



Digital Euro Cost Study

**Additional information supplementing the
Digital Euro Cost Study from June 2025**

March 2026



Commissioned by the European Association of Co-operative Banks (EACB), the European Banking Federation (EBF) and the European Savings and Retail Banking Group (ESBG)

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Introduction

The Digital Euro Cost Study (hereafter the Study) was published on 5 June 2025 and is among the first published efforts by the private sector to estimate the implementation costs of the digital euro for retail banks. 19 banks and banking groups from the euro area, representing different sizes, regions and business models, participated, using a uniform methodology. The primary goal of the Study was to provide a constructive contribution to the dialogue with institutional stakeholders, by providing a fact-based assessment of investment and resource requirements of the introduction of the digital euro.¹ This assessment effort was based also on assumptions in areas where some implementation aspects were (and still are) under discussion.

The political debate having advanced since June 2025, a new version of the rulebook having become available and progressive insights gained, this additional paper aims to revisit the findings of the Study and test them against new information having become available. In this context, the banks that participated in the Study were asked to reassess their original findings, considering, among others, design assumptions, group synergies and anticipated market synergies.

In formulating findings, this document draws on both the original Study results and additional information provided by the participating banks, as well as additional documents published, for example by the European Central Bank (ECB), as part of the wider discussion around the costs of implementation of the digital euro.

¹ The Digital Euro Cost Study focussed on the change costs for euro area retail banks. The offline functionality, multiple accounts as well as running costs were not considered within the estimates.

Key takeaways

Since the publication of the Digital Euro Cost Study on 5 June 2025, additional information has become available. The banks that participated in the Study were asked to revisit their initial cost estimates to assess if they were still valid following the publication of this new information, including rulebook version 0.9. They addressed, among others, design assumptions, group synergies and anticipated market synergies.

The feedback received confirmed that:

- **Assumptions remain valid:** The design assumptions underlying the Study were reviewed against version 0.9 of the digital euro rulebook and remain materially unchanged from version 0.8, which was used as the basis for the original Study.
- **The digital euro is not a simple add-on to existing infrastructure:** Banks confirmed their original cost estimates, noting that: (1) the digital euro card requires new software, protocols, and certifications, (2) ATMs require complex backend modifications, even without rigid digital euro requirements on NFC/QR code functionality, (3) POS terminals require software updates and re-certification specifically to facilitate digital euro transactions.
- **Costs remain substantial despite mitigation efforts:** Banks assumed reuse of existing infrastructure, standards (e.g., for ATMs, POS terminals, and physical cards), and outsourcing arrangements to reduce projected costs. Despite these favourable assumptions, costs remain substantial, as the majority of investment stems from new IT infrastructure, processes, and systems required by the digital euro's current design, which cannot be fully avoided through outsourcing.
- **Market synergies through outsourcing offer potential but uncertain savings:** Potential cost savings from outsourcing were factored into the Study. However, realising these savings depends not only on individual banks' overall strategies and operational models but also on the readiness and adequacy of service providers at the time of the digital euro's launch.
- **Group synergies have been accurately accounted for:** To reflect cost savings within banking groups (e.g., centralised development, shared materials or common IT platforms), participating banks applied established internal methodologies to account for these synergies.
- **Costs have been extrapolated to the euro area level using a solid methodology:** The Study's cost estimates at bank level were extrapolated across the euro area retail banks level to indicate the overall magnitude, using a methodology that factored in bank size, region, and group structure through varying cost factors and synergy levels.

In conclusion, the assumptions and estimates of the original Study were reconfirmed and the extrapolated order of magnitude of 18 billion euro in change costs for euro area retail banks remains realistic.

The digital euro may appear at first glance to be just a new payment method, but the Digital Euro Cost Study shows otherwise: there is significant complexity revealed when examining implementation steps across all affected areas of a bank. Evolving design choices may impact complexity and resulting costs in either direction. This raises a legitimate question for policymakers: whether the shared and critically important goal of European sovereignty in payments could be achieved in a more cost-effective way, for example, by closely cooperating with or building upon private sector initiatives.

Design Assumptions

The digital euro is not a simple add-on to existing infrastructure: (1) the digital euro card requires new software, protocols, and certifications, (2) ATMs require complex backend modifications, even without rigid digital euro requirements on NFC/QR code functionality, (3) POS terminals require software updates and re-certification specifically to facilitate digital euro transactions.

Physical digital euro card

The Digital Euro Scheme Rulebook foresees that end-users should also be able to pay using a physical card. All traditional card-based payments work on a set of predefined rules, standards and messaging protocols that form a scheme. Today, only international schemes like Visa and Mastercard offer pan-European coverage. Since the digital euro aims to provide sovereignty and independence from these schemes, a new European one must be created.² The Study assumed that this would fall within the responsibilities of the ECB as scheme manager.

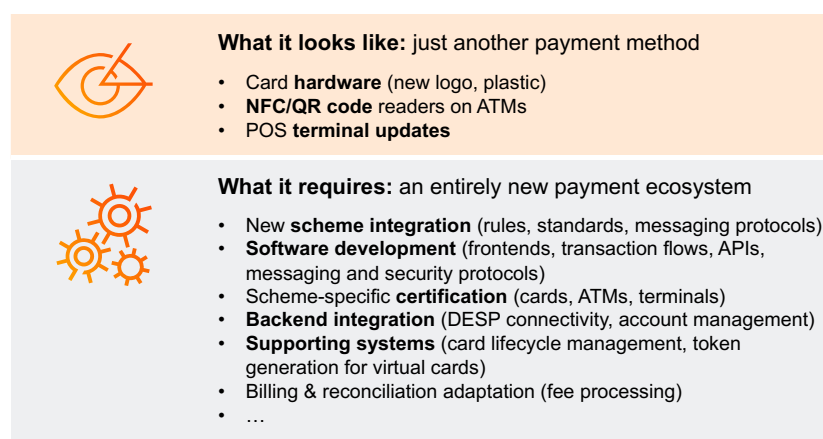


Figure 1: Complexity of digital euro implementation (illustrative)

On the surface, the digital euro card might look like a traditional payment card with a new logo. This hardware aspect – the physical card, or the microchip on it, is the simple part – as it likely only requires small adjustments and the related processes are often outsourced. However, the real cost lies beneath the surface. The digital euro card is a new payment instrument, linked to a new type of account,

operating under a new scheme, and settling in central bank money rather than commercial bank money. This means entirely new digital euro-specific software, security architecture, cryptography, messaging protocols, and certification processes, which must first be defined by the scheme manager and adopted by digital euro service providers.³ Banks will need to adapt and implement these and cannot simply re-issue their existing cards.

Beyond the actual card infrastructure, additional supporting infrastructure for lifecycle management of the card must be built and maintained: issuing, blocking, replacing, and managing cards, all newly built or integrated into existing banking systems and adapted to a scheme that does not yet exist. In their cost estimates, banks accounted for reusing infrastructure wherever possible, leaving very limited scope for

² See for example the FAQs on the digital euro published by the ECB

³ The Digital Euro Scheme Rulebook 0.9 as well as the Annex A1 already foresee concrete certification requirements and processes

further cost reductions. The assumption that a physical digital euro card would incur no change costs does not reflect operational reality.

ATM and Branch Infrastructure

The Digital Euro Scheme Rulebook foresees NFC and QR code technology for connecting the digital euro app or card with ATMs. The Digital Euro Scheme Rulebook did not outline whether all ATMs would need to support both NFC and QR code, or only a subset. In the Study, banks assumed that not all ATMs would need to have NFC and/or QR code capabilities. This assumption was confirmed by the ECB after the conclusion of the Study.⁴

Importantly, NFC and QR code only establish the initial connection between the card or app and the ATM. Their existence has to be coupled with special IT infrastructure and software for the digital euro. Funding and defunding digital euro accounts, processing transactions, and communicating with the settlement platform all require new transaction flows (cash to digital euro instead of cash to deposits and vice versa), APIs, security protocols, and scheme-specific certifications, all of which must be developed, tested, and deployed to the devices.

The operational models around ATMs add further complexity. Banks have increasingly outsourced ATM infrastructure to dedicated joint ventures or companies, or these have been sold to independent ATM deployers (IADs). These non-bank entities currently provide approximately 20% of ATMs in Europe.⁵ In light of increasing costs and reduced usage of ATMs in the euro area, this share is expected to grow.⁶ Banks already factored this trend into their cost estimates. However, outsourcing shifts rather than eliminates costs. Banks retain significant expenses for vendor selection, integration, and testing, as well as for meeting regulatory outsourcing and re-certification requirements.⁷ Such joint ventures and IADs, in turn, must develop, certify, and deploy digital euro functionalities themselves and will pass these costs on through project-specific charges or higher service fees. This fragmented landscape poses a particular challenge for pan-European banking groups, which often work with different ATM providers across different markets. Coordinating the digital euro ATM rollout across these diverse partners, each with different processes, systems, and certification timelines, limits economies of scale and drives up overall implementation costs.

The adaptation requirements extend beyond ATMs to the branches that support them. Teller and back-office systems will need software updates and integration with the digital euro settlement infrastructure. Internal processes and compliance workflows will need to be redesigned, and staff trained on new procedures. Rolling out these changes across extensive retail branch networks requires dedicated

⁴ See also slide 30 of the ECB presentation “ERPB engagement on digital euro fit in the payment ecosystem”, February 2025.

⁵ See ECB, A view on recent assessments of digital euro investment costs for the euro area banking sector, Oct 2025

⁶ See ECB Payment Statistics, 29 January 2026

⁷ Requirements stemming from e.g., Digital Operational Resilience Act (DORA), Payment Services Directive 2 and 3 (PSD2/3) or also MaRisk

change management and internal support structures, representing a meaningful additional implementation cost.

Point-of-Sale

Study participants identified multiple factors contributing to implementation costs at the point-of-sale (POS). Hardware is one, driven primarily by the number of POS terminals a bank operates. Participants made assumptions, focusing on remotely updating infrastructure and replacing terminals within natural cycles. However, hardware is only one element in a broader picture.

Every terminal accepting digital euro payments, regardless of type, will need new software and re-certification under the new scheme. This includes building new payment processes, making the terminal compliant with the digital euro scheme, and meeting its security standards. Similar efforts were required when mobile wallets were introduced across the market.

Some expect that newer terminal types like SoftPOS⁸ and SmartPOS⁹ could lower costs.¹⁰ However, the shift is not that simple. Many large retailers still rely on IT systems that are not easily compatible with SoftPOS (e.g., Windows-based systems).¹¹ In addition, certain card transactions (e.g., high-value payments or after a specified number of contactless transactions) still require customers to physically insert their card. Smartphones cannot support this, and online PIN is not yet universally supported. Accessibility also remains a challenge: visually impaired users still depend on physical keypads, and software-based alternatives are not yet widely available. Meanwhile, SmartPOS devices are more complex than traditional terminals and may increase costs rather than reduce them. In short, while the trend towards Soft/SmartPOS is there, the conditions for a broad shift are not yet fully in place.

Fee Calculation

In the Study, fees for digital euro transactions were assumed to be calculated within the Digital Euro Service Platform (DESP) and communicated to the respective payee and payer banks. This led to minimal cost estimates for this component, representing only 1% of total estimates.¹²

These costs, however, are not zero because, once fees are calculated within the DESP, they must still be received, validated, reconciled and booked within the bank's systems, requiring adaptations to existing billing, accounting and reconciliation infrastructure. Fee structures may also differ from existing payment product fee models, requiring adjustments to adjacent systems, e.g., pricing.

⁸ SoftPOS: Software that turns a standard smartphone or tablet into a contactless payment terminal using its built-in NFC, with no dedicated hardware required.

⁹ SmartPOS: A purpose-built typically Android-based payment terminal that combines traditional card acceptance (chip, contactless, PIN) with smart-device features like apps and a touchscreen.

¹⁰ Please refer to "A view on recent assessments of digital euro investment costs for the euro area banking sector", ECB, Oct 2025

¹¹ See for example Financial IT, 24.04.2025 "Why SoftPOS isn't killing the PIN pad"

¹² Digital Euro Cost Study, June 2025

Group Synergies

The Study considered synergies within banking groups, reflecting that banking groups centralise development efforts to reduce costs. These synergies were calculated based on established bank-specific methodologies and remain valid.

Many of the banks participating in the Digital Euro Cost Study are part of larger banking groups operating across multiple countries. In their respective inputs to the Study, rather than providing feedback for individual banks, these banking groups have considered if and what synergies could be created at the group level in the implementation of a digital euro.

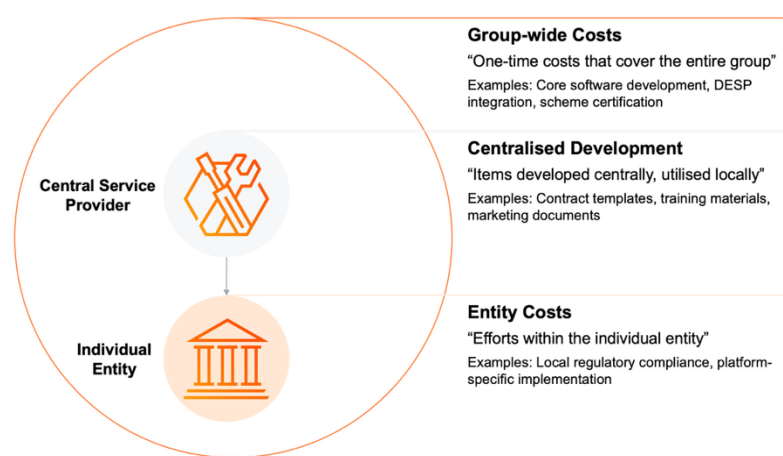


Figure 2: Synergy structure within banking groups (schematic)

In practice, these synergies arise because banking groups develop key functionalities, processes and materials (such as marketing campaigns and training programmes) once at central level and share them across the group. This applies to all types of banking groups. Centralised groups operate their entities on a shared IT platform, meaning a solution built once can be deployed across all entities. Decentralised groups,

whether national or international, such as members of institutional protection schemes (IPS)¹³, consist of individually licensed credit institutions with their own infrastructure but can still share development work, materials or even IT platforms. In both cases, costs for individual entities are reduced compared to individual banks.

The banks participating in the Study quantified these synergies based on established internal methodologies used to estimate costs for other large-scale implementation projects. To ensure the robustness of the resulting figures, participating institutions typically submitted the cost estimates for review by relevant subject matter experts within each institution and for approval from senior management bodies. The estimates therefore represent institution-level assessments grounded in common business practices and structured internal processes used for normal change projects.

¹³ For information on Institutional Protection Schemes, please refer to the European Parliament ECON Committee’s report entitled “Institutional Protection Schemes – What are their differences, strengths, weaknesses, and track records?”, March 2022.

By way of example, typically pan-European banking groups estimated the full digital euro implementation costs for their central entity and then applied a scaled cost factor for each additional country in which the group operates. This scaling factor was calibrated to reflect the complexity of the local IT infrastructure in each market. Where efforts to harmonise group-wide IT systems were already under way, these were factored into the estimates, including the degree of harmonisation progress expected to have been achieved by the time of the digital euro rollout.

These considerations were reflected in the methodology used to extrapolate costs to the euro area. The extrapolation assumed that entities fully dependent on a parent institution's infrastructure would bear no additional implementation costs, thereby avoiding the risk of double-counting. For instance, in the case of IPS banks, the cost estimate was attributed to a single entity within the group. It should be noted that 50% of all euro area-based IPS members were represented in the Study. All remaining entities were treated as bearing no incremental costs. More broadly, the methodology employed in the Study incorporated varying degrees of synergies across different types of banking groups, as set out in the Study's methodological framework. On average, group synergies in excess of 79% were assumed during the extrapolation process.

Furthermore, the assumptions underpinning the clustering methodology and synergy calculations were validated on an institution-by-institution basis to ensure that individual organisational structures and the allocation of entities to synergy clusters were accurately reflected. In total, more than 80% of all entities covered by the extrapolation were validated either by a representative of a banking group included in the Study or members of a national banking association.

Market Synergies

The potential to generate savings by outsourcing digital euro-related tasks was a key cost consideration for participating banks. However, realising these savings also depends on individual operational models and provider readiness at launch.

The Study was conducted with the understanding that banks would leverage existing infrastructure and outsourcing arrangements wherever possible, within the limitations of uncertainties regarding e.g., availability of providers and the tight implementation timeline. Participants accounted for this to the extent possible in their estimates. However, various commercial and strategic aspects deserve closer consideration in this context.

A central ECB assumption is that dedicated service providers will emerge to offer digital euro solutions as a service, reducing the cost burden for individual banks by spreading development costs across the market. However, these providers will need to develop, certify and maintain digital euro capabilities and will pass their costs for these investments on to banks through service fees, licensing models or implementation charges – therefore, this is just a shift of these costs over a longer time horizon.¹⁴ On top of this, it cannot be excluded that only a limited market for digital euro services will be available from day one. This would then be reflected in the providers' pricing and would limit banks' ability to switch providers or negotiate favourable terms, potentially creating vendor lock-in at a critical stage of the implementation.

The degree to which market synergies can be realised varies significantly across the euro area. Larger banks with established vendor relationships may negotiate favourable terms; smaller institutions with less leverage may face proportionally higher costs. More fundamentally, it remains unclear whether providers will be ready on time. Banks cannot afford to wait and, where third-party capabilities are unavailable, they will need to develop solutions in-house or risk non-readiness at launch.

Outsourcing itself also generates costs: vendor selection, governance and technical integration all require significant investment.¹⁵ The Study focused exclusively on change costs; ongoing costs for vendor management and service fees would add a permanent cost layer that has not been considered. Further reductions based on outsourcing assumptions would therefore overstate achievable savings and overlook the strategic risks that outsourcing in a new and immature ecosystem entails.

This leads to a broader strategic concern. Outsourcing core payment infrastructure to a small number of providers also raises operational risk and concentration risk. Banks would become dependent on third parties for a payment instrument carrying a legal acceptance obligation.

¹⁴ Requirements outlined in Digital Euro Scheme Rulebook V0.9

¹⁵ Refer, for example, to the EBA Guidelines on outsourcing arrangements

Extrapolation

The Study extrapolated the cost estimates to the euro area, taking into account average group synergies of more than 79%. The methodology included different cost and synergy factors reflecting differences in bank size, region and group structure. The conclusion remains that an order of magnitude of 18 billion euro in total costs for euro area banks and banking groups is realistic.

The 19 participating banks estimated over 2 billion euro in implementation costs. To project costs across the entire euro area, a top-down extrapolation was applied using the ECB's SSM framework, which categorises banks into Significant Institutions (SIs) and Less Significant Institutions (LSIs), covering 877 entities (114 significant consolidated entities under direct ECB supervision and 763 subsidiaries of these entities). 186 non-retail institutions and 479 entities reliant on group-level central providers were excluded.

Ø synergies assumed: **79%**

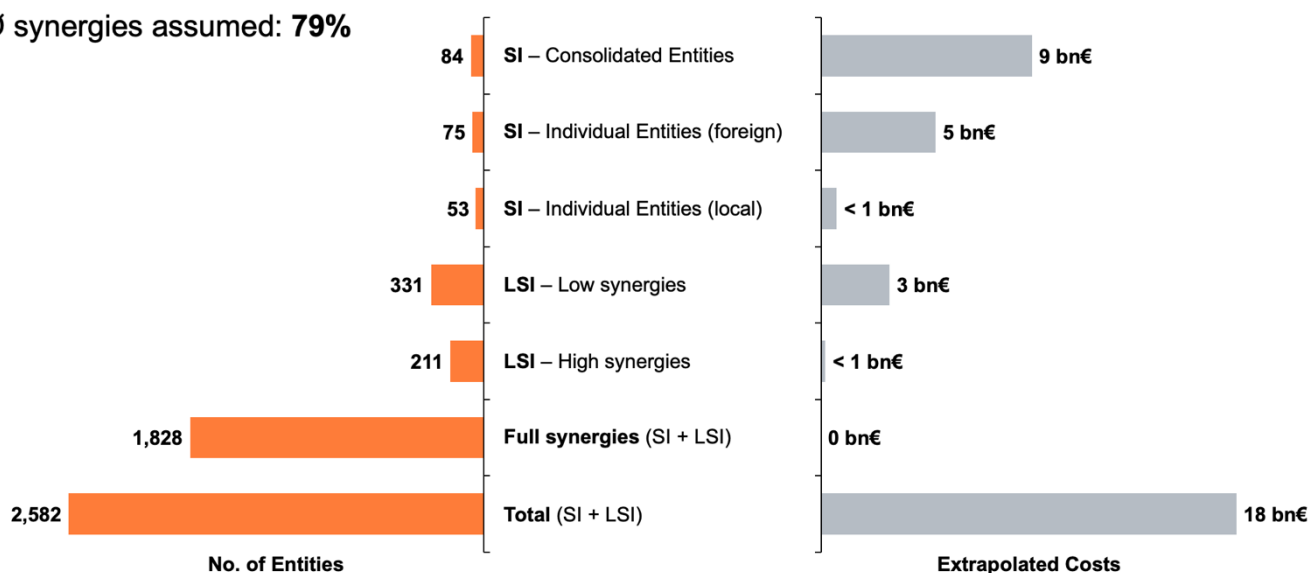


Figure 3: Entities per category and associated costs

Of the 114 significant consolidated entities, 84 were identified as affected by the digital euro, either due to their retail business or their role as central provider for a group that includes retail institutions. Each was assigned the Study's average implementation cost of 110 million euro, totalling approximately 9 billion euro. An additional 75 foreign subsidiaries, often operating on separate IT platforms, were assigned incremental costs of 75% or 25% of the core cost depending on synergy potential, adding approximately 5 billion euro. A further 53 local subsidiaries were estimated at 30 million euro each (the Study average for medium-sized banks), or 25% thereof where group infrastructure applies, contributing around 690 million euro. In total, the extrapolated cost for significant institutions amounts to approximately 15 billion euro.

For less significant institutions, 331 standalone entities were each assigned the Study's small-bank average of 9.2 million euro, totalling approximately 3 billion euro. Another 211 institutions with partially shared infrastructure were estimated at roughly 2 million euro each (25% of full cost), adding 485 million euro. The remaining 1,349 LSIs, fully dependent on shared infrastructure, were assumed to bear no direct costs. This brings the total for less significant institutions to approximately 3.5 billion euro.

Overall, the total estimated cost for introducing the digital euro across the euro area amounts to approximately 18 billion euro, with average group synergies of 79%. Only 754 retail banks would bear direct implementation costs, with the specific amount depending on size and ability to share infrastructure within their banking group. The remaining 1,828 retail banks are expected to fully leverage their parent group's systems and infrastructure and bear no individual costs.



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