

Who Pays For Public Money?

Infrastructure Funding, The Online–Offline Divide And Competition Between Cash And The Digital Euro

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Abstract

The negotiation of the Single Currency Package has revived a question that monetary economics usually leaves implicit: who bears the cost of the infrastructure through which public money reaches the public. A recurrent claim in the debate holds that the online digital euro is subsidised while its offline version, the one closest to cash, is not. This paper separates the three layers of a payment system (issuance and scheme, intermediation, and physical distribution) and documents, from primary sources, who pays for each in the case of cash and of the two forms of the digital euro. The Eurosystem has committed to bearing the scheme and infrastructure costs of both the online and the offline digital euro, including an offline component procured externally, and to charging no scheme or processing fees. The online–offline asymmetry arises only at the intermediation layer, where the Parliament's mandate would leave offline transactions free of merchant charges. Cash shares the publicly funded issuance layer but relies on a distribution layer that is privately financed and, so far, uncompensated. The paper discusses the competitive implications of these arrangements and their bearing on the legal tender regulation now in trilogue.

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- Keywords: digital euro, cash, central bank money, payment infrastructure, legal tender, compensation model, two-sided markets.

1. Introduction

Every payment instrument rests on infrastructure that someone has to build, operate and renew. For commercial bank money that cost is recovered through a web of fees: scheme fees paid to card networks, interchange paid between banks, merchant service charges paid by retailers and account fees paid by consumers. For public money the question has rarely been asked in explicit terms, because until now public money has existed in retail form only as banknotes and coins, and the division of costs around cash settled into place decades ago without much regulatory attention.

The digital euro changes this. The Commission's proposals of June 2023 for a regulation establishing the digital euro and for a regulation on the legal tender of euro banknotes and coins place two forms of public money side by side, and the negotiation of the package has forced the co-legislators to say who pays for what. The Council adopted its mandate on 19 December 2025, the European Parliament on 9 July 2026, and trilogues began on 13 July 2026, with the compensation model for payment service providers among the most contested issues (Council of the European Union, 2025; Freshfields, 2026).

In that debate a specific claim has gained currency: that the online digital euro is subsidised while the offline digital euro, the variant designed to reproduce the privacy and resilience of cash, is left without funding. The claim matters beyond its technical content, because the offline digital euro and physical cash compete for the same function and are often presented as complements in the same resilience strategy. If the claim were right, public policy would be tilting the field towards the online, account-based form of public money and away from the forms that work without a network.

This paper examines the claim against the primary sources available as of September 2026. Its argument can be stated briefly. The Eurosystem funds the issuance, scheme and settlement layer of both the online and the offline digital euro, as it funds the production and issuance of banknotes, and it has committed to charging no scheme or processing fees for either. What differs between online and offline is the treatment of the intermediaries who provide the service to end users, and there the relevant asymmetry lies in the Parliament's proposal that offline payments be free of charges for merchants. Cash stands in a comparable position to the offline digital euro at the public layer, but in a weaker one at the distribution layer, which is privately financed and currently receives no regulated revenue or compensation. Seen this way, the relevant comparison for regulation is less online against offline than a publicly funded issuance layer common to all forms of public money against distribution layers that are treated very differently.

Section 2 sets out the three layers of a payment system and the ways each is financed. Section 3 documents what the Eurosystem has committed to pay for in the digital euro. Section 4 examines the compensation model for intermediaries and the online–offline divide. Section 5 describes the corresponding arrangements for cash. Section 6 draws out the competitive implications, and

Section 7 relates the analysis to the legal tender regulation. Section 8 concludes. Throughout, the paper distinguishes between agreed positions, negotiating proposals and the author's own interpretation, since the texts are still under negotiation.

2. Three layers of a payment system

For the purposes of this paper a retail payment system can be decomposed into three layers. The first is the issuance, scheme and settlement layer: the creation of the monetary liability, the rules that govern its circulation, and the core systems that record and settle transfers. In a card network this layer corresponds to the scheme and its processing infrastructure; for cash it corresponds to the design, production and issuance of banknotes by the central bank; for the digital euro it corresponds to the settlement engine, the scheme rulebook and the common components operated by the Eurosystem.

The second is the intermediation layer: the services through which end users gain access to the instrument, such as account opening, wallets, funding and defunding, onboarding of merchants, acquiring and customer support. These are provided by banks and other payment service providers, which need a revenue stream to cover their costs.

The third is the physical distribution layer: the tangible assets that bring the instrument to the point of use, such as ATMs, bank counters, cash-in-transit logistics and deposit machines for cash, or terminals, cards and devices capable of storing value for offline digital payments.

In private card payments each layer has an explicit price. Schemes charge fees to issuers and acquirers, interchange flows from acquirers to issuers, and merchants pay a merchant service charge that bundles both. The economics of such platforms is the economics of two-sided markets, in which the structure of prices across the two sides, and not only their level, determines adoption and use (Rochet and Tirole, 2003). The design of the digital euro compensation model is, in effect, a decision about that price structure for a new two-sided instrument whose first layer is publicly provided.

3. The digital euro: what the Eurosystem pays for

The ECB has been explicit about its own role in funding the first layer. In its report closing the preparation phase, published on 30 October 2025, it stated that the Eurosystem would not charge or benefit from any digital euro transaction fees and would instead bear the costs of establishing the digital euro scheme and infrastructure, as it does for the production and issuance of euro banknotes, which it describes as a comparable public good; these costs would be covered by seigniorage, even if digital euro holdings were small compared with banknotes in circulation (ECB, 2025a). In a speech of 1 April 2026, Executive Board member Piero Cipollone repeated that the Eurosystem will not charge scheme or processing fees for digital euro transactions (Cipollone, 2026b).

The same documents quantify the commitment. Total development costs until first issuance, currently expected during 2029, are estimated at around €1.3 billion, comprising externally and internally developed components, and annual operating costs are projected at approximately €320 million from 2029 (ECB, 2025b). For the banking sector, Cipollone put implementation costs at between €4 billion and €6 billion over four years on the basis of indications from banks (FStech, 2026), and argued that intermediaries would recoup them through fees charged to merchants, since they would pay no scheme fees (Cipollone, 2026a).

The point most relevant to the debate concerns the offline component. In October 2025 the ECB concluded framework agreements for five components of the digital euro service platform, one of which is the offline solution. A consortium led by Giesecke+Devrient, with Nexi and Capgemini, was ranked first, and equensWorldline second (ECB, 2025c). According to the consortium, the framework agreement covers the design, development, implementation and partial operation of the offline component and its integration into the overall digital euro architecture (Giesecke+Devrient, 2025). The ECB has also noted that some components, such as settlement, would be developed internally, while others, such as the offline services component, are covered by framework agreements with external providers (ECB, 2026a).

The conclusion for the first layer is therefore unambiguous. The Eurosystem funds the scheme and core infrastructure of the digital euro as a whole, including the offline solution, and does not recover those costs through fees on transactions of either kind. In the economic sense of a public input supplied to users and intermediaries at zero price and financed from the issuer's income, both the online and the offline digital euro are

subsidised at this layer. The ECB prefers to describe the arrangement as the provision of a public good financed by seigniorage, in the same way as banknotes, and that description is compatible with the one used here. The claim that only the online version benefits from public funding does not hold at the level of the Eurosystem's own infrastructure.

4. The intermediation layer and the online–offline divide

The asymmetry that underlies the debate arises at the second layer. Under the Commission's proposal, the fees that payment service providers could charge merchants, and the inter-PSP fees between them, would be capped at the lower of the providers' relevant costs plus a reasonable profit and the fees charged for comparable digital means of payment (European Commission, 2023a; Freshfields, 2026). Both co-legislators have replaced this with euro-area uniform caps, set first under a transitional model based on comparable private means of payment and later on a cost-based methodology. The Council's mandate provides for a transitional period of at least five years in which interchange and merchant service charges are capped at a level based on fees for comparable means of payment, followed by caps based on the actual costs of the digital euro (Council of the European Union, 2025). The ECB has indicated that, during the transition, caps would be set at a level comparable to average fees for debit cards usable both at the point of sale and online (Cipollone, 2026a).

The co-legislators differ on several points. The Parliament would allow the transitional model to become permanent if a Commission report finds that it delivers lower costs for merchants and more competition, while the Council would end it after ten years at the latest; the Parliament would protect each merchant individually against paying more than for comparable digital means of payment, while the Council prefers national caps (Freshfields, 2026). On offline payments, reports of the compromise reached by Parliament's negotiators in June 2026 indicate that all offline transactions would be processed free of charge for merchants (heise online, 2026). The Council Presidency's discussion note of 31 August 2026 lists, among the elements of the Parliament's compensation model it intends to examine, “the lack of compensation for offline transactions” (Council Presidency, 2026). Freshfields (2026) records that fees for offline transactions remain to be resolved in trilogue.

The online–offline divide is therefore real, but it is a divide in the remuneration of intermediaries and not in public funding of the infrastructure. Under the Parliament's text, a bank or payment institution that enables offline digital euro payments would bear the costs

of that service at the second and third layers, such as device provisioning, funding and defunding of offline balances and merchant acceptance, without a regulated merchant fee to recover them. Online transactions would carry capped fees designed to cover costs plus a margin. Table 1 summarises the positions as they stand.

Table 1. Funding of the digital euro by layer and institutional position (as of September 2026)

Layer	Online digital euro	Offline digital euro	Status
Scheme, settlement and core components	Eurosystem bears costs; no scheme or processing fees	Eurosystem bears costs, including externally procured offline component	ECB commitment (2025–2026)
Intermediary compensation	Capped merchant and inter-PSP fees; transitional then cost-based	Parliament: free of charge for merchants; Council: to be settled	Open in trilogue
End users (basic services)	Free of charge	Free of charge	Common to proposals

Sources: ECB (2025a, 2025b, 2025c, 2026a); Council of the European Union (2025); Council Presidency (2026); Freshfields (2026); heise online (2026). “Free of charge” for end users refers to basic digital euro services as described in the ECB’s public statements.

5. Cash: the same public layer, a different private layer

For cash, the first layer is funded in the way the ECB invokes as a model for the digital euro. The Eurosystem designs, produces and issues euro banknotes, with production shared among national central banks under ECB coordination; there are more than 30 billion euro banknotes in circulation with a total value of more than €1.5 trillion (ECB, 2025d). The income the Eurosystem earns on the assets that back this liability, its seigniorage, covers the costs of production and issuance. Since the digital euro has not yet been issued, this income currently arises from banknotes and coins.

The second and third layers of cash are organised differently. Bringing banknotes from central bank vaults to ATMs, bank counters and shop tills, and back again, is the work of commercial banks, cash-in-transit companies and other cash handlers. Their costs are recovered, where they are recovered at all, through account fees, withdrawal fees, charges to merchants for deposits and cross-subsidies within banking relationships. No regulated remuneration exists for this layer comparable to the capped fees proposed for the digital

euro. The ECB's cross-country study of the costs of retail payments found that the social cost of retail payment instruments amounted to almost 1% of GDP in the participating countries, that cash accounted for nearly half of that total, and that cash nevertheless had on average the lowest cost per transaction, followed closely by debit cards, though not in every country (Schmiedel, Kostova and Ruttenberg, 2012). A more recent Bundesbank study of German retail found cash to be the least expensive payment method for merchants per transaction, at an average of €0.43, with the domestic girocard cheapest relative to turnover and international cards more expensive on both measures (Deutsche Bundesbank, 2025).

The legal tender regulation would change the institutional setting of this private layer without, in the Commission's proposal, changing its financing. It would oblige Member States to monitor access to cash, report annually to the Commission and the ECB and adopt remedial measures where sufficient and effective access is not ensured (European Commission, 2023b). The rapporteur's draft report, presented in November 2025, added that any additional costs such measures impose on financial intermediaries must be compensated by the Member State, so that providers are not penalised for sustaining adequate access (European Parliament, 2026). Whether that provision is retained in the final Parliament mandate and in the trilogue outcome is not yet established in public documents, and the Council's mandate contains no equivalent that the author has been able to identify.

National practice offers one reference point. In the Netherlands, the *Wet chartaal betalingsverkeer*, adopted by the Senate on 19 May 2026, obliges banks to ensure a basic cash infrastructure and good and affordable cash services, and an amendment introduced a zero tariff for private individuals, religious bodies and charitable organisations when depositing and withdrawing cash (Eerste Kamer, 2026; Goede Doelen Nederland, 2026). The obligation is placed on banks. Table 2 places cash alongside the two forms of the digital euro and private card payments.

Table 2. Who pays for each layer: cash, digital euro and private card payments

Layer	Cash	Digital euro (online)	Digital euro (offline)	International card schemes
Issuance / scheme / settlement	Eurosystem, from seigniorage	Eurosystem, from seigniorage	Eurosystem, from seigniorage	Scheme fees paid by issuers and acquirers
Intermediation	Banks; recovered through account and cash-service fees or cross-subsidy	PSPs; capped merchant and inter-PSP fees	PSPs; no merchant fee under Parliament text	Issuers and acquirers; interchange and merchant service charges
Physical distribution	Banks, CIT companies, merchants; no regulated compensation	PSPs and merchants (terminals, apps)	PSPs and users (devices, cards)	Acquirers and merchants (terminals)

Sources: as in Table 1; ECB (2025d); Schmiedel et al. (2012); Deutsche Bundesbank (2025). The table describes the allocation of costs in the texts and statements cited; it does not measure their size.

6. Competitive implications

The allocation of costs across layers has consequences for competition along three margins. What follows is the author's interpretation of the documented arrangements.

6.1 Public money against private schemes

The first margin is the one the ECB emphasises. International card schemes accounted for approximately 61% of euro area card payments in 2022, and thirteen euro area countries rely entirely on them for card transactions (ECB, 2025e). By supplying the scheme and settlement layer at zero price, the Eurosystem removes the component of merchant costs that corresponds to scheme fees and sets a benchmark against which private fees can be compared. In two-sided market terms, the public provision of the first layer lowers the total price of the platform and leaves the regulated caps to determine its structure. This is a deliberate subsidy in favour of a European alternative to international schemes, justified by its promoters on grounds of strategic autonomy and competition.

6.2 Public money against public money

The second margin concerns cash itself. At the point of sale, the merchant who accepts the online digital euro would pay a capped fee comparable, during the transition, to debit card fees. If the Parliament's text prevails, the merchant who accepts the offline digital euro would pay no fee at all. The merchant who accepts cash pays no fee to a payment provider but bears handling, security and deposit costs, which the Bundesbank study includes in its estimate of €0.43 per transaction. The two figures are not strictly comparable, since the offline digital euro also generates some costs for merchants outside fees, but the direction is clear. A fee-free offline digital euro would compete with cash on the very ground where cash has been cheapest for merchants, while the distribution layer of cash remains unfunded and, under current trends, contracting.

It would be a mistake to read this as an argument against a free offline digital euro. The resilience and privacy properties that justify the offline form are the same that justify cash, and a regulatory framework that treated both generously would be consistent. The difficulty lies in the asymmetry: the public layer of both instruments is funded from the same source, while only one of them would acquire, in the online variant, a regulated revenue stream for intermediaries, and neither the offline digital euro nor cash would, under the Parliament's text, provide intermediaries with a fee income to sustain their distribution.

6.3 The incentives of intermediaries

The third margin concerns the intermediaries who distribute all three instruments. Banks and payment service providers respond to the revenue attached to each service. Under the arrangements described, the online digital euro would carry capped but positive fee income; the offline digital euro, under the Parliament's text, none; and cash distribution, none regulated. An intermediary facing these incentives has reason to promote the online form, provide the offline form to the extent required, and continue to rationalise cash infrastructure. The Council Presidency's concern with the absence of offline compensation can be read in this light, as can the rapporteur's proposal for the compensation of cash access obligations. Both point to the same risk from different directions: services that are mandated or expected but not remunerated tend to be under-supplied.

7. Implications for the regulation to come

Three implications follow for the legal tender regulation and the digital euro regulation, which are negotiated as a package.

First, the framing of the debate can be sharpened. The relevant distinction is between the public layer, which the Eurosystem funds for all forms of central bank money, and the intermediation and distribution layers, whose treatment differs. Describing the online digital euro as subsidised and the offline one as not obscures the fact that the Eurosystem funds both, and diverts attention from the question of how the intermediaries of each instrument are to be remunerated.

Second, the principle the ECB invokes to justify public funding of the digital euro, that central bank money is a public good whose infrastructure the issuer bears, has so far been applied to cash only at the issuance layer. The legal tender regulation is the first EU instrument that would impose obligations on Member States regarding the distribution layer of cash. How those obligations are financed, whether by compensation as in the rapporteur's draft, by obligations on banks as in the Dutch law, or by neither, will determine whether the access provisions are effective in the areas where the market case for cash infrastructure is weakest.

Third, the offline digital euro and cash share both a function and an economic problem. Each is intended to preserve privacy and resilience, and each depends on intermediaries who, under the texts now on the table, would receive no regulated remuneration for providing it. A consistent approach would examine the two together, including through the common indicators for monitoring access and acceptance that the Commission is to define under the legal tender regulation. Precedents for compensating the net cost of mandated services exist in other network industries, notably the universal service provisions of the European Electronic Communications Code (Directive (EU) 2018/1972), and they show that such mechanisms can be designed to cover only the net cost of obligations that the market would not otherwise meet.

8. Conclusion

On the evidence of the ECB's own statements and procurement decisions, the digital euro is publicly funded at the issuance, scheme and settlement layer in both its online and its

offline form. The Eurosystem will bear development costs estimated at around €1.3 billion and annual operating costs of about €320 million, has procured an offline component from external providers, and will charge no scheme or processing fees. The widely repeated claim that only the online digital euro is subsidised is therefore inaccurate at that layer. The asymmetry that does exist concerns the remuneration of intermediaries, and under the Parliament's mandate it would leave offline digital euro payments, like cash distribution today, without a regulated revenue stream.

Cash occupies a distinctive position in this landscape. It shares with the digital euro the publicly funded issuance layer that the ECB uses as its model, and it is currently the source of the seigniorage from which the Eurosystem's costs are met. Yet its distribution layer is privately financed and uncompensated, precisely as the legal tender regulation prepares to impose access obligations on Member States. The consistency of the Single Currency Package will depend in part on whether the co-legislators apply to the distribution of both forms of public money a common principle about who pays.

The texts discussed here remain under negotiation. The analysis should be revisited once the trilogue produces agreed provisions on the compensation model, offline fees and the financing of cash access obligations.

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