EUROPEAN CENTRAL BANK

EUROSYSTEM

Technical data on financial stability impact of digital euro

09 October 2025

Purpose of this presentation

- **The ECB received a specific request by co-legislators for technical data related to the potential financial stability impact of different digital euro holding limits.**
  - Data requested included impact of hypothetical holding limits up to €3,000 per individual
  - Request to to quantify the potential impacts of each limit on certain key indicators, including: bank deposits, liquidity metrics, banking profitability, and lending dynamics.
- This analysis **provides input on these aspects, to the best of the available data and methods** that have been developed and collected by the ECB as part of the preparation of the methodology, with the objective of responding to the requests as fully as possible and delivering complete technical input.
- The **presentation and the results should not be interpreted as the outcome of the methodology** (which includes all three pillars), **nor as the ECB's view on the appropriate level of the holding limits**, but solely as a technical answer to a specific request from the co-legislators.

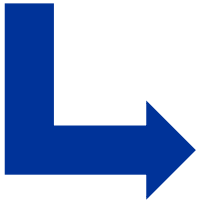
Anticipating the environment in which the digital euro will be introduced

The first element considered is the impact of payment digitalisation trend on demand for banknotes

Evaluating the **usage of cash going forward** (as what matters is the **total amount of central bank money in circulation**)

Banknotes for transaction purposes

Households' bank deposits



€127 billion inflow of deposits due to the ongoing digitalisation of payments until 2034, which is equal to 0.4% of total banking sector assets or 1.5% of total retail sight deposits

Focus on financial stability pillar

"The resilience of the financial sector is a necessary condition to prevent a potential conflict between price and financial stability. The Governing Council systematically assesses the interactions between monetary policy and financial stability at regular intervals."

ECB's monetary policy strategy statement, June 2025.

The model

We simulate a bank's reaction to digital euro demand (deposit outflows) using a **constrained balance sheet optimization model** (based on **Meller and Soons, 2023**) in which banks maximize profits.

The data

We use **bank-level data for 115 SIs and 1,910 LSIs** (complemented with the ad-hoc data collection) to obtain bank-specific results for **2,025 euro area banks.**

Detailed data and insights enabled a reassessment of outflows compared to earlier estimates (e.g., not everyone consistently maintains €3,000 in their accounts).

How do we measure the impact on banks?

Impact on **liquidity**

Facing an outflow, each bank re-optimises its balance sheet using different funding options:

1. own reserves;
2. (un)secured market funding;
3. additional reserves via central bank.

Impact on **profitability**

Changes in interest income and expenses are determined by considering changes in the volumes of the various banks' balance sheet items.

Taking into account:

- each bank specificity: access / no access to interbank, level of available collateral, use of Institutional Protection Scheme, etc.
- market situation (normal vs. stress time, in which interbank market is frozen), Eurosystem footprint in the market, etc.

Hypothetical digital euro introduction under different scenarios

Likely level

Business-as-usual

Contained deposit outflows – digital euro as a means of payment for day-to-day expenditures.

Holdings predicted based on digital euro **demand estimates** derived from the **survey results**.

Very hypothetical and unlikely

Flight-to-safety

System-wide outflows due to a loss of confidence in the banking system (unrelated to digital euro and abstracting from crisis reaction by ECB).

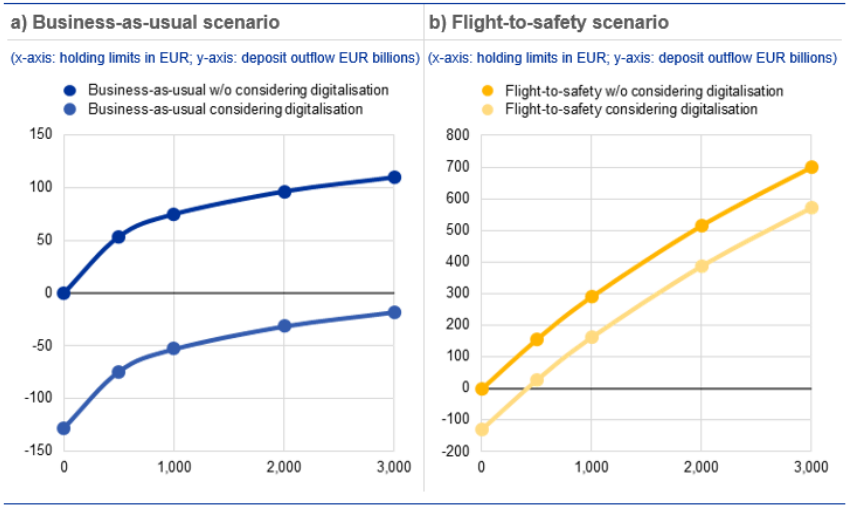
Everyone would hold the **maximum amount** of digital euro holdings.

Nota bene: Idiosyncratic bank run already feasible and even faster due to digitalisation, so not specifically modelled given limited marginal impact of digital euro.

Estimated deposit outflows by holding limit

Deposit outflows are estimated for both scenarios, assuming a **likely level of demand** derived from the survey results (business-as-usual scenario) and a **maximum amount of** demand (flight-to-safety scenario), both considering digitalisation trend impacts.

Estimated deposit outflows by holding limits



Source: ECB calculations based on supervisory reporting data from the first quarter of 2024 and DRDEPO data collection.
Notes: The sample includes 2,025 banks. Negative starting amounts result from inflows related to digitalisation considered in scenario.

- Under the business-as-usual scenario, the estimated impact of introducing a digital euro on bank deposits is contained for all assessed holding limit levels.
- By contrast, under the flight-to-safety scenario, the estimated aggregate deposit outflow increases from €156 billion with a €500 holding limit (0.5% of total banking sector assets or 1.8% of total retail sight deposits), to €699 billion with a €3,000 holding limit (2.2% of total banking sector assets or 8.2% of total retail sight deposits).

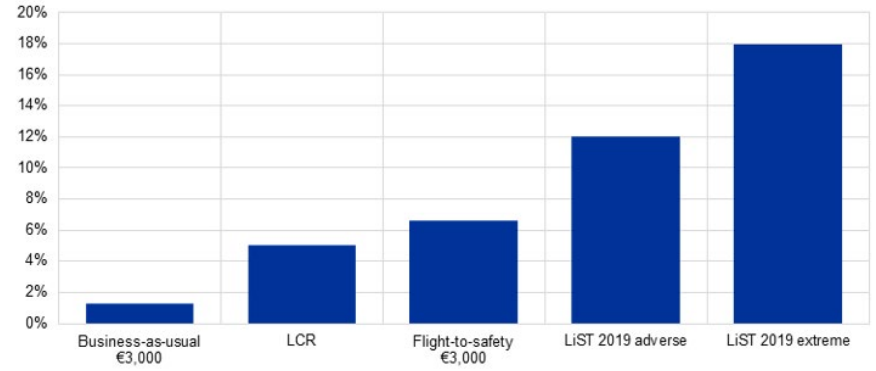
The impacts on deposits are contained under the business-as-usual scenario, but – as expected – more material under the flight-to-safety scenario.

Comparison with ECB Banking Supervision liquidity stress test (LiST)

This impact on deposits is compared with the underlying assumptions in the liquidity coverage ratio (LCR) and ECB Banking Supervision liquidity stress test (LiST) scenarios from 2019 to get a sense of their relative magnitude. LiST was performed to assess banks' ability to withstand hypothetical idiosyncratic liquidity shocks.

Stable retail deposits outflow rates under digital euro scenarios vs. LCR and supervisory stress scenarios (LiST)

(x-axis: digital euro, LCR, and LiST scenarios; y-axis: percentage of total retail sight deposits)



Source: ECB calculations, Sensitivity Analysis of Liquidity Risk – Stress Test 2019.

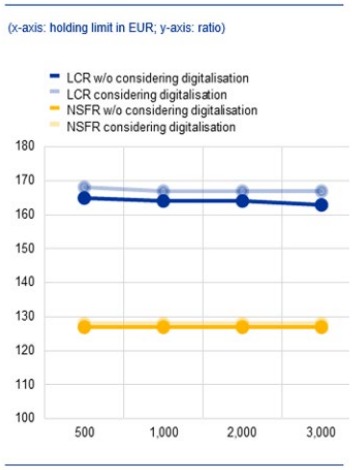
- Under the business-as-usual scenario, with a €3,000 holding limit, deposit run-off rates remain well below what banks would experience if 5% of their retail deposits were withdrawn, as prescribed in the LCR Regulation.
- Under the flight-to-safety scenario and with a €3,000 holding limit, results are below both the LiST adverse and extreme scenario outflow rates.

Potential outflows into the digital euro in a hypothetical and very unlikely scenario are milder than the non-digital euro assumptions used by ECB Banking Supervision in its regular assessment of liquidity risk.

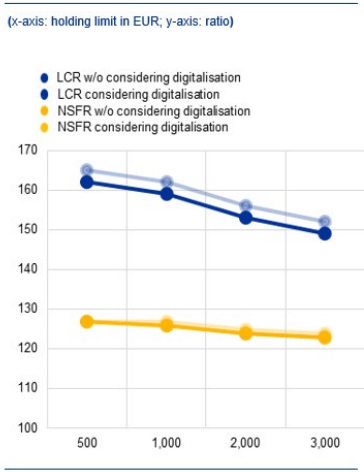
Aggregate liquidity metrics under the business-as-usual and flight-to-safety scenarios

Reaction of banks' balance sheets in business-as-usual and flight-to-safety scenarios is modelled and analysed, focusing on consequences of possible **deposit outflows on banks' liquidity position.**

Aggregate liquidity metrics under the business-as-usual scenario



Aggregate liquidity metrics under the flight-to-safety scenario



Source: ECB calculations.

Notes: Calculations based on balance sheet optimisation model using supervisory reporting data from the first quarter of 2024 and DRDEPO data collection. The sample includes 2,025 banks. Chart 7) The aggregate ratio is calculated by summing the numerator and denominator for all banks.

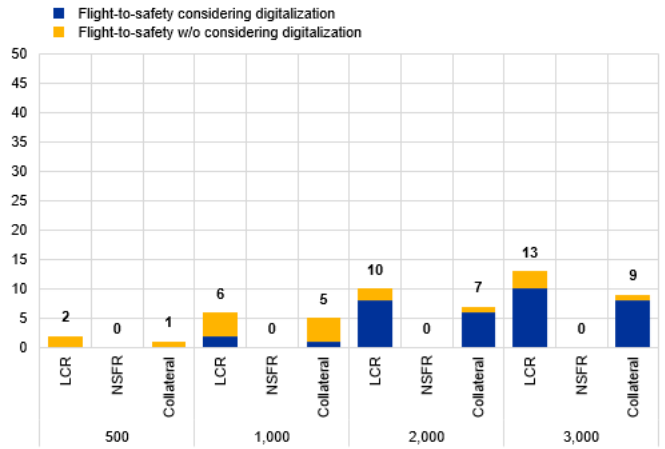
- Even without considering any compensating digitalisation trend, the various balance sheet indicators would only be marginally affected on aggregate in the business-as-usual scenario.
- Under the flight-to-safety scenario, the impact on liquidity metrics is more pronounced but remains manageable.

Even under the very hypothetical and unlikely scenario scenario (and without considering the digitalisation trend), regulatory liquidity metrics on aggregate remain well above 100%.

Individual liquidity outcomes under the flight-to-safety scenario

Number of banks that reach the 100% LCR and NSFR level and those that are at risk of going below the 100% level under the flight-to-safety scenario

(x-axis: holding limit in EUR; y-axis: number of banks)



Source: ECB calculations.
Notes: Calculations based on balance sheet optimisation model using supervisory reporting data from the first quarter of 2024 and DRDEPO data collection. The sample includes 2,025 banks. The aggregate ratio is calculated by summing the numerator and denominator for all banks. "Collateral" is short for the banks that are at risk of depleting their liquidity buffers below the 100% level due to their lack of unencumbered eligible non-HQLA collateral.

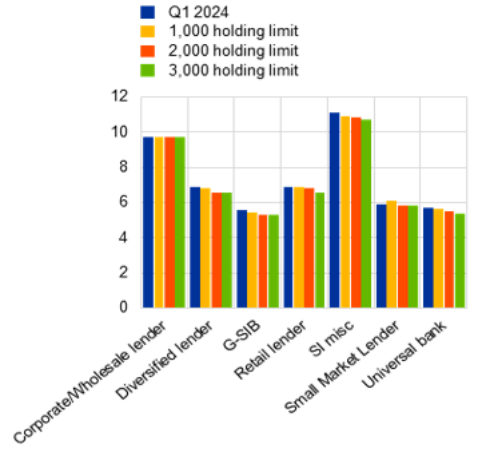
- On the individual bank-level, with a €3,000 holding limit, only 13 banks (out of 2,025) representing 0.3% of total banking sector assets would reach the 100% LCR level.
- Only 9 of those banks representing 0.1% of total banking sector assets would be at risk of depleting their liquidity buffers below the 100% level as they do not retain enough unencumbered eligible non-HQLA collateral to borrow from the central bank through standard monetary policy operations.

Even under this stressed scenario and when conservatively not considering the digitalisation trend, banks generally can source liquidity via collateral.

Estimated impact of digital euro on other liquidity and funding metrics

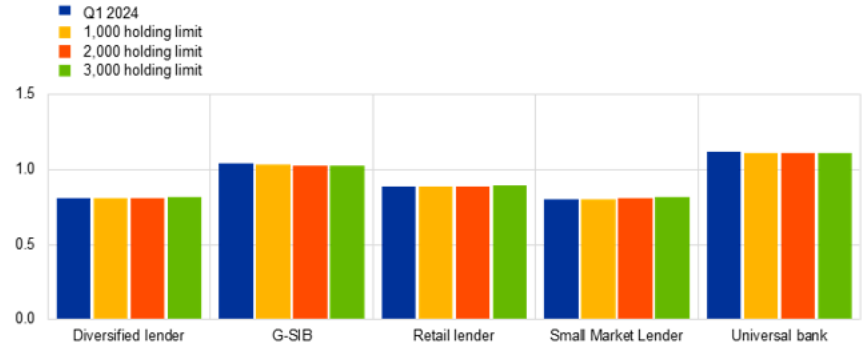
Liquidity capacity period under flight-to-safety scenario considering digitalisation

(x-axis: business models; y-axis: LCP in months)



Loan-to-deposit ratio under flight-to-safety scenario considering digitalisation

(x-axis: business models; y-axis: loan-to-deposit ratio)



Source: ECB calculations

Notes: Based on balance sheet optimisation model outputs, liquidity stress test, supervisory reporting data from the first quarter of 2024, and DRDEPO data collection. "SI misc" includes SIs without specified business model and others. Loan-to-deposit ratio is not computed for corporate/wholesale lenders since this indicator is not relevant for this type of banks.

The LCP, which measures survival periods under liquidity stress, remains stable for most business models; all business models experience little to no decline.

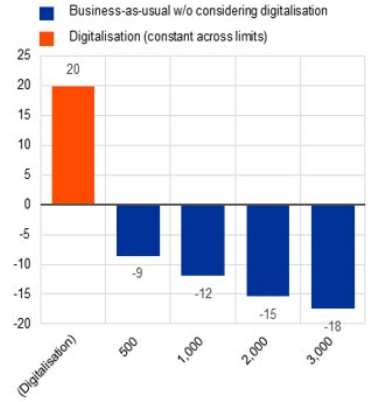
Examining the loan to deposit ratio (which provides a proxy of the amount of loans being funded by deposits), reveals limited impacts, with only minor variations across business models.

Impact on profitability

Assesses the potential impact on banks' profits**, focusing on net interest income (NII)**. The analysis does not consider possible profitability gains from the provision of services related to the digital euro, which could lead banks to offset the impact on profitability.

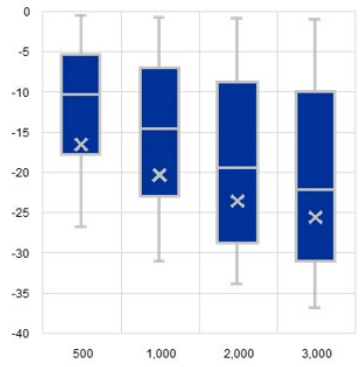
RoE impact under the business-as-usual scenario

(x-axis: holding limit in EUR; y-axis: RoE variation in basis points)



Distribution of RoE impact at country level under the business-as-usual scenario

(x-axis: holding limit in EUR; y-axis: RoE variation in basis points)



Sources: Supervisory reporting data, DRDEPO data collection, Iboxx, MMSR, iMIR.
Notes: The sample includes 2,002 banks. Data is from first quarter of 2024. Weighted averages by total assets. Chart 12) The analysis assumes that current levels of excess liquidity are fully available to be drawn down. "Digitalisation" isolates the effect of inflows from digitalisation constant for all holding limits and scenarios; this can be added to impacts without digitalisation to get impact with digitalisation. Chart 13) The box shows the 25th and 75th percentile (interquartile range, IQR), with the line inside marking the median. Whiskers extend to 1.5×IQR. The digitalisation trend is not considered.

- For holding limits between €500 and €3,000, the decline in NII ranges from 8 basis points to 18 basis points without a digitalisation trend.
- When accounting for a digitalisation trend, there is an increase in NII for holding limits where deposit inflows due to digitalisation outweigh outflows to digital euro (i.e., up to a €3,000 limit).

These reductions are small compared to the historical fluctuations in banks' return on equity (RoE), amounting to at most 4.8% of its usual variation.

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Thank you

Additional supporting materials:

- Timeline and progress on a digital euro
- Digital euro FAQ
- Webpage: Digital euro and privacy
- ECB opinion on the EU Commission's digital euro legislative proposal
- Digital euro two-pager
- Digital euro LinkedIn page