written feedback was requested from all participants and was subsequently published on the ECB's digital euro website (165 detailed comments on the value drivers were

3 Complete list of presentations presented during the workstream can be found in the Annex – Presentations delivered during the technical sessions and workshop.

4 Complete list of value drivers presented during the workstream can be found in the Annex – Value drivers of the fit of the digital euro in the payment ecosystem workstream.

received, along with additional general comments on the specific sessions).[5] An outcome session for each theme concluded the respective topics.

Figure 2
Structure and timeline of the workstream



In the kick-off session, the ECB reiterated the Eurosystem's commitment to creating a digital euro that benefits all stakeholders – consumers, PSPs and merchants.

Although dedicated engagement on "fit in the payment ecosystem" was appreciated, stakeholder views differed and occasionally were mutually incompatible, or incompatible with the views of the ECB. Feedback on the value drivers presented was generally mixed. Amongst the three themes that prioritised themes for intermediairies, PSPs saw most benefits in the value drivers related to "synergies", such as integrating the digital euro into established private solutions, reusing well-established and widely used standards and processes, and facilitating "digital euro as a service". In other instances, for example on the compensation model, views between stakeholder groups differed, notably between PSPs and merchants and/or consumers, but also between banks and non-bank PSPs. Next to this, both merchant and consumer representatives highly appreciated the targeted discussions aimed primarily at their interests. Merchants recognised the value of the digital euro, especially due the expectation of a lower merchant service charge (MSC) as a result of there being no scheme or processing fees. Consumers highly appreciated the digital euro's strong emphasis on privacy.

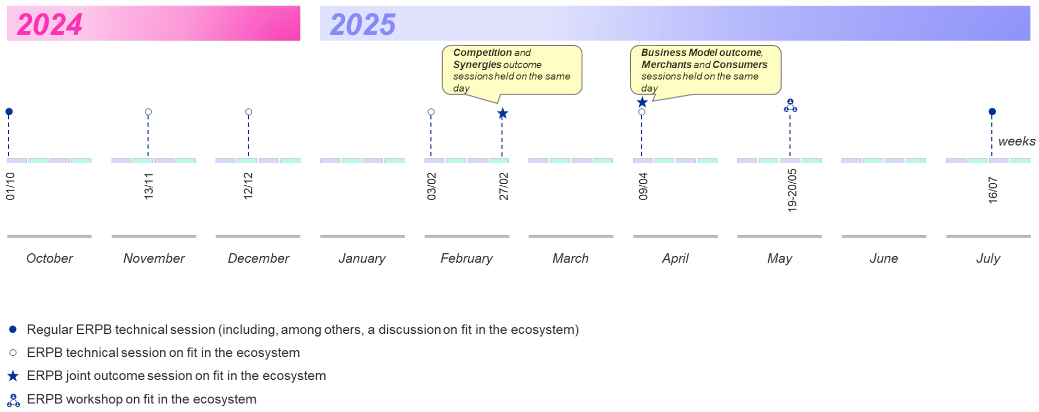
Following the technical sessions, a two-day workshop was held in Frankfurt in May 2025. It aimed to further explore topics that had generated significant interest and requests for deeper discussions from stakeholders. Based on productive discussions among participants, the ECB drafted provisional conclusions t of the

5 Detailed written feedback can be found in the Annex – Written feedback provided by market stakeholders.

engagement and outlined the path forward for future collaboration. These were reviewed and adopted with amendments from all stakeholders accommodated.

This report summarises the feedback gathered from all stakeholders who participated in the "fit in the payment ecosystem" technical sessions and workshop, as well as written feedback shared afterwards. It also provides an overview of the topics discussed from the ECB's perspective, along with the conclusions drawn from the interactions with market stakeholders.

Figure 3
Timeline of the workstream



Structure of the report

Chapters 3-7 provide the main substance of this report. They outline the topics discussed during the entire workstream and specifically during the workshop, highlighting areas where (i) further engagement is warranted, (ii) no joint agreement could be reached (nor a sufficiently broad "coalition of the willing"), and (iii) no follow-up action is warranted. Each section in the following chapters is structured as follows:

1. **Description of input**: this section outlines the ECB's synthesised perspective based on the feedback received from stakeholders, whether during the technical session or through written submissions. It also includes the key reasons for either supporting or disagreeing with the stakeholder feedback. In addition, it summarises the input received from all stakeholders during both the technical sessions and the workshop. The summary is designed to outline only the key messages, e.g. those repeatedly emphasised by stakeholders. All original feedback provided by stakeholders can be found in the annex section of this report: Written feedback provided by market stakeholders.

2. **Conclusion and proposed next steps**: this subsection presents the proposed joint agreements or points of disagreement between the ECB and the ERPB representative on the topics discussed.

Note that the titles of the chapters below may differ from the themes and value driver names presented to the ERPB participants during the workstream. Themes below focus on the topics that were deemed most relevant and critical for in-depth analysis by the ECB and participants during the workstream and after the workshop.

3 Competition

The primary objective of the digital euro is to make retail central bank money fit for a digital age. This will ensure it helps safeguard strategic monetary sovereignty, creates additional resilience, maintains the highest possible privacy and strengthens the role of the euro. Moreover, the digital euro offers distinct benefits for end users by being accessible to all consumers and accepted everywhere in the euro area. Accompanied by its own scheme rulebook and underpinned by European legislation, the digital euro can also strengthen the innovativeness and competitiveness of the European retail payments market, serving as a platform for innovation and value-added services that could be built on top of it.[6]

Under the **competition** theme, two key topics were further explored:

1. **benefiting from the digital euro without diminishing domestic or regional European schemes**
2. **enhancing competition with global digital wallets and X-Pays**

3.1 Benefiting from the digital euro without diminishing domestic or regional European schemes

The ECB believes that the digital euro is designed as a basic means of payment, leaving room for PSPs to develop value added services that can be built on top of it to be monetised. The design foresees the possibility – but no obligation – of integration in private solutions, for instance through co-badging on physical cards and in existing digital wallets. In both instances the digital euro could be the "fall-back" that enables full pan-European reach while preserving the market share of domestic or regional schemes where and to the extent they are accepted. Domestic or regional schemes (e.g. Girocard as a card-based scheme or Bizum as an A2A solution) are generally well-functioning and low-cost yet differ in levels of market share, penetration and adoption across use cases.

According to the ECB, today, there is no pan-European private solution that addresses all three use cases envisioned for the digital euro across all euro area countries, that is person-to-person payments, online payments and physical stores. In addition to a fragmented landscape, European private solutions continue to have limited penetration, particularly at the physical POS.

For the ECB, the digital euro aims to enable those domestic or regional schemes to scale up across various use cases and across borders, facilitating easier, broader and more efficient acceptance of European private sector solutions. Despite concerns from PSPs that the mandatory acceptance of the digital euro could create an uneven playing field with private sector solutions, European

6 For further information on the dedicated workstream: Digital euro innovation platform

PSPs could generally benefit from the scale-up opportunities facilitated by the digital euro. Benefits could primarily come from increased geographical reach and use cases that are not yet served, thanks to the introduction of a common acceptance layer.

From the perspective of the ECB, a key value driver pursued by the digital euro project is to empower PSPs to negotiate more favourable conditions with ICS, which have captured considerable market share from domestic card schemes for various reasons. First, domestic schemes do not (yet) offer comparable geographical reach or a comparable portfolio of use cases. Second, rapidly expanding X-Pays initially did not support domestic schemes, creating a mechanical migration of domestic card transactions to ICS transactions.[7] Third, fast-growing pan-European banks and neobanks opted for the simplicity of offering one-card/one-scheme solutions (using one of the two ICS) to all customers. Finally, ICS offered attractive packages with very low fees to issuers willing to migrate away from domestic schemes. At the same time, fees for acquirers were raised, as acquirers effectively have to accept both major ICS in order to have a viable offering for merchants that also need to accept both. Without a strong domestic or regional card or A2A scheme for all relevant use cases that is accepted everywhere in the euro area, the negotiating position of PSPs versus ICS remains limited (as a result ICS facilitated 64% of all electronically initiated transactions with cards issued in the euro area in 2023, up from 62% in 2022).[8]

The Eurosystem carries its own cost for settlement infrastructure and, unlike ICS, would not charge scheme fees (i.e. fees charged by card networks for processing credit and debit card transactions, typically paid by scheme members). Savings would therefore go directly to distributing PSPs and other digital euro ecosystem participants, including ultimately end users.

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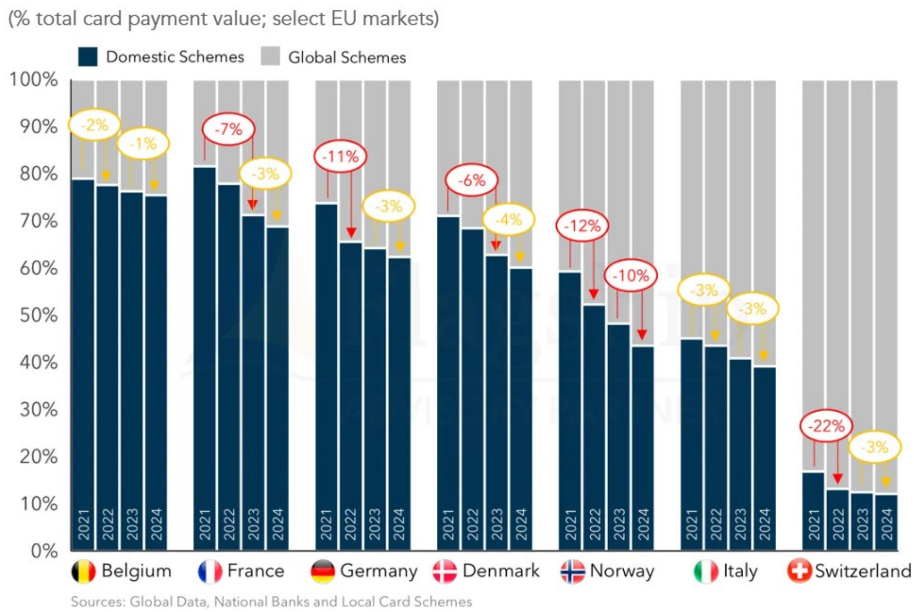
7 For example, Commerzbank announced it would support Apple Pay via Girocard in November 2024 and to date German cooperative banks support Apple Pay only via Visa or MasterCard.

8 This is the volume share of international card schemes of total electronically initiated card payments with cards issued in the euro area and transactions carried out worldwide for the first half of 2023 and the full year 2022, respectively. It is based on data collected under Regulation (EU) No 1409/2013 of the European Central Bank on payments statistics (ECB/2013/43) (OJ L 352, 24.12.2013, p. 18).

Figure 4

Europe's local card schemes on a steady decline – changes in domestic schemes' card payment value share[9]



PSPs, however, do not agree with the economics of the value driver of enhanced bargaining power and stressed that ICS rebates make the net effects uncertain. From an acceptance point of view, it is possible that neither merchants nor their PSPs effectively gain stronger negotiating power, assuming that ICS acceptance remains de facto mandatory, while distributing ICS-based solutions may remain necessary to cover payment use cases outside the euro area. Additionally, the availability of a cheaper alternative, like the digital euro, could prompt ICS to offer higher incentives for PSPs and thereby influence consumer choices in favour of ICS. ICS might offer higher discounts to issuers and invest more in marketing targeted at consumers.

With regard to distribution, PSPs are concerned that the digital euro may capture transactions from European private solutions rather than ICS. In addition, if the digital euro captures ICS transactions, the need to keep offering or accepting ICS at reduced transaction volumes may result in higher ICS costs per transaction due to loss of volume discounts (i.e. lower economies of scale).

While merchants expect limited opportunities to negotiate more favourable conditions with ICS, they acknowledge the significant advantage of the absence of scheme and processing fees for the digital euro. They also emphasised and reiterated the ECB's point of view that broader adoption of pan-European private sector solutions could enhance fee transparency (further explained

[9] Flagship Advisory Partners (2025), "European Local Card Schemes: Pace of Market Share Losses Declines", 23 September.

in Chapter 6.2), foster overall competition in the payments market, and lower the cost of digital payments compared to the current fragmented payment landscape.

Consumers expressed general concerns about the European payment landscape's reliance on non-European schemes. The digital euro therefore presents an opportunity to position European solutions at the forefront of the payments market by addressing Europe's coordination challenges in fragmented national markets.

Conclusions

While there was broad alignment on the topics discussed among consumers, merchants and the ECB, issuing and acquiring PSPs remain sceptical of the ECB's value drivers regarding competition.

The ECB and workstream participants concluded that the mandatory acceptance of the digital euro and the absence of scheme and processing fees (subject to a fair and suitable compensation model) may make merchants, and possibly to a lesser extent intermediaries, better off. This conclusion would hold true if the benefits of a potentially better negotiating position with regard to ICS (the indirect channel) and a carefully balanced compensation model (the direct channel) outweighed the downsides of potentially lower ICS volumes for economies of scale. Generally, both benefits could apply, especially for those markets where there is no domestic or regional card scheme or where such a scheme has limited penetration.

PSPs, in stark contrast with the ECB perspective, were the only ones to argue that where domestic card schemes still enjoy a strong market position or where A2A schemes have a strong or fast-growing position in e-commerce – with potential plans to expand to in-store payments – the digital euro is more likely to disincentivise the development of those solutions. The ECB believes that the digital euro will not discourage domestic card or A2A schemes that hold a strong or rapidly growing position, as there is no need for additional incentives to gain a stronger market position in these cases. Even if new solutions or services are planned, the digital euro is expected to act as an accelerator, as these solutions would benefit from access to a system of open standards, enabling them to be accepted by merchants without requiring an upgrade to their checkout environment. Moreover, contrary to the views of PSPs, the ECB believes that differences in scheme fees between domestic card and A2A solutions and ICS – with domestic or A2A scheme fees for merchants in most European countries expected to be on a par with the digital euro and therefore cheaper than ICS – make it far more likely in terms of merchant steering preference that the digital euro will displace ICS rather than domestic or A2A schemes. In addition, scheme fees are part of the MSC, and the MSC for the digital euro will be lower than that of ICS and similar to domestic or regional card schemes or A2A. Therefore, merchants are unlikely to promote the digital euro over domestic or regional card schemes or A2A.

The ECB and all stakeholders agreed that one avenue to address the potential risk of stifling European private sector initiatives is voluntary "co-branding/co-

badging" of the digital euro with domestic brand physical cards or digital wallets. In the "co-branding/co-badging" scenario, the private sector schemes would be the preferred brand wherever they are accepted, and the digital euro would be the fall-back solution wherever the private sector scheme is not (yet) accepted. This could provide a low-cost alternative to interoperability initiatives between domestic/regional solutions. It could also reduce dependency on ICS, essentially requiring them only for non-euro payments and/or as a premium product and help domestic providers to create reach across the euro area.

More joint work on "co-branding/co-badging" is needed to assess business logic as well as technical feasibility, while also allowing for merchant preference and preserving final consumer choice. Both for co-badging and, in particular, possible tri-badging, the ECB needs to work with the market to ensure that the customer experience does not deteriorate. In addition, the European Card Payment Association (ECPA) has contributed to the visionary workstream of the Innovation Partnership and has already carried out a preliminary assessment, which could serve as input for the assessment proposed here.

3.2 Enhancing competition with global digital wallets and X-Pays

For the ECB, in the current payment landscape, European PSPs' solutions have little choice but to surrender significant revenue to global digital wallets (e.g. PayPal or Alipay) and X-Pays (e.g. Apple Pay or Google Pay), and with it also risk losing consumer relationships and exclusive access to consumer data. By shifting a portion of digital wallet and X-Pay transaction volumes to the digital euro, distributing PSPs could directly benefit and potentially increase their profitability.

Global digital wallets are payment solutions that combine stored value functionality and staged (linked account) transactions. Stored value functionality enables users to preload funds into the wallet, while staged functionality allows them to link payment credentials, such as a bank account or credit card, to carry out transactions directly through the payment network without holding funds in the wallet. In contrast, X-Pays are classified as pass-through wallets, as they provide only staged functionality.

From the perspective of the ECB, the digital euro Regulation, in conjunction with the Digital Markets Act (DMA), may reduce PSPs' need to rely on global digital wallets and X-Pays and be bound to their fees or data-sharing requirements for consumers. The DMA is the EU's law to make the markets in the digital sector fairer and more contestable. With the introduction of the DMA, European PSPs are now able to freely choose which digital wallet their customers can use to make payments. Previously, PSPs were restricted to using the contactless payment technology NFC (near-field communication) developed by smartphone manufacturers. The digital euro Regulation would also enable PSPs to avoid relying on manufacturers' proprietary solutions, allowing them to freely choose their preferred options. This could reduce PSPs' dependence on single global digital wallets or X-Pays, which often charge significant fees. To give an example, one well-known X-Pay's fees are believed to be around 8 basis points (bps) for POS and 12 bps for e-commerce.[10]

In the view of the ECB, to position the digital euro as a true alternative to global digital wallets and X-Pays, consumer trust and widespread adoption of the digital euro would be crucial. Efforts would need to focus on educating consumers about the benefits of the digital euro, such as wide acceptance in the whole Eurozone and enhanced privacy compared to existing global digital wallets. The digital euro must integrate seamlessly with existing payment systems to ensure smooth operation and avoid disruptions for users. This means designing a common acceptance layer and ensuring compatibility with current standards. In particular, the common acceptance layer would enable the establishment of harmonised acceptance standards within the European payment ecosystem. As a result, European payment options could expand their geographical reach within Europe without the need to establish a proprietary technical acceptance network. Nevertheless, merchants and some PSPs expressed concern that it would be challenging to persuade current wallet and X-Pay users to switch to other wallets or apps due to the unmatched convenience, ease of use and speed these wallets offer.

10 ECB assumptions on the basis of information from Roland Berger.

Figure 5

Estimated fees paid to a major X-Pay player, split by POS and e-commerce use cases

Although the X-Pay fees lie in the range of a few basis points, they erode a large portion of received interchange fees.[11] Demand from consumers nonetheless requires banks to offer the X-Pay player at a reduction of their overall margin.

Indicative

	X-Pay player PoS	X-Pay player E-Com	Digital euro All consumer banks
1 Interchange fee	+ 0.20%	+ 0.20%	variable or fixed fee
2 Scheme fee	- 0.11%1)	- 0.11%1)	-
3 X-Pay player fee	- 0.08%2)	- 0.12%2) (-0.02% to -0.03% for 3DS)2)	-
Profit	**0.01%**	**- 0.03%** (-0.05% to -0.06% incl. 3DS)	**variable or fixed fee**

1) Roland Berger analysis; 2) ECB assumptions.

The ECB believes that it is the responsibility of European PSPs to determine how they will offer the digital euro to their clients. PSPs may opt to provide access through their own applications or solutions, enable clients to utilise the digital euro wallet expected to be developed by the Eurosystem, or facilitate its integration into third-party wallets.

The ECB's fundamental principle for global digital wallets and X-Pays, as for any participant in the digital euro scheme, is "same rights, same obligations". In practice, the digital euro Regulation and the digital euro scheme rulebook must ensure equal conditions for all participants, preventing any selective application of rights without corresponding obligations. At the same time, within the EU's free market economy, all PSPs would have rights and obligations to distribute the digital euro commensurate with their respective licences.

For bank PSPs it is important to ensure that global digital wallets and X-Pays do not disproportionately benefit from distributing the digital euro by focusing on providing only the front-end solution to end users (further details on this topic, i.e. "open funding", can be found on chapter 5.2 of this report). They also noted that the digital euro Regulation does not prohibit global digital wallet and X-Pay fees for PSPs and that the fee economics remain uncertain. The application of

[11] The interchange fee shown in the figure (+0.20%) represents the highest possible fee, since fees are lower in countries using the Member State option in the Interchange Fee Regulation.

the principle of “same rights, same obligations” to global digital wallets and X-Pays requires specific digital euro scheme rulebook provisions. In fact, the recent opening of the NFC has allowed big tech companies to attempt to gain market share. For bank PSPs, contrary to the ECB's perspective outlined in this chapter, it is uncertain whether the ECB and the digital euro can outperform these companies. Suggestions include clarifying the role of global digital wallets and X-Pays in the digital euro scheme rulebook, defining basic and premium services, and preventing big tech companies from gaining an unfair advantage. There is a risk that global digital wallets and X-Pays might distribute the digital euro without engaging in necessary banking activities, leaving the costs to the European players.

Non-bank PSPs, on the other hand, seek to sustain fair competition within the digital euro framework, allowing participation from both European and non-European companies provided they adhere to established rules and branding guidelines.

The ECB sustains that the introduction of the digital euro could provide economic advantages to all ecosystem participants compared to the current use of global digital wallets and X-Pays. The digital euro could offer comparable compensation for PSPs, but without the scheme and processing fees of the ICS most commonly used in conjunction with global digital wallets and X-Pays, and without the need to rely on and pay separate fees to global digital wallets and X-Pays. Part of these savings (specifically the acquiring benefits) can be expected to be passed on to merchants. For example, one well-known digital wallet has significantly expanded its penetration in Europe, effectively capturing a substantial portion of the PSPs’ interchange fee, which is the main revenue stream for distributing (issuing) PSPs.[12] X-Pays have so far been the most visible and widely used mobile-based payment solution for European cards, thanks to their native device integration and, in some cases, because they were until recently the only available option. The introduction of the digital euro ensures that consumers can make NFC payments without relying on X-Pays and the associated costs.[13] Therefore, for every transaction that would otherwise occur via ICS and X-Pays, issuing banks could save on both ICS scheme and processing fees and X-Pay fees.

Consumers voiced widespread concern that PSPs in several European countries have decided to discontinue or avoid offering their own wallet solutions for mobile card payments, opting instead to support global digital wallets and X-Pays. For consumers, this means having to rely on a third-party solution from a big tech company, which raises privacy concerns given big tech’s questionable reputation in terms of compliance with GDPR and other consumer protection law. Despite being a key consumer interface, wallets are largely unregulated under the revised Payment Services Directive (as well as the forthcoming Payment Services Regulation), as they are categorised as technical service providers.

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12 Banks are a type of payment service provider that may act in different capacities as either distributor (vis-à-vis consumers), acquirer (vis-à-vis merchants) or both.

13 This would complement existing private solutions already taking advantage of the opening of NFC technology (e.g. Vipps MobilePay).

Conclusions

The ECB and market representatives concluded that all participants in the digital euro ecosystem must operate under the "same rights, same obligations" principle. PSPs, however, remain sceptical of the ECB's considerations on these aspects. The ECB believes that this approach is essential to ensuring a level playing field for all parties and preventing global digital wallets and X-Pays from gaining undue advantages through the introduction of the digital euro. It is also a prerequisite for guaranteeing a harmonised user experience and a key factor for consumer adoption. This principle may need to be laid down in both the digital euro legislation and the scheme rulebook. Nonetheless, the ECB encourages banks to explore the distribution of the digital euro through domestic and regional digital solutions, which could enhance the relevance of these platforms and wallets. Additionally, banks may consider utilising global digital wallets and X-Pays, provided they comply with the digital euro Regulation and the scheme rulebook.

While all stakeholders support innovation and fair access, the co-legislators should be made aware of some understandable concerns from certain stakeholders about non-EU big tech dominance. The ECB advocated for a "fair for all" business model, aiming to minimise risks for all actors. Among other aspects, this issue (i.e. "open funding", further elaborated in Chapter 5.2 of this report) is part of the draft legislation, which falls within the remit of the co-legislators.

The ECB will continue advocating access to hardware and software features of mobile devices for the digital euro, although any decisions are fully in the remit of co-legislators. However, non-bank PSPs do not see the need for a duplication of this access requirement (as the DMA already covers access to NFC antenna and the Secure Element) for the digital euro.

4 Synergies

Designed to co-exist with and reinforce private payment solutions, the digital euro aims to strengthen European sovereignty in payments. Establishing a common acceptance network for A2A payments that can be used by the private sector is key in this context. To further ensure a seamless and efficient introduction of the digital euro with minimal effort, the Eurosystem has proposed a phased roll-out approach. Furthermore, the Eurosystem strives to provide users with the flexibility to access the digital euro through their own PSP's solutions (e.g. through their bank of choice) or potentially via third-party wallet providers. Such integration, whether within PSPs' apps or through third-party wallets, will focus on delivering a prominent, user-friendly solution that encourages consumers to adopt the digital euro as a trusted and convenient payment method. However, this integration will remain optional, as consumers will also have the alternative (i.e. a fall-back) of accessing the digital euro through the Eurosystem's dedicated app.

Under the **synergies** theme, four key topics were further explored:

1. **staggered roll-out approach with the objective of achieving quick wins first**
2. **how and where to join forces to establish a European acceptance network and to reuse existing standards, implementations and processes**
3. **integrating the digital euro in European payment solutions with a digital euro app as a necessary fall-back**
4. **assessing co-badging, to be available if and when needed**

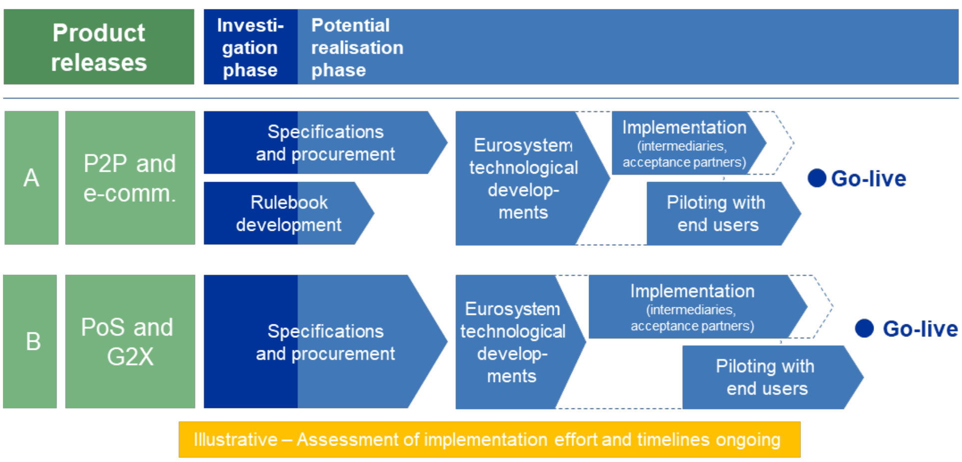
4.1 Staggered roll-out approach with the objective of achieving quick wins first

The ECB believes that the digital euro should be introduced in a swift and structured manner, particularly in light of heightened geopolitical uncertainties. To this end, the Eurosystem has proposed a staggered roll-out featuring a well-defined sequence and combination of use cases, such as peer-to-peer (P2P) payments, physical stores and e-commerce, to address the diverse needs of end users and bridge market gaps across euro area countries. This approach aims to strike an optimal balance between market relevance, the Eurosystem's policy objectives, and technical and implementation costs.

By adopting a staggered roll-out, as suggested by the Eurosystem, the strategy ensures a smoother payment experience for end users, allowing them to gradually familiarise themselves with and adopt the various use cases and technologies. Additionally, it helps minimise the complexities associated with large-scale implementation, such as rolling out the solution at a pan-European level.

Each product release could be preceded by a pilot phase to validate and test key design decisions. These could be carried out in parallel to streamline and optimise the overall release timeline.

Figure 6
6th ERPB technical session: Overall structure of roll-out plan from early 2023 underlying current thinking



The approach proposed by the Eurosystem is designed to provide all stakeholders with adequate time to distribute their efforts across a predictable timeline. For instance, one goal is to align any hardware upgrades required for POS terminals and ATMs with their natural replacement cycles, thereby minimising the need for premature replacements wherever feasible.

To ensure the smooth introduction of the digital euro, particularly given heightened geopolitical uncertainties, bank PSPs remarked that it is crucial to evaluate which objectives could also be achieved through private sector solutions. The public and private sectors could then effectively join forces to reach the common objectives of sovereignty in EU retail payments and resilience. The Eurosystem’s involvement in front-end solutions, such as apps, should not be the highest priority according to PSPs. Additionally, bank PSPs cautioned that a complex, rollout of the digital euro -if simultaneous with private sector initiatives - could consume resources over the next three to four years. This could divert ongoing investments in European private sector payment solutions (e.g. pan-European A2A payments and domestic schemes) that aim to deliver everyday convenience comparable to the currently dominant global digital wallets and X-Pay solutions.

Non-bank PSPs suggested postponing the offline solution, as it represents a technically novel approach for all stakeholders which may entail additional complexity and cost to implement. For them, a clear definition of objectives and priorities is essential, with a focus on addressing market gaps that according to them exist particularly in P2P payments. Prioritising P2P payments in the initial phase could help drive user recognition and adoption of the digital euro. They would prefer a purely digital solution in the initial stages.

Merchants believe that the overarching goal should be to achieve 80% of the desired impact with 20% of the effort, while prioritising both resilience and market penetration. From a resilience perspective, payments at the physical POS have the highest priority. Although the digital euro project may still seem complex, its total costs are likely minimal compared to the potential risks of not having such a solution. For resilience and to shorten time-to-market, merchants prefer “deferred authorisation” of the online digital euro ahead of the implementation of a separate offline digital euro wallet.

Consumers showed strong support for a staggered roll-out as described by the ECB.

Conclusions

The ECB and all participants concluded that there is a clear urgency to act given heightened geopolitical uncertainties. Taking into account that the introduction of the digital euro could be complemented by private sector initiatives, it is crucial to prioritise high-impact, high-usage and low-effort use cases, to achieve quick wins. According to some PSPs, the roll-out should focus on P2P payments initially, followed by e-commerce and POS transactions. However, merchants advocate prioritising POS transactions, as they are higher-impact and higher-usage than P2P payments, as well as more critical for resilience. They acknowledge nonetheless that this would require greater effort. Non-bank PSPs disagreed with the suggestion of starting with one wallet per person and emphasised that prioritisation should not hinder non-bank PSPs from offering the digital euro as well as value added services.

Joint work could address a staggered roll-out approach for the digital euro that spreads costs over time and ensures that the most important basic use cases – which ensure adoption and are most crucial for resilience – are prioritised over use cases that can be introduced at a later stage. This approach is considered premature by some PSPs as there are still many open points in the design discussion. Moreover, the ECB will more clearly identify the space for the private sector to develop “value added services” on top of the digital euro for which they can consider charging. While stakeholders so far view opportunities from value added services to be limited, this work may build on opportunities highlighted in the recently concluded innovation workstream. This should be one of the main areas of follow-up channelled via the ERPB members.

The ECB and market participants have also concluded that a way to reduce total investment costs for the market is to investigate how digital euro development (and operational) costs can be mutualised. Follow-up work should assess how intermediaries and merchants can mutualise costs, e.g. by leveraging existing national infrastructure or commercial third parties offering “digital euro as a service”. Such cost mutualisation is already mainstream for card processing, which only the largest banks and banking groups in Europe still do on-premises, whereas many banks have outsourced those activities to minimise running cost and limit upfront capital expenditure.

4.2 How and where to join forces to establish a European acceptance network and to reuse existing standards, implementations and processes

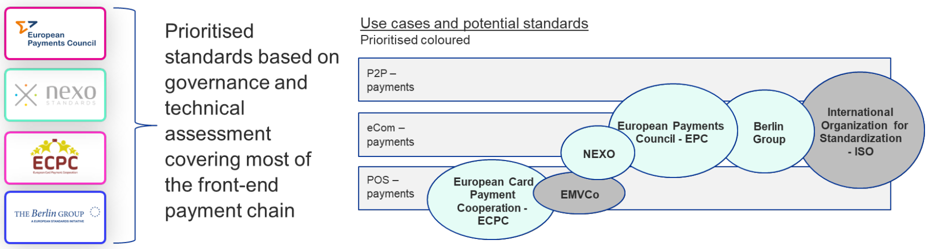
The Eurosystem aims to maximise the reuse of payment processes and industry standards to limit investment efforts or, where needed, establish new open standards to create a pan-euro area acceptance network that can be leveraged by the private sector. Establishing joint public acceptance standards would maximise benefits for all stakeholders and minimise the work required on acceptance (i.e. exploiting synergies as much as possible).

As explained by the ECB, numerous standards are employed throughout the payment chain and the Eurosystem has undertaken an initial assessment to determine which of these standards meet its specific requirements. These requirements have also been vetted by the Eurosystem's Legal Committee. Any standard in question must not only satisfy the technological needs of the digital euro, but also be non-proprietary and have a governance structure that allows the Eurosystem to exert sufficient influence without taking a formal voting role.

Standards under consideration that fulfil those technical and governance criteria are set by the European Payments Council (EPC), the International Organization for Standardization (ISO), the Berlin Group, NEXO and the European Card Payment Cooperation (ECPC). Collectively, they cover most of the front-end payment chain from the user device to the intermediary.

Figure 7

Four standard-setting bodies and their standards along the digital euro payment chain in focus



The ECB believes that the key synergy of the digital euro and private solutions could lie in establishing a common open acceptance layer for A2A payment schemes in particular, with an open, European, non-proprietary POS kernel. Such an acceptance layer is a convergence on existing open standards - rather than the creation of an entirely new layer - that neither industry efforts nor European regulation have addressed or can easily address. The mandatory acceptance of the digital euro is the only way to ensure that these standards are implemented across the entire market.

In line with the ECB's perspective, bank PSPs supported the reuse of well-established and widely adopted standards and processes, as well as taking advantage of the work of existing standard setters. PSPs also highlighted that the success of the digital euro will depend heavily on its ability to integrate seamlessly into existing payment solutions and wallets. It is therefore crucial to avoid creating only a proprietary solution that exclusively supports the digital euro, as this would only lead to further fragmentation. Ensuring compatibility with well-established solutions will not only enhance user adoption but also position the digital euro more effectively within the ecosystem. Lastly, they recognised that a key synergy between the digital euro and domestic or regional private solutions could lie in the development of a common open acceptance layer, particularly for A2A payment schemes.

Non-bank PSPs also supported reusing standards, implementations and processes, highlighting that this is important to speed up the deployment of a new payment system such as this. Reusing well-established standards also aligns with the broader goal of fostering collaboration across payment methods and systems. This approach is viewed as a progressive step. Nevertheless, it was reiterated that a significant synergy between the digital euro and domestic or regional private solutions could be achieved through the establishment of a common open acceptance layer for A2A payment schemes.

Merchants voiced a need for cohesive and standardised European payment infrastructure to support the implementation of a digital euro. By standardising and leveraging existing building blocks, Europe can create a cost-efficient, interoperable system that benefits merchants, consumers and intermediaries alike. This would also facilitate least-cost routing and allow merchants to optimise transaction flows across different payment channels.

Consumers agreed with the positions of market stakeholders and also supported reusing existing standards, implementations and processes.

Conclusions

The ECB and all market participants have concluded that the reuse of existing standards, implementations and processes should be maximised. Therefore, the digital euro project should continue to strive for standardised solutions that achieve "plug-and-play" status for A2A/push payments at a level currently only available for cards schemes.

All stakeholders agreed that the ECB's efforts should focus on establishing retail payment infrastructure based on open non-proprietary standards which will be beneficial for the ecosystem. Such infrastructure bears the potential to create efficiencies and network effects, stimulate competition and thereby lower costs for all participants – particularly for merchants and therefore

consumers. The Eurosystem is committed to using open standards for the digital euro where possible, which will help ensure open infrastructure is available on the merchant side. This would also enable "least-cost routing" (as is common in some markets) and give merchants a better negotiating position.

Therefore, the main synergy identified – and strongly supported by all market stakeholders – is the creation of what is dubbed a "common acceptance layer" for A2A/push payments for POS and e-commerce transactions. This would mean creating and partially reusing the same level of standardisation for the "A2A rails" that would be adopted (due to the mandatory acceptance of the digital euro and the expansion of existing A2A solutions) as exists for cards[14]. All private sector solutions would then be able to take advantage of this standardisation. It would also entail limited and one-off change efforts for merchants, allowing them to accept all payment schemes that follow these standards either from the start or over time, and would provide for a more consistent customer and merchant experience.

The main components of this common acceptance layer, building on existing systems where feasible, would be open standards based on a "free to use", scheme-agnostic, contactless kernel (NFC, first priority, especially for POS and ATM) with a push payment, terminal-host protocol, open QR code standards (second priority), open banking API standards and several other components currently under evaluation.

Alongside that, the ECB will facilitate follow-up engagement to identify further opportunities to align on a common acceptance layer, data definitions, and standards and processes already widely adopted. The objective is to create further synergies and cost advantages in the implementation and running of digital euro services, on top of several already identified and adopted. These include the digital euro account number (DEAN) structure to mimic the IBAN structure, industry classification of merchants to adopt (ISO merchant category code), and reporting and fraud-related standards. This engagement builds further on the extensive work carried out in this domain by the RDG.

While the ECB must continue preparing and detailing the rules for digital euro acceptance standards, there is a standing invitation for the industry and private sector scheme stakeholders to collaborate where mutual benefits are identified. In this way, stakeholders' feedback can be considered in a timely manner when detailing the rules, ensuring smoother progress and mutual benefits for all parties. Initial discussions with private sector players are already under way, and this cooperative approach is both recognised and appreciated by all stakeholders, emphasising the importance of working together to develop a shared and ongoing understanding.

As well as leveraging digital euro standards, the industry has suggested that it could see value in reusing existing processes to the maximum extent for the digital euro, such as anti-money laundering (AML), know your customer (KYC), fraud risk management, and onboarding/offboarding processes. Further

[14] Primarily through EMVCo, PCI DSS and ISO 8583/20022 standards.

reflection may be necessary as part of the digital euro scheme rulebook development process. The ECB, following the industry's suggestion, has engaged with the market and made design choices with this commitment in mind. The ECB is open to engaging in further technical discussions if the market identifies industry-wide roadblocks (e.g. to remove market uncertainty).

4.3 Integrating the digital euro in European payment solutions with a digital euro app as a necessary fall-back

According to the ECB, users should always have the option to access the digital euro through a dedicated standalone app and via services integrated into PSP solutions. Integration within PSP solutions enables PSPs to maintain client relationships and accelerate adoption through value added services offered with a consistent and harmonised pan-European user experience. Meanwhile, the standalone app is crucial for promoting financial inclusion and ensuring system resilience.

The Eurosystem encourages the integration of the digital euro into PSPs' existing solutions (either in their own apps or in wallets they already support), as long as minimum requirements are met to ensure a harmonised look-and-feel and user experience. Those PSPs that today serve their customers well holistically – and those are primarily European PSPs – are also in a prime position to retain client relationships for the digital euro. Leveraging consumer trust in existing solutions is also best to speed up digital euro adoption. Existing European payment solutions will be able to cover use cases not yet served and achieve pan-European reach without relying on ICS, although there are payment initiatives already working towards providing such pan-European reach.

Figure 8

Illustration of integration within existing European payment solutions

The image illustrates two different approaches to integrating the digital euro into a PSP's existing European solution. The phone on the left shows a possible integration within a well-known European A2A payment solution's standalone app, while the one on the right gives an example of integration within another European payment app. The first solution is primarily focused on P2P payments, whereas the second app supports a wider range of use cases, including POS payments. Consequently, the solution on the right offers significantly more features. The visual representation of the digital euro is an example only and follows the design choice (vertical selection vs horizontal selection) made by the provider. [15]

For the ECB, a digital euro app for which support is mandatory (subject to co-legislators' decisions) will ensure that users always have the option to use the digital euro app as their preferred front-end interface. The availability of a standalone app will add additional resilience against unlikely, albeit possible, failures of PSPs' proprietary apps. It will also promote financial inclusion through a highly accessible platform and ensure a consistent and harmonised pan-European user experience. By providing a centralised and standardised interface, the digital euro app will allow users to seamlessly switch PSPs without needing to download or familiarise themselves with a new payment application. This capability reduces friction for users, enhances competition amongst PSPs, and ensures business continuity. Furthermore, it will ensure that the relationship between users and the PSP of their choice is clarified via the inclusion of clear PSP branding. Finally, the digital euro app will support smaller PSPs, which may lack experience with POS payment apps, by significantly reducing their development costs.

Bank PSPs supported the integration of the digital euro into existing solutions, emphasising that ensuring compatibility with established solutions and wallets will enhance user adoption and better position the digital euro within the ecosystem. However, concerns were raised on the potential costs for PSPs associated with the additional mandatory support of the digital euro app, especially

[15] The final implemented solutions may differ substantially from the examples given here.

for small banks. Given that most PSPs already have existing apps, they opposed mandatory market-wide implementation.

Like bank PSPs, non-bank PSPs also opposed mandatory support for the digital euro app. They argued that flexibility should be provided so that, if customers showed little interest in the product, banks could opt out of integration with it. Also, the mandatory support could disintermediate the customer relationship. They argue that the app should only be mandatory for public institutions (e.g. post offices) for inclusion purposes.

Merchants voiced support for the integration of the digital euro into existing PSPs' solutions, as well as for the mandatory availability of the digital euro app to enhance convenience and resilience.

Consumers stressed their support for mandating the provision of a separate, independent digital euro app to accommodate consumers who prefer to maintain a standalone digital euro account rather than using their current PSP. Additionally, there is support for integrating the digital euro into existing PSPs' apps to enhance convenience and resilience.

Conclusions

The ECB and all stakeholders agreed that integrating the digital euro into existing PSPs' solutions would be beneficial for both current and potential customers, allowing the digital euro to achieve a stronger position within the payment ecosystem.

Diverging views remain on the need to support the digital euro app. The ECB, merchants and consumers concluded that mandatory support for the digital euro app by PSPs is necessary to enable payment innovations, resilience and financial inclusion. PSPs, however, opposed the mandatory integration of the digital euro app for those PSPs that already offer a payment wallet and integrate the digital euro services in these channels, and raised concerns that a fully mandatory integration of all digital euro services into their own solutions would be too burdensome, especially for smaller PSPs with limited IT resources. While the ECB is convinced that using the standalone digital euro app for smaller PSPs would be a much cheaper option than integrating it into their own app, the mandatory nature for support is necessary to ensure a consistent front-end interface and harmonised user experience across Europe, subject to the assessment and decision of the co-legislators. It will also enhance resilience against PSP app failures, promote financial inclusion through accessibility, and support smaller PSPs by reducing their development costs for payment apps.

4.4 Assessing co-badging, to be available if and when needed

For the ECB, physical cards are one of the form factors for the digital euro. Voluntary co-badging on an existing physical card may be an attractive option for domestic schemes, PSPs and the digital euro. Linking the digital euro to an existing, trusted domestic solution could facilitate and speed up its adoption. For the domestic scheme, it could represent a competitive alternative to classical ICS co-badging for intra-EU cross-border payments, resulting in greater bargaining power vis-à-vis ICS and lower fees in general. At the same time, co-badging could allow domestic schemes to provide a pan-euro area retail payment solution across all channels, including e-commerce and POS, using the digital euro. Enabling conscious consumer choice and a user-friendly experience are key requirements for pursuing co-badging.

As described by the ECB, the network effects generated by a digital euro will function as public infrastructure, benefiting both public and private initiatives. This approach is akin to creating a unified European railway network, where various companies can operate their own services for their customers. Hence, it ensures the fit of the digital euro into the European payments ecosystem, making it more resilient, competitive, user-friendly and inclusive, and fostering its strategic autonomy.

However, PSPs remain sceptical about the physical integration of the digital euro through co-badging. Despite banks continuing to issue physical cards to all their customers, their majority position seems to remain that integration should be carried out exclusively through digital means, noting that most people prefer using mobile applications. As this trend is expected to grow further in the future, digital euro cards could be issued by a publicly funded institution. Also, PSPs expect that users will likely continue using ICS cards due to their comprehensive services, whereas domestic schemes are primarily favoured for their cost benefits. For PSPs, co-/tri-badging entails material complexity/cost and may primarily reinforce ICSs.

Nonetheless, the ECB believes that the use of physical cards for transactions remains highly relevant in Europe, and no European bank has stopped issuing them yet. For instance, in Germany mobile wallets accounted for approximately 13% of cashless POS transactions in 2024, while the majority of such transactions still relied on physical cards.[16] In the Netherlands, contactless payments made via mobile phones or smartwatches represent around 35% of total POS transactions in 2024, compared to approximately 43% made with physical debit cards.[17]

Merchants noted that if the digital euro were issued on a co-badged card, it would be important that the user experience remain seamless and fast, in particular for contactless payments. It would also be important that merchants

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16 Treibauf (2025), "Payment trends – Our report from the EHI Payment Kongress 2025".

17 De Nederlandsche Bank, "Point of sale payments in 2024". Payments made via mobile phones or smartwatches could also include iDEAL payments, which are not card-based.

could still pre-select a default payment application that consumers could override as a conscious choice.

Consumers expressed strong support for voluntary co-badging as described by the ECB.

Conclusions

While there was broad alignment on the topic among consumers, merchants and the ECB, some PSPs remain sceptical of the ECB's value drivers regarding co-badging.

The ECB, merchants, consumers and certain PSPs concluded that voluntary co-badging of domestic schemes and the digital euro on a physical card could be a beneficial option. Co-badged domestic or regional card schemes in particular could be an effective way of offering customers a pan-European payment solution at low cost without the need to co-badge with ICS. This is especially true since most cards issued are never used outside Europe. For use outside Europe, global coverage could be explored in different ways, for example through tri-badging or offering a separate (possibly virtual) "world card" for those travelling outside Europe.

As stakeholders' views on the potential risks and complexities of co-badging/tri-badging differ, further exploration is warranted. The industry is therefore invited to jointly examine how user experience (UX), branding and "business logic" (e.g. domestic solutions where available with digital euro as an alternative) could be shaped.

5 Business model

The key objectives of the digital euro project from a business model standpoint are to minimise transaction costs and implementation efforts for PSPs, while unlocking revenue potential, thereby offsetting the associated investment costs. The Eurosystem will cover the scheme and processing costs, and the proposed compensation model – fully within the remit of the co-legislators – aims to ensure that the benefits accrue to all of the parties involved. Additionally, the Eurosystem supports the outsourcing of digital euro services through technical service providers to minimise implementation costs.[18]

Under the **business model** theme, three key topics were further explored:

1. **calibrating a compensation model that compensates effort and liability**
2. **practical solutions to avoid unintended consequences of open funding**
3. **what is needed to facilitate "digital euro as a service" – enabling a "make-or-buy" decision**

5.1 Calibrating a compensation model that compensates effort and liability

It is solely the responsibility of the co-legislators to establish a balanced approach that accounts for the diverse European payments landscape and ensures appropriate compensation for efforts and liabilities.

The Eurosystem supports a model that creates fair and reliable economic incentives for PSPs and helps them recoup the investment and operational costs of distributing a digital euro. The draft legislation envisages a compensation model with fair economic incentives for all involved (e.g. consumers, merchants, PSPs), in line with the following principles:

1. As a public good, a digital euro would be free of charge for basic use. It would be equally accessible in all euro area countries.
2. PSPs could charge merchant fees for providing digital euro-related services to offset the operational costs of distributing a digital euro, as is currently the case with other comparable digital means of payment. PSPs would also be able to develop additional digital euro services for their customers, on top of those required for basic use (i.e. payment, account or support services considered essential for the use of the digital euro by individuals).[19]

18 Without prejudice to any considerations around e.g. business continuity or concentration risks.

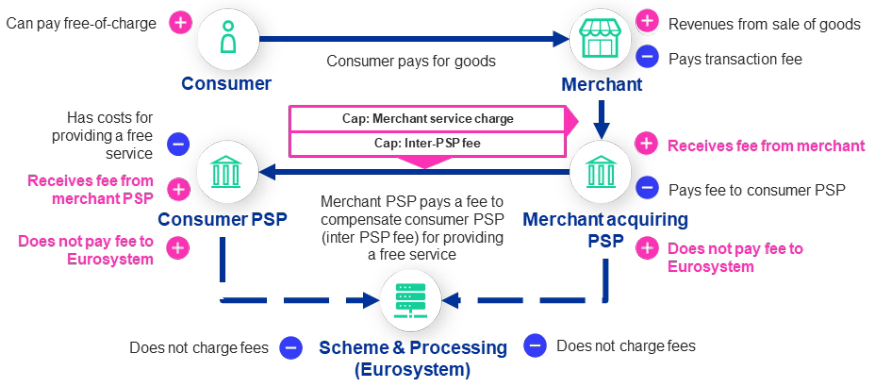
19 For further information see Annex 2 - Digital euro Regulation

3. The fees that merchants obliged to accept digital euro as legal tender pay to PSPs for digital euro services would be subject to a cap to ensure adequate safeguards against excessive charges.

4. The Eurosystem would bear the issuance costs, including scheme and processing fees, as it does in the production of banknotes.

Figure 9

Calibrating a compensation model that compensates effort and liability



Bank PSPs consider it essential to ensure that PSPs are fairly compensated and remunerated for the services they provide. Here, inconsistencies between the proposed distribution model and the compensation framework have been raised. Specifically, while the current distribution model can involve multiple parties, the compensation structure appears to take a simpler approach. Due to the holding limits, the distribution model requires that users be able to easily fund and defund their digital euro account using commercial bank money, even if the commercial bank money account is held by a PSP other than the one providing the digital euro account. For bank PSPs, if the distribution model is a six-corner model - i.e. if the bank PSP holding the deposit/liquidity/current non-digital euro payment account is not the PSP handling the digital euro wallet - then the compensation model should also include six corners, instead of the four-corner model currently proposed. Thus, every participant in the model would be remunerated. Indeed, if the compensation model is not adapted to a six-corner model, PSPs handling a non-digital euro payment account will be cut off from any remuneration. Also, the proposed inter-PSP fee is considered essential to partially offset the cost of providing digital euro services, and it is recommended that a minimum threshold for this fee be set. Lastly, key business considerations, such as risks and investment costs, should be taken into account for bank PSPs to fully benefit from it.

Moreover, all PSPs expressed concerns about introducing a regulated MSC from the outset, deeming it inadvisable. They argue that launching a market product with a predefined price ceiling is unprecedented and may face barriers to success. Furthermore, the diversity of the European market makes the application of a uniform MSC cap across the euro area impractical and potentially ineffective.

Conversely, merchants view a regulated MSC as essential, emphasising a key distinction between the digital euro, as public money, and other payment methods. In their view, legally, the digital euro must be accepted at full face value when settling debts. This principle is likely to raise questions as to why merchants should receive less than the face value paid by consumers. There is also scepticism about merchants bearing costs for the issuing side, as card interchange fees often cover risks, cashbacks and rewards, which do not apply to intermediaries in the digital euro framework. Furthermore, a low enough MSC cap will allow the application of a uniform MSC cap across the euro area, irrespective of the diversity of the European market makes, and will ensure that merchants benefit from the absence of scheme fees.

Consumers expressed strong support for the compensation model as described by the ECB.

Conclusions

Any final conclusion on the compensation model and other aspects of the business model are part of the draft legislation, which is within the remit of the co-legislators. The Eurosystem aims to strike a balance between fair compensation, capped fees and free access, with a potential transitional regime to address uncertainties.

Stakeholders have differing, mutually incompatible views on the proposed digital euro compensation model. PSPs noted that the European market is diverse and did not support imposing a uniform MSC cap across the euro area potentially leading to acquirers having to offer digital euro at a loss. Bank PSPs highlighted that the compensation model must reflect the six-corner reality if open funding persists, with appropriate inter-PSP remuneration and liability alignment. Merchants stated that the MSC cap is essential and that the fees payable by merchants should be substantially lower than those they pay for comparable retail payment methods. They also noted that SEPA Instant Credit Transfers would be a more appropriate benchmark than debit cards schemes.

The ECB stands by its position that, due to the digital euro's status as legal tender, there must be both adequate compensation for distribution and capped fees for acceptance, ensuring that merchants also benefit. Both actual unit costs and comparable means of payment should be taken into consideration when establishing cap or fee levels. A transitory regime could alleviate potential difficulties since the per-unit costs will only emerge and be representative and verifiable over time. Merchants are concerned that gathering and analysing data and calculating actual unit costs could become "an industry in itself" and worry that PSPs may unduly allocate indirect costs.

The ECB aims to explain the requirements of a "fair for all" business model with the lowest possible risks for actors with the co-legislators. In this context, the "fair for all" principle should consider the legal obligations expected of i) the banks distributing the digital euro and ii) the merchants accepting the digital euro. The main ingredients of a suitable compensation model are identified as:

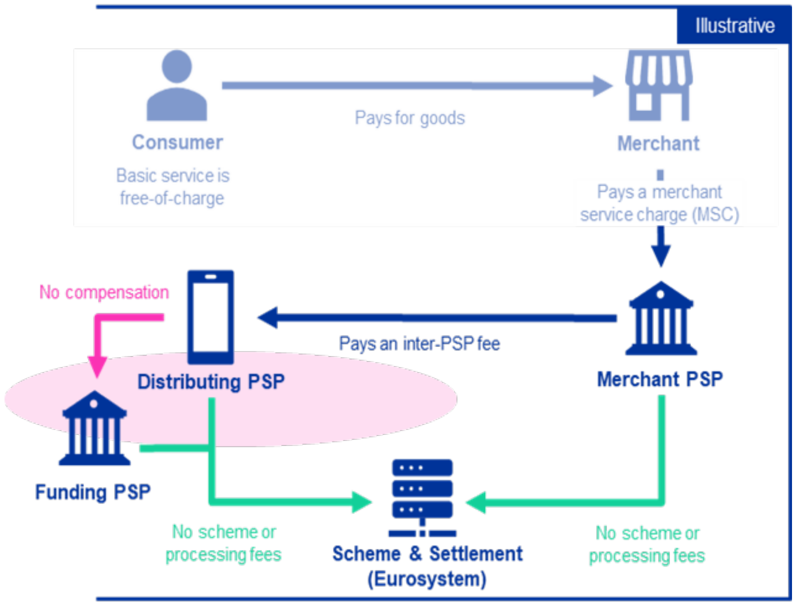
- Fair and simple compensation for intermediaries (with, notably, the payee PSPs seeing no benefits in capping the MSC).
- Safeguards for merchants, also ensuring that the scheme fee advantage is passed on to merchants, and therefore to consumers.
- Clearly defined basic services to allow more opportunities for intermediaries and merchants to charge for additional services.

5.2 Practical solutions to avoid unintended consequences of open funding

It falls within the remit of the co-legislators to strike a balance between the openness of the ecosystem (also including large non-European players with potentially dominant positions) and the strengthening of European payment sovereignty.

As described by the ECB, the draft regulation mandates PSPs to allow end users to link a non-digital euro account with a digital euro account to use reverse waterfall for free, whether held with the same or another PSP. The distributing PSP is remunerated as it provides digital euro payment services to the end-user, also requiring the PSP to perform e.g. KYC, fraud prevention checks, transaction processing and dispute management. The (open) funding PSP is not remunerated for providing (de)funding services.

Figure 10
Compensation model in open funding



Bank PSPs expressed a preference for a four-corner distribution model due to its simplicity and the customer experience benefits it offers, as it allows the PSP distributing the digital euro to be the same entity that manages the user's traditional payment account. Also, they noted that ensuring fair remuneration for the services provided is critical, while recognising that offering free services appeals to consumers, merchants and non-bank PSPs. Moreover, since non-bank PSPs compete directly with banks in the digital euro market, maintaining a level playing field is essential. Also, bank PSPs call for compensation and liability alignment for funding PSPs, or for restrictions to ensure that the open funding model does not create unintended competitive imbalances or operational disadvantages for certain categories of payment service providers. A key concern in fact is ensuring that big tech companies do not disproportionately benefit from the issuance of the digital euro, while focusing on distributing the solution to end users. It is not about excluding them from competition but ensuring that European PSPs role is not only on the cost-driven parts like handling risk management and other non-value-adding activities, while the big tech companies can collect the benefits and monetarise them.

Meanwhile, non-bank PSPs stressed that restricting free open funding would effectively exclude them from the digital euro ecosystem, as their wallets could then only provide a significantly inferior user experience compared to bank-issued wallets. Furthermore, introducing compensation for funding would run counter to existing market practices, where payment initiation service providers are not required to compensate banks for initiating transactions – a directly comparable scenario. Additionally, reducing non-bank PSP remuneration for digital euro services due to the need to allocate a portion of their inter-PSP revenue to a funding bank would place them at a substantial competitive disadvantage.

Conclusions

Stakeholders (specifically bank and non-bank PSPs) have differing and mutually incompatible views on the potential benefits and risks of open funding. Open funding and other aspects of the business model are part of the draft legislation, which falls within the remit of the co-legislators. While all stakeholders support innovation and fair access, the co-legislators should be made aware of some understandable concerns from certain stakeholders about non-EU big tech dominance. Bank PSPs also noted that the open reverse waterfall process affects transaction management, authentication, liability distribution and fraud issues, raising concerns about customer experience and transaction processing complexity.

If the co-legislators can agree on an appropriate method or benchmark for how to compensate funding PSPs if they are required to support the open funding service, relief on liabilities for funding PSPs would also be required to ensure fairness and a level playing field.

The ECB aims to explain the requirements of a "fair for all" business model with the lowest possible risks for actors with the co-legislators. In the context of open funding, the main ingredients are:

- Upholding the principle that liabilities must go hand-in-hand with financial incentives.
- Balancing openness against any unintended consequences that could undermine the aim of greater strategic autonomy.

5.3 What is needed to facilitate "digital euro as a service" – enabling a "make-or-buy" decision

The ECB sees an opportunity for PSPs to partner with outsourcing service providers[20] to deliver operational and digital euro services ("digital euro as a service") and thus mutualise investments and/or avoid large upfront investments in a "pay as you go" set-up. In addition to centralised IT providers, domestic processors could potentially provide these services. The current draft of the digital euro scheme rulebook sets out the principles for outsourcing service providers. Specifically, Section 2 (Scheme scope and interplay) notes that: "Intermediaries may engage third-party entities […] while remaining fully liable […]. Such third-party entities would not be participants in the digital euro payment scheme". Scheme participants' liability for the digital euro scheme, regardless of whether or not outsourcing service providers are used, remains a central requirement.

In line with the ECB, bank PSPs confirmed that outsourcing service providers have an important role to play in enabling the provision of payment services and that they should continue to be able to do so. PSPs should also be free to

[20] Terminology as used in the draft scheme rulebook. May be subject to change in the future.

engage such providers to distribute the digital euro and streamline its integration with existing, often widely accepted payment solutions. Overall, outsourcing service providers could provide increased harmonisation and robustness and faster time-to-market in the implementation of the digital euro, particularly in the case of small banks.

Non-bank PSPs acknowledged that outsourcing service providers have an important role to play in the provision of payments services in various domains, with recognised resilience and efficiency. This should be leveraged to the maximum extent possible. These providers are often innovators in the market. They should therefore be maintained and leveraged in the design of the digital euro. It was suggested that the scope might be broadened to enable qualified technical service providers to provide a "full-stack" digital euro service (including front-end and back-end services).

Merchants believe that if they (and/or their PSPs) can reuse the integrations and the terminal encryption terminals they already have with the current acquirers or processors, the integration costs will be lower than if they have to integrate a new solution from scratch. The integration of a new standard protocol should be considered if this protocol is easy and simple to implement, as this would not require many resources of merchants and will bring greater future benefits.

Consumers agreed with the market stakeholders' views and supported the stance of the ECB.

Conclusions

The ECB and all of the market stakeholders concluded that facilitating a "make-or-buy" decision, or "digital euro as a service", is crucial to mutualising investments and maintenance costs for PSPs, especially for smaller ones. While some banking groups in certain countries already have shared IT services with jointly owned providers, many other banks still rely on either local or regional bank-owned or independent service providers or processors (often those used for cards). Limits on this "make-or-buy" decision (and de facto outsourcing) should be set in line with the existing regulations (e.g. the Digital Operational Resilience Act, DORA) and the applicable guidelines (e.g. the EBA guidelines on outsourcing arrangements).[21]

Likewise, the ECB and the participants agreed that the possibility of accessing the digital euro service platform (DESP) via an intermediary – as is currently the case for indirect access to the Target services – would also be beneficial. This potential two-tier access would particularly benefit smaller PSPs, which would outsource the operational burden of managing interactions with the DESP to another intermediary, thus facilitating cost containment for such PSPs when implementing the digital euro.

21 Without prejudice to any considerations around e.g. business continuity or concentration risks.

Further technical discussions should address any industry-wide roadblocks to enabling “digital euro as a service”, which should subsequently be taken up in the context of the RDG.

6 Resilience and transparency

The Eurosystem will ensure that the digital euro infrastructure is robust and resilient. Thanks to offline functionality, digital euro payments can continue even in the event of internet connectivity issues or cash supply disruptions during emergencies, such as natural disasters.[22] The digital euro also aims to simplify the complexity of transaction fee reporting, enabling stakeholders, particularly merchants, to make informed business decisions.

Under the **resilience and transparency** theme, two key topics were further explored:

1. **ensuring the resilience of the payment system**
2. **fee reporting – reducing complexity for merchants**

6.1 Ensuring the resilience of the payment system

For the ECB, an "offline digital euro" could enhance the overall resilience of the payment system by enabling instantly settled transactions during internet connectivity issues or cash supply disruptions in emergencies. This ensures that digital payments can continue during such events, thereby maintaining economic activity.

The ECB believes that while cash offers resilience, like the offline digital euro it also relies on "prefunding" to function. The need to prefund an offline digital euro was reported as a drawback in terms of resilience by bank PSPs, particularly given that cash already serves as a reliable means of ensuring resilience. However, while cash is put forward as a resilient solution, a physical wallet must also be "prefunded". Cash cannot be withdrawn, for instance, when ATMs are offline during emergencies.

From the perspective of the ECB, offline funding through P2P payments offers a critical lifeline during emergencies when online systems are unavailable. It is worth noting that a wallet can be funded in two ways: a consumer can either fund their wallet online through their PSP or receive funds offline from another consumer. P2P payments, which do not require online connectivity, could therefore prove highly valuable in emergency situations when PSP systems or the ledger infrastructure are unavailable.

In accordance with the ECB, unlike current offline payments, offline digital euro payments offer a more resilient "defunding process", allowing merchants to convert funds even during issuing PSP outages. Offline digital euro payments would be fully authorised and settled offline. When merchants receive offline

[22] In the event of a power outage, the devices of both payers and payees must have sufficient battery to process and settle transactions.

payments, they would need to "defund" the payment – converting the offline digital euro into commercial bank funds. This process does not involve the issuing PSP, thus reducing reliance on online entities and strengthening resilience. In other words, if the distributing PSP is unavailable, the merchant could still process the defunding online using its acquiring PSP. In contrast, under the existing deferred offline payment model, an issuing PSP outage would prevent merchants from collecting new funds. Nonetheless, it is important to acknowledge that the offline digital euro is not a standalone solution for achieving ultimate payment system resilience. Rather, it complements other methods, such as cash, to enhance the overall resilience of the system.

The ECB believes that, rather than a binary choice, an offline digital euro can be implemented through a phased and flexible approach. An offline digital euro is often regarded as an all-or-nothing solution. However, it need not be framed as a binary choice between online and offline. Instead, an offline digital euro offers a range of features that can be phased in gradually, enabling a more flexible and cost-efficient rollout alongside the online solution. Further analysis is needed to determine whether its implementation will have to rely entirely on costly ATM or POS terminal hardware upgrades – which should be avoided as much as possible. A more digital-first strategy could be considered, where initial deployment focuses on software updates alone. Over time, the market could naturally transition to upgraded hardware, driven by evolving security requirements and user convenience. Such upgrades would facilitate, for example, other offline features such as offline refunds. This phased approach could keep costs under control while allowing the offline digital euro to develop progressively.

For the ECB, offline refunds for merchants would require that POS terminals be equipped with a robust security mechanism. In all likelihood, this would require a secure element similar to the one required for a mobile device. A secure element is a tamper-resistant hardware component that provides a high level of cryptographic security, ensuring that sensitive operations and data are protected even in offline scenarios. However, most existing POS terminals currently lack the appropriate secure elements. To address this, offline refunds could be rolled out via a phased approach, in line with the replacement/upgrade cycle of current POS terminals. This would ensure that costs are kept as low as possible for the market, while still enabling refunds to be processed online instead of offline. To ensure this phased approach is viable, further analysis would need to be conducted with the offline solution provider and in the form of a comprehensive security assessment.

At the same time, in the view of the ECB, offering a physical smart card is essential for fostering inclusion and ensuring strategic autonomy. While the percentage of phones incompatible with offline digital euro transactions is small, it is not negligible.[23] A public good such as an offline digital euro must provide accessible alternatives for everyone. A physical payment option, such as a smart card, would address these gaps and ensure that no one is excluded. Moreover, none

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[23] By 2029, in terms of expected EU shipments by the top five phone suppliers, approximately 90% of phones are likely to meet the necessary secure requirements. Source: Europe Mobile Phone Insurance Market Outlook, 2029

of the smartphones currently on the market are fully designed and manufactured in Europe, further highlighting the need for hardware-independent payment methods.

For the ECB, by taking a balanced and inclusive approach, an offline digital euro could complement the online solution while enhancing resilience and accessibility across the payment system. To begin with, one potential way forward worth assessing could be to co-badge the offline digital euro on existing physical smart cards, such as those of ICS.

Figure 11
Offline digital euro – use case examples

Most PSPs stated that the current online payment infrastructures are already resilient and that outages are rare. Bank PSPs expect the cost of implementing an offline digital euro to be high. These costs arise from the presumed need for hardware upgrades to POS terminals and ATMs, as well as the distribution of physical smart cards. They find it difficult to justify these expenses, given the infrequency of outages and the continued availability of cash to which the Eurosystem is committed to. Lastly, PSPs believe that the advantages of offline use can only be realised through regular usage.

Also, PSPs view prefunding an offline wallet as a necessary operation requiring online connectivity, which limits the system's full resilience capabilities. Some argue that cash already provides sufficient resilience. Others stress the importance of defining emergency scenarios to better evaluate the offline digital euro's role in enhancing resilience. Also, PSPs generally expect low transaction volumes, attributing this to policy decisions governing the digital euro and its transition from online to offline usage, rather than expecting a significant surge during emergencies. Some PSPs highlight privacy as a more significant factor than resilience for offline transactions.

For merchants, however, the impact of outages is significant, and they view resilience offered through the digital euro as a key value for the payment system.

Consumers noted that an offline version of digital payments is seen as valuable from their perspective due to its potential to enhance resilience in specific scenarios and its ability to offer greater privacy and cash-like characteristics. While resilience remains a key benefit, the offline functionality provides additional consumer-focused advantages.

Conclusions

The ECB, merchants and consumers concluded that an offline digital euro could add value by complementing existing systems, enhancing resilience through a phased, cost-efficient rollout from day one. PSPs largely assume that the current online payment systems are already resilient. However, the ECB believes that an offline digital euro could serve as a value-added solution, enhancing resilience during emergencies to soften the impact of outages. The concerns raised by PSPs over implementation costs and technical challenges – such as hardware upgrades – highlight the importance of a phased and flexible rollout. The ECB also stressed that a more digital-first approach for offline, focusing initially on software updates, could help reduce costs, e.g. by postponing offline refunds. Gradual hardware upgrades would allow the market to adapt over time. Offering a physical smart card with co-badged digital euro would also play a vital role in ensuring inclusivity and accessibility for all users, especially those with incompatible devices.

The ECB also remains determined to explore further adjustments to the offline wallet funding and spending limits without requiring online connectivity, with the aim of making the system more robust. Similarly, evaluating whether payments can be processed when a phone has residual battery charge but is powered off could help address usability challenges during emergencies. Meanwhile, as PSPs noted, defining emergency scenarios would help clarify an offline digital euro's potential to effectively address real-world challenges.

The ECB, merchants and consumers concluded that, although not a standalone solution, an offline digital euro adds value by complementing existing systems such as cash and online payments. Together, these systems enhance the resilience, accessibility and adaptability of Europe's payment ecosystem. By addressing these areas, an offline digital euro could offer meaningful benefits to both consumers and merchants, serving as an inclusive and forward-looking addition to Europe's payment landscape.

The ECB is committed to conducting in-depth workshops with market participants to provide a detailed explanation of the digital euro's offline functionalities. Addressing potential misconceptions will be crucial to achieving the intended outcomes and fostering better understanding. Additionally, to ensure an offline digital euro achieves maximum cost efficiency, as mentioned by the participants, the ECB plans to conduct a comprehensive cost study to analyse its key cost drivers and share the findings with the market.

6.2 Fee reporting – reducing complexity for merchants

The ECB stated that in the current card-dominated payments landscape, merchants have limited cost control capabilities due to the unilaterally imposed, complex pricing structures in place. Scheme fees (the fees charged by card networks for processing credit and debit card transactions) are typically paid by scheme members. On the acquiring side these fees are ultimately passed on by acquirers to merchants as part of the overall cost of accepting card payments. The fact that scheme fee rates are not publicly disclosed makes it difficult for merchants to effectively compare quotes from acquirers when sourcing acquiring services. Furthermore, once operational, merchants face challenges in verifying whether the scheme fees charged accurately reflect the services delivered, even when acquirers issue reports enabling them to identify the various applicable fee components (i.e. interchange, card scheme and acquiring fees).[24] Lastly, merchants rely on their acquirers to announce any changes to scheme fees transparently and in due time.

For the ECB, in the absence of scheme fees, digital euro payment transactions should be priced competitively. In addition, transaction fee reporting should be significantly more transparent to help merchants make informed business decisions.

PSPs agreed on the importance of a straightforward and uncomplicated fee structure for the digital euro.

Merchants noted that, beyond the elimination of scheme fees, removing inter-PSP fees and simplifying fee structures would make reporting and reconciliation processes much more efficient. A system where merchants are responsible only for managing the fees charged by acquiring intermediaries for processing digital euro payments would create a more streamlined and efficient framework.

Consumers noted that there is strong support for enhancing fee reporting and transparency for merchants as described by the ECB.

Conclusions

The ECB, merchants and consumers agreed that reducing fee complexity and prioritising simplicity would improve merchants' cost control capabilities. At present, scheme fees are a major driver of fee reporting complexity for merchants, restricting their ability to effectively manage and control costs. The absence of scheme fees for digital euro payments should therefore make it easier for merchants to make informed business decisions.

The ECB encourages stakeholders, particularly merchants, to actively participate in shaping the rules, requirements and guidelines outlined in the digital euro scheme rulebook, which could also serve as the foundation for defining reporting best practices for acquirers going forward.

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24 Also known as “Interchange ++” models.

7 Digital financial inclusion, privacy and fraud prevention

The digital euro is designed to be secure, user-friendly and inclusive, ensuring that no one is left behind. As a public good, the digital euro is being developed with the aim of serving everyone equally, and inclusion, privacy and fraud prevention measures are cornerstones of its technical design. In particular, the digital euro is designed to meet the needs of individuals with disabilities, those without access to a bank account and those who are not digitally confident or have limited digital and financial skills.

Privacy and fraud prevention are fundamental values of the Eurosystem and are thus key design features of the digital euro. Ensuring user privacy requires technological innovation, a robust legal framework and strict compliance procedures. At the same time, the Eurosystem must cater for robust user protection against fraud, while upholding high privacy standards. Effective fraud detection and prevention are critical to safeguarding all stakeholders and building trust in the use of the digital euro.

Under the **digital financial inclusion, privacy and fraud prevention** theme, two key topics were further explored:

1. **digital financial inclusion**
2. **privacy and fraud prevention**

7.1 Digital financial inclusion

For the ECB, digital financial inclusion is a cornerstone of the technical design of the digital euro. Indeed, if the digital euro as central bank money is to be available everywhere and accessible to all, it must also cater to the most vulnerable and underserved groups. To be successfully adopted by consumers, the digital euro must be simple to understand and "easy to use", whether to pay via PSPs' interfaces or via the Eurosystem digital euro app. In this regard, the accessibility of digital euro consumer interfaces is key, since central bank money should be available to all, including people with disabilities, for whom existing digital payment interfaces are still progressing toward achieving the highest level of accessibility. A digital euro will help further digital financial inclusion by addressing the needs of those at risk of financial exclusion due to the digitalisation of financial services in an increasingly fragmented and complex ecosystem.

As questions were raised about the added value of the digital euro in areas where financial inclusion is already high and non-digital alternatives are available, the ECB acknowledges the role of existing services, and the efforts already made by PSPs. However, the ECB maintains that digital exclusion remains a significant risk in an increasingly fragmented and complex payments ecosystem and given the ongoing decline in rural bank branches across many euro area countries. While 96% of adults have access to a bank account[25], only about 64% use online banking services[26]. Although advancing financial inclusion is not the "raison d'être" of the digital euro, it will nonetheless be designed to ensure that no one is left behind as financial services continue to digitalise.

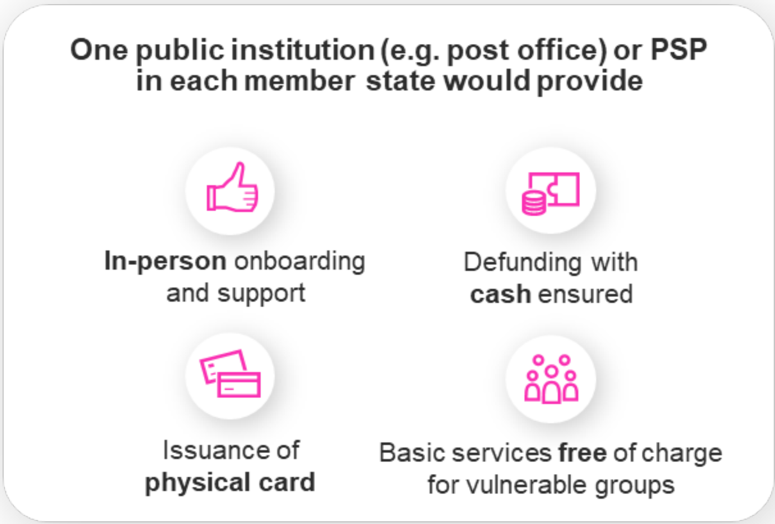
A digital euro app provided by the Eurosystem and accessible to all has been highlighted by consumer organisations as a critical tool for ensuring universal access to the digital euro, including by those with disabilities or limited digital or financial skills. To this end, the digital euro app will ensure accessibility tailored to diverse user needs. Moreover, to support usability across all channels, the ECB recognises the need for an intuitive and harmonised user experience across digital user interfaces in the euro area, while allowing flexibility for innovation and adapting to local contexts.

In addition to any technical design considerations, the ECB highlights the importance of inclusive distribution. This requires developing multiple access channels, including physical ones at a local level, to ensure that all users can engage with the digital euro. These local support channels are necessary to meet the needs of individuals who either cannot use the digital euro or need appropriate guidance. Under the current legislative proposal, dedicated entities in each country would be responsible for providing basic digital euro services and in-person support to vulnerable individuals. The argument is that branch-based and other non-digital services should be accessible to everyone, just as they are already available for other existing services. PSPs argued that fees should also be charged for in-branch digital euro-related services.

25 European Banking Authority (2024), Risk Assessment Report of the European Banking Authority, November.

26 Eurostat, "Digital society statistics at regional level".

Figure 12
A digital euro available to everyone



PSPs, however, argued that banks already support these individuals by offering solutions such as physical cards, instead of relying solely on mobile-based options, and that the unique value offered by the digital euro, above and beyond the existing services, remains unclear. Although financial inclusion has improved in the euro area over the last decade, digital exclusion persists due to individual circumstances and limited access to technology. Banks questioned the need for a digital solution for these individuals, given the availability of traditional banking services.

Consumer organisations emphasised the importance of designing the digital euro to promote financial inclusion and accessibility, addressing needs not typically prioritised by private solutions. Key recommendations include the development of a basic payment app and alternative physical tools, such as payment cards, to ensure access for individuals with disabilities and impairments, or people who are unable to use smartphones. Also emphasised was the need to develop dedicated physical locations for in-person support for consumers facing onboarding challenges. A digital euro app provided by the Eurosystem and accessible to all was highlighted as a critical tool for ensuring universal access. This mobile application would complement private intermediaries' offerings while providing a reliable alternative for users. Also, as accessibility is important to address the needs of people with disabilities, the digital euro app will at least comply with the European Accessibility Act yet aims to achieve the higher AAA-rating. This interface would notably provide inclusive and universal access to basic digital euro services for underserved segments and individuals who do not wish to have a bank account.

Conclusions

The ECB and consumers concluded that the digital euro should be designed to be accessible to all, including individuals with impairments and disabilities and individuals who are not digitally confident or have limited digital and financial skills. This is especially relevant in the context of increasingly fragmented and digitalised financial services, where a digital equivalent of cash is needed. Therefore, both the ECB and consumer organisations agreed on the importance of bridging the accessibility gaps and of ensuring a best-in class level of accessibility for digital euro user interfaces. However, PSPs argued that digital inclusion is primarily about skills and device access, not the availability of a new payment instrument.

The ECB and consumers agreed that the design of the digital euro should be accessible and should promote digital financial inclusion to ensure universal access, notably by complying with European accessibility regulations and technical standards. Nonetheless, key recommendations from consumer organisations include the development of a basic payment app and alternative physical tools, such as payment cards, to ensure access for individuals with disabilities and impairments, or people who are unable to use smartphones. Also emphasised was the need to develop dedicated channels to provide in-person onboarding and support to consumers, to assist the most vulnerable and facilitate onboarding. PSPs, meanwhile, were alone in arguing that digital financial inclusion is already addressed in the market thanks to existing market solutions and the fact that cash is always available. PSPs were also alone in highlighting the role of savings and retail banks in providing access to financial services, and their involvement in public-private partnerships that serve local communities.

7.2 Privacy and fraud prevention

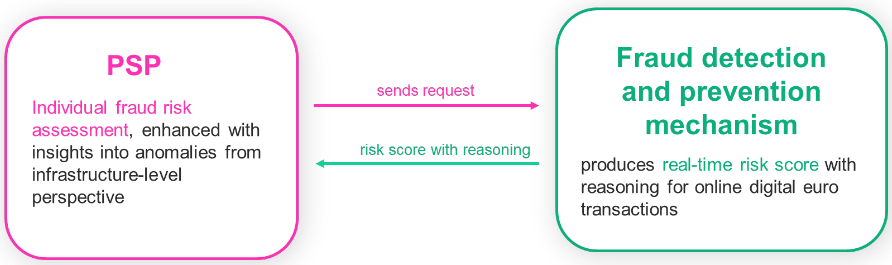
As stated by the ECB, the objectives of the digital euro include robust data protection and privacy features that prioritise and safeguard consumer privacy. Enhancing privacy and data protection is considered crucial for fostering trust and encouraging user adoption. This is only possible if the digital euro is fully compliant with all data protection principles and follows a strict risk-based approach throughout its entire life cycle. The Eurosystem is aware of this and has taken a privacy by design and by default approach when developing the digital euro. This approach will also be followed when distributing the digital euro.

The ECB believes that, for online digital euro payments, privacy will be ensured by preventing the Eurosystem from directly linking transactions to individuals. Offline payments offer cash-like privacy, without any third parties having visibility or records of these transactions. Both online and offline, digital euro data will only be processed as stipulated in the regulations. The Eurosystem has undertaken to only process the personal data strictly needed to ensure the functioning of the digital euro infrastructure. The digital euro infrastructure will also use privacy-enhancing technologies such as pseudonymisation, hashing and data encryption to protect the identity of users and prevent unlawful or unauthorised data access. The Eurosystem is also conducting data protection risk mapping and monitoring procedures to strengthen the digital euro's privacy safeguards.

For the ECB, as regards fraud prevention, financial fraud poses a serious threat to the stability and integrity of the European financial system and to customer confidence in payment systems. Social engineering techniques such as phishing, smishing, vishing and impersonation (manipulation of the payer) are on the rise and account for more than half of the total value of fraudulent credit transfers.[27] Social engineering increasingly leads to authorised push payments fraud. The methods have evolved considerably over recent years, and continue to do so, targeting payment system users rather than technology.[28] The Eurosystem has a particular duty of care to less digitally savvy and elderly users. Together with industry experts, the ECB has evaluated the existing and emerging anti-fraud technologies. Protecting payment systems from financial crime, while upholding user privacy, is crucial. The Eurosystem will leverage technological innovation and engagement with external stakeholders (industry, consumers, researchers, etc.).

In the view of the ECB, under the current design, the online digital euro includes a robust fraud prevention and detection mechanism. This mechanism will provide PSPs with a real-time risk score with reasoning. This information is crucial to tackling certain fraudulent activities, such as social engineering, while individual PSPs' fraud prevention systems are effective in other fraud scenarios (e.g. identity theft, unauthorised payments). PSPs' fraud prevention will be further improved through learning from situation awareness and threat intelligence. This will enhance their ability to detect fraudulent transactions.

Figure 13
Fraud prevention via the fraud detection and prevention mechanism



PSPs reiterated that setting in place strong privacy safeguards is considered crucial for fostering public trust, noting that consumers are particularly sensitive to the Eurosystem's potential access to payment data. Striking a balance between privacy, fraud prevention and the goals of the digital euro is essential. While privacy is a priority, it must be aligned with other goals such as financial stability, access to payment services and fraud prevention.

27 European Banking Authority and European Central Bank (2024), *2024 Report on Payment Fraud*
28 European Payments Council (2024), *2024 Payment Threats and Fraud Trends Report*.

Consumers consider it essential to strike a balance, incorporating strong privacy features that prioritise and respect their privacy. Enhancing privacy safeguards is viewed as a crucial factor in building trust and driving user adoption. While fraud prevention is essential, consumers highlighted the need to broaden the focus to include protection against fraud. This approach would combine robust prevention measures with effective dispute resolution mechanisms to address consumer complaints and ensure fair reimbursement in cases of monetary loss. Recognising that not all fraud can be prevented, a transparent and fair resolution process is vital. This will likely be a key consideration for consumers, particularly when comparing the digital euro with international payment solutions.

Conclusions

The ECB and the market participants concluded that the digital euro should be accompanied by robust fraud prevention and, to the extent possible, protection measures.

According to stakeholders (mostly PSPs), fraud protection should be considered from a holistic perspective in market discussions and in the framework of the ongoing discussions on the revised Payment Services Directive. The debate should properly address both fraud prevention and liabilities along the entire payment chain, well beyond PSPs, as the evidence suggests that social engineering is now the most widespread source of fraud. While prevention through smart product design is essential, the discussion would benefit from including the fraud prevention measures implemented by intermediaries, as well as the importance of dispute resolution as a key aspect of consumer protection. Dispute resolution is primarily necessary in cases where the digital euro does not function like physical cash, such as in e-commerce, merchant-initiated transactions/ recurring transactions.

Effectively and efficiently combatting fraud is a common goal of the ECB and all stakeholders, and significant work on this is underway in the RDG. Additional work is needed as a next step to work together on fraud management aspects (including how privacy and fraud prevention could coexist, how fraud prevention would work in an open funding scenario, and how the risk distribution would be arranged) and ensure that fraud can be addressed by intermediaries across all payment methods, making the digital euro, to the extent possible, fraud-resistant by design.

8 Areas for further exploration

At both the May 2025 workshop and the July 2025 technical session of the fit in the payment ecosystem workstream, the ECB and the participants agreed on the need to continue exploring several areas that require joint efforts. These areas are partly operational (e.g. identifying which standards to reuse) and partly strategic (e.g. ensuring a potential digital euro is issued in as cost-efficient a manner as possible). As a result, the workstream is set to continue.

The four areas for further exploration are:

1. **Detail, in collaboration with private sector European card and A2A schemes (channelled via ERPB member associations) and merchant representatives, how these schemes and the digital euro value drivers can coexist and strengthen each other, building on existing infrastructure where possible.**

This work will involve:[29]

(a) Building on the RDG work on the use of existing standards or mandating new/upgraded standards that also benefit private sector schemes.

(b) On a voluntary basis, working out how co-badging/tri-badging (if applicable) would work in practice, addressing the concerns raised in the context of the ERPB workstream. This includes collaboration with stakeholders to explore user experience (UX), branding and business logic solutions (e.g. prioritising domestic solutions or offering the digital euro as an alternative).

(c) Organising a deep dive session on leveraging existing processes, while taking note of any misalignment of principles, rules and thresholds with the existing regulatory landscape. This includes maximising the reuse of existing processes such as AML/KYC, fraud risk management and onboarding/offboarding for the digital euro. Industry-wide roadblocks to any mutually beneficial principles would be addressed as needed.

2. **Launch collaborative work to ensure that a potential digital euro is issued in as cost-efficient a manner as possible.** Though some stakeholders consider it premature given the current state of the digital euro design and the scheme rulebook, the ECB commits to working together with all stakeholders on mapping out a digital euro rollout strategy and, where possible, assessing the room for optimising the current design without reducing its scope and use cases:

[29] European Association of Co-operative Banks (EACB) representatives were not in a position to confirm this proposal, as it mandates work for entities they do not represent.

(a) speed to market, implementing a step-by-step approach and striving for simplification, assessing a “one form factor per use case” approach or the later implementation of specific functionalities.

(b) adoption by users.

(c) costs for ecosystem participants, ensuring that the implementation costs on both the issuing and acceptance sides are minimised.

(d) time management, distributing work over time without jeopardising policy objectives.

Moreover, any technical roadblocks to “digital euro as a service” should be discussed and analysed. This could include workshops with potential service providers.

3. **Organise a deep dive on digital euro fraud risk management (within the context of the RDG workstream).** Working together on fraud management aspects (including how privacy and fraud prevention could coexist, how fraud prevention would work in an open funding scenario, and how the risk distribution would be arranged) to ensure that fraud can be addressed by intermediaries and merchants across all payment methods and to make the digital euro, to the extent possible, fraud-resistant by design.

4. **Organise a multi-stakeholder deep dive on the offline digital euro to clarify its characteristics and requirements.**

The co-legislators are invited to take note of the report, which is provided solely for their consideration and does not require any action or follow-up. Furthermore, the co-legislators are encouraged to recognise that achieving a “fair for all” compensation model is in the shared interest of both the Eurosystem and market stakeholders. Such a model would help minimise the risk of unintended consequences while ensuring the equitable distribution of liabilities and value among intermediaries, consumers and merchants. Through the work of the ERPB, several key topics that merit further attention have been identified (without limitation):

- Open funding, particularly in terms of balancing openness against sovereignty, as well as operational and user experience complexity.

- Compensation model, especially fee caps and inter-PSP fees.

- Access to the original equipment manufacturer (OEM) secure element, especially the contractual and pricing implications.

- The role of global digital wallets and X-Pays in the digital euro ecosystem while balancing liabilities in view of the compensation model.

9 Annexes

ERPB association participants in the fit in the payment ecosystem workstream

Consumers

Bureau Européen des Unions de Consommateurs (BEUC)

AGE Platform Europe

Merchants

EuroCommerce

Ecommerce Europe

European Association of Corporate Treasurers (EACT) & BusinessEurope

Bank PSPs

European Association of Co-operative Banks (EACB)

European Savings & Retail Banking Group (ESBG)

European Banking Federation (EBF)

Non-bank PSPs

European Payment Institutions Federation (EPIF)

Electronic Money Association (EMA)

European Third-Party Providers Association (ETPPA)

European Digital Payments Industry Alliance (EDPIA)

Note: Not all members participated in every session of the workstream. AGE, Ecommerce Europe and EACT did not take part in any sessions or provide any written feedback.

Presentations delivered during the technical sessions and workshop

List of the presentations delivered during the technical sessions of the ERPB digital euro "Fit of the digital euro in the payment ecosystem" workstream:

Fit of the digital euro in the payment ecosystem - agenda item 2

ERPB engagement on digital euro fit in the payment ecosystem - Competition

ERPB engagement on digital euro fit in the payment ecosystem - Synergies

ERPB engagement on digital euro fit in the payment ecosystem - Business model

ERPB engagement on digital euro fit in the payment ecosystem - Competition & Synergies - Provisional outcomes session

ERPB engagement on digital euro fit in the payment ecosystem - Business Model - Provisional outcomes session

ERPB engagement on digital euro fit in the payment ecosystem - End Users - Kick-off session

ERPB Engagement on digital euro - Fit in the payment ecosystem - Concluding workshop - Presentation

16th ERPB technical session on digital euro – presentation

Written feedback provided by market stakeholders

Breakdown of written feedback submitted by participants following the technical sessions of the ERPB digital euro "Fit of the digital euro in the payment ecosystem" workstream:

Written feedback after the Competition session (Fit in the payment ecosystem)

Written feedback after the Synergies session (Fit in the payment ecosystem)

Written feedback after the Business model session (Fit in the payment ecosystem)

Written feedback after the Competition & Synergies provisional outcomes session (Fit in the payment ecosystem)

Written feedback after the End Users session (Fit in the payment ecosystem)

Value drivers of the fit of the digital euro in the payment ecosystem workstream

List of value drivers presented to participants during the technical sessions of the ERPB digital euro "Fit of the digital euro in the payment ecosystem" workstream:

Table 1

Value drivers discussed during the technical sessions

Item	Value drivers	Rationale
Payment service providers – competition		
1	Better negotiation position vs ICS	In countries without domestic schemes: No scheme fees would be charged on behalf of the Eurosystem. Having a digital euro as a relevant alternative for intra-EU transactions will ensure a better negotiation position and substantially lower costs, despite incumbent brands having strong leverage due to the high switching cost. In countries with domestic schemes: The same logic applies but to cross-border transactions only, as domestic schemes already offer low fees to participating PSPs.
2	Better negotiation position vs payment processors	No digital euro processing fees would be charged on behalf of the Eurosystem. Having a digital euro as a relevant alternative for intra-EU transactions will ensure a better negotiation position with international processors, while potentially lowering the fees.
3	Digital euro bringing pan-European reach to issuing PSPs	The digital euro will be accepted by merchants operating in the euro area. This ensures maximum reach for issuing PSPs, competing with global payment players or e-shop payment apps, and moving volumes to PSP channels.
4	Attractive pricing at the Point-of-Interaction (POI)	With capped merchant service charges, a digital euro would have attractive pricing at the POI, leading merchants to prioritise digital euro payments over ICS at the POS and moving volumes to PSP channels.
5	Digital euro bringing offline solution to EU PSPs	In the event of outage, payment volumes would partly move to the offline digital euro functionality, further increasing volumes. Offline transactions would not be accessible to PSPs, but issuing PSP would still be compensated.
6	Fewer dependencies on pass-through digital wallets	If the digital euro is taken up, pass-through wallets will be less of an unavoidable solution for issuing PSPs, rebalancing negotiating power in partnerships talks. Additionally, pass-through wallets seeking to provide digital euro services would need tokenisation services, which can be provided by issuing PSPs only, further enhancing issuing PSPs' bargaining power vs pass-through wallets.
7	Fewer dependencies on staged and stored value digital wallets	With capped merchant service charges, the digital euro would have attractive pricing at the POI, leading merchants to prioritise digital euro payments over expensive stage/stored value wallets, fostering a direct relationship between merchants and PSPs.
8	Guaranteed access at the forefront of digital front-ends	"Digital euro payment accounts should be accessed via one of the main pages of the internet website or an application, or any other front-end services, on an equal footing with non-digital euro payment accounts." Recital 63 will ensure that the digital euro always remains an option at the front-end.
Payment service providers – synergies		

9	Digital integration in own solutions and wallets	Digital euro integration into PSPs' own solutions, such as banking or A2A apps and wallets, may strengthen customer relationships and serve as an entry point to pan-euro area payments. How would integration be most beneficial to PSPs also in the context of supporting the Eurosystem digital euro app?
10	Physical integration via co-badging	Co-badging could provide issuers a pan-euro area card-based alternative to ICS, building on a trusted domestic card brand. Domestic schemes could maintain relevance as pan-euro area co-badging partners. How do you judge the value of co-badging, also in the context of capped digital euro merchant service charges?
11	Reuse and harmonisation of standards	The digital euro will reuse payment processes and reuse (or, where needed, establish) standards to create a pan-euro area acceptance network that can be leveraged by the private sector without the need for heavy investment. What would be needed for PSPs to benefit most from this euro area harmonisation?
12	Bundling operational services through technical service providers	PSPs may engage technical service providers to provide operational digital euro services and reduce duplication of efforts. Domestic processors could potentially act as such service providers. How do you judge the value of the technical service provider role? Would you rely on existing entities?
13	Leveraging existing certification capabilities	PSPs could benefit from relying on existing certification entities and capabilities where applicable and where compliant with the digital euro scheme. Would you see a role for domestic schemes and processors for certification purposes and if so, how impactful do you judge it to be?
Payment service providers – business model		
14	Keeping investment and maintenance costs low through reuse of existing processes and infrastructure	PSPs and the Eurosystem may jointly identify relevant cost drivers and actionable mitigation measures, improving the overall business model of a digital euro. What are the major cost drivers, how are these assessed and what would be actionable mitigation measures without compromising the digital euro's overall value proposition?
15	No scheme and processing fees	The Eurosystem will bear the scheme and processing costs, impacting transactional costs favourably. Which concrete suggestions could further optimise the compensation model for all parties involved?
16	Innovation potential and additional revenue from non-basic services	PSPs can offer a range of additional and innovative services linked to or built on the digital euro. These services are not subject to caps and can be fully monetised. How is the innovation and revenue potential for additional services considered?
Merchants – competition		
17	Better negotiation position for merchants vis-à-vis incumbents (ICSs)	In the two-sided retail payments market, which is characterised by strong network effects, where the value for each group increases as more participants join the other side, new market entrants will have difficulties competing with incumbents that have established extensive networks. The digital euro to be distributed by consumers' banks and accepted by merchants by way of its legal tender status will create a viable alternative for merchants, aiming to rebalance merchants' negotiation power.
Merchants – synergies		
18	Minimising implementation efforts through standardisation	The Eurosystem is committed to drawing from and building on existing standards and scheme solutions as much as possible to create synergies and limit implementation costs. In addition, by establishing open standards, the digital euro aims to integrate seamlessly into existing digital solutions and allow domestic schemes to leverage on a pan-European acceptance network.
Merchants – business model		

19	Public ownership of the project	The digital euro, that will serve as public good available to all euro area citizens, will be issued by the ECB within its mandate of protecting monetary and financial stability. Profit maximisation is not among the objectives set by the ECB to rollout the digital euro. Instead, introducing a digital euro would minimise the likelihood of adverse economic outcomes in the future and ensure the resilience of our payment system in an increasingly digital world.
20	Informed decision-making through transparency	With the absence of scheme fees, digital euro payment transactions should not only be priced competitively, but complexity in terms of transaction fee reporting should reduce significantly, improving merchants' ability to make informed business decisions.
Consumers – digital financial inclusion		
21	Availability	The digital euro will help advance digital financial inclusion and address the needs of vulnerable groups that are underserved by PSPs or at risk of exclusion due to the digitalisation of financial services.
22	Usability	To be successfully adopted by consumers, the digital euro would be simple to understand and "easy to use", whether to settle transactions via PSPs' interfaces or via the digital euro app.
23	Accessibility	Accessibility of the digital euro is key as central bank money should be available to all, including persons with disabilities whose needs are not systematically met by private payment solutions.
Consumers – privacy, fraud prevention and resilience		
24	Privacy by design	For online digital euro payments, privacy will be ensured by preventing the Eurosystem from directly linking transactions to individuals. Offline payments offer cash-like privacy without third-party validation. The digital euro uses privacy-enhancing technologies like pseudonymisation, hashing and data encryption to secure data, protecting user identities.
25	Fraud prevention	The online digital euro will include a robust fraud prevention and detection mechanism through the establishment of the Risk and Fraud Management component. This enhances PSPs' ability to detect fraudulent transactions that they might not otherwise identify by enriching their individual fraud risk assessments with insights into patterns and anomalies from a central infrastructure-level perspective.
26	Resilience	The offline digital euro will enhance payment system resilience by enabling transactions without an internet connection, ensuring digital payments can continue during internet outages, thus maintaining economic activities.
Consumers – competition		
27	Free of charge	With no scheme fees or processing fees charged by the Eurosystem and capped merchant service charges, these savings can be passed on to consumers. Additionally, the basic use of the digital euro, including opening an account, conducting transactions, and funding or defunding, will be free of charge for consumers.
28	Universally accepted	The digital euro, as legal tender, could be used anywhere in the euro area for electronic payments in shops, online or from person to person, much like cash today. It would be universally accepted and available for any digital payments across all euro area countries.
29	A platform for innovation	The digital euro would offer a foundation for further innovation by private PSPs, serving as a platform for a range of additional services such as cashback, loyalty programmes, personalised product recommendations, digital receipts and embedded payments.

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