DEUTSCHE BUNDESBANK EUROSYSTEM

Technical Paper

Euro stablecoins and bank liquidity: A scenario analysis of German banks

05/2026

Fabian Rose

Technical Papers represent the authors' personal opinions and do not necessarily reflect the views of the Deutsche Bundesbank or the Eurosystem.

Editorial Board: Falko Fecht
Stephan Kohns
Alexander Schulz
Kirstin Hubrich

Deutsche Bundesbank, Wilhelm-Epstein-Straße 14, 60431 Frankfurt am Main, Postfach 10 06 02, 60006 Frankfurt am Main

Tel +49 69 9566-0

Please address all orders in writing to: Deutsche Bundesbank, Press and Public Relations Division, at the above address or via email: www.bundesbank.de/contact

Internet http://www.bundesbank.de

Reproduction permitted only if source is stated.

DOI https://doi.org/10.71734/TP-2026-5

Non-technical Summary

Research Question

How would wider use of euro-denominated stablecoins affect the liquidity positions of German banks? Stablecoins are digital instruments designed to maintain a stable value relative to a reference value, typically a currency. When customers purchase them using bank deposits, the implications for banks depend on how stablecoin issuers invest the proceeds. Funds may leave the German banking system or return as deposits held by stablecoin issuers or those who sell securities to them. Even if funds return, changes in the composition of depositors and the distribution of deposits across banks can affect banks' ability to meet regulatory liquidity requirements.

Contribution

Using supervisory data for the first quarter of 2026, this paper simulates the effects of stablecoin adoption on banks' regulatory liquidity coverage ratio (LCR), which measures high-quality liquid assets relative to net cash outflows under a 30-day stress scenario. The analysis neither forecasts stablecoin adoption nor incorporates banks' funding and liquidity-management responses. It considers stablecoin purchases funded by retail or wholesale deposits under three reserve-investment scenarios and assesses the liquidity available within banking networks to cover individual banks' shortfalls.

Results

Retail-funded adoption of stablecoins causes greater bank-level LCR declines than wholesale-funded adoption. Domestic reinvestment can reduce the aggregate LCR more than an outflow of funds from the German banking system. This is because returning issuer deposits carry higher regulatory outflow weights than the deposits they replace. In the scenario with domestic issuer deposits, the resulting increase in net cash outflows more than offsets the positive effect of replenished liquid assets on the aggregate LCR.

At an assumed issuance volume equivalent to 5% of the combined deposit base, funded entirely by retail deposits, the aggregate LCR remains above the regulatory minimum, while the LCRs of numerous banks fall below it. Surpluses within the cooperative and savings-bank networks could in theory cover all modelled member-bank shortfalls relative to the LCR minimum if these surpluses can be transferred without frictions. Banks' own responses could also mitigate these effects.

Nichttechnische Zusammenfassung

Fragestellung

Wie würde sich eine stärkere Nutzung euro-denominierter Stablecoins auf die Liquiditätspositionen deutscher Banken auswirken? Stablecoins sind digitale Instrumente, deren Wert gegenüber einem Referenzwert, in der Regel einer Währung, stabil gehalten werden soll. Wenn Kunden Stablecoins mit Bankeinlagen erwerben, hängen die Auswirkungen auf Banken davon ab, wie die Emittenten von Stablecoins die Erlöse anlegen. Die Mittel können das deutsche Bankensystem verlassen oder als Einlagen der Stablecoin-Emittenten beziehungsweise derjenigen zurückfließen, die Wertpapiere an die Stablecoin-Emittenten verkaufen. Auch bei einem Rückfluss können Veränderungen der Einlegerstruktur und der Verteilung der Einlagen auf einzelne Banken beeinflussen, wie gut diese die regulatorischen Liquiditätsanforderungen erfüllen.

Beitrag

Die Analyse simuliert anhand aufsichtlicher Daten für das erste Quartal 2026 die Auswirkungen auf die regulatorische Liquiditätsdeckungsquote (LCR). Diese setzt hochliquide Aktiva ins Verhältnis zu den erwarteten Nettozahlungsmittelabflüssen über einen Zeitraum von 30 Tagen unter Stress. Die Analyse prognostiziert weder die Verbreitung von Stablecoins noch berücksichtigt sie Anpassungen der Refinanzierung und des Liquiditätsmanagements der Banken. Die Analyse betrachtet Käufe mit Privatkunden- und Großkundeneinlagen unter drei Szenarien zur Reserveanlage sowie die verfügbare Liquidität innerhalb der Bankenverbünde.

Ergebnisse

Stablcoin-Käufe mit Privatkundeneinlagen führen zu stärkeren LCR-Rückgängen bei einzelnen Banken als Käufe mit Großkundeneinlagen. Eine Wiederanlage im Inland kann die aggregierte LCR stärker senken als ein Abfluss der Mittel ins Ausland. Dies liegt daran, dass zurückfließende Emittenteneinlagen höheren regulatorischen Abflussraten unterliegen als die ersetzten Einlagen. Der daraus resultierende Anstieg der Nettozahlungsmittelabflüsse belastet die aggregierte LCR im Szenario mit inländischen Emittenteneinlagen stärker, als die zurückfließende Liquidität sie verbessert.

Bei einem unterstellten Emissionsvolumen von 5% der betrachteten Einlagenbasis, das vollständig aus Privatkundeneinlagen finanziert wird, bleibt die aggregierte LCR oberhalb der regulatorischen Mindestanforderung, während zahlreiche Banken diese unterschreiten. Überschüsse innerhalb des genossenschaftlichen Verbunds und der Sparkassengruppe könnten theoretisch sämtliche modellierten Liquiditätslücken ihrer Mitgliedsinstitute schließen, sofern sie friktionslos übertragbar sind. Auch Anpassungen der Banken könnten die Auswirkungen abmildern.

Euro Stablecoins and Bank Liquidity:

A Scenario Analysis of German Banks

Fabian Rose[†]

October 1, 2026

Abstract

Stablecoin adoption can weaken banks' regulatory liquidity positions even if issuers reinvest the proceeds within the domestic banking system. This paper uses bank-level supervisory data to simulate how substantial stablecoin adoption would affect German banks' Liquidity Coverage Ratios (LCRs). The analysis considers euro-denominated e-money tokens issued by non-bank electronic money institutions. It compares retail and wholesale deposit substitution at a common system-wide issuance amount under three reserve-allocation scenarios.

In the simulations, retail-funded adoption produces larger bank-level LCR declines than wholesale-funded adoption. Domestic reserve investment can also produce greater aggregate LCR decline than funds leaving the German banking system, because returning issuer deposits receive higher regulatory outflow weights (100%) than the displaced customer deposits. At an assumed issuance volume equivalent to 5% of the combined deposit base, funded entirely by retail deposits, the aggregate LCR remains above 100% in every scenario, while numerous institutions fall below the threshold.

Liquidity surpluses within the cooperative and savings-bank networks would be sufficient to cover all modelled member-bank shortfalls under the assumption of frictionless transfers and unchanged bank-level net liquidity outflows. This represents an upper bound on support through redistribution of existing HQLA within those networks, assuming frictionless transfers and unchanged bank-level net liquidity outflows. The results highlight the importance of stablecoin reserve allocation and funding composition for banks' regulatory liquidity positions.

Keywords: Stablecoins; bank funding; liquidity coverage ratio; deposit substitution; stablecoin reserve assets.

JEL classification: E42, G21, G23, G28.

Acknowledgements: I thank Paul Grau, Luzie Thiel, Elisaweta Maksimov, Sören Friedrich, Edgar Vogel, Thomas Droll, Thilo Liebig and Christoph Memmel for their helpful comments and discussions.

[†]E-mail: fabian.rose@bundesbank.de; phone: +49 (0) 69 9566 33463; Deutsche Bundesbank, Generaldirektorat Finanzstabilität. Wilhelm-Epstein-Straße 14, 60431 Frankfurt.

1 Introduction

Wider use of stablecoins for payments and settlement could change the composition and distribution of bank funding. Market expectations summarised by Altavilla et al. (2026) place global stablecoin capitalisation between USD 0.9 trillion and USD 4.0 trillion by 2030. Although these estimates concern the global market and do not establish the scale of future euro-denominated issuance, they motivate examining the consequences of substantial adoption for the banking system. The effect of stablecoins on banks' liquidity positions depends on what stablecoins substitute for and on how issuers invest the proceeds. Funds may leave the domestic banking system or return through issuer deposits and payments to securities sellers. Even if aggregate deposits are retained, their ownership, distribution across banks, and regulatory liquidity treatment can change. The resulting transformation of bank liabilities is therefore central to assessing the prudential implications of stablecoin adoption.

This paper uses bank-level supervisory data for Q1 2026 to simulate how substantial adoption of euro-denominated stablecoins would affect the Liquidity Coverage Ratio (LCR) of German banks. The analysis considers e-money tokens (EMTs) issued by non-bank electronic money institutions and compares adoption funded by retail or broad wholesale deposits at the same system-wide issuance amount. The analysis distinguishes three reserve scenarios: (i) reserve investment generates no return flows to German banks; (ii) funds return through issuer deposits and securities purchases from domestic non-bank sellers; and (iii) all funds return through securities purchases from domestic non-bank sellers. The latter is a counterfactual analysis that isolates the securities-purchase channel and sets aside regulatory minimum deposit requirements. The highest calibration converts 5% of the combined retail and wholesale deposit base into stablecoins, corresponding to approximately EUR 227 billion. This calibration is intended to assess the liquidity implications of substantial stablecoin adoption and does not represent a projection of future demand. The analysis measures mechanical balance-sheet effects before funding adjustments, active liquidity management, central-bank operations, valuation changes, or behavioural feedback, and does not simulate a stablecoin run.

Three findings emerge. First, domestic reserve recycling can produce a larger aggregate LCR deterioration than an equivalent outflow from the German banking system. In the scenario where the issuer holds domestic deposits, the additional net outflows associated with returning deposits outweigh the benefit of retaining liquidity within the banking system. This result is driven by the treatment of issuer deposits as non-operational financial-sector funding with a 100% outflow rate. Second, retail-funded adoption generates substantially larger bank-level LCR effects than wholesale-funded adoption, reflecting the different regulatory outflow treatment of the displaced deposits. Third, aggregate results conceal considerable heterogeneity. If stablecoin purchases are funded by retail deposits and amount to 5% of the combined deposit base, the aggregate LCR remains above 100% in every scenario, while numerous individual

institutions fall below the threshold.

In a second step, the paper examines whether liquidity available within the cooperative and savings-bank networks could cover their members' shortfalls. Following the motivation in Fritz, Krüger and Wong (2024), it distinguishes individual-bank liquidity positions from the capacity available through network coordination. At 5% adoption funded entirely by retail deposits, the High-quality liquid assets (HQLA) surpluses within each network are sufficient to cover all member-bank shortfalls, provided these assets can be transferred between institutions.

The analysis builds on the literature linking stablecoin reserve purchases to bank intermediation. Liao and Caramichael (2022) show that the effects on bank balance sheets and credit provision depend jointly on the source of stablecoin funding and the composition of reserves. Coste (2024) examines the associated prudential mechanisms, illustrating how replacing retail deposits with stablecoin issuer deposits can weaken banks' LCRs even if funds return to the banking system. Altavilla et al. (2026) provide empirical evidence on deposit substitution and examine its implications for lending and monetary-policy transmission. Related policy analysis highlights the importance of reserve location and concentrated issuer deposits for bank funding and liquidity (Adrian et al., 2025). More directly, European Systemic Risk Board (2025) presents a stylised aggregate LCR calculation for euro-area significant institutions under substitution from retail to issuer deposits. The present paper complements these contributions by quantifying alternative funding and reserve-allocation scenarios across individual German banks. Bank-specific liquidity buffers and outflow weights, together with the recalculation of recognised inflows, allow the analysis to distinguish aggregate effects from the distribution of regulatory shortfalls.

The remainder of the paper proceeds as follows. Sections 2 and 3 describe the analytical framework and supervisory data. Section 4 presents the aggregate and bank-level results, and Section 5 examines liquidity balancing within banking networks. Section 6 concludes.

2 Framework and Scenario Design

2.1 Stablecoin adoption, reserve location, and scenario design

This analysis quantifies the immediate mechanical effects of deposit-funded stablecoin issuance on the Liquidity Coverage Ratio (LCR) of German banks. The analysis considers stablecoins issued by non-bank entities and applies adoption scenarios to bank balance sheets observed in 1Q 2026. It assesses how liquidity positions would change at specified levels of adoption, without assigning probabilities to adoption levels or modelling the transition towards them. The calculations abstract from replacement funding, active liquidity management, central-bank operations, valuation effects and second-round behavioural responses. Adoption

is not assumed to occur during a run or within the LCR's 30-day stress horizon.

When depositors finance additional stablecoin issuance with existing bank deposits, they replace claims on banks with claims on the issuer. The issuer invests the proceeds in reserve assets, including bank deposits and eligible liquid securities.[1] The implications for German banks depend on both the initial deposit withdrawal and the subsequent reserve investment. Proceeds may remain outside the German banking system or return as issuer reserve deposits or deposits credited to non-bank securities sellers at German banks. These flows can change the aggregate size of domestic bank balance sheets, their funding composition and the distribution of deposits and liquid assets across banks. In particular, preserving aggregate deposits and settlement liquidity does not necessarily preserve banks' LCRs (Coste, 2024): issuer deposits and securities sellers' deposits can generate the same liquid-asset inflow while carrying different regulatory outflow weights.

The system-wide amount of additional stablecoin issuance is defined as

$$SC(a) = a\left(D_{system}^{retail} + D_{system}^{wholesale}\right), \tag{1}$$

where the deposit base comprises of retail D_{system}^{retail} and wholesale $D_{system}^{wholesale}$ balances. The adoption parameter (a) therefore measures issuance relative to this combined base.The highest adoption rate considered is $a = 5\%$, corresponding to approximately EUR 227 billion in stablecoin issuance. The calibration is informed by the upper market expectation of USD 4 trillion in global stablecoin capitalisation by 2030 reported by Altavilla et al. (2026). Relative to estimated global personal, corporate and public deposits of USD 117 trillion in 2023 (McKinsey & Company, 2024), this corresponds to approximately 3.4%. Applying the same proportion to German domestic non-bank deposits of EUR 4.54 trillion in March 2026 yields approximately EUR 155 billion (Deutsche Bundesbank, 2026a). The full issuance amount is assumed to be financed by substitution away from the selected deposits. The calibration defines a risk scenario designed to quantify potential implications of substantial adoption and does not represent a projection of German stablecoin demand.

In this analysis, three different reserve-allocation scenarios (see below) are evaluated under two alternative funding cases. Stablecoin purchases are either entirely funded with retail deposits or wholesale deposits. Holding the system-wide issuance amount constant makes the two cases comparable in scale, while allowing the source and distribution of deposit withdrawals to differ. Withdrawals are proportional to each bank's share of deposits in the respective category. Consequently, a given value of a implies different withdrawal rates relative to the retail

[1] Under MiCAR, issuers of e-money tokens (EMTs) must hold at least 30% of the funds received in separate accounts with credit institutions; the remaining funds must be invested in secure, low-risk assets that qualify as highly liquid financial instruments with minimal market, credit, and concentration risk, such as qualifying government bonds. For significant EMTs, the minimum share to be held as deposits increases to 60% (Regulation (EU) 2023/1114, Arts. 54(a)–(b), 45(7)(b) and 58).

and wholesale deposit bases.

The funding cases capture distinct potential uses of stablecoins. Retail-funded adoption could be motivated by household and small-business payments and transaction balances; wholesale-funded adoption could accommodate corporate treasury operations, business-to-business payments and financial-market settlement. The wholesale base comprises selected operational and non-operational deposits, including financial-customer deposits, while excluding specified balances within institutional protection schemes and cooperative networks, as well as deposits maintained for cash-clearing and central-credit-institution services.[2]

The retail–wholesale distinction matters because the displaced deposits carry different effective regulatory outflow rates. For a given bank and withdrawal amount, a higher outflow rate generates a larger reduction in projected regulatory outflows, cushioning the LCR effect of liquid-asset depletion. The resulting bank-level LCR also depends on initial liquidity positions, the recognition of inflows and the amount and type of funds returning through reserve investment. In the scenarios where domestic securities are bought by the issuer, deposits received by non-bank sellers are assigned each receiving bank's effective wholesale outflow rate as a proxy for their regulatory treatment. The three scenarios below vary these return flows; the subsequent subsection formalises their transmission to the LCR.

Scenario 1: foreign issuer without German reserves. German customers acquire stablecoins from non-bank issuers which do not acquire or hold reserves in Germany. Therefore, the reserve investment generates neither issuer deposits nor securities sellers' deposits at German banks. The initial withdrawal of customer deposits and settlement liquidity is therefore not offset by domestic inflows. This scenario assumes that the proceeds remain outside the German banking system, although foreign issuers could also place reserves at German banks.

Scenario 2: German issuers with 60/40 domestic reserves. This scenario assumes a stylised system of German non-bank issuers holding 60% of their aggregate reserves as deposits at German banks and investing the remaining 40% in eligible liquid securities purchased from domestic non-bank sellers. The deposit share is a scenario assumption informed by the liquidity framework for significant e-money-token issuers.[3] Issuer deposits are allocated equally across the ten largest recipient banks, ranked by total assets. This represents concentrated

[2]The selected COREP categories do not fully distinguish deposits held by banks from those of other financial customers. When a bank uses an interbank deposit to purchase stablecoins, it replaces its claim on the deposit-taking bank with stablecoins and may lose eligible LCR inflows associated with that claim. The simulation captures the withdrawal at the deposit-taking bank but not these corresponding changes at the depositing bank. Where both banks are included in the sample, the aggregate wholesale results therefore omit potentially offsetting effects and should not be interpreted as a complete assessment of interbank deposit substitution.

[3]See Regulation (EU) 2023/1114, Articles 45(7)(b) and 58. The assumed reserve composition does not require every issuer in the stylised system to be classified as significant.

placement at large banks without modelling individual issuers' reserve portfolios or imposing concentration limits.[4]

Securities sellers' proceeds are credited to German banks and allocated in proportion to their existing broad-wholesale deposits. For LCR purposes, issuer deposits receive an assumed 100% outflow weight. Sellers' deposits receive each recipient bank's effective outflow rate on its existing broad-wholesale deposits, used as a proxy for the treatment of the incoming balances. Aggregate deposits and settlement liquidity are retained within the German banking system, while their distribution and the composition of bank funding change.

Scenario 3: German issuers with reserves in securities only. German non-bank issuers invest their entire reserve in securities purchased from domestic non-bank sellers, whose proceeds are credited to German banks. Therefore, no issuer reserve deposits are held at German banks. The allocation and assumed outflow rates of sellers' deposits follow Scenario 2. This scenario abstracts from MiCAR's minimum bank-deposit requirement for non-bank e-money-token issuers.[5]

[4] In particular, the analysis does not impose the 1.5% limit on reserve placements relative to the recipient bank's total assets.

[5] Article 54(a) of Regulation (EU) 2023/1114 requires at least 30% of funds received in exchange for e-money tokens to be deposited in separate accounts at credit institutions under the ordinary safeguarding framework.

Table 1: Stylised balance-sheet flows in the three scenarios

Market participant	Scenario 1: foreign issuer	Scenario 2: German issuer, 60/40 reserve	Scenario 3: German issuer, full securities recycling
Stablecoin users	Bank deposits ↓; stablecoin holdings ↑	Bank deposits ↓; stablecoin holdings ↑	Bank deposits ↓; stablecoin holdings ↑
German banking system	Customer deposits and HQLA decline; no offsetting inflow	Customer deposits decline; issuer deposits rise by 60% of SC; securities sellers' deposits rise by 40% of SC	Customer deposits decline; securities sellers' deposits rise by 100% of SC
Stablecoin issuer	Stablecoin liabilities rise; reserve assets are placed outside Germany	Stablecoin liabilities rise; 60% of reserves are bank deposits and 40% domestic securities	Stablecoin liabilities rise; reserves consist entirely of domestic securities
Domestic non-bank securities sellers	No transaction	Securities decline; bank deposits rise by 40% of SC	Securities decline; bank deposits rise by 100% of SC

Notes: The table gives a system-level overview. In Scenarios 2 and 3, securities-sale proceeds are redistributed as broad wholesale deposits across German banks in proportion to existing broad wholesale deposits. Thus, a bank that loses customer deposits can also receive part of the sellers' deposit inflow. In Scenario 2, issuer reserve deposits are concentrated at the ten largest banks.

2.2 LCR transmission channels and simulation mechanics

For bank i, the Liquidity Coverage Ratio is

$$LCR_i = \frac{HQLA_i}{NLO_i}, \tag{2}$$

where $HQLA_i$ is the recognised liquidity buffer and NLO_i denotes net liquidity outflows over the regulatory 30-day horizon. Net outflows are calculated as $NLO_i = \max(TO_i - RI_i, 0)$, with TO_i denoting weighted outflows and RI_i denoting recognised inflows. The ratio is defined for $NLO_i > 0$. Deposit substitution and reserve recycling affect both the liquidity buffer and weighted outflows.

2.2.1 Deposit allocation and the liquidity buffer

The system-wide stablecoin amount is allocated across banks according to the source of funding. For source $s \in \{R, W\}$, denoting retail and broad wholesale deposits, bank i faces a

customer withdrawal of

$$o_i^s = SC(a)\frac{D_i^s}{\sum_j D_j^s}, \tag{3}$$

where D_i^s denotes the corresponding pre-shock deposit balance. The two funding cases use the same stablecoin amount $SC(a)$ but allocate it by retail or broad-wholesale deposit shares, respectively. In the following, o_i denotes the withdrawal in the funding case considered.

For the asset-side calculation, customer withdrawals are first offset against reserve-related settlement inflows received by the same bank. Let $R_i = RD_i + SEC_i$, where RD_i denotes issuer reserve-deposit receipts and SEC_i denotes receipts associated with domestic securities sales. The remaining liquidity need is $N_i = \max(o_i - R_i, 0)$, while any net liquidity surplus is $S_i = \max(R_i - o_i, 0)$. This netting is applied over the assumed adoption process; intraperiod settlement needs are not modelled. Customer deposit withdrawals and incoming deposits are separately accounted for in the calculation of regulatory outflows.

To meet the net liquidity need, a bank's liquid-asset categories are drawn down proportionally according to their market values before regulatory haircuts, up to the amount available. Assets are assumed to be monetised at unchanged market values. The resulting reduction in recognised HQLA can therefore be smaller than the amount raised, since assets subject to regulatory haircuts contribute less than their market value to the liquidity buffer. The depletion in each category is multiplied by its pre-shock effective regulatory valuation factor, which is held fixed. The sum of these contributions is the recognised HQLA loss, ℓ_i.

Any net liquidity surplus is retained as settlement liquidity and increases recognised HQLA one-for-one. The post-shock liquidity buffer is consequently

$$HQLA_i^{post} = HQLA_i^{pre} - \ell_i + S_i, \tag{4}$$

where $HQLA_i^{pre}$ is the recognised value of the same liquid-asset categories used to calculate depletion. Depletion is limited to the available stock and uses the same valuation factors, so that $\ell_i \leq HQLA_i^{pre}$ and the post-shock buffer remains non-negative. If the net liquidity need exceeds the available liquid-asset portfolio, the residual is assumed to be financed by selling other assets not recognised as HQLA at unchanged market values.[6]

[6]The proceeds are used in full to meet the remaining withdrawal and do not replenish the liquidity buffer. These sales create no additional liability; their potential effects on prospective contractual inflows are disregarded. The feasibility of selling sufficient additional assets is not assessed.

At 5.0% stablecoin adoption in the retail case, the residual net liquidity need after local reserve-deposit and securities-recycling inflows exceeds the nominal liquid assets for 84 institutions in S1, 69 institutions in S2, and 55 institutions in S3. The aggregate residual amounts are EUR 1.175 billion in S1, EUR 1.011 billion in S2, and EUR 0.866 billion in S3; the largest institution-level amount is approximately EUR 244 million in each case. No such cases occur in the wholesale-settlement case at any adoption rate up to the 5.0%.

2.2.2 Funding composition and the post-shock LCR

In Scenario 2, issuer reserve deposits are modelled as sight deposits held by an electronic money institution and assigned a 100% LCR outflow rate. Electronic money institutions qualify as financial customers under Article 411(1) CRR, since issuing electronic money is an activity listed in Annex I of Directive 2013/36/EU. For deposits callable within 30 days that do not qualify for operational treatment, the 100% outflow rate follows from Article 31a of Commission Delegated Regulation (EU) 2015/61.

The non-operational classification reflects the assumed role of these balances as reserves available to meet token redemptions. Although issuers must hold part of their reserves as bank deposits, they need not keep these funds at a particular bank. They can withdraw balances to meet redemptions or transfer them to another reserve bank. The reserve requirement therefore does not, by itself, make these deposits a stable funding source for the recipient bank. Operational treatment under Article 27 requires balances needed for essential banking services, such as clearing or cash management, together with legal or operational restrictions that make substantial withdrawals within 30 days unlikely. Balances exceeding those needs are non-operational.

This treatment is consistent with Coste (2024) and the approach adopted by Born et al. (2026). However, applying it to all issuer reserve deposits is a modelling assumption. In reality, individual arrangements may qualify for different treatment depending on their legal, contractual and operational characteristics.

Securities sellers' deposits in Scenarios 2 and 3 are assigned each recipient bank's effective broad-wholesale outflow weight. This bank-specific statistical proxy reflects the existing composition of broad wholesale funding. It does not replicate the legal LCR classification of individual securities sellers or the maturity and operational characteristics of their incoming deposits.

Under the above assumptions, issuer reserve deposits and securities sellers' deposits both increase recipient banks' HQLA one-for-one, but can generate different additions to projected outflows because of their different outflow weights.

Let ω_i^R and ω_i^W denote the bank-specific effective retail and wholesale outflow weights, calculated as pre-shock weighted outflows divided by the corresponding deposit balances. These weights are held fixed. For the funding source s considered in a given simulation, weighted outflows after the transactions are

$$TO_i^{post} = TO_i^{pre} - \omega_i^s o_i + RD_i + \omega_i^W SEC_i. \tag{5}$$

The withdrawal removes the projected outflows associated with the displaced deposits, while reserve recycling creates new weighted outflows.

Eligible inflows RI_i are held at their pre-shock levels. Deposit receipts from reserve recycling are realised in the simulated transactions and are not added to these prospective inflows. Recognised inflows are recalculated using post-shock weighted outflows and the applicable regulatory caps.[7] A reduction in outflows can tighten a binding cap and thereby reduce recognised inflows, limiting the decline in net outflows. Conversely, higher outflows can relax a binding cap and increase recognised inflows.

As retail deposits carry lower effective outflow weights than wholesale deposits, a given withdrawal reduces weighted outflows by less in the retail funding case. A bank can record a higher LCR despite losing HQLA if its net outflows fall by a larger percentage than its liquidity buffer.

Conversely, a bank can gain HQLA while its LCR declines. Considered in isolation, an issuer-deposit receipt increases HQLA and net outflows by the same amount when recognised inflows remain unchanged. As illustrated by Coste (2024), this moves an LCR above 100% towards the regulatory threshold. If the additional outflows instead relax a binding inflow cap, recognised inflows can increase, attenuating or potentially reversing this effect.

Post-shock bank-level LCRs are obtained from the updated buffers and net outflows using Equation (2). The aggregate LCR is calculated as $\sum_i HQLA_i^{post} / \sum_i NLO_i^{post}$, with inflow caps applied separately to each bank before aggregation. The resulting ratios measure the immediate mechanical effects of the specified transactions, without subsequent funding adjustments or behavioural responses.

3 Data and Measurement

The analysis is based on COREP and FINREP regulatory reporting data from German banks for 1Q 2026. The input comprises of 1,150 banks that have reported required LCR components and enter the scenario analysis. The data is consolidation-adjusted to avoid double counting institutions within consolidated groups. The residual category, “Other specialised institutions”, comprises financial holding companies, promotional and special-purpose institutions, building societies, mortgage lenders, leasing institutions, and securities firms.

[7] See Commission Delegated Regulation (EU) 2015/61, Article 33 and Annex II.

Table 2: Baseline sample by analytical banking group

Group	Banks	Assets EUR bn	Retail deposits EUR bn	Wholesale deposits EUR bn	System LCR %
O-SII	14	4,899.1	979.4	950.0	145.9
Other com. banks	110	491.3	173.0	143.0	183.2
Cooperative banks	635	1,193.3	721.3	126.4	178.3
Savings banks	333	1,576.5	884.6	210.3	187.8
Other spec. banks	58	932.6	219.0	128.1	207.4
Total sample	**1,150**	**9,092.8**	**2,977.4**	**1,557.7**	**161.9**

4 Results

4.1 Headline results and aggregate effects

The analysis leads to three main findings. First, as anticipated, retail-funded adoption produces materially larger bank-level LCR reductions than wholesale adoption at the same system-wide stablecoin amount. Second, domestic reserve recycling changes the composition and location of liquidity; it does not mechanically stabilise the LCR. Third, while the aggregate system-LCR remains well above 100% in all scenarios, substantial threshold breaches among individual banks occur.

Figure 1 reports the system LCR. Retail-funded adoption produces the larger LCR decline in every scenario. At the upper calibration of 5% adoption - EUR 227 billion, the system LCR falls from 161.9% to 144.0% in S1, 140.9% in S2, and 148.4% in S3. At the same stablecoin amount in the wholesale funding case, the corresponding system LCRs are 158.8%, 153.1%, and 161.9%. The smaller LCR declines in the wholesale-funded case primarily reflect the greater reduction in regulatory outflows when deposits with higher outflow weights are withdrawn. However, the aggregate results do not capture potentially adverse effects on banks that use their interbank deposits to purchase stablecoins.[8]

The comparison across reserve scenarios shows how the composition and allocation of returning deposits affect the aggregate LCR. In Scenario 2, the increase in net outflows associated with these deposits more than offsets the benefit of replenishing HQLA, resulting in a larger LCR decline than when funds leave the German banking system in Scenario 1. This ranking is conditional on the classification of issuer reserve deposits as non-operational financial-sector

[8] An interbank deposit is a liability of the deposit-taking bank and an asset of the depositing bank. Its withdrawal reduces projected outflows at the former, but may also reduce eligible LCR inflows at the latter, thereby increasing its net liquidity outflows. This second effect is not modelled. Where both banks are included in the sample, the aggregate calculation therefore captures the outflow relief but omits a potentially offsetting loss of inflows.

funding with a 100% outflow rate. Domestic retention therefore does not necessarily mitigate the LCR impact. Scenario 3 produces the most favourable outcome by recycling funds without the issuer-deposit channel. This advantage reflects the lower outflow weights assigned to securities sellers' deposits relative to issuer reserve deposits. [9]

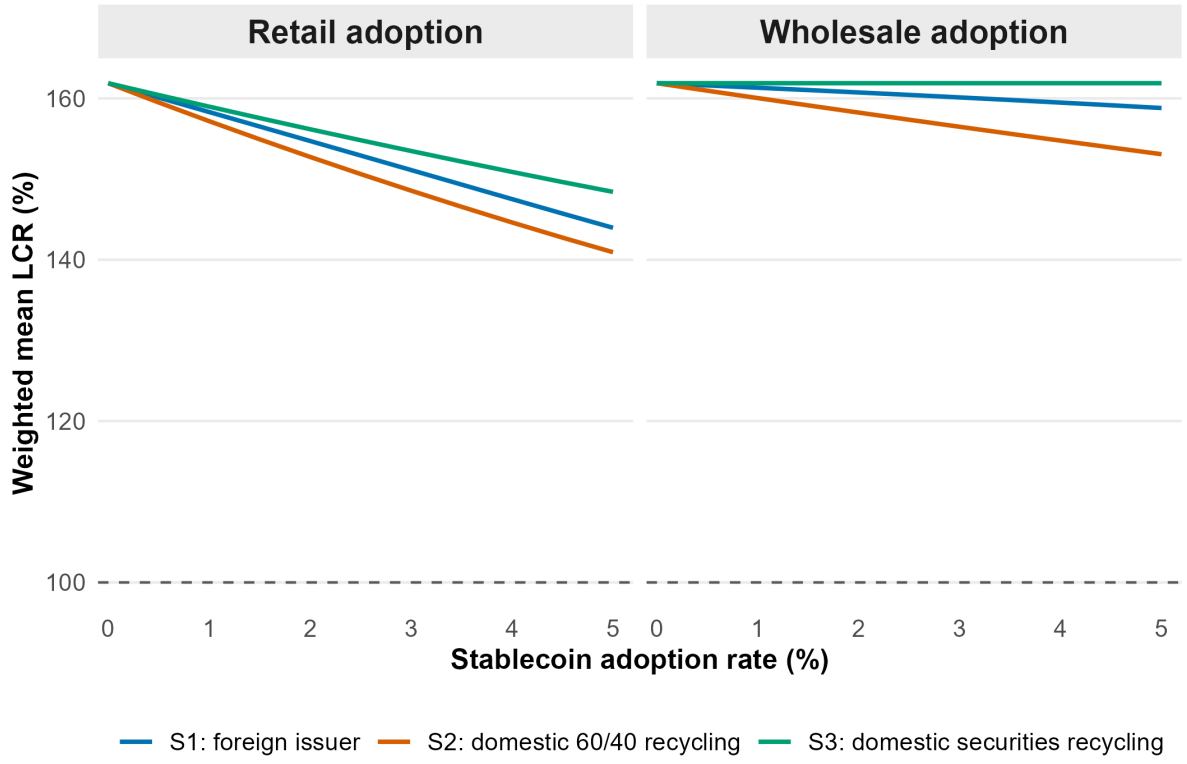


Figure 1: System LCR after the stablecoin shock by stablecoin adoption rate. The system LCR equals aggregate HQLA divided by aggregate net liquidity outflows.

Figure 2 explicitly illustrates the numerator–denominator mechanism. In S1, HQLA leave the German banking system with the customer withdrawal, while also reducing net outflows. In S2, the domestic recycling of deposits restore HQLA in aggregate, but the 100%-weighted issuer deposits raise net outflows. In S3, domestic securities recycling creates broad-wholesale deposits with lower outflow weights than stablecoin issuer deposits.

[9] If the incoming deposits warrant higher outflow rates than implied by recipient banks' existing broad-wholesale funding composition which is used as a proxy, projected outflows would be larger. The proxy may therefore overstate the aggregate LCR in Scenario 3.

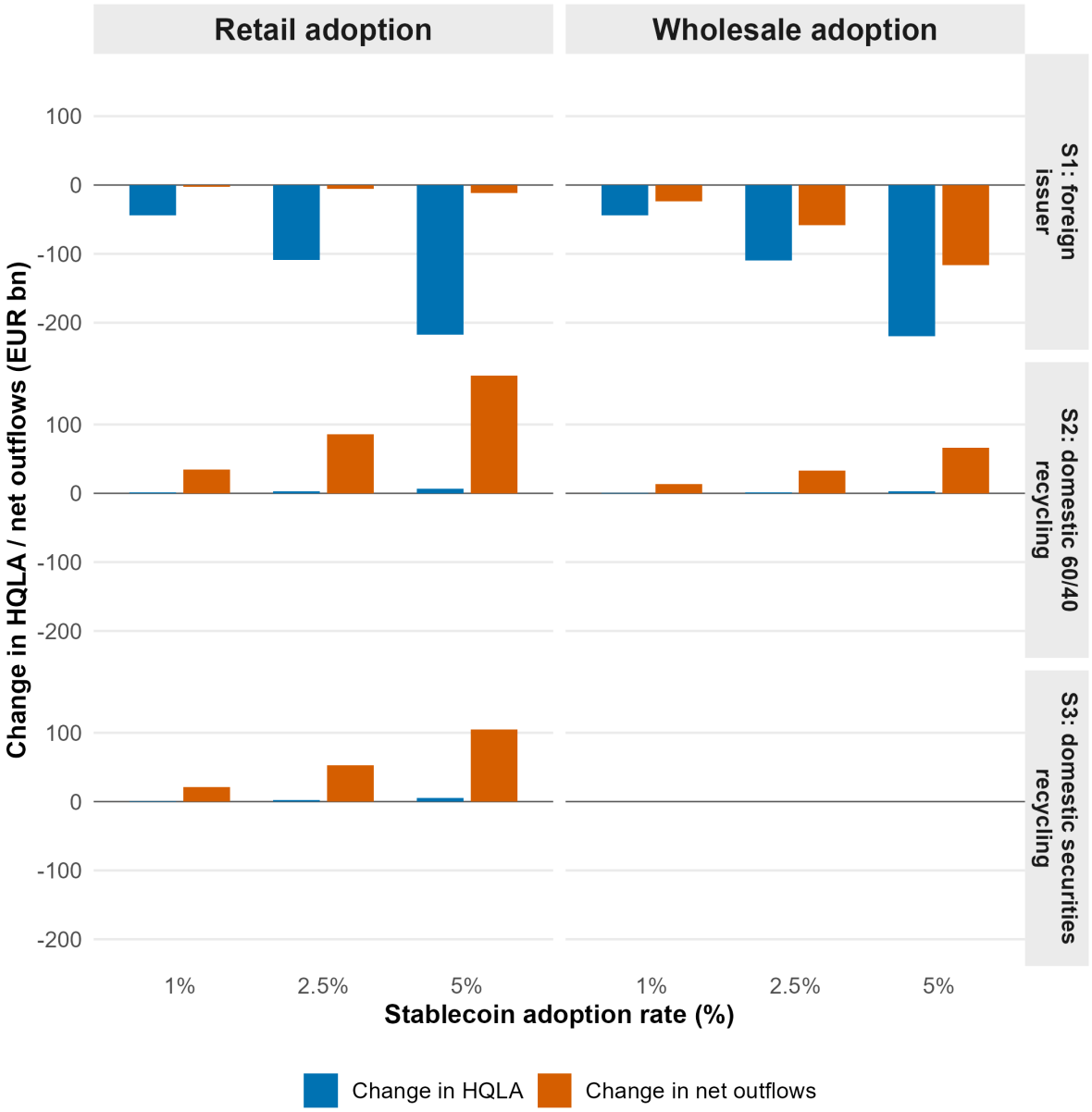


Figure 2: Changes in aggregate HQLA and aggregate net liquidity outflows. A positive LCR effect can arise from a reduction in net outflows even when HQLA decline.

4.2 Distributional incidence and threshold effects

Aggregate results understate the impact that retail-funded adoption would have across individual banks. At EUR 227 billion of retail adoption, the system LCR remains between 140.9% and 148.4%, yet 497 banks would fall below the 100% threshold in S1, 453 in S2, and 390 in S3. The associated aggregate liquidity shortfall, defined as $\sum_i \max(NLO_i^{post} - HQLA_i^{post}, 0)$, is EUR 15.94 billion in S1, EUR 13.45 billion in S2, and EUR 10.64 billion in S3.

Figure 3 reports banks that fall below the regulatory threshold asset-weighted. At 5% adop-

tion, 12.1% of sample assets would be held by banks below the threshold in S1, compared with 10.6% in S2 and 8.6% in S3. The corresponding wholesale shares are close to zero.

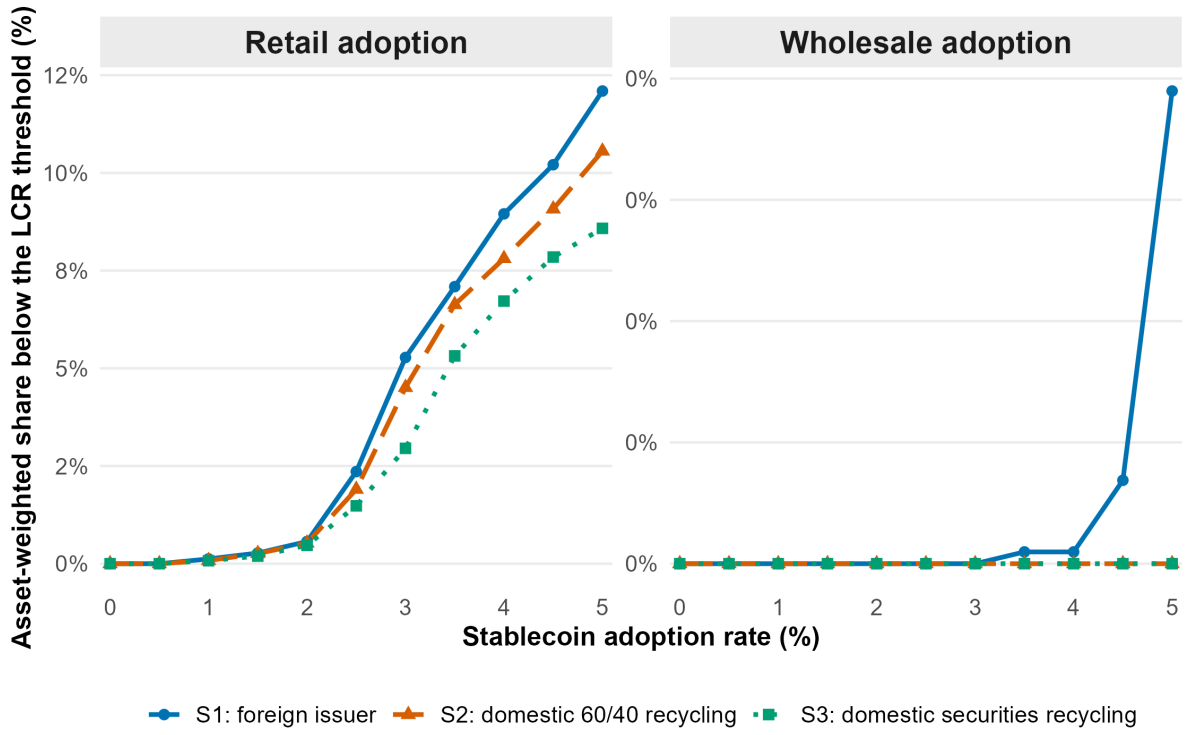


Figure 3: Asset-weighted share of sample assets held by banks with post-shock LCR below 100%, by stablecoin adoption rate.

4.3 Sectoral incidence and retail-deposit concentration

The allocation of the retail customer outflow follows each bank's retail-deposit share. Savings and cooperative banks jointly account for 60.5% of the retail deposit base in the sample and therefore bear a corresponding share of the proportional retail shock.

Figure 4 reports group system-LCR changes at 5% adoption. Cooperative banks record the largest retail LCR declines: 70.1 percentage points in S1, 64.8 percentage points in S2, and 57.5 percentage points in S3. Savings-bank declines are 46.7, 43.3, and 38.8 percentage points, respectively. Domestic recycling partly mitigates the direct customer-outflow shock in these deposit-rich sectors. The effect is not uniform across groups: reserve deposits in S2 are concentrated at large recipient banks and carry a 100% outflow weight. Accordingly, the O-SII group records a larger retail LCR decline in S2 (-13.4 percentage points) than in S1 (-9.4 percentage points). In the wholesale adoption case where group LCR increases, the change is a denominator effect and does not indicate a liquidity gain.

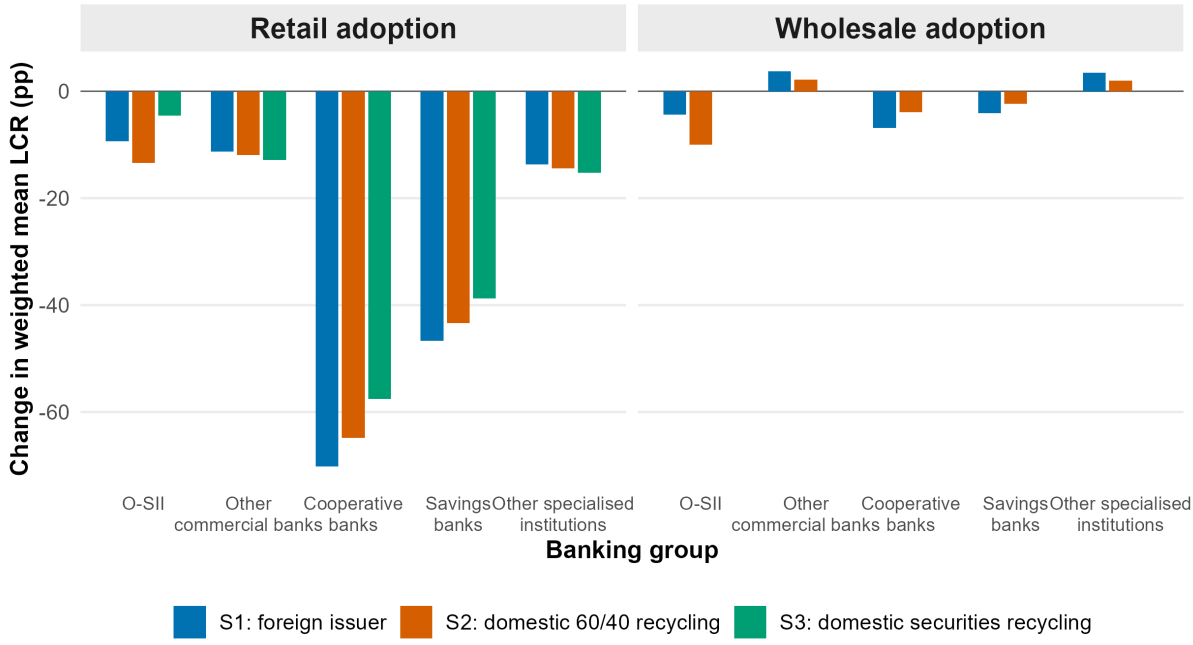


Figure 4: Change in group system LCR at 5% stablecoin adoption. Each group system LCR is aggregate HQLA divided by aggregate net outflows.

5 Liquidity Balancing within Banking Networks

Liquidity management within the savings-bank and cooperative networks can, in principle, mitigate the effects of deposit outflows at individual institutions. Central institutions coordinate liquidity management, allowing member banks to access balances held with them and facilitating liquidity redistribution within the network. Fritz, Krüger and Wong (2024) show that such redistribution can help banks accommodate deposit substitution into digital euro. The results presented above indicate that cooperative banks and savings banks are most affected at the individual-bank level. This raises the question of whether the liquidity available within each network would be sufficient to cover its members' post-shock LCR shortfalls.

To answer this question, we consider two separate hypothetical nationwide liquidity pools: the cooperative network and the savings-bank network. Starting from the bank-level results of each stablecoin scenario, recognised HQLA above the amount required to maintain a 100% LCR are made available to institutions below that threshold. Donors contribute in proportion to their surpluses, and recipients receive liquidity in proportion to their shortfalls, subject to the total amount available. The calculation assumes immediate, one-for-one transferability of recognised HQLA and holds each bank's post-shock net liquidity outflows fixed. Redistribution therefore leaves aggregate HQLA and the aggregate LCR of each network unchanged; it affects only the distribution of liquidity and the number of institutions meeting the threshold.

At 5% retail adoption, aggregate donor surpluses exceed the combined member-bank HQLA shortfalls in both networks under all three reserve scenarios. Under the assumed transferability and fixed net outflows, these surpluses are sufficient to eliminate the modelled shortfalls. Transfer requirements are largest in Scenario 1: the cooperative network has a combined HQLA shortfall of EUR 11.4 billion across 431 institutions, compared with a donor surplus of EUR 53.9 billion. The savings-bank network has a shortfall of EUR 1.2 billion across 50 institutions, against a donor surplus of EUR 117.3 billion. The results hold in all three scenarios even if the donor LCR floor is raised to 110% and recipient usability of transferred HQLA is simultaneously reduced to 75%.

Whether the liquidity capacity can be mobilised depends on the arrangements governing liquidity transfers. Legal and operational constraints, internal liquidity policies, and the effects of transfer instruments on banks' LCR positions may restrict redistribution. The results thus indicate scope for coordinated liquidity management to mitigate bank-level shortfalls, without establishing that actual arrangements would eliminate them. The calculation therefore provides an upper-bound benchmark for the redistribution of existing HQLA within each network, conditional on unchanged bank-level net liquidity outflows.

6 Conclusion

This paper shows that the LCR effects of stablecoin adoption depend on both the deposits used to fund stablecoin purchases and the subsequent investment of reserves. In the scenarios considered, retail-funded adoption produces larger bank-level LCR declines than wholesale-funded adoption. The aggregate LCR remains well above 100% in all scenarios, but individual shortfalls indicate that aggregate results can conceal substantial differences across banks.

Retaining funds within the German banking system does not necessarily mitigate these effects. Under the assumed regulatory treatment of receiving a LCR outflow weight of 100%, returning issuer deposits can increase net liquidity outflows sufficiently to produce a larger aggregate LCR decline than funds leaving the system. Domestic securities purchases produce more favourable results because the sellers' deposits receive lower outflow weights. Conversely, an LCR increase following wholesale deposit substitution can reflect a proportionately larger reduction in net outflows than in HQLA, rather than an increase in available liquidity.

These findings are conditional on the initial balance sheets and the assumed deposit substitution, reserve allocation, and regulatory treatment. The simulation uses supervisory data for Q1 2026 and excludes subsequent funding adjustments, liquidity management, central-bank operations, and market or behavioural responses. The 100% outflow weight reflects the classification of issuer deposits as non-operational financial-sector funding in the model, and the treatment of liquid-asset depletion affects the magnitude of the results. The scenarios quantify

immediate mechanical effects rather than predict banks' eventual liquidity positions.

Liquidity redistribution within banking networks could mitigate these adverse effects: HQLA surpluses within the cooperative and savings-bank networks are sufficient to cover the modelled member-bank shortfalls, provided these assets can be transferred between institutions. The liquidity implications of stablecoin adoption therefore depend on the composition and distribution of returning deposits, as well as banks' ability to adjust their funding and mobilise liquidity.

References

Adrian, T., P. Bains, M. Bechara, E. Cerutti, S. Forte, F. Grinberg, A. Gullo, M. Hengge, A. Jekabsone, K. Kao, T. Mancini Griffoli, S. Martinez Peria, M. Miccoli, M. Reuter, and N. Sugimoto (2025). "Understanding Stablecoins." IMF Departmental Paper No. 2025/009, International Monetary Fund.

Altavilla, C., M. Boucinha, L. Burlon, R. Adalid, R. Fortes and F. Maruhn (2026). "Stablecoins and monetary policy transmission." ECB Working Paper Series No. 3199.

Born, A., Lambert, C., Nguyen, B., Soons, O., Staunton, D., and van der Kraaij, A. (2026). "Euro stablecoins and their potential effect on sovereign bond markets." ECB Macroprudential Bulletin, No. 33, April.

Coste, C. (2024). "Toss a Stablecoin to Your Banker: Stablecoins' Impact on Banks' Balance Sheets and Prudential Ratios." ECB Occasional Paper No. 353.

Deutsche Bundesbank (2026). "Deposits of Domestic Non-Banks (Non-MFIs) at Banks (MFIs) in Germany." *Monthly Report*, September, Statistical Section, Table IV.7, pp. 34*–35*.

European Systemic Risk Board (2025). *Crypto-assets and decentralised finance: Report on Stablecoins, Crypto-investment Products and Multi-function Groups*.

Fritz, B., U. Krüger and L.-H. Wong (2024). "Digital euro: short-term effects on the liquidity of German banks considering holding limits." Deutsche Bundesbank Technical Paper 05/2024.

Liao, G. Y. and J. Caramichael (2022). "Stablecoins: Growth Potential and Impact on Banking." International Finance Discussion Papers No. 1334, Board of Governors of the Federal Reserve System.

McKinsey & Company (2024). *Global Banking Annual Review 2024: Attaining Escape Velocity*. October, Exhibit 1, p. 3.