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DEMAND FOR SAFETY IN THE CRYPTO ECOSYSTEM

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Demand for Safety in the Crypto Ecosystem
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ABSTRACT

We study the demand for safety and liquidity in the crypto ecosystem. We do so under a framework in which a representative investor allocates liquidity across stablecoin deposits in lending pools and traditional safe assets (e.g., MMF shares). Our model delivers three main predictions: (i) the stablecoin deposit premium co-moves with the Treasury premium when investors value the safety and liquidity services of stablecoins; (ii) increases in Treasury supply reduce the stablecoin deposit premium; and (iii) drops in the perceived safety and liquidity of stablecoin deposits (e.g., due to de-pegs or hacker attacks) reduce their premium. Using granular data from hundreds of DeFi pools spanning multiple protocols, tokens, and blockchains, we find evidence supporting these predictions. Investors treat stablecoin deposits as money-like instruments that are borderless and permissionless, yet as fragile as other forms of privately produced safe assets.

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1 Introduction

Safe assets are essential to any financial system. They are short-term instruments that investors value not only for their cash flows but also for the safety and liquidity services they provide. These services include their use as means of exchange, store of value, and collateral (Gorton, 2017). Safe assets are usually issued by governments or systemically important financial institutions. When the public supply of safe assets falls short of investor demand, the private sector may offer substitutes (Krishnamurthy and Vissing-Jorgensen, 2015). Private alternatives are inherently riskier, so their safe-asset status rests on investor confidence and current market conditions (d'Avernas and Vandeweyer, 2024; Cipriani and La Spada, 2021).

This paper examines how the demand for — and supply of — safety and liquidity services are met in crypto markets: a new, largely unregulated, and highly volatile environment.[1] Crypto investors demand these services for the same reason other investors do, yet they exhibit a preference for holding their capital in the digital space: funds kept on-chain can be promptly redeployed when alternative crypto opportunities arise, and many investors operate under mandates that favor digital assets. Switching costs reinforce this preference. Moving in and out of crypto entails on- and off-ramping expenses, gas fees, deposit and withdrawal fees, tax scrutiny, as well as regulatory uncertainty (De Simone et al., 2025; Cong et al., 2023; Campello et al., 2024; Gorton et al., Forthcoming).[2] As a result, part of those investors' demand for safety and liquidity remains in the digital space. On the flip side, supply of safe assets is limited. Most crypto assets have risky — sometimes unverifiable — payoffs and lack the backing of a government or regulated financial institution. The mismatch between demand and supply in digital asset markets creates an incentive to engineer crypto-native instruments whose services mimic those of traditional safe assets. Identifying which assets play that role, and how well they do it, is central to understanding the integration of crypto with traditional financial markets.

Our analysis focuses on stablecoin deposits in decentralized finance (DeFi). This asset class sits at the intersection of two major innovations in the crypto ecosystem: (i) stablecoins, which are digital tokens pegged to fiat currencies, and (ii) DeFi, which enables financial intermediation through smart contracts. Stablecoin deposits are viewed as low-risk investments within crypto because they carry relatively low counterparty risk and incorporate several risk-mitigation features. Together, these characteristics enable the core safety services investors look for; namely, stable cash flows, a reliable store of value, and prompt redeemability.

The mechanics of stablecoin deposits are simple. An investor deposits coins into a pool

[1] Safety and liquidity are intertwined in any asset market (Gorton, 2017). Because these two attributes cannot be cleanly separated, we use "safety" and "liquidity" interchangeably.

[2] These costs are widely acknowledged by investors in digital markets (Fidelity Digital Assets, 2022).

and earns a real-time rate, the annual percentage yield (APY), while retaining access to the funds on demand. The pool can pay this yield because the deposited tokens are immediately lent out. Two features make stablecoin deposits relatively safe and distinguish them from other DeFi products: loan overcollateralization and pooling of collateral. The first guarantees liquidity, while the second limits counterparty risk. Investors also benefit from the price stability of the stablecoins themselves, which are primarily backed by Treasuries. These design features reduce adverse selection (Gorton and Pennacchi, 1990) and raise the information-insensitivity (Holmstrom, 2015) of stablecoin deposits.

To guide our analysis, we develop a model of stablecoin deposit demand and supply. It consists of a dynamic-environment framework in which a representative investor allocates liquidity across traditional safe assets (e.g., bank deposits or MMF shares) and stablecoin deposits. In it, the safety of both investments ultimately rests on Treasuries: money market funds hold them directly, while stablecoin pools intermediate deposits denominated in Treasury-backed stablecoins. A key contribution of our work is advancing a single framework that unifies three questions the literature and policy debate have treated separately: the integration of crypto with traditional markets, its link to the monetary system, and its fragility. All three spring from one force: the demand for safe and liquid claims anchored in Treasuries.

Our model yields three novel testable predictions. First, the stablecoin premium — the spread between a benchmark rate and the stablecoin deposit return — co-moves positively with the Treasury premium. The intuition is that when Treasuries yield lower returns, liquidity transformation becomes more costly. Competitive intermediaries pass this cost on to investors, so all liquidity-providing assets must offer lower returns. Shifts in the Treasury premium transmit to crypto-native instruments, linking crypto and traditional money markets. Second, an increase in Treasury supply lowers the stablecoin deposit premium. More abundant Treasuries enhance intermediaries' ability to provide liquidity services. Money market funds respond by offering higher returns, and stablecoin deposits must follow to clear the market. This channel captures how Treasury supply shocks transmit into crypto markets. Third, a decline in the perceived safety of stablecoin deposits lowers their premium, as investors derive fewer benefits from holding them. This formalizes the fragility of these deposits: their capacity to provide safety and liquidity services weakens with stablecoin de-pegs, security breaches, and spikes in aggregate volatility.

We put together a host of new, granular data to empirically test our model's predictions. We start by collecting daily data on DeFi pools from the DeFiLlama API. These data cover pools that allow the deposit of the major USD fiat stablecoins (USDT and USDC), and of the two main crypto assets (BTC and ETH). The data also cover pools involving their synthetic representations (e.g., WBTC, M.USDC), together with various asset-class combinations (e.g., USDT-USDC). For each pool, we observe all their characteristics, including the hosting blockchain, the protocol operating the pool (e.g., Aave or Compound), and the accepted tokens (denomination). We also know whether each pool is classified as lending or non-lending and whether it is a stablecoin pool, defined as a pool whose deposits are denominated in stablecoins. We complement our dataset with additional information sourced from Refinitiv, Bloomberg, Binance, FRED, the SEC, the U.S. Treasury, and U.S. Fiscal Data, among others. Our final sample contains over 41 thousand weekly observations covering 372 pools, 94 protocols/projects, 13 categories, and 145 token denominations from February 2022 through December 2025.

We subsequently assemble the empirical constructs needed to test our model. We measure the stablecoin premium as the difference between the 3-month overnight indexed swap (OIS) rate and the return on stablecoin deposits (APY). Following the literature, we compute the 3-month Treasury premium as the difference between the 3-month OIS and the 3-month Treasury bill yield (Sunderam, 2015). We construct a measure of Treasury supply defined as the ratio of Treasuries held by private investors (including via repo transactions) to the total assets of money market funds. As we discuss below, we leverage the richness of our data to aid identification. Among other strategies, we exhaust our empirical models with a wide range of fixed effects at the protocol, blockchain, token denomination, and time levels — often interacted — to absorb confounding heterogeneity and better isolate investors' demand for safety.

Our empirical results are as follows. First, we find a positive and significant co-movement between the stablecoin and the Treasury premia. This relationship is concentrated in lending pools denominated in USD fiat stablecoins, suggesting that the liquidity premium is tied to stablecoin-denominated lending claims. The effect is sizable: a one-standard-deviation increase in the Treasury premium increases the stablecoin deposit premium by 0.63, which is large relative to its unconditional mean of -0.60. The implication is that stablecoin deposits provide safety and liquidity services that resemble those of traditional safe assets. Also consistent with the model's predictions, the co-movement is stronger for pools with higher liquidity weights and is weaker for larger pools, highlighting the distinct roles of liquidity services and pool size in determining the sensitivity of stablecoin premium to the Treasury premium.

Second, Treasury scarcity is associated with a higher stablecoin premium, suggesting that a reduced Treasury supply increases the shadow price of liquid instruments. The economic impact is large here as well: a one-standard-deviation drop in the Treasury supply leads to a 0.73 increase in the stablecoin premium. Consistent with our model, this highlights the specialness of Treasuries in the creation of money-like claims, extending into the crypto system.

Third, stablecoin premia are sensitive to shifts in preferences and beliefs. During episodes of digital-market stress (e.g., the Terra collapse and the SVB run), periods of elevated uncertainty (high VIX), and hacker attacks, the positive co-movement between Treasury and stablecoin premia weakens. This points to the fragility of stablecoin deposits as providers of liquidity services during adverse shocks, like other privately produced money-like instruments.

A potential concern with our baseline tests is that speculative motives could simultaneously move the Treasury market and stablecoin premia through borrowing demand. We address this concern using a Treasury General Account (TGA)-based instrument that isolates plausibly exogenous variation in Treasury supply. Over our sample period, Treasury markets experienced several institutional disruptions, including debt ceiling episodes and large drawdowns and rebuilds of the TGA. These events generated substantial fluctuations in the supply of government securities available to private investors (Vissing-Jorgensen, 2025). A set of TGA-based IV estimations confirm our baseline findings, supporting the interpretation that stablecoin deposits provide safety and liquidity services within the crypto ecosystem.[3]

We fully exploit the rich cross-sectional variation in DeFi pools to help characterize our results. One advantage of our data is that we can include time fixed effects that absorb time-varying common factors by drawing on the full sample of lending and non-lending pools. This includes unobserved sentiment factors that could simultaneously move the Treasury premium and APYs through aggregate demand for speculation. In line with our model, we find that the response to Treasury premium and supply is significantly more pronounced in stablecoin lending pools than in other pools.

We push the cross-sectional analysis further to test additional predictions. For example, we examine how pool characteristics, including the underlying token, the operating protocol (project), and the hosting blockchain (e.g., Ethereum versus others), shape the sensitivity of the stablecoin premium to the Treasury premium. Our model predicts that pools providing greater liquidity services co-move more strongly with the Treasury premium. Testing these predictions both validates the model and identifies which characteristics matter most for safety provision in the crypto ecosystem.

We begin with token denomination, the most visible source of cross-pool heterogeneity. USDT and USDC dominate the stablecoin market but differ in governance, redeemability, transparency, regulatory alignment, and backing from traditional financial institutions. USDC is issued by Circle, a U.S. company that adheres to U.S. regulatory standards, and its reserves are verified by a major accounting firm. In contrast, USDT was registered in the British Virgin Islands and then relocated its headquarters to El Salvador. It has fewer regulatory disclosures and offers limited information on entities that are custodians, counterparties, or bank account providers of its reserves.[4] On the one hand, one might expect the

[3]Consistent with our proposed identification strategy, the instrumented variable is not significant when considering a control sample of non-lending stablecoin pools as a placebo test.

[4]These distinctions are evidenced by S&P Global Ratings' Stablecoin Stability Assessments, which

response to the demand for safety to be concentrated in pools denominated in stablecoins with greater transparency and institutional backing. On the other, market segmentation may drive some investors to prefer USDT for additional benefits (e.g., lower KYC). We find that the stablecoin premia of lending pools denominated in both USDC and USDT co-move positively with the Treasury premium. The estimated coefficients are qualitatively similar across tokens, suggesting that investors do not exhibit a strict preference for the more transparent stablecoin. These results are consistent with a segmented market structure in which distinct investors rely on different stablecoin features when seeking safety.

Next, we examine heterogeneity across protocols, the smart-contract systems that operate DeFi pools. Established protocols such as Aave and Compound should provide stronger safety and liquidity services because they feature more developed oracle frameworks, more elaborate liquidation mechanisms, and longer track records. We find that the co-movement between stablecoin and Treasury premia is strongest for pools operating on these protocols.

Finally, we examine heterogeneity across blockchains, which differ in terms of the depth and maturity of the DeFi system they support. Established blockchains, such as Ethereum, occupy a central role in DeFi markets, and their position can strengthen the liquidity services provided by the pools they host. We find that the co-movement between stablecoin and Treasury premia is strongest for pools on those blockchains. In all, our cross-sectional tests show that safety provision in crypto depends not only on the design of stablecoin lending pools, but also on the protocol and blockchain through which those pools operate.

Our paper contributes to the literature on safe assets by studying safety provision in crypto markets, a largely unregulated setting where assets differ sharply from traditional safe instruments. This strand of literature started with a focus on government-issued safe assets (Krishnamurthy and Vissing-Jorgensen, 2012; Greenwood et al., 2015, 2018; Gorton, 2017; Gorton et al., 2012; Nagel, 2016). More recent research has documented the characteristics of privately issued safe assets. In this realm, some studies have focused on assets issued by traditional financial institutions, such as banks (Krishnamurthy and Vissing-Jorgensen, 2015; Krishnamurthy and Li, 2023; Kacperczyk et al., 2021), while others examined those created by shadow banks (Sunderam, 2015; Cipriani and La Spada, 2021). Mota (2023) has enlarged the scope of this literature by investigating the role of corporations in providing quasi-safe assets. Relatedly, Vuillemey (2024) shows that the demand for safety also explains features of equity markets, including the adoption of limited liability. We push this literature forward: crypto produces safe-like assets outside the traditional financial system — with no regulated intermediary or government backstop — yet anchored in Treasuries.

evaluate each stablecoin's capacity to maintain its peg to the U.S. dollar. As of late 2025, S&P Global assigns USDT its lowest possible rating of 5 (weak), whereas USDC retains a rating of 2 (strong).

Our paper also relates to the growing research on decentralized finance and crypto assets.[5] A seminal contribution to this literature is Liu et al. (2023), who carefully describe the economics of lending protocols and what led to the crash of the Terra-Luna system. Rivera et al. (2023) show how lending platforms set interest rates as a function of pool utilization rates, while Barbon et al. (2026) examine how U.S. monetary policy transmits to USD-pegged stablecoin lending rates. Related work has focused on the functions, leverage, and collateral liquidation of lending protocols (Lehar and Parlour, 2022; Heimbach and Huang, 2024). Another branch of literature focuses on the macro and trading aspects of DeFi ecosystems (Lehar and Parlour, 2025; Capponi et al., 2024). On the features of stablecoins, Gorton et al. (Forthcoming) study banknotes from the free-banking era and stablecoins as private money. Anadu et al. (2023) show that stablecoins exhibit flight-to-safety dynamics akin to money market funds, particularly during high Bitcoin volatility. We add to this literature by showing that stablecoin deposits function as crypto-native providers of safety and liquidity services. In doing so, we link the study of DeFi to the economics of safety and liquidity provision.

Our main contribution is to show how safety and liquidity services are intermediated in crypto markets. We show that stablecoin deposits in lending pools cater to investors' demand for those services. While existing research has focused on the technological and financial innovation of DeFi, we highlight its ability to replicate some of the functions of safe assets through endogenous yield adjustments and institutional design. The result is a new class of safe assets that are borderless and permissionless. Because these crypto-native instruments remain inherently fragile, their growing integration ties a largely unregulated market to traditional finance, opening new channels through which liquidity stress can spill between the two. Understanding these dynamics is increasingly important for the design of policy and financial stability.

2 DeFi Lending Pools

DeFi lets users lend, borrow, and trade digital assets through smart contracts. A central role within the DeFi ecosystem is played by stablecoins, digital tokens designed to maintain a one-to-one peg to a reference fiat currency. The two dominant dollar stablecoins are USDT, issued by Tether, and USDC, issued by Circle. Both maintain their peg through full backing by reserves, most of which are in cash and U.S. Treasuries held by the issuer, who pledges to redeem tokens for fiat on demand.

DeFi lending protocols, such as Aave and Compound, intermediate between lenders and borrowers (Cornelli et al., 2024). Lenders are crypto investors — from retail holders to

[5] See Makarov and Schoar (2022) and Harvey et al. (2021) for comprehensive reviews.

crypto-native funds — who deposit cryptocurrencies, including stablecoins, to earn yield while keeping their funds liquid within crypto. Borrowers are typically crypto-market participants seeking leverage: the most common use case is borrowing stablecoins against volatile crypto collateral (e.g., ETH) to take leveraged long positions. They also include market makers, arbitrageurs, and traders looking to short specific tokens. DeFi lending is characterized by the absence of fixed maturities for deposits and loans. Lenders can withdraw their funds at any time, provided there is sufficient liquidity in the pool. Borrowers can repay loans on demand without strict repayment schedules.

Two key features of lending pools matter for the analysis that follows. The first is the *pooling of capital*. Rather than lend bilaterally to specific borrowers, lenders contribute to a common pool, holding claims proportional to their deposits and sharing the interest that borrowers pay. As a result, they are exposed to the pool's aggregate performance rather than to the credit risk of any individual borrower. The second is the *overcollateralization of loans*. Borrowers must post collateral worth more than the amount they borrow, with collateralization ratios (typically 125 to 150 percent) set by the protocol and varying by collateral asset. The protocol monitors collateral values in real time through on-chain price oracles. If collateral values fall below a predetermined threshold, the position becomes eligible for liquidation by external arbitrageurs, who repay the debt and receive collateral in return. Together, pooling and overcollateralization mean that a default by any one borrower is first absorbed by their own collateral rather than by the pool, minimizing the counterparty risk borne by lenders.[6]

While the mechanisms above limit counterparty risk, DeFi lending pools remain exposed to operational risks specific to the technology it sits on: smart-contract bugs, oracle failures, governance attacks, and liquidation failures during periods of extreme volatility. These risks are small in normal market conditions but can be significant when they materialize.

The interest paid to lenders is expressed as the annual percentage yield (APY). The APY is set algorithmically by the protocol as a function of the pool's *utilization rate*, defined as the ratio of borrowed funds to total deposits in the pool (Rivera et al., 2023). When more investors deposit funds than borrow, the total capital supply increases and the APY declines. Conversely, when fewer funds are available, the APY rises as borrowers compete for access to the limited capital. As of late 2025, APYs on Aave's USDC and USDT lending pools on Ethereum range from 3 to 8 percent, depending on pool conditions.[7]

The APY is the yield at the center of our analysis. From it we construct the stablecoin

[6]Some protocols, including Aave, supplement these features with a reserve fund (the "Safety Module") that absorbs shortfalls during periods of extreme market stress. For further details, see `https://aave.com/docs/primitives/safety-module`.

[7]Current and historical APY data for individual Aave pools are publicly available at `https://app.aave.com/markets/`. See Cornelli et al. (2024) for details of the dynamic interest rate mechanisms in Aave.

premium, so its variation, across pools and over time, is what our analysis seeks to explain.[8] Beyond its yield, a pool is described by its size, commonly measured by *total value locked* (TVL), the market value of the tokens in the pool. Though sometimes criticized as noisy, TVL remains the standard proxy for pool size (Saggese et al., 2025; FSB, 2023).

The institutional features described above suggest that depositing stablecoins in a DeFi lending pool bears features that resemble traditional safe assets, such as money market fund shares. This observation motivates the analysis that follows.

3 Model

We model a representative investor who optimizes liquidity holdings by investing in both traditional safe, liquid assets (e.g., money market funds) and crypto assets (i.e., stablecoin lending pools). The model characterizes how the Treasury market is integrated with stablecoins and lending pools. A key measure of interest is the Treasury premium, defined as the yield spread that investors are willing to accept when holding Treasuries (a traditional safe asset) relative to assets that do not provide safety or liquidity services. The stablecoin premium is the spread for stablecoin deposits in lending pools.

The key mechanism we model is the substitutability of liquidity provision between traditional and crypto markets. Treasuries are special because financial intermediaries — money market funds in traditional markets and stablecoin issuers in crypto — hold them to back the liquid liabilities they issue. This specialness determines the Treasury premium, which transmits to the prices of those Treasury-backed liabilities. Notably, stablecoin lending pools do not hold Treasuries themselves; rather, they intermediate deposits denominated in Treasury-backed stablecoins. Treasury conditions therefore reach the pools indirectly, through the value of the stablecoins deposited and through investors' substitution between pool deposits and traditional liquid assets. As a result, the stablecoin premium responds to the Treasury supply and the Treasury premium even though the pool's own assets are crypto-collateralized loans. Other forces may also influence these prices. For parsimony, however, we do not model them explicitly but will discuss them when designing our empirical strategy.

3.1 Environment

Investors in our economy value consumption and liquid asset holdings. We consider two liquid assets: money market fund (MMF) shares and stablecoin deposits in lending pools. We use

[8] Interest is credited through interest-bearing tokens. In Aave, depositing into a pool mints aTokens representing the depositor's claim on the underlying asset plus accrued interest, with the aToken balance growing as interest accumulates. See `https://aave.com/docs/developers/smart-contracts/tokenization`.

MMF shares to represent traditional assets that provide safety services, as their features are the closest to those of a stablecoin lending pool deposit. Other examples include bank deposits and direct holdings of Treasury securities (Krishnamurthy and Li, 2023). These alternative assets can be included in the model without materially changing our conclusions.

Accordingly, there are two lending sectors: a representative MMF and a unit mass of stablecoin lending pools (SCLPs) indexed by n. The MMF issues dollar liabilities, whereas SCLPs issue liabilities in dollar-denominated stablecoins. Stablecoins are created by a separate stablecoin issuer (SCI) that backs them with liquid assets (e.g., U.S. Treasury). The representative SCI issues stablecoins in exchange for dollars.

At each point t of our dynamic environment, investors determine the face value of liquid liabilities used as "money:" MMF shares m_t and SCLP deposits $s_t(n)$. Liquid instruments are indexed by $i \in \{m, s\}$ and pay net returns R^i_{t+1}. We also consider two additional assets in the economy: Treasury bills in exogenous supply with risk-free net return R^T_{t+1}, and an outside asset with net return R^a_{t+1}. The return on the outside asset can be interpreted as a risk-adjusted return on risky assets that do not provide liquidity services (e.g., stocks). We define $y^i_{t+1} \equiv R^a_{t+1} - R^i_{t+1}$ as the premium that asset i commands for the liquidity services it provides. All returns and premia are net rates and are indexed by the date of realization; the portfolio decision that earns R^i_{t+1} and y^i_{t+1} is taken at t.

The representative MMF invests in a portfolio of Treasuries and outside assets. SCLPs do not hold Treasuries directly; they accept stablecoin deposits and extend collateralized loans. The MMF's expected profit equals the portfolio return minus the liability rate and expected liquidity costs, whereas the SCLP's expected profit is the lending-borrowing spread net of costs.

We assume that the stablecoin issuer (SCI) incurs a cost to promote the adoption and usage of its stablecoin across exchanges, wallets, and DeFi protocols. This cost reflects the resources devoted to integration, liquidity incentives, and platform support, and ultimately captures efforts to defend market share in the face of competition from other stablecoins. These costs determine the equilibrium supply of stablecoins. Like the MMF, the SCI invests its proceeds in either Treasuries or the outside asset.

Both the MMF and the SCI can face liquidity shocks; hence, they need to hold liquid assets. After experiencing adverse liquidity shocks, they must liquidate assets to meet withdrawals, possibly at a fire-sale discount. We define asset liquidity services as the ability to sell at minimal cost. Treasuries provide liquidity services that mitigate this cost, whereas the outside asset does not.

Let B_t be the total Treasury supply and $\bar{X}_t$ the quantity held by exogenous holders (e.g., official reserves). The free float available to intermediaries is $B^L_t \equiv B_t - \bar{X}_t$. Letting ω^m_{bt} and

ω_{bt}^{s} denote the Treasury portfolio shares of the MMF and the SCI, respectively, the market clearing for Treasuries is

$$\omega_{bt}^{m}\, m_t + \omega_{bt}^{s}\, s_t = B_t^{L}. \tag{1}$$

The Treasury net return R_{t+1}^{T} adjusts to clear (1), taking as given the exogenous free float B_t^L, the portfolio weights ω_b^m and ω_b^s, and the equilibrium quantities m_t and s_t implied by the investors' and the SCI's problems.

3.2 Investors

Investors derive utility from current consumption c_t and liquidity services L_t. Liquidity is produced by holding two types of assets: MMF shares m_t, and a continuum of SCLP deposits $s_t(n)$, indexed by $n \in [0,1]$. Each asset $i \in \{m, s\}$ yields a net return R_{t+1}^{i} in the next period and provides liquidity today.

The representative investor's utility in each period t is

$$U(c_t, L_t) = u(c_t) + \psi_t\, L(m_t, s_t(\cdot)), \tag{2}$$

where $\psi_t > 0$ measures the weight of liquidity services in utility.

Liquidity services are aggregated by a CES index:

$$L(m_t, s_t(\cdot)) = \left[(1-\bar{\alpha}_t)\, m_t^{\frac{\sigma-1}{\sigma}} + \int_0^1 \alpha_t(n)\, s_t(n)^{\frac{\sigma-1}{\sigma}}\, dn\right]^{\frac{\sigma}{\sigma-1}}, \quad \int_0^1 \alpha_t(n)\, dn = \bar{\alpha}_t \in (0,1),\ \sigma > 0. \tag{3}$$

$\bar{\alpha}_t$ reflects the time-varying substitution between SCLP and MMF. For example, if there is a hacker attack on a specific protocol, this can create a run from the SCLP, reflected in a smaller $\alpha_t(n)$ for that pool. σ is a preference parameter that we assume to be more stable than these demand fluctuations, and thus we model it as a constant.

At the beginning of period t, the investor's wealth is w_t. This wealth is allocated across consumption c_t, MMF balances m_t, SCLP deposits $s_t(n)$, and an outside asset a_t. The current-period budget is

$$w_t = c_t + a_t + m_t + \int_0^1 s_t(n)\, dn. \tag{4}$$

Wealth evolves according to

$$w_{t+1} = (1 + R_{t+1}^{a})\, a_t + (1 + R_{t+1}^{m})\, m_t + \int_0^1 (1 + R_{t+1}^{s}(n))\, s_t(n)\, dn. \tag{5}$$

We assume that investors are not allowed to short assets. In turn, investors choose

$\{c_t, m_t, s_t(\cdot), a_t\}$ to maximize

$$\max_{\{c_t, m_t, s_t(\cdot), a_t\}_{t\geq 0}} \mathbb{E}_0 \left[\sum_{t=0}^{\infty} \beta^t U(c_t, L_t) \right] \tag{6}$$

subject to (4) and the no-short-sales constraint

$$a_t = w_t - c_t - m_t - \int_0^1 s_t(n)\, dn \geq 0. \tag{7}$$

Let λ^c_{t+1} denote the marginal utility of $t+1$ wealth and $\lambda^a_t \geq 0$ the multiplier on the constraint $a_t \geq 0$. Given the CES structure, investors hold positive money-like assets, so that only the constraint on a_t may bind.

We can show that the investor's first order conditions imply the relative demand:

$$\left(\frac{s_t(n)}{m_t} \right)^{1/\sigma} = \frac{\alpha_t(n)}{1-\bar{\alpha}_t} \frac{y^m_{t+1} + \tilde{\lambda}_t}{y^s_{t+1}(n) + \tilde{\lambda}_t}, \tag{8}$$

where

$$y^m_{t+1} \equiv R^a_{t+1} - R^m_{t+1}, \quad y^s_{t+1} \equiv R^a_{t+1} - R^s_{t+1}(n), \text{ and } \tilde{\lambda}_t \equiv \frac{\lambda^a_t}{\beta\, \mathbb{E}_t[\lambda^c_{t+1}]}.$$

We refer to y^m_{t+1} as the MMF premium and $y^s_{t+1}(n)$ as the stablecoin premium. The relative-demand equation (8) reveals the key substitution mechanism governing investors' portfolio allocation.

Investors tilt their holdings toward assets that provide liquidity services, even if they yield lower returns than the outside asset, as reflected in the MMF and stablecoin premia. When the MMF premium (y^m_{t+1}) rises relative to the stablecoin premium ($y^s_{t+1}(n)$), investors substitute away from MMF shares toward stablecoin deposits, with the magnitude governed by the preference weight $\alpha_t(n)/(1-\bar{\alpha}_t)$ and the elasticity of substitution σ. This co-movement ties together movements in the premia of all liquid assets in the economy. The term $\tilde{\lambda}_t$ captures the shadow value of the no-short-sales constraint on the outside asset. When the constraint binds ($\tilde{\lambda}_t > 0$), it acts as a common shifter on the effective premia of all liquid assets: both $y^m_{t+1} + \tilde{\lambda}_t$ and $y^s_{t+1}(n) + \tilde{\lambda}_t$ inherit movements in $\tilde{\lambda}_t$ as a common factor, so movements in $\tilde{\lambda}_t$ are reflected in MMF and stablecoin premia together. At the same time, the relative-demand ratio $(y^m_{t+1} + \tilde{\lambda}_t)/(y^s_{t+1}(n) + \tilde{\lambda}_t)$ is pushed toward unity, which dampens the responsiveness of portfolio composition to gaps between the bare premia. Investors' willingness to substitute between MMF and SCLP in their provision of liquidity services is the key mechanism through which shocks to liquidity demand or supply propagate across traditional and crypto markets.

3.3 MMFs

MMFs issue shares and invest the proceeds in assets, so total assets under management equal total liabilities, m_t. Portfolio weights satisfy

$$\omega_{bt}^m + \omega_{at}^m = 1. \tag{9}$$

MMFs may face liquidity shocks that force them to liquidate part of their portfolios at unfavorable prices. Treasury securities provide superior liquidity, so holding more Treasuries reduces the expected cost of such fire sales. We capture this by assuming that MMFs incur an expected liquidity cost

$$\kappa_t^m(\omega_{bt}^m), \qquad \kappa_t^m \geq 0, \quad (\kappa_t^m)'(\omega_{bt}^m) \leq 0. \tag{10}$$

Net revenue per unit of assets, including the liquidity cost, is

$$\pi_m^{\text{unit}} = \omega_{bt}^m \, R_{t+1}^T + (1 - \omega_{bt}^m) \, R_{t+1}^a - \kappa_t^m(\omega_{bt}^m) - R_{t+1}^m. \tag{11}$$

Total profit is $\pi_m = \pi_m^{\text{unit}} \, m_t$. Competition drives profits to zero, $\pi_m = 0$, which requires

$$y_{t+1}^m = \omega_{bt}^m \, y_{t+1}^T + \kappa_t^m(\omega_{bt}^m), \tag{12}$$

where $y_{t+1}^T \equiv R_{t+1}^a - R_{t+1}^T$ is the Treasury premium. We assume that ω_{bt}^m is fixed, reflecting tight regulation on MMF portfolio composition.[9]

The zero-profit condition for MMFs links the MMF premium to the Treasury premium. Treasuries are special in our model for two reasons: MMFs face regulatory minimum holdings requirements for Treasuries, and holding Treasuries minimizes liquidity costs. As such, Treasuries command a liquidity premium, which, in equilibrium, affects the liquidity premium of all assets in the economy.

3.4 Stablecoin Issuer (SCI)

The SCI issues s_t units of its stablecoin at time t. To promote adoption and active usage, the SCI incurs costs $\chi(s_t)$ per unit of coins issued. We assume that $\chi(\cdot)$ is monotonic and convex.

[9] This simplifying assumption is supported by empirical evidence showing that both money market funds and major stablecoins (such as USDT and USDC) maintain relatively stable allocations to Treasuries or other liquid assets over time. See Figure 3 in Appendix B.

The SCI invests in a portfolio of Treasuries and the outside asset, with portfolio weights

$$\omega_{bt}^s + \omega_{at}^s = 1. \tag{13}$$

Treasuries provide liquidity services to the SCI. Like for the MMF, a higher Treasury share reduces the liquidity losses the SCI incurs when facing redemption shocks. We capture this through a liquidity cost function

$$\kappa_t^s(\omega_{bt}^s), \qquad \kappa_t^s(\cdot) \geq 0, \quad (\kappa_t^s)'(\cdot) \leq 0. \tag{14}$$

Net revenue per unit of assets combines portfolio returns, liquidity costs, and the cost of servicing stablecoin liabilities. Because stablecoins pay no interest, it can be written as:

$$\pi_{st}^{\text{unit}} = \omega_{bt}^s \, R_{t+1}^T + (1 - \omega_{bt}^s) \, R_{t+1}^a - \kappa_t^s(\omega_{bt}^s) - \chi(s_t). \tag{15}$$

Total profit is $\pi_{st} = \pi_{st}^{\text{unit}} \, s_t$. Competition among SCIs drives profits to zero, $\pi_{st} = 0$, so the SCI must choose s_t such that

$$\omega_{bt}^s \, (R_{t+1}^T - R_{t+1}^a) - \kappa_t^s(\omega_{bt}^s) + R_{t+1}^a - \chi(s_t) = 0. \tag{16}$$

Like in the case of MMFs, we assume that ω_{bt}^s is fixed. The weights are either determined by regulation or by the credibility of the SCI, which must hold sufficient liquid assets to guarantee convertibility and maintain the peg to the dollar. The equilibrium supply of stablecoins is then determined by the Treasury premium and exogenous costs.

3.5 Stablecoin Lending Pools

A stablecoin lending pool (SCLP), indexed by n, acts as a monopolistic competitor that chooses the scale of its balance sheet — the quantity of deposits it intermediates, $s_t(n)$ — to maximize profits. The pool takes as given the two residual inverse demand functions that map quantities into net rates. First, the lending (borrower) inverse demand

$$R_t^\ell(n) = f_t\big(d_t(n)\big),$$

where $d_t(n)$ denotes the loan volume. And second, the deposit inverse supply

$$R_t^s(n) = g_t\big(s_t(n)\big),$$

where $s_t(n)$ denotes deposits.

A protocol-imposed utilization rule specifies the fraction of deposits that can be lent out:

$$d_t(n) = \theta_t(n)\, s_t(n), \qquad \theta_t(n) \in (0, 1]. \tag{17}$$

The pool's per-period profit is therefore

$$\pi_t(n) = f_t\big(d_t(n)\big)\, d_t(n) - g_t\big(s_t(n)\big)\, s_t(n). \tag{18}$$

Substituting (17) gives profit as a function of deposit scale:

$$\pi_t(n) = f_t\big(\theta_t(n)\, s_t(n)\big)\, \theta_t(n)\, s_t(n) - g_t\big(s_t(n)\big)\, s_t(n). \tag{19}$$

The SCLP chooses $s_t(n)$ to maximize profits:

$$\max_{s_t(n) \geq 0} \; \pi_t(n). \tag{20}$$

We do not explicitly model the optimization problem of SCLPs, as doing so is not needed to derive the propositions of interest. What matters for our purposes is that, when loan demand is sufficiently high, an SCLP may optimally set the deposit rate $R^s_{t+1}(n)$ at a level that exceeds the return on the outside asset, R^a_{t+1}. In this case, the stablecoin premium, $y^s_{t+1}(n)$, becomes negative, and the short-sale constraint in the investor's problem binds. Finally, we assume that the total amount of deposits across all SCLPs cannot exceed the total supply of stablecoins issued by the SCI; that is, $\int_0^1 s_t(n)\, dn \leq s_t$. In the equilibria we consider, this constraint is slack, with stablecoins held both inside and outside SCLPs.

3.6 Equilibrium

We solve for an equilibrium taking as given the model's exogenous primitives, which we recall are: the total Treasury supply B_t and the quantity held by exogenous holders $\bar{X}_t$; the Treasury portfolio weights of the MMF and the SCI, ω^m_b and ω^s_b, set by regulation; the pool-level liquidity weight $\alpha_t(n)$, with aggregate $\bar{\alpha}_t \equiv \int_0^1 \alpha_t(n)\, dn$; the pool share of stablecoin deposits $\varphi(n)$; the protocol-imposed utilization rate $\theta_t(n)$; the weight of liquidity services in utility ψ_t; the SCI adoption cost function $\chi(\cdot)$; the MMF and SCI liquidity cost functions $\kappa^m_t(\cdot)$ and $\kappa^s_t(\cdot)$; the CES elasticity of substitution σ; and the investor's discount factor β.

An equilibrium is a sequence

$$\big(m_t,\, s_t(\cdot),\, R^m_t,\, R^s_t(\cdot),\, R^T_t\big)_{t \geq 0}$$

such that investor demands m_t and $s_t(n)$ satisfy the first-order conditions and relative-demand expressions given the asset premium ($y^i_{t+1} = R^a_{t+1} - R^i_{t+1}$); the intermediary zero-profit conditions for the MMF and SCI hold; and the SCLP and Treasury markets clear.

Define the pool-n share of aggregate stablecoin deposits as[10]

$$\varphi_t(n) \equiv \frac{s_t(n)}{s_t}, \qquad \int_0^1 \varphi_t(n)\, dn = 1.$$

Also define $b_t \equiv \dfrac{B^L_t}{m_t}$, which measures the free float of Treasuries available to private intermediaries relative to the size of the traditional money-like sector. From the Treasury market clearing condition (1), dividing by m_t yields $s_t/m_t = (b_t - \omega^m_{bt})/\omega^s_{bt}$. Accordingly, we define

$$Q^n(b_t) \equiv \frac{s_t(n)}{m_t} = \frac{\varphi_t(n)\,(b_t - \omega^m_{bt})}{\omega^s_{bt}}, \qquad \tilde{R}^i_{t+1} \equiv y^i_{t+1} + \tilde{\lambda}_t, \text{ for } i \in \{m, s\}.$$

From the investors' FOC described in equation (8), in equilibrium, we have

$$\frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\frac{\tilde{R}^m_{t+1}}{\tilde{R}^s_{t+1}(n)} = \left[\, Q^n(b_t)\,\right]^{1/\sigma}. \tag{21}$$

Plugging in the relationship between MMF and Treasury premium from (12) gives:

$$y^s_{t+1}(n) = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\left[\omega^m_{bt}\, y^T_{t+1} + \kappa^m_t(\omega^m_{bt}) + \tilde{\lambda}_t\right]\left[\, Q^n(b_t)\,\right]^{-1/\sigma} - \tilde{\lambda}_t. \tag{22}$$

We seek to establish a relationship between the Treasury premium and the stablecoin premium. In many settings with CES liquidity preferences, such as Krishnamurthy and Vissing-Jorgensen (2015), it is useful to log-linearize equation (21). However, we note that both the Treasury and stablecoin premia, when measured relative to traditional benchmarks such as the OIS rate, can be negative. This highlights two empirical challenges. First, the difficulty in measuring the benchmark rate R^a_{t+1} of an asset that is risk-free and provides zero safety services. Second, the difficulty in measuring $\tilde{\lambda}_t$, the shadow value of the no-short-sales constraint. We overcome these difficulties by linearizing the equilibrium equation around a steady state using a Taylor expansion. This approach will prove useful for our empirical strategy, which employs linear regressions. For tractability, we assume a time-invariant distribution of deposits across pools, $\varphi_t(n) = \varphi(n)$.

We linearize the equilibrium condition in $(y^T_{t+1}, b_t, \tilde{\lambda}_t)$ around their steady-state values,

[10] To avoid extra notation, we assume $s_t = \int_0^1 s_t(n)\, dn$; i.e., all stablecoin supply resides in lending pools. Here, $\varphi(n)$ denotes pool n's share of total pool assets, so $\int_0^1 \varphi(n)\, dn = 1$.

treating $\alpha_t(n)$ as a time-varying shifter on the coefficients. This delivers the regression specification used in our empirical analysis.[11] The linearized equilibrium condition gives:

$$y^s_{t+1}(n) \approx \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_{TR}(n)\,y^T_{t+1} + \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_b(n)\,b_t + \delta_t(n), \tag{23}$$

where the steady-state objects are $\bar{y}^T$, $\bar{b}$, and $\bar{\lambda}$ for the dynamic variables y^T_{t+1}, b_t, and $\tilde{\lambda}_t$. Let $\bar{y}^m \equiv \omega^m_b\,\bar{y}^T + \kappa^m(\omega^m_b)$ be the MMF premium implied by the zero-profit condition (12), and

$$Q^n(\bar{b}) = \frac{\varphi(n)\,(\bar{b}-\omega^m_b)}{\omega^s_b}, \qquad \frac{\partial Q^n}{\partial b_t}(\bar{b}) = \frac{\varphi(n)}{\omega^s_b} > 0.$$

Evaluated at the steady state, the coefficients in (23) are

$$\delta_Q(n) \equiv \left[Q^n(\bar{b})\right]^{-1/\sigma}, \tag{24}$$

$$\delta_{TR}(n) \equiv \omega^m_b\,\delta_Q(n), \tag{25}$$

$$\delta_b(n) \equiv -\frac{\varphi(n)}{\omega^s_b\,\sigma}\left(\bar{y}^m + \bar{\lambda}\right)\left[Q^n(\bar{b})\right]^{-(1+\sigma)/\sigma}, \tag{26}$$

$$\delta_t(n) \equiv \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\left[\delta_Q(n)\,\kappa^m(\omega^m_b) - \delta_b(n)\,\bar{b}\right] + \left[\frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_Q(n) - 1\right]\tilde{\lambda}_t. \tag{27}$$

3.7 Testable Predictions

We organize the testable implications of the model into two groups. The first group consists of *equilibrium correlations* between endogenous objects: useful as tests of whether the traditional and crypto money markets are connected through investors' demand for liquidity, but not interpretable as causal effects. The second group consists of *comparative-statics responses* of the stablecoin premium to primitives of the model, which can support causal interpretation when those primitives admit plausibly exogenous variation.

Proposition 1 (Co-movement of Premia) *Holding the Treasury free float b_t and the shadow value $\tilde{\lambda}_t$ fixed, the stablecoin premium $y^s_{t+1}(n)$ loads positively on the Treasury premium y^T_{t+1} whenever investors value the liquidity services of SCLP deposits, i.e., $\alpha_t(n) > 0$. When $\alpha_t(n) = 0$, this direct loading is zero.*

The mechanism is the substitutability of liquidity provision across traditional and crypto markets. When Treasury liquidity is more valuable and y^T_{t+1} rises, the MMF zero-profit condition raises y^m_{t+1} proportionally. Because of investors' CES demand for liquidity, this passes

[11] The linear approximation is local to the interior of the no-short-sale region; it is not meant to characterize behavior at the regime boundary $y^s_{t+1}(n) = 0$, where the multiplier $\tilde{\lambda}_t$ departs from its steady-state value.

through to SCLP deposits, whose premia must rise in equilibrium. The strength of this transmission scales with $\alpha_t(n)$: if SCLP deposits provide no liquidity services, the two markets share no common factor and their premia move independently. A positive co-movement is direct evidence that the two markets are connected through investors' demand for liquidity.

Both premia are equilibrium objects, jointly determined by the underlying primitives — chiefly the liquidity demand ψ_t and the Treasury free float b_t — and by the endogenous shadow value $\tilde{\lambda}_t$. Proposition 1 therefore characterizes an equilibrium correlation rather than a causal effect, and the slope from a reduced-form regression of $y^s_{t+1}(n)$ on y^T_{t+1} should be read as a measure of market connectedness rather than a treatment effect.

Corollary 1 (Differential Loading across SCLPs) *Consider two SCLP deposits n and n' with equal shares of aggregate stablecoin deposits, $\varphi(n) = \varphi(n')$, but different liquidity weights $\alpha_t(n) > \alpha_t(n')$. The premium of pool n loads more strongly on the Treasury premium y^T_{t+1} than the premium of pool n'. Holding pool size fixed, the co-movement with y^T_{t+1} is increasing in $\alpha_t(n)$.*

Deposits with higher $\alpha_t(n)$ are closer substitutes for traditional money-like instruments in investors' CES demand for liquidity. When Treasury liquidity becomes scarce and the broader cost of liquidity rises, investors bid up the prices of these high-quality deposits more aggressively than those of low-α deposits, generating a larger response of $y^s_{t+1}(n)$ to y^T_{t+1}. The cross-sectional dispersion in stablecoin premia thus reflects heterogeneity in liquidity quality — deposits offering superior liquidity services command larger premia precisely when traditional safe-asset liquidity becomes more valuable.

The corollary motivates a sharper empirical specification than Proposition 1. It permits tests across pools with heterogeneous perceived liquidity, admitting time fixed effects that absorb the aggregate drivers of the stablecoin premium — $\tilde{\lambda}_t$, common safety-demand shocks, the monetary stance — so that the co-movement between Treasury premium and the SCLP premium is identified from differential loadings across pools on the same aggregate movement.

Corollary 2 (Pool Size and Loading on the Treasury Premium) *Consider two SCLP deposits n and n' with equal liquidity weights, $\alpha_t(n) = \alpha_t(n')$, but different shares of aggregate stablecoin deposits, $\varphi(n) > \varphi(n')$. The premium of pool n loads* less *strongly on the Treasury premium y^T_{t+1} than the premium of pool n'. Holding liquidity quality fixed, the co-movement with y^T_{t+1} is decreasing in pool size $\varphi(n)$.*

At first pass the prediction can sound counterintuitive. One might expect larger pools to be "more money-like" and so load more on aggregate liquidity shocks, but the CES mechanism delivers the opposite. Notably, the prediction reflects diminishing marginal liquidity services in the CES index. A deposit in a larger pool faces a higher penetration ratio, so its marginal contribution to investors' liquidity services is smaller. When Treasury liquidity becomes more valuable and investors substitute toward crypto, the marginal value of an additional dollar of deposits is higher in a small pool, and small-pool deposits are bid up more aggressively.

Like Corollary 1, this cross-sectional prediction lets us exploit variation across pools and tighter identification with time fixed effects, bringing added evidence to bear on our model.

Proposition 2 (Treasury Supply) *Near the steady state, the stablecoin premium is strictly decreasing in the free float $b_t \equiv B_t^L/m_t$:*

$$\frac{\partial y^s_{t+1}(n)}{\partial b_t} = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_b(n) < 0.$$

holding the Treasury premium y^T_{t+1} and the shadow value $\tilde{\lambda}_t$ fixed.

This proposition isolates the *direct* channel through which Treasury scarcity transmits to stablecoin lending pools: holding the Treasury premium fixed, a fall in b_t reduces the stablecoin penetration ratio $Q^n(b_t) = s_t(n)/m_t$, making each marginal SCLP deposit more valuable at the margin in producing liquidity services; investors bid up its price, lowering its APY. There is also an *indirect* channel that operates through the MMF: by the zero-profit condition (12), scarcer Treasuries raise the Treasury premium y^T_{t+1}, which the MMF passes through to its liability rate by lowering R^m_{t+1}; through investors' liquidity demand, this transmits to stablecoin lending pools, which must also offer lower APYs in equilibrium. The linearized regression (23) decomposes the two channels: when y^T_{t+1} is included as a regressor, $\delta_b(n)$ identifies the direct channel, while the indirect channel is absorbed by the coefficient on y^T_{t+1}. This decomposition motivates the empirical specification used below.

Unlike Proposition 1 and Corollary 1, this is a structural comparative-statics statement: it describes the response of the endogenous stablecoin premium to an *exogenous* variation of Treasury free float B_t^L entering through b_t. Because B_t^L is determined by debt issuance, the debt-ceiling cycle, and official reserve holdings — features sitting outside the equilibrium block we model — it admits plausibly exogenous variation, and the proposition therefore supports causal identification.

Proposition 3 (Market Uncertainty and Liquidity Preferences) *All else constant, the partial response of the stablecoin premium to the pool-level liquidity weight is positive,*

$$\frac{\partial y^s_{t+1}(n)}{\partial \alpha_t(n)} > 0.$$

A fall in $\alpha_t(n)$ lowers the premium $y^s_{t+1}(n)$ and raises the equilibrium APY $R^s_{t+1}(n)$ relative to the return on the outside asset, R^a_{t+1}.

The pool-level liquidity weight $\alpha_t(n)$ captures the extent to which deposit n provides liquidity services. When $\alpha_t(n)$ falls, investors derive fewer liquidity benefits from holding that deposit and require a higher return as compensation, raising the equilibrium APY relative to the outside asset. Empirically, $\alpha_t(n)$ can be shifted by pool-specific events that the model treats as exogenous — security breaches, hacks, oracle failures, audit downgrades, and broader spikes in crypto-market uncertainty — and the proposition admits causal identification through such shocks.

Together, these results map the model's mechanism into a set of distinct, testable empirical predictions. Proposition 1 and Corollaries 1 and 2 deliver equilibrium correlations that diagnose whether traditional and crypto money markets are linked through investors' demand for liquidity, with the cross-sectional corollaries permitting tighter, fixed-effects identification. Propositions 2 and 3 deliver comparative-statics responses to plausibly exogenous variation in Treasury supply and pool-level liquidity demand, supporting causal interpretation. The remainder of the paper takes these predictions to the data. The next section describes our data on stablecoin lending pools, Treasury markets, and the associated premia. It also describes how we construct counterparts for our model's objects. The sections that follow test each of our model's predictions.

4 Data and Descriptive Statistics

4.1 Data

To test the model's predictions, we assemble data spanning the two markets it connects: crypto and traditional finance.

From crypto markets, we collect daily data on all pools in each DeFi category (e.g., lending and non-lending) from the DeFiLlama API, over the longest available series, February 2022 through December 2025. We select pools whose token symbol includes at least one of the two largest stablecoins (USDT, USDC) or the two largest non-stablecoin crypto assets (BTC, ETH), including their synthetic or wrapped representations (e.g., WBTC, M.USDC). For each pool, we observe the protocol (or "project") that operates it (e.g., Aave, Compound) and the blockchain that hosts it (e.g., Ethereum). A single protocol can operate multiple pools across different chains. We also collect Bitcoin volatility from Bloomberg, Bitcoin futures funding rates from Binance, and hacker attacks from DeFiLlama.

From traditional markets, we add T-bill yields, the Treasury General Account (TGA), the federal funds rate, the amount of Treasuries held by the Fed and commercial banks, and the VIX, all from the Federal Reserve Economic Data (FRED) database. We add OIS rates from Eikon/Refinitiv, the amount of Treasuries outstanding from the Debt to the Penny dataset, repo data from the New York Fed, and money market fund assets from the SEC. TGA forecasts and the coupon settlement schedule are from Wrightson ICAP's *Money Market Observer*.

Following practice in the literature (e.g., Kacperczyk et al., 2021; d'Avernas and Vandeweyer, 2024), we collapse the dataset from daily to weekly frequency by taking the last NYSE trading day of the week. We clean the data by removing pools with extreme APY values and keeping only the top-decile pools in the three key categories (i.e., stablecoin lending, non-stablecoin lending, and non-lending). These filters retain roughly 90% of the initial market (see Appendix B for details on data construction and cleaning). The final weekly sample has more than 41,000 observations across 372 pools, 94 protocols/projects, 13 categories, and 145 token denominations.

4.2 Summary Statistics

Table 1 reports summary statistics for our key variables. Panel A reports aggregate statistics for macro variables and the stablecoin premium at weekly frequency. The premium is defined as the spread between the OIS rate and the APY (annual percentage yield). We refer to this measure as the *stablecoin premium* for stablecoin lending pool deposits and as the *crypto premium* for the broader sample of DeFi pools.

Panels B–E report pool-week statistics for the subsamples used in the analysis. Although we focus on stablecoin lending pools, we also report non-lending and non-stablecoin pools, which serve as comparison groups in which the safety and liquidity mechanism should be weaker or absent. For USDT/USDC lending pools (Panel B), the stablecoin premium is negative and averages -0.34 percentage points with a standard deviation of 4.47. The premium is comparable for the broader sample of USD fiat stablecoin lending pools (Panel C), with a mean of -0.60 percentage points and a standard deviation of 4.88. By contrast, when considering the full sample of lending pools (Panel D), the crypto premium is positive and averages 2.30 percentage points. A similar value is observed for the full sample including non-lending pools (Panel E), where the average crypto premium is 1.43. On average, the premium is negative for stablecoin lending pools and Treasuries, while positive across the broader sample of DeFi pools. On this dimension, stablecoin lending deposits line up with Treasuries, not with the other DeFi pools.

[Table 1 about here.]

Table 2 reports the composition of the sample across the dimensions we exploit: pools, categories, tokens, blockchains, projects, and pool-week observations. The variation along each dimension is rich enough to support the fixed effects and heterogeneity tests below, and it is not concentrated in a few projects or tokens. Even our narrowest subsample, stablecoin lending pools, spans many blockchains, projects, and tokens.

[Table 2 about here.]

Figure 1 plots our three key variables: the stablecoin premium, the Treasury premium, and Treasury supply. The stablecoin premium (top plot) is positive through 2022, then swings sharply negative during 2023 and again in late 2024 before recovering toward zero. The Treasury premium (middle plot) follows a similar pattern: large and positive early in the sample, reaching about 0.5%, before turning slightly negative and more stable from mid-2023 onward. This variation shows that the safety and liquidity value of Treasuries is far from constant. Both premia are measured against the 3-month OIS rate, which is highly liquid and carries very low credit risk.[12] The final plot shows Treasury supply, defined as the net floating amount of Treasuries plus repo backed by Treasuries divided by the total assets of MMFs. It rises through 2022, contracts sharply in early 2023 as the debt-ceiling standoff and the drawdown of the TGA curtailed net issuance, then rebuilds to a peak in mid-2024 before declining. In all, the two premia and Treasury supply move substantially over the sample, the movements the rest of the paper sets out to explain.

5 Main Empirical Results

We estimate the following specification to test the propositions and corollaries from Section 3:

$$\begin{aligned} \textit{Stablecoin Premium}_{it} = {} & \beta_1 \textit{Tsy Premium}_{t-1} + \beta_2 \textit{Tsy Supply}_{t-1} \\ & + \textit{Controls}_{t-1} + \alpha_p + \alpha_c + \alpha_k + \alpha_q + \varepsilon_{it}. \end{aligned} \tag{28}$$

Stablecoin Premium measures the difference between the 3-month overnight indexed swap (OIS) rate and the annual percentage yield (APY) earned in the lending pool i. The remaining subscripts denote p for protocol, c for blockchain, k for token denomination, q for quarter, and t for time. *Tsy Premium* denotes the Treasury premium, defined as the difference

[12] OIS contracts exchange no notional and involve no upfront cash, so they are not used as collateral or a store of value. Subtracting the T-bill yield from the OIS rate therefore strips out variation due to the level of interest rates and isolates the T-bill's idiosyncratic characteristics (Sunderam, 2015; Kacperczyk et al., 2021).

Figure 1: **Stablecoin premium, Treasury premium and Treasury supply**. The figure reports: in the top plot, the Stablecoin premium, namely the 3-month OIS rate minus the equal-weighted APY for the sample of USDT and USDC lending pools; in the middle plot, the Treasury premium, namely the 3-month OIS rate minus the U.S. Treasury bill yield; and, in the third plot, the Treasury supply, namely the net floating amount of Treasuries plus repo backed by Treasuries divided by the total assets of MMFs.

between the 3-month OIS rate and the 3-month T-bill yield, reflecting the specialness of Treasury securities. *Tsy Supply* is defined as the ratio of the net supply of Treasuries and Treasury repo available to private investors to the total assets of money market funds (MMFs).

We are interested both in how the two endogenous prices co-move and in the causal effect of Treasury supply on the stablecoin premium. Through the lens of equation (23), the main source of endogeneity in estimating β_1 and β_2 is our inability to measure $\delta_t(n)$, which captures two economic forces: (i) the shadow price of the short-selling constraint, which is primarily driven by speculative demand, and (ii) the expected liquidity costs faced by intermediaries. Both affect the stablecoin premium and are likely correlated with our regressors, producing a classic omitted-variable bias. A secondary concern is the time×pool component $\alpha_t(n)$, which captures pool-specific liquidity weights. These are slow-moving preference parameters, so resulting biases are likely second-order. Nonetheless, we set out to address biases in our estimations with three strategies: (i) controlling for observable drivers of $\delta_t(n)$, (ii) exploiting cross-sectional variation across pools, and (iii) instrumenting Treasury supply with plausibly exogenous variation.

6 Time-Series Variation

In the baseline specification of equation (28), we exploit only the time-series variation of the Treasury premium and supply. We add three key controls: Bitcoin volatility (*BTC Vol*) proxies crypto market conditions; the Bitcoin perpetual futures funding rate (*BTC Fut. Funding Rate*) captures leverage costs and speculative demand in crypto markets; and the federal funds rate (*FFR*) captures monetary policy stance and residual funding variation in traditional financial markets (Nagel, 2016; Barbon et al., 2026). We also include project (the protocol-level identifier in DeFiLlama, e.g., Aave, Compound), blockchain, token denomination, and quarter fixed effects, the last capturing seasonal variation in crypto market activity.

According to Propositions 1 and 2, we expect $\beta_1 > 0$ and $\beta_2 < 0$. A positive β_1 means that stablecoin lending pools provide liquidity services that substitute for traditional safe assets, so their premia co-move positively with the Treasury premium. A negative β_2 means that a fall in the Treasury supply held by private investors raises premia in these pools, as a tighter relative supply of safe assets lifts the shadow price of liquid instruments.

Table 3 reports the estimates of specification (28). Column (1) uses lending pools denominated in a single stablecoin, USDT or USDC (single-token pools); Column (2) uses all lending pools denominated in USD fiat stablecoins. We find a significant, positive β_1: the stablecoin premium rises with the Treasury premium, so investors accept lower yields in exchange for safety and liquidity. Adding our full set of fixed effects (Columns (3)–(4)) leaves the coefficient highly significant in both subsamples. The effect is economically sizable: a one-standard-deviation rise in the Treasury premium (0.15) raises the stablecoin premium by about 0.63 percentage points, large relative to its unconditional mean of -0.60. Columns (5) and (6) exclude lending pools from the sample of stablecoin pools, with (6) further excluding "Yield" and "Yield aggregator" pools.[13] The coefficient becomes insignificant in (5) and negative in (6), confirming that lending (not stablecoin denomination) drives the co-movement.

In line with Proposition 2, the table reports a negative β_2. A lower Treasury supply

[13] "Yield" and "Yield" aggregator pools have partial exposure to lending pools, since they automatically allocate across pool types, including lending.

relative to MMF assets raises the stablecoin premium, so stablecoin lending deposits provide more valuable liquidity services when Treasuries are scarce. A one-standard-deviation increase in Treasury supply (0.07) lowers the stablecoin premium by about 0.73 percentage points. The coefficient is smaller in Column (5) and, for the non-lending pools in Column (6), becomes insignificant and flips sign — evidence that the mechanism is specific to lending protocols. Results are robust to time-series aggregation (see Table 16 in Appendix C).

[Table 3 about here.]

7 Cross-sectional Variation

We now exploit the variation across pools to test Corollary 1 of Proposition 1, which predicts that pools offering greater liquidity services are more exposed to the Treasury premium. We use the entire sample, including both stablecoin and non-stablecoin pools, and interact the Treasury premium with dummies that classify pools as single-token stablecoin lending pools (*USDT/USDC Lending*) and USD fiat stablecoin lending pools (*SC Lending*).

The main advantage of exploiting the cross-section is that, alongside the pool-level fixed effects, we can include time (year × week) fixed effects, which absorb shocks common to all pools (e.g., aggregate speculative demand). If liquidity weights are stable, these fixed effects absorb the model-implied confounders captured by $\delta_t(n)$ in equation (23). Results are reported in Table 4. In line with Table 3, we find positive and statistically significant coefficients on the interaction term when we include project, token, chain, and time fixed effects (Columns (1)–(2)).

The coefficient remains positive and significant with token×chain (Columns (3)–(4)) and project×chain (Columns (5)–(6)) fixed effects. The strictest specification adds project × chain × token and time fixed effects, absorbing pool-level heterogeneity (e.g., USDC on Aave and Ethereum) and common shocks (e.g., macro news, risk sentiment). We also interact *Tsy Supply* with dummies identifying stablecoin lending pools. The interaction between *Tsy Supply* and a stablecoin lending dummy is negative and significant, consistent with these deposits providing liquidity services that are more valuable when safe assets are scarce.

[Table 4 about here.]

Next, we jointly test Corollary 1 and Corollary 2, restricting the sample to stablecoin lending pools — the objects to which the model directly applies. Corollary 1 predicts that pools providing greater liquidity services exhibit stronger co-movement with the Treasury premium. Corollary 2 predicts that, holding liquidity quality fixed, larger pools exhibit a weaker loading on the Treasury premium.

Testing the two corollaries jointly is informative because liquidity quality and pool size have distinct predicted effects on the loading on the Treasury premium. By Corollary 1, holding size fixed, pools with higher liquidity quality load more on the Treasury premium; by Corollary 2, holding liquidity quality fixed, larger pools load less. To separate these effects, we interact the lagged Treasury premium with (i) an indicator for single-token USDT and USDC lending pools, a proxy for deposits with higher liquidity weights $\alpha_t(n)$, and (ii) several measures of pool size, which proxy for the pool's share of aggregate stablecoin deposits $\varphi(n)$.

Table 5 reports the results. The estimates provide support for both cross-sectional predictions. Consistent with Corollary 1, the interaction between the Treasury premium and the USDT/USDC lending pool indicator is positive and significant across all specifications, with coefficients ranging from 0.495 to 0.760. This finding suggests that single-token USDT and USDC lending pools load more strongly on Treasury-market conditions. At the same time, the interaction between the Treasury premium and pool size is negative and robust across alternative size measures (above-median indicators, lagged TVL, trailing average TVL). Economically, these estimates imply that larger pools exhibit a weaker response of the stablecoin premium to Treasury-market conditions, consistent with Corollary 2.

[Table 5 about here.]

Overall, our baseline results support Propositions 1 and 2. Stablecoin lending pools respond to both the Treasury premium and Treasury supply, indicating that investors view stablecoin deposits as substitutes for traditional safe assets.

8 An Instrumental Variables Approach

Our test results thus far establish a robust association between the stablecoin premium and Treasury-market conditions. We now study if this relationship is causal, proposing a sharper test of whether stablecoin deposits provide liquidity services and act as partial substitutes for traditional liquid assets. A potential concern is that variation in the demand for leverage moves both the Treasury and stablecoin premia. When speculative demand rises, borrowing from SCLPs increases, and the deposit rate (APY) adjusts upward to attract additional capital. As shown in Section 3, higher APYs in turn compress the stablecoin premium. If speculative demand is also correlated with the Treasury premium (for instance, because it covaries with expected MMF liquidation costs), our estimate of β_2 could be biased.

We address this concern in three complementary ways. First, the baseline specification includes the BTC perpetual futures funding rate — the most direct proxy for speculative leverage demand in crypto — as a control. Second, our cross-sectional tests identify the model's pass-through coefficients while absorbing any aggregate shock through a time fixed effect (e.g., sentiment or leverage demand). Third, we instrument Treasury supply to isolate variation unrelated to crypto-market conditions, identifying its causal effect on stablecoin premia.

A valid instrument for Treasury scarcity must satisfy two conditions: it must generate meaningful variation in the supply of Treasuries available to private investors (inclusion), and it must affect the stablecoin lending premium only through that supply channel (exclusion). We propose the weekly level of the Treasury General Account (TGA) as such an instrument. The TGA is the U.S. Treasury's operating account at the Federal Reserve. When the TGA balance rises, the Treasury is absorbing cash from the private sector, typically by issuing bills in excess of redemptions. When it falls, the Treasury is releasing cash, mechanically contracting net bill issuance. Because the TGA is managed to meet the Treasury's near-term cash needs rather than to target market conditions, its fluctuations are plausibly exogenous to stablecoin lending markets. They shift the supply of short-term government securities available to private investors, thereby affecting the scarcity value of safe assets. Our sample period is particularly informative because debt-ceiling episodes generated large TGA drawdowns and rebuilds, creating substantial exogenous variation in bill supply.[14]

We therefore use $log(TGA)_{t-1}$ as an instrument for $Tsy\ Supply_{t-1}$. The inclusion condition is satisfied. As reported in the first-stage panel of Table 6, $log(TGA)_{t-1}$ enters positively and significantly across all specifications, with first-stage F-statistics of 92–113, well above conventional thresholds. The exclusion restriction requires that TGA-driven variation affects stablecoin premia only through Treasury market conditions, and not through direct effects on DeFi lending demand or protocol-specific fundamentals. The natural concern is that TGA fluctuations could proxy for broader liquidity conditions (aggregate risk appetite or dollar funding stress) that independently shift crypto borrowing demand. We address this concern in three ways. First, all specifications control for Bitcoin volatility, the federal funds rate, and the BTC funding rate, and some specifications also include the lagged Treasury premium. These controls absorb the main macro and crypto-specific channels through which TGA movements could plausibly reach DeFi markets. Second, and more directly, we re-estimate the same IV specification on a sample of non-lending stablecoin pools, which should not respond to Treasury supply if the exclusion restriction holds. Third, we later

[14] Cassidy and Mirani (2024) also exploit TGA dynamics to construct instruments for Treasury bill supply, via debt ceiling events. Our 2022 to 2025 sample contains only two such events. We use the TGA directly, which captures broader cash-management variation and matches the weekly frequency of our DeFi panel.

replicate the IV using TGA "surprises," defined as the residual from professional forecasts, isolating unanticipated Treasury supply variation, and the coupon bond settlements.

Table 6 presents the results. The IV estimates based on TGA in Columns (3) and (4) show a negative and significant effect of Treasury supply on the stablecoin premium, consistent with Proposition 2. Columns (5) and (6) report placebo results for non-lending pools. The insignificant estimates suggest that TGA variation operates through Treasury supply rather than through a generic liquidity effect common to all crypto markets. Finally, we collapse the data to the weekly level to abstract from cross-sectional pool-level heterogeneity and estimate the relationship at the aggregate market level. Here, too, the effect remains negative and significant (see Table 17 in Appendix C).

[Table 6 about here.]

To sharpen identification further, we propose two alternative instruments as robustness tests. The first is a TGA forecast surprise. Following the forecast-error methodology of Jones (2024), who applies it to projections of T-bill auction sizes, we instead use Wrightson ICAP's *Money Market Observer* to obtain weekly projections of the TGA balance. We define the weekly TGA forecast surprise as the realized TGA balance minus the Wrightson projection. Because Treasury supply is a persistent stock variable, we cumulate the weekly surprises over a 26-week trailing window to align the instrument with it. Using the forecast surprises rather than the realized level reinforces the exclusion restriction. By construction, the surprise component is orthogonal to public information and therefore cannot reflect anticipated macro-financial conditions that might shift crypto borrowing demand. The substantial variation in TGA surprises over our sample period yields a strong first stage (first-stage $F = 90$).[15]

As an additional instrument, we use the Treasury coupon-bond settlement calendar from the same Wrightson source. This instrument draws on a different source of Treasury supply variation and is closer in spirit to the calendar-based supply instruments in Greenwood et al. (2015). Whereas the TGA surprises draw exogeneity from unforecastability, identification here rests on predetermination. The Treasury's coupon auction schedule is set quarterly through the Refunding Announcement, and individual auctions are announced 1 to 2 weeks before settlement. Hence, the settlement calendar is set well before contemporaneous shocks can move it. As with the TGA surprise, we cumulate the weekly schedule over a trailing horizon to obtain a stock-level instrument aligned with the slow-moving regressor $Tsy\ Supply_{t-1}$. The 12-week horizon spans one Quarterly Refunding cycle, the natural window over which coupon settlement plans are committed. On settlement day, the dollar volume of coupon-bearing securities mechanically enters the stock of privately held Treasury debt, satisfying

[15] We run a similar test using the measure of Jones (2024) based on weekly Treasury surprises. In Appendix D, we discuss the construction of the instruments and their properties in more detail.

the inclusion condition for the instrument. The coupon instrument also yields a strong first stage ($F = 40$). Tables 20 and 21 in Appendix C report the second-stage and first-stage estimates from both instruments. The two second-stage estimates match the baseline results and agree despite the two instruments being essentially uncorrelated ($\rho \approx 0.04$). Placebo samples of non-lending pools and pools with no lending features yield insignificant effects.

9 Market Uncertainty and Liquidity Preferences

We now turn to Proposition 3, which characterizes how the stablecoin premium responds to shifts in investors' liquidity preferences. Our hypothesis is that elevated market uncertainty erodes the perceived liquidity of crypto assets, as investors reassess whether stablecoin lending pools remain a reliable source of safety and liquidity under stress. Our sample is well suited for this test, as it contains several large shocks of distinct origin. We examine three systemic episodes. First, the Terra collapse, the first large-scale failure of an algorithmic stablecoin, triggered the de-pegging of USDT. Second, the SVB failure, a traditional bank run, de-pegged USDC and laid bare the crypto ecosystem's reliance on traditional banking rails. Third, the FTX bankruptcy, the fraud-driven collapse of a major centralized exchange, spread panic across crypto markets. To complement these events, we use a novel dataset on crypto hacks to study how investors respond to idiosyncratic DeFi shocks.

Table 7 reports panel estimates in which we interact the Treasury premium with a series of *Shock* dummies. We aggregate the three major crypto shocks in our sample period (the Terra and SVB stablecoin episodes, and the FTX centralized-exchange failure) into an *All Crypto* dummy. We also test a broader measure of aggregate market stress (the VIX) that is not specific to crypto. For the crypto shock, the dummy equals one for the two weeks following the triggering event. For the VIX specification in Columns (5)–(6), the indicator *High VIX* equals one when the VIX is in the top quartile of our sample. We estimate the specification separately for stablecoin lending pools and for non-lending pools. Table 18 in Appendix C reports analogous specifications using weekly aggregated data. Our results indicate that during periods of elevated uncertainty, and particularly during crypto-specific stress, investors treat stablecoin lending pools as less safe and liquid, attaching less liquidity value to their stablecoin deposits. As shown in Columns (1)–(3) and (5), the interaction coefficient is negative and statistically significant for the aggregate *All Crypto* dummy, for the two stablecoin-specific shocks (Terra and SVB), and for the *High VIX* dummy. As expected, this pattern does not appear for non-lending pools (Columns (4) and (6)).

[Table 7 about here.]

Table 8 extends the analysis to a more granular set of uncertainty shocks using our dataset on crypto hacks. We focus on incidents involving losses above USD 100 million, identifying 16 such events. These high-impact episodes provide a sharp test of how investors reallocate their portfolios when the perceived security and reliability of DeFi protocols deteriorate. The granularity of the dataset lets us distinguish hacks targeting DeFi protocols (Columns (1)–(2)), DeFi hacks specifically on Ethereum (Columns (3)–(4)), and all major hacks combining DeFi and non-DeFi events (Columns (5)–(6)). Table 19 in Appendix C reports analogous specifications using weekly aggregated data.

[Table 8 about here.]

Our results show that hack episodes meaningfully disrupt the safety and liquidity services of stablecoin lending pools. In Columns (1)–(4), the interaction coefficient with the relevant hack indicator is negative and significant for lending pools, while the non-lending placebos in Columns (2) and (4) are insignificant. The effect is largest for hacks on Ethereum (Columns (3)–(4)), which involve larger dollar losses and draw broader attention, prompting stronger revisions in investors' safety assessments. By contrast, Columns (5)–(6) broaden the dummy to non-DeFi hacks and yield an insignificant coefficient, confining the effect to attacks on decentralized financial infrastructure. In short, such attacks weaken the safety and liquidity investors perceive in stablecoin lending pools.

10 Heterogeneous Effects

In this final section, we exploit the granularity of our dataset to examine whether investors differentiate among DeFi pools. We explore four dimensions of heterogeneity: token denomination, pool type (lending *vs.* non-lending), protocol, and blockchain. Although our model abstracts from these specific features, it predicts that the sensitivity of the stablecoin premium to the Treasury premium should depend on the extent to which each pool provides safety and liquidity services. Our cross-sectional tests therefore identify which characteristics determine whether DeFi pools are effective providers of safety and liquidity.

The advantage of our cross-sectional analysis is that we can refine our base model (28) by incorporating time fixed effects. These effects alleviate concerns about time-varying omitted variables that might jointly drive the Treasury premium and the demand for DeFi deposits.

10.1 Heterogeneity across Tokens

Table 9 reports the results on token heterogeneity using the full sample. In Columns (1)–(3), we focus on single-token USDT and USDC lending pools. The interaction terms with the

Treasury premium are positive and statistically significant across different combinations of fixed effects, including token and project × chain × time fixed effects. These results suggest that lending pools denominated in the two major dollar stablecoins co-move with the Treasury premium. he point estimates are larger for USDC than for USDT, though the difference is not statistically significant. This possibly reflects differences in transparency, collateral structures, and links to traditional financial institutions. Both tokens provide safety and liquidity services, but investors may value different attributes, pointing to segmentation within the stablecoin market.

In Columns (4)–(6), we interact the Treasury premium with a dummy for single-token lending pools denominated in USDC or USDT and with a dummy for stablecoin lending pools holding multiple tokens. Single-token deposits earn standardized claim tokens (e.g., aUSDC or aUSDT) that can be readily used across a range of DeFi applications, making them more reusable as money-like instruments. The results suggest that single-token pools provide stronger safety and liquidity services.

[Table 9 about here.]

10.2 Heterogeneity across Protocols

Next, we investigate heterogeneity across protocols (referred to as "projects" in DeFiLlama). Protocols differ in the quality of the infrastructure they provide (e.g., oracle framework, liquidation mechanism, and composability) and hence in the safety and liquidity services their pools deliver. Our model predicts that these differences map into differences in the sensitivity of the stablecoin premium to the Treasury premium.

In Table 10, we interact the Treasury premium with indicators classifying pools by protocol. In particular, we distinguish Aave, Compound, and JustLend from the rest of the sample. These are the largest protocols, but they differ in their infrastructure, with Aave and Compound being more sophisticated and having longer track records. We find that the co-movement between the stablecoin premium and the Treasury premium is stronger for pools associated with Aave and Compound. These findings are consistent with the view that protocols with more robust infrastructure, such as sounder liquidation mechanisms and more reliable oracles, are better positioned to provide safety and liquidity services to investors. The results are confirmed when restricting the sample to lending pools only (Columns (4)–(6)). By contrast, the interaction for JustLend is negative and statistically insignificant, suggesting that its pools do not provide comparable safety and liquidity services. Although JustLend is one of the largest lending protocols, it is less integrated into the Ethereum-centered DeFi ecosystem, where most lending, trading, and collateral-management activity takes place. This pattern indicates that protocol characteristics beyond size shape whether a protocol's pools provide safety and liquidity services to investors.

[Table 10 about here.]

10.3 Heterogeneity across Blockchains

We examine heterogeneity across hosting blockchains. Blockchains differ in the depth and interconnectedness of the DeFi ecosystems they host, that is, in how easily assets interact within an ecosystem and how widely they can be used across applications. For instance, Ethereum supports a deep and highly interconnected DeFi ecosystem, allowing assets to be used across a wide range of applications. Exploring blockchain heterogeneity lets us assess whether these network characteristics strengthen the safety and liquidity services of stablecoin lending pools.

In Table 11, we interact the Treasury premium with indicators for stablecoin lending pools hosted on Ethereum, Avalanche, and Tron, the three largest blockchains for DeFi lending activity. In Columns (1)–(3), the interaction terms with Ethereum and Avalanche are positive and statistically significant, indicating that the co-movement between stablecoin and Treasury premia are particularly strong for pools hosted on these blockchains. By contrast, the interaction with Tron is negative and statistically insignificant. In the lending-pool sample, the interactions with the Ethereum and Avalanche dummies remain positive and statistically significant (Columns (4)–(6)). These results suggest that the mechanism is strongest within the most established blockchain environments, though not exclusive to Ethereum.

[Table 11 about here.]

11 Additional Results and Robustness Tests

We conclude our analysis with a series of additional tests. First, we extend it to staking, the largest non-lending category. Staking refers to the process of locking crypto assets to participate in the validation and security of Proof-of-Stake (PoS) and PoS-like blockchain networks. In return, stakers are granted validator privileges and earn block rewards.[16] Our model centers on stablecoin deposits in lending pools because their design delivers the safety and liquidity services we study. Still, non-lending yields might co-move with the Treasury premium through alternative mechanisms not explicitly captured in the model. While

[16] For instance, in ETH staking pools, investors generate yield by delegating their tokens, which validators use to support network operations.

staking (in particular, liquid staking) shares certain features with lending pools, its design inherently exposes investors to the price of the staked asset (primarily ETH). By contrast, stablecoin lending pools largely avoid this exposure because their deposits are denominated in dollar-pegged tokens backed mainly by Treasuries.

In Table 12, we report results for the category "Staking," which includes "liquid staking" and "staking pools." For reference, Column (1) repeats our base results for stablecoin lending pools. Columns (2)–(3) show that, for staking pools, the coefficient on the Treasury premium is negative and statistically significant, indicating that they do not provide safety and liquidity services. Columns (4)–(5), which restrict the sample to staking pools on the Ethereum blockchain, yield similar results. Likewise, the coefficient on Treasury supply is positive and statistically significant, implying that the staking premium rises when Treasury supply expands, in contrast to the decline in the stablecoin premium. Our results suggest that staking pools do not provide safety and liquidity services akin to those of stablecoin lending pools.

[Table 12 about here.]

Second, the model predicts stablecoin supply, not just the premium. The SCI's zero-profit condition (equation (16)) implies that an increase in Treasury specialness reduces the profitability of issuing stablecoins and, all else equal, contracts equilibrium supply. We test this prediction by regressing weekly growth in the circulating supply of USD fiat stablecoins on the Treasury premium. Table 14 in Appendix C reports a negative and statistically significant coefficient on the Treasury premium across all specifications. A one-standard-deviation increase in the Treasury premium is associated with a reduction in weekly stablecoin supply growth of roughly 0.3 to 0.5 percentage points.

Third, we decompose the APY into *APY Base* (the equilibrium component driven by pool-level supply and demand) and *APY Reward* (the protocol-token incentives layered on top to attract liquidity). We then re-compute the stablecoin premium using each component and re-estimate the baseline specification (see Table 15 in Appendix C). The estimates show that our findings are driven by the *APY Base* component, indicating that our mechanism operates through equilibrium lending rates rather than through protocol incentive programs.

Finally, we perform a number of additional robustness tests. We begin by examining whether the observed relationship is sensitive to the maturity used in constructing the Treasury premium. While our baseline specification uses the 3-month T-bill–OIS spread, our results are robust to using the 1-month maturity. Next, we replicate the main results using aggregate-level regressions. The findings remain robust to this aggregation (see Appendix C).

Our baseline results are also robust to how standard errors are computed. We re-compute them as heteroskedasticity-robust, one-way clustered on five dimensions (time, pool, chain, project, and token), and two-way clustered including time.

Taken together, these tests show that our core findings are robust to specification choices, not confined to a narrow market niche, and not driven by sample composition.

12 Concluding Remarks

We show how the demand for safety manifests in crypto markets, focusing on stablecoin lending pools in the decentralized finance (DeFi) ecosystem. We develop a model in which stablecoin deposits, much like traditional safe assets, provide safety services and adjust their yields in response to the Treasury markets. Using granular data on hundreds of DeFi pools spanning multiple protocols, tokens, and blockchains, we test our model's predictions. Our evidence shows that the stablecoin premium co-moves positively with the Treasury premium, responds to Treasury supply, and weakens during periods of market stress and elevated uncertainty.

Our findings indicate that these dynamics are specific to stablecoin lending pools, with no comparable patterns among other pools. This suggests that safety and liquidity services in crypto markets are not an inherent feature of digital assets but arise from specific institutional arrangements that combine Treasury-backed stablecoins with features such as pooling and overcollateralization. While the relationship holds broadly across major stablecoins — despite their substantial differences in transparency, reserve backing, and regulatory alignment — its strength depends on the infrastructure through which these services are supplied. The co-movement is strongest on Ethereum and among established lending protocols such as Aave and Compound, underscoring the importance of composability, technological reliability, and institutional credibility in supporting money-like functions.

Our contribution lies at the intersection of the literature on safe assets and the rapidly growing field of DeFi. By casting the integration of crypto with traditional markets, its link to the monetary system, and its fragility as facets of one force — the demand for safe and liquid claims anchored in Treasuries — we offer a single framework for questions the literature has treated separately. We show that in an unregulated, high-volatility environment where traditional guarantees are absent, private crypto-native instruments can replicate some of the functions of safe assets through design and market dynamics.

The result is a new class of borderless and permissionless safe assets. Like other privately produced safe assets, these instruments are fragile. What distinguishes them is the boundary across which that fragility can now travel. As crypto becomes more deeply integrated with traditional finance, distress can spread between a largely unregulated market and the regulated financial system.

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Table 1: **Summary Statistics**. The table reports summary statistics for the key variables used in the analysis. Panel A reports aggregate statistics for macro variables and the stablecoin premium at the weekly frequency. Panels B–E report pool-week statistics for different subsamples of DeFi pools: USDT and USDC lending pools (Panel B), USD fiat stablecoin lending pools (Panel C), all lending pools (Panel D), and the full sample of pools (Panel E). The *Stablecoin Premium* is defined as the spread between the 3-month OIS rate and the APY (annual percentage yield) for stablecoin lending pools. For sub-samples including non-stablecoin pools, we refer to this measure as the *Crypto Premium*. *APY* denotes the annualized return offered by a DeFi pool deposit. *TVL* denotes total value locked in millions of U.S. dollars. APY is expressed in percentage points. The *Treasury Premium* is defined as the spread between the 3-month OIS rate and the 3-month U.S. Treasury yield. *Treasury supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets.

	Obs.	Mean	STD	10%	25%	50%	75%	90%
Panel A: Aggregated Sample (Weekly)								
Treasury Premium	203	–0.0352	0.1503	–0.1661	–0.1390	–0.0910	0.0100	0.2014
Treasury Supply	203	3.0351	0.0745	2.9335	2.9888	3.0369	3.0806	3.1440
BTC Realized Volatility (30d)	203	41.74	14.04	25.82	33.47	39.14	49.56	59.74
BTC Futures Funding Rate	203	0.0704	0.0826	–0.0038	0.0269	0.0641	0.1095	0.1095
Stablecoin Premium – log(TVL)-Weighted	203	–0.1519	2.3580	–3.2446	–1.5878	–0.0048	1.8872	2.7545
Stablecoin Premium – Equal-Weighted	203	–0.1651	2.3664	–3.2533	–1.5443	0.0103	1.8422	2.7243
Panel B: USDT/USDC Lending								
TVL (USD, millions)	5 089	87.2	223.7	1.6	7.9	26.5	59.4	187.7
APY (%)	5 089	4.8865	4.5710	1.1323	2.0104	3.5904	6.3800	9.9425
Stablecoin Premium	5 089	–0.3403	4.4676	–5.2527	–1.8105	0.6881	2.5424	3.4928
Pools	37							
Panel C: USD Fiat Stablecoin Lending								
TVL (USD, millions)	7 258	80.7	216.2	1.2	4.9	21.1	54.4	171.3
APY (%)	7 258	5.1063	4.9521	0.8375	1.9743	3.8602	6.7775	10.41
Stablecoin Premium	7 258	–0.6003	4.8778	–5.7622	–2.2528	0.4280	2.5376	3.6465
Pools	60							
Panel D: All Lending Pools								
TVL (USD, millions)	21 754	195.5	595.3	3.3	13.2	34.7	107.6	397.8
APY (%)	21 754	2.2005	3.9442	0.0000	0.0015	0.3600	2.8081	6.6508
Crypto Premium	21 754	2.3020	3.9371	–2.0753	1.4274	3.7625	4.3330	5.2111
Pools	199							
Panel E: Full Sample								
TVL (USD, millions)	42 214	280.0	1 651.4	1.8	7.0	24.2	86.5	419.8
APY (%)	42 214	3.1297	4.9452	0.0000	0.0032	1.5628	4.1785	8.3080
Crypto Premium	42 214	1.4329	4.9489	–3.7280	0.3328	2.8951	4.3180	5.1878
Pools	372							

Table 2: **Sample Composition**. This table reports the composition of the DeFi pool sample. *USDC Lending* and *USDT Lending* include single token lending pools denominated in USDC and USDT, respectively. *SC Lending* includes lending pools denominated in USD fiat stablecoins. *SC Non-Lending* includes non lending pools classified as stablecoin pools. *All Lending Pools* includes all lending pools in the sample, while *All* denotes the full sample including lending and non-lending pools as well as pools involving BTC and ETH. Columns report the number of pools, pool types, tokens (symbols), projects, blockchains and pool week observations.

	Pools	**Categories**	**Tokens**	**Chains**	**Projects**	**Observations**
USDC Lending	25	1	1	12	17	3402
USDT Lending	12	1	1	6	10	1687
SC Lending	60	1	23	14	22	7258
SC Non-Lending	36	8	21	8	16	4702
All Lending Pools	199	1	59	20	31	21754
Full Sample	372	13	145	23	94	42214

Table 3: **Stablecoin premium and demand for safety: Baseline panel regressions**. The table reports OLS estimates of equation (28). The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools on stablecoin deposits. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Columns (1) and (3) use a sample of single-token lending pools denominated in USDT or USDC (USDT/USDC Only). Columns (2) and (4) use a broader sample of USD fiat stablecoin lending pools, including pools denominated in USD-backed stablecoins such as USDT and USDC (SC). Column (5) uses the full sample of USD fiat stablecoin pools in categories other than lending. Column (6) excludes from the sample in Column (5) pools classified in the "Yield" and "Yield aggregator" categories. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility*. Fixed effects are included at the project, chain, token, and calendar quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)	(5)	(6)
Pools:	USDT/USDC Lending	SC Lending	USDT/USDC Lending	SC Lending	SC Non-Lending	SC Non-Lending excl. "Yield"
$Tsy\ Premium_{t-1}$	6.163***	5.814***	4.796***	4.223***	2.370	–3.720
	(3.71)	(3.43)	(3.16)	(2.83)	(1.24)	(–0.94)
$Tsy\ Supply_{t-1}$	–11.23***	–9.923***	–10.84***	–9.794***	–5.574*	1.389
	(–4.61)	(–4.02)	(–5.34)	(–4.93)	(–1.73)	(0.36)
FFR_{t-1}	0.626***	0.709***	0.671***	0.765***	1.010***	–0.0957
	(3.52)	(3.69)	(3.84)	(4.43)	(3.86)	(–0.17)
$BTC\ Fut.\ Funding\ Rate_{t-1}$	–12.38***	–12.84***	–10.80***	–11.94***	–7.301***	–4.382
	(–4.22)	(–4.52)	(–3.93)	(–4.56)	(–2.96)	(–1.24)
$BTC\ Vol_{t-1}$	–0.0186	–0.00923	–0.0167	–0.0106	–0.0287***	–0.0189**
	(–1.35)	(–0.67)	(–1.33)	(–0.90)	(–3.10)	(–2.62)
FE	None	None	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	5041	7187	5041	7187	4643	2095
R^2	0.102	0.0726	0.405	0.399	0.437	0.569
Adj. R^2	0.101	0.0720	0.401	0.394	0.433	0.565

Table 4: **Differential loading on the Treasury premium: stablecoin lending pools versus other pools (with time fixed effects)**. The table reports OLS estimates of the baseline specification using the full sample of DeFi pools, augmented with interaction terms for stablecoin subsamples. Non-lending stablecoin pools classified in the "Yield" and "Yield aggregator" categories are excluded. The dependent variable is the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Both variables are interacted with dummies for stablecoin lending pool subsamples. All specifications include time (year×week) fixed effects and a combination of the project, chain, and token fixed effects. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

FE	token, chain, project, time		token × chain, project, time		token, project × chain, time		project × chain × token, time	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tsy Premium$_{t-1}$ × *USDT/USDC Lending*	6.488***		6.054***		6.499***		4.199***	
	(5.64)		(5.19)		(5.67)		(3.70)	
Tsy Supply$_{t-1}$ × *USDT/USDC Lending*	–1.050***		–1.190***		–1.025***		–12.46***	
	(–5.96)		(–7.99)		(–6.01)		(–5.14)	
Tsy Premium$_{t-1}$ × *SC Lending*		5.605***		5.238***		5.594***		3.476***
		(4.63)		(4.29)		(4.65)		(2.87)
Tsy Supply$_{t-1}$ × *SC Lending*		–1.084***		–1.225***		–1.060***		–11.90***
		(–6.08)		(–8.08)		(–6.14)		(–4.80)
N	31357	31357	31357	31357	31357	31357	31357	31357
R^2	0.592	0.592	0.597	0.597	0.594	0.593	0.609	0.610
Adj. R^2	0.587	0.587	0.592	0.592	0.589	0.589	0.604	0.604

Table 5: **Differential loading on the Treasury premium across stablecoin lending pools: liquidity weights and pool size**. The table reports OLS estimates of the *Stablecoin Premium* regressed on the lagged *Treasury premium*, interacted with two predetermined proxies: a USDT/USDC indicator, proxying for the pool-level liquidity weight α_n, and a measure of pool size, proxying for φ_n. The dependent variable is *the Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. The sample is restricted to USD fiat stablecoin lending pools (SC Lending). The table is organized in two panels of four columns each. In Panel A, Columns (1)–(2) use a binary indicator equal to one if pool TVL is above the absolute median, and Columns (3)–(4) use the lagged log of pool TVL. In Panel B, Columns (5)–(6) use the lagged log of the 4-week trailing mean of TVL, and Columns (7)–(8) use a binary indicator equal to one if the 4-week trailing mean of TVL is above the median. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility*, all lagged. For readability, all variables, with the exception of the dummies, are standardized variables. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
Panel A				
Tsy. Premium$_{t-1}$ × *USDT/USDC Lending*	0.669**	0.495**	0.760***	0.529**
	(2.38)	(2.24)	(2.93)	(2.40)
Tsy. Premium$_{t-1}$	0.423		0.120	
	(1.25)		(0.40)	
Tsy. Premium$_{t-1}$ × *TVL above median (absolute)*	–0.533**	–0.406*		
	(–2.24)	(–1.91)		
Tsy. Premium$_{t-1}$ × *log(TVL)*$_{t-1}$			–0.275**	–0.143
			(–2.07)	(–1.23)
Controls	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, time	project, chain, token, quarter	project, chain, token, time
N	7,187	7,187	7,187	7,187
R^2	0.402	0.505	0.403	0.504
Adj. R^2	0.397	0.487	0.399	0.486
	(5)	(6)	(7)	(8)
Panel B				
Tsy. Premium$_{t-1}$ × *USDT/USDC Lending*	0.760***	0.548**	0.710**	0.541**
	(2.93)	(2.45)	(2.55)	(2.43)
Tsy. Premium$_{t-1}$	0.0448		0.280	
	(0.15)		(0.88)	
Tsy. Premium$_{t-1}$ × *log(4-week avg TVL)*$_{t-1}$	–0.280**	–0.155		
	(–2.05)	(–1.25)		
Tsy. Premium$_{t-1}$ × *TVL Above median (4 weeks)*			–0.340*	–0.300*
			(–1.93)	(–1.76)
Controls	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, time	project, chain, token, quarter	project, chain, token, time
N	6,978	6,978	7,187	7,187
R^2	0.403	0.504	0.401	0.504
Adj. R^2	0.398	0.486	0.396	0.486

Table 6: **Stablecoin premium and demand for safety: IV panel regressions**. The table reports OLS and IV estimates of equation (28). The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. This ratio is instrumented using variation in the Treasury General Account (TGA). Columns (1)–(4) use the sample of USD fiat stablecoin lending pools. Columns (1) and (2) report the baseline OLS estimates, while Columns (3) and (4) report the corresponding IV estimates. Column (5) reports IV estimates using the full sample of USD fiat stablecoin pools in categories other than lending. Column (6) reports IV estimates when additionally excluding from the sample in column (5) pools classified in the "Yield" and "Yield aggregator" categories. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility*. Fixed effects are included at the project, chain, token, and quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	SC Lending				SC Non-Lending	SC Non-Lending excl. "Yield"
	OLS		IV (2SLS)		IV (2SLS)	IV (2SLS)
	(1)	(2)	(3)	(4)	(5)	(6)
Tsy Supply$_{t-1}$	–9.551***	–9.794***	–20.77***	–19.60***	–6.434	5.562
	(–4.75)	(–4.93)	(–5.95)	(–6.04)	(–1.23)	(0.81)
Tsy Premium$_{t-1}$		4.223***		4.542***	2.396	–3.864
		(2.83)		(2.75)	(1.22)	(–0.95)
First Stage: *log(TGA)*$_{t-1}$ → *Tsy Supply*$_{t-1}$						
log(TGA)$_{t-1}$			0.089***	0.091***	0.090***	0.091***
First-stage F			113.6	108.3	100.5	92.21
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	7187	7187	7187	7187	4643	2095
R^2	0.394	0.399	0.0544	0.0671	0.0545	0.0153
Adj. R^2	0.390	0.394	0.0473	0.0599	0.0462	0.00435

Table 7: **Stablecoin premium and demand for safety during periods of higher uncertainty**. The table reports OLS estimates of our baseline model augmented with interactions between the *Treasury premium* and dummies capturing periods of elevated uncertainty. The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Shock* indicators are defined as dummies equal to one in the two weeks following a major uncertainty event. Columns (1)–(4) use crypto-market shock dummies: *All Crypto*, *SVB*, and *Terra*. The *All Crypto* dummy is an aggregate indicator that takes the value one in the two weeks following the SVB episode, the Terra collapse, or the FTX bankruptcy, and zero otherwise; the *SVB* and *Terra* dummies isolate each of these stablecoin episodes individually. Columns (1)–(3) use the sample of stablecoin lending pools, and Column (4) reports a placebo specification on non-lending stablecoin pools using the *All Crypto* dummy. Columns (5)–(6) use the *VIX top 25%* dummy, which equals one when the VIX is in its top quartile of the sample distribution, on the lending and non-lending samples, respectively. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility*. Fixed effects are included at the project, chain, token, and quarter levels. Because event indicators are short-lived, covariates are standardized to make interaction coefficients comparable across specifications. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Crypto Shocks				Market Uncertainty	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock:	*All Crypto*	*SVB*	*Terra*	*All Crypto*	*VIX top 25%*	*VIX top 25%*
Pools:	SC Lending	SC Lending	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending
Tsy Premium$_{t-1}$ × *Shock*	–1.299***	–4.648***	–1.378***	–0.437	–0.756**	–0.695
	(–4.01)	(–5.14)	(–4.06)	(–0.89)	(–2.64)	(–1.21)
Tsy Premium$_{t-1}$	0.665***	0.661***	0.651***	–0.558	0.851***	–0.293
	(2.96)	(2.95)	(2.89)	(–0.92)	(2.88)	(–0.43)
Tsy Supply$_{t-1}$	–0.722***	–0.759***	–0.718***	0.0865	–0.788***	0.119
	(–4.93)	(–5.17)	(–4.84)	(0.29)	(–5.04)	(0.40)
Shock	0.258	0.475	0.924	–1.002	1.278***	0.0586
	(0.35)	(1.11)	(1.65)	(–0.93)	(3.96)	(0.31)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	7187	7187	7187	2095	7187	2095
R^2	0.399	0.399	0.399	0.570	0.408	0.571
Adj. R^2	0.395	0.395	0.394	0.565	0.403	0.566

Table 8: **Stablecoin premium and demand for safety during crypto hacks**. The table reports OLS estimates of the baseline model augmented with interactions between the *Treasury premium* and dummies capturing hack events. The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Hack* indicators are defined as dummies equal to one in the week following a hack event. Columns (1) and (2) use a dummy covering all major DeFi hack events. Columns (3) and (4) focus on DeFi hacks affecting the Ethereum blockchain. Columns (5) and (6) use a dummy equal to one for all (DeFi and non-DeFi) hack events. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility*. Fixed effects are included at the project, chain, token, and quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	DeFi Hacks		DeFi Ethereum Hacks		All Hacks	
	(1)	(2)	(3)	(4)	(5)	(6)
Pools:	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending
$Tsy\ Premium_{t-1} \times Hack$	–3.757**	–0.858	–5.971**	–2.056	–2.052	–0.636
	(–2.01)	(–1.06)	(–2.28)	(–1.18)	(–1.34)	(–1.08)
Hack	0.376	–0.00175	–0.228	0.0808	0.433*	0.114
	(1.08)	(–0.01)	(–0.35)	(0.15)	(1.83)	(0.67)
$Tsy\ Premium_{t-1}$	5.120***	–3.442	5.085***	–3.400	4.628***	–3.575
	(3.00)	(–0.86)	(3.29)	(–0.85)	(2.68)	(–0.89)
$Tsy\ Supply_{t-1}$	–9.556***	1.367	–10.28***	1.281	–10.11***	1.303
	(–4.73)	(0.34)	(–4.93)	(0.31)	(–5.01)	(0.34)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	7187	2095	7187	2095	7187	2095
R^2	0.400	0.569	0.401	0.570	0.401	0.569
Adj. R^2	0.396	0.564	0.396	0.565	0.396	0.565

Table 9: **Stablecoin premium and demand for safety: Token heterogeneity (USDT vs. USDC, single vs. multiple-token pools)**. The table reports OLS estimates of the baseline specification augmented with interaction terms capturing heterogeneity across token types. The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Columns (1)–(3) include interaction terms with dummies equal to one for USDT- and USDC-denominated single-token lending pools. Columns (4)–(6) include interaction terms with a dummy equal to one for lending pools involving multiple tokens. Interaction coefficients capture differential effects of the Treasury premium relative to the omitted group that includes BTC- and ETH- lending and non-lending pools. The equality test reports the p-value of a Wald test for equality of the two coefficients in each Column using the two-way clustered variance-covariance matrix. Fixed effects are included at the project, chain, token, and time (year×week) levels in Columns (1) and (4), and in different combinations in the remaining Columns. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Full sample	USDT vs USDC			Single vs Multi-Token		
	(1)	(2)	(3)	(4)	(5)	(6)
Tsy Premium$_{t-1}$ × *USDT Lending*	7.525***	7.318***	6.576***			
	(4.17)	(4.46)	(4.35)			
Tsy Premium$_{t-1}$ × *USDC Lending*	10.02***	10.52***	8.926***			
	(6.62)	(6.72)	(5.97)			
Tsy Premium$_{t-1}$ × *Single-Token SC Lending*				9.437***	9.512***	8.094***
				(6.83)	(7.01)	(5.99)
Tsy Premium$_{t-1}$ × *Multi-Token SC Lending*				4.272**	2.007	0.0722
				(2.31)	(1.10)	(0.04)
FE	token, chain, project, time	token, project, chain×time	token, project×chain×time	token, chain, project, time	token, project, chain×time	token, project×chain×time
Wald F	1.690	3.030	2.394	8.296	14.64	14.49
Wald p	0.195	0.0833	0.123	0.0044	0.0001	0.0001
N	41637	40954	33327	41637	40954	33327
R^2	0.575	0.611	0.710	0.575	0.611	0.710
Adj. R^2	0.571	0.584	0.638	0.571	0.584	0.638

Table 10: **Stablecoin premium and demand for safety: Protocol heterogeneity**. The table reports OLS estimates of the baseline specification augmented with interaction terms for the three largest protocols (identified by DeFiLlama's "project" field) in the sample: *Aave*, *Compound*, and *JustLend*. Protocol size is based on their total TVL across stablecoin (USD fiat) lending pools, after aggregating across version suffixes (e.g., *aave-v2* and *aave-v3* are combined into a single *Aave* group; *compound-v2* and *compound-v3* into *Compound*; *justlend* into *JustLend*. The dependent variable is the difference between the OIS rate and the APY offered by DeFi pools. Columns (1)–(3) use the full sample, while Columns (4)–(6) restrict the sample to lending pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. The *Treasury premium* is interacted with protocol dummies. All specifications include time (year× week) fixed effects and a combination of project, chain, and token fixed effects. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Full Sample			Lending Only		
	(1)	(2)	(3)	(4)	(5)	(6)
Tsy Premium$_{t-1}$ × *Aave SC Lending*	5.876***	6.204***	5.309***	1.749	2.625**	3.963***
	(4.55)	(4.33)	(4.36)	(1.51)	(2.20)	(3.65)
Tsy Premium$_{t-1}$ × *Compound SC Lending*	11.05***	11.15***	10.82***	6.850***	7.062***	9.501***
	(6.73)	(6.00)	(5.61)	(4.62)	(4.25)	(5.93)
Tsy Premium$_{t-1}$ × *JustLend SC Lending*	–0.729	–1.719	–0.378	–3.623	–1.583	–1.142
	(–0.24)	(–0.54)	(–0.14)	(–1.27)	(–0.53)	(–0.40)
FE	token, chain, project, time	token, project, chain×time	token, project×chain×time	token, chain, project, time	token, project, chain×time	token, project×chain×time
N	41637	40954	33327	21520	21095	19692
Joint F	9.500	7.271	6.824	8.753	4.858	7.999
Joint p	0.0001	0.0008	0.0013	0.0002	0.0087	0.0004
R^2	0.573	0.609	0.709	0.545	0.637	0.691
Adj. R^2	0.568	0.581	0.636	0.539	0.592	0.607

Table 11: **Stablecoin premium and demand for safety: Blockchain heterogeneity**. The table reports OLS estimates of the baseline specification augmented with interaction terms for the largest blockchains in the sample: *Ethereum*, *Tron*, and *Avalanche*. Blockchains are identified as the three largest by total TVL across stablecoin (USD fiat) lending pools. The dependent variable is the difference between the OIS rate and the APY offered by DeFi pools. Columns (1)–(3) use the full sample, while Columns (4)–(6) restrict the sample to lending pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. The *Treasury premium* is interacted with blockchain dummies. All specifications include time (year × week) fixed effects and different combinations of project, chain, and token fixed effects. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Full Sample			Lending Only		
	(1)	(2)	(3)	(4)	(5)	(6)
Tsy Premium$_{t-1}$ × *Ethereum SC Lending*	8.413***	8.806***	6.949***	4.696***	5.058***	5.228***
	(5.79)	(5.38)	(4.24)	(3.48)	(3.10)	(3.38)
Tsy Premium$_{t-1}$ × *Tron SC Lending*	–0.522	–1.525	–0.330	–3.213	–1.420	–1.122
	(–0.17)	(–0.49)	(–0.12)	(–1.14)	(–0.48)	(–0.39)
Tsy Premium$_{t-1}$ × *Avalanche SC Lending*	6.788***	6.822***	6.380***	3.542**	6.392***	6.378***
	(3.97)	(3.46)	(3.28)	(2.02)	(3.19)	(3.28)
FE	token, chain, project, time	token, project, chain×time	token, project×chain×time	token, chain, project, time	token, project, chain×time	token, project×chain×time
Joint F	3.821	4.258	2.908	3.366	2.539	2.528
Joint p	0.024	0.015	0.057	0.037	0.082	0.083
N	41637	40954	33327	21520	21095	19692
R^2	0.573	0.610	0.709	0.546	0.638	0.691
Adj. R^2	0.568	0.582	0.636	0.540	0.593	0.607

Table 12: **Stablecoin premium and demand for safety. Staking pools**. The table reports OLS estimates of equation (28) for a sample of staking pools. The dependent variable is the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Column (1) reports the baseline results for stablecoin lending pools for comparison purposes. Columns (2) and (3) use samples of staking pools: Column (2) includes both "Staking Pools" and "Liquid Staking" pools, while Column (3) includes only "Liquid Staking" pools. Columns (4) and (5) restrict the sample to staking pools hosted on the Ethereum blockchain. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility.* Fixed effects are included at the project, chain, token, and quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1) SC Lending	(2) All Staking	(3) Liquid Staking	(4) All Staking Ethereum	(5) Liquid Staking Ethereum
$Tsy\ Premium_{t-1}$	4.223***	–2.766***	–3.055***	–2.482***	–2.765***
	(2.83)	(–3.13)	(–3.13)	(–2.92)	(–2.93)
$Tsy\ Supply_{t-1}$	–9.794***	2.929*	3.017*	3.097**	3.215*
	(–4.93)	(2.00)	(1.95)	(2.08)	(2.04)
Controls	Yes	Yes	Yes	Yes	Yes
FE	project chain token quarter	project chain token quarter	project chain token quarter	project chain token quarter	project chain token quarter
N	7187	2994	2519	2716	2241
R^2	0.399	0.498	0.509	0.495	0.506
Adj. R^2	0.394	0.492	0.503	0.485	0.497

A Model Additional Calculations

A.1 Notation

Table 13 summarizes the notation used throughout the model.

Table 13: Model Notation

Symbol	Description
Investor variables	
c_t	Consumption at time t
w_t	Total wealth at time t
m_t	MMF balances held by the investor
$s_t(n)$	Deposits in stablecoin lending pool n
s_t	Aggregate stablecoin deposits, $s_t = \int_0^1 s_t(n)\,dn$
a_t	Holdings of the outside asset
L_t	CES aggregator of liquidity services
Gross returns and premia	
R^T_{t+1}	Net return on Treasuries
R^a_{t+1}	Net return on the outside asset
R^m_{t+1}	Net return on MMF shares
$R^s_{t+1}(n)$	Net return on SCLP-n deposits
$y^T_{t+1} \equiv R^a_{t+1} - R^T_{t+1}$	Treasury premium
$y^m_{t+1} \equiv R^a_{t+1} - R^m_{t+1}$	MMF premium
$y^s_{t+1}(n) \equiv R^a_{t+1} - R^s_{t+1}(n)$	Stablecoin (SCLP-n) premium
$\tilde{R}^i_{t+1} \equiv y^i_{t+1} + \tilde{\lambda}_t$	Shadow spread for asset $i \in \{m, s\}$
Treasury supply	
B_t	Total Treasury supply
$\bar{X}_t$	Treasuries held by exogenous holders
$B^L_t \equiv B_t - \bar{X}_t$	Free float of Treasuries available to intermediaries
$b_t \equiv B^L_t / m_t$	Free float of Treasuries relative to MMF assets
Intermediaries: portfolio weights, costs, and shares	
$\omega^m_{bt}, \omega^m_{at}$	MMF portfolio weights on Treasuries and outside asset
$\omega^s_{bt}, \omega^s_{at}$	SCI portfolio weights on Treasuries and outside asset
$\kappa^m_t(\omega^m_{bt})$	MMF liquidity cost

Continued on next page

Table 13 continued from previous page

Symbol	Description
$\kappa_t^s(\omega_{bt}^s)$	SCI liquidity cost
$\chi(s_t)$	SCI per-unit issuance/adoption cost; monotonic and convex
$\theta_t(n) \in (0,1]$	SCLP-n utilization rate
$\varphi_t(n) \equiv s_t(n)/s_t$	SCLP-n share of aggregate stablecoin deposits
$Q^n(b_t) \equiv s_t(n)/m_t$	Stablecoin penetration ratio for pool n
Preferences and constraints	
$\beta \in (0,1)$	Investor discount factor
$\sigma > 0$	Elasticity of substitution in the CES liquidity aggregator
$\psi_t > 0$	Weight on liquidity services in utility
$\alpha_t(n)$	Liquidity weight of SCLP-n deposits
$\bar{\alpha}_t \equiv \int_0^1 \alpha_t(n)\, dn$	Aggregate SCLP liquidity weight
λ_{t+1}^c	Marginal utility of next-period wealth
λ_t^a	Multiplier on the no-short-sales constraint $a_t \geq 0$
$\tilde{\lambda}_t \equiv \lambda_t^a / \big(\beta\, \mathbb{E}_t[\lambda_{t+1}^c]\big)$	Normalized shadow value of the no-short-sales constraint
Steady-state objects and linearization coefficients	
$\bar{y}^T, \bar{b}, \bar{\lambda}$	Steady-state values of $y_{t+1}^T, b_t, \tilde{\lambda}_t$
$\bar{y}^m \equiv \omega_b^m \bar{y}^T + \kappa^m(\omega_b^m)$	Steady-state MMF premium
$\delta_Q(n) \equiv [Q^n(\bar{b})]^{-1/\sigma}$	SS curvature of the penetration ratio
$\delta_{TR}(n) \equiv \omega_b^m\, \delta_Q(n)$	Sensitivity of y^s to y^T (per unit of α-share)
$\delta_b(n)$	Sensitivity of y^s to b_t; $\delta_b(n) < 0$
$\delta_t(n)$	Time-varying intercept absorbing $\alpha_t(n)$ and $\tilde{\lambda}_t$

A.2 Investor's First Order Conditions

At the end of the period, wealth evolves according to

$$w_{t+1} = (1 + R_{t+1}^a)\, a_t + (1 + R_{t+1}^m)\, m_t + \int_0^1 (1 + R_{t+1}^s(n))\, s_t(n)\, dn. \tag{29}$$

Combining (4) and (29) gives the intertemporal budget constraint

$$w_{t+1} = (1 + R_{t+1}^a)(w_t - c_t) - (R_{t+1}^a - R_{t+1}^m)\, m_t - \int_0^1 (R_{t+1}^a - R_{t+1}^s(n))\, s_t(n)\, dn. \tag{30}$$

The first-order conditions are

$$u'(c_t) = \beta\,\mathbb{E}_t[\lambda^c_{t+1}\,(1 + R^a_{t+1})] + \lambda^a_t, \tag{31}$$

$$\psi_t\,\frac{\partial L_t}{\partial m_t} = \beta\,\mathbb{E}_t[\lambda^c_{t+1}\,(R^a_{t+1} - R^m_{t+1})] + \lambda^a_t, \tag{32}$$

$$\psi_t\,\frac{\partial L_t}{\partial s_t(n)} = \beta\,\mathbb{E}_t[\lambda^c_{t+1}\,(R^a_{t+1} - R^s_{t+1}(n))] + \lambda^a_t, \qquad \forall n \in [0,1]. \tag{33}$$

From the CES liquidity aggregator,

$$\frac{\partial L_t}{\partial m_t} = L_t^{1/\sigma}\,(1-\bar{\alpha}_t)\,m_t^{-1/\sigma}, \tag{34}$$

$$\frac{\partial L_t}{\partial s_t(n)} = L_t^{1/\sigma}\,\alpha_t(n)\,s_t(n)^{-1/\sigma}. \tag{35}$$

Substituting into (32)–(33) yields

$$\psi_t\,L_t^{1/\sigma}\,(1-\bar{\alpha}_t)\,m_t^{-1/\sigma} = \beta\,\mathbb{E}_t[\lambda^c_{t+1}(R^a_{t+1} - R^m_{t+1})] + \lambda^a_t, \tag{36}$$

$$\psi_t\,L_t^{1/\sigma}\,\alpha_t(n)\,s_t(n)^{-1/\sigma} = \beta\,\mathbb{E}_t[\lambda^c_{t+1}(R^a_{t+1} - R^s_{t+1}(n))] + \lambda^a_t. \tag{37}$$

Assuming returns R^i_{t+1} are known at time t (or interpreting them as risk-adjusted expectations), the right-hand sides become $\beta\,\mathbb{E}_t[\lambda^c_{t+1}](y^i_{t+1} + \tilde{\lambda}_t)$ with $\tilde{\lambda}_t \equiv \lambda^a_t/\big(\beta\,\mathbb{E}_t[\lambda^c_{t+1}]\big)$. Taking the ratio of the two equations eliminates the common factor $\psi_t L_t^{1/\sigma}\beta\,\mathbb{E}_t[\lambda^c_{t+1}]$ and yields the relative demand:

$$\left(\frac{s_t(n)}{m_t}\right)^{1/\sigma} = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\frac{y^m_{t+1} + \tilde{\lambda}_t}{y^s_{t+1}(n) + \tilde{\lambda}_t}. \tag{38}$$

Aggregation. Solving each FOC for optimal holdings,

$$m_t = \left(\frac{\psi_t\,L_t^{1/\sigma}(1-\bar{\alpha}_t)}{\beta\,\mathbb{E}_t[\lambda^c_{t+1}]}\right)^{\sigma}\big(y^m_{t+1} + \tilde{\lambda}_t\big)^{-\sigma}, \quad s_t(n) = \left(\frac{\psi_t\,L_t^{1/\sigma}\alpha_t(n)}{\beta\,\mathbb{E}_t[\lambda^c_{t+1}]}\right)^{\sigma}\big(y^s_{t+1}(n) + \tilde{\lambda}_t\big)^{-\sigma}.$$

Aggregating across pools,

$$\frac{s_t}{m_t} = \left(\frac{1}{1-\bar{\alpha}_t}\right)^{\sigma}\int_0^1 \alpha_t(n)^{\sigma}\left(\frac{y^m_{t+1} + \tilde{\lambda}_t}{y^s_{t+1}(n) + \tilde{\lambda}_t}\right)^{\sigma} dn.$$

In the symmetric case where $\alpha_t(n) \equiv \alpha_t$ and $R^s_{t+1}(n) \equiv R^s_{t+1}$, this simplifies to

$$\frac{s_t}{m_t} = \left[\frac{\bar{\alpha}_t}{1-\bar{\alpha}_t} \frac{y^m_{t+1} + \tilde{\lambda}_t}{y^s_{t+1} + \tilde{\lambda}_t} \right]^{\sigma}. \tag{39}$$

A.3 Equilibrium

Starting from the Treasury-clearing condition

$$\omega^m_{bt}\, m_t + \omega^s_{bt}\, s_t \;=\; B^L_t,$$

dividing through by m_t and rearranging,

$$\frac{s_t}{m_t} = \frac{1}{\omega^s_{bt}}\big(b_t - \omega^m_{bt}\big), \qquad b_t \equiv \frac{B^L_t}{m_t}. \tag{40}$$

Since $s_t(n) = \varphi_t(n)\, s_t$, the pool-$n$ penetration ratio is

$$Q^n(b_t) \;\equiv\; \frac{s_t(n)}{m_t} \;=\; \frac{\varphi_t(n)\,\big(b_t - \omega^m_{bt}\big)}{\omega^s_{bt}}. \tag{41}$$

Combining (41) with the relative demand (38),

$$\frac{\alpha_t(n)}{1-\bar{\alpha}_t} \frac{\tilde{R}^m_{t+1}}{\tilde{R}^s_{t+1}(n)} = \big[Q^n(b_t)\big]^{1/\sigma}. \tag{42}$$

Substituting the MMF zero-profit condition (12), $y^m_{t+1} = \omega^m_{bt}\, y^T_{t+1} + \kappa^m_t(\omega^m_{bt})$, into the definition of $\tilde{R}^m_{t+1}$ and solving for $y^s_{t+1}(n)$ gives

$$y^s_{t+1}(n) = \frac{\alpha_t(n)}{1-\bar{\alpha}_t} \left[\, \omega^m_{bt}\, y^T_{t+1} + \kappa^m_t(\omega^m_{bt}) + \tilde{\lambda}_t \,\right] \big[Q^n(b_t)\big]^{-1/\sigma} - \tilde{\lambda}_t. \tag{43}$$

A.4 Linearization

For tractability, impose time-invariant pool shares and Treasury weights, $\varphi_t(n) = \varphi(n)$, $\omega^m_{bt} = \omega^m_b$, $\omega^s_{bt} = \omega^s_b$, and the corresponding constant liquidity cost $\kappa^m(\omega^m_b)$. Under these assumptions,

$$Q^n(b_t) = \frac{\varphi(n)\,(b_t - \omega^m_b)}{\omega^s_b}, \qquad \frac{\partial Q^n}{\partial b_t}(b_t) = \frac{\varphi(n)}{\omega^s_b} > 0.$$

Define $F : \mathbb{R}^3 \to \mathbb{R}$ by

$$F(y^T, b, \tilde{\lambda}) \equiv \big[\omega^m_b\, y^T + \kappa^m(\omega^m_b) + \tilde{\lambda}\big] \big[Q^n(b)\big]^{-1/\sigma},$$

so that equation (43) can be written compactly as

$$y^s_{t+1}(n) = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\, F(y^T_{t+1}, b_t, \tilde{\lambda}_t) - \tilde{\lambda}_t.$$

Let $(\bar{y}^T, \bar{b}, \bar{\lambda})$ denote the steady-state values of $(y^T_{t+1}, b_t, \tilde{\lambda}_t)$, with $\bar{y}^m \equiv \omega^m_b\, \bar{y}^T + \kappa^m(\omega^m_b)$ the implied MMF premium. The partial derivatives of F at the steady state are

$$\left.\frac{\partial F}{\partial y^T}\right|_{ss} = \omega^m_b\, [Q^n(\bar{b})]^{-1/\sigma} \;\equiv\; \delta_{TR}(n), \tag{44}$$

$$\left.\frac{\partial F}{\partial b}\right|_{ss} = -\frac{1}{\sigma}\left(\bar{y}^m + \bar{\lambda}\right)[Q^n(\bar{b})]^{-(1+\sigma)/\sigma}\,\frac{\varphi(n)}{\omega^s_b} \;\equiv\; \delta_b(n) \;<\; 0, \tag{45}$$

$$\left.\frac{\partial F}{\partial \tilde{\lambda}}\right|_{ss} = [Q^n(\bar{b})]^{-1/\sigma} \;\equiv\; \delta_Q(n), \tag{46}$$

where $\delta_{TR}(n) = \omega^m_b\, \delta_Q(n)$ and the sign of $\delta_b(n)$ follows from $\partial Q^n/\partial b > 0$ and $\bar{y}^m + \bar{\lambda} > 0$.

A first-order Taylor expansion of F around the steady state gives

$$F(y^T_{t+1}, b_t, \tilde{\lambda}_t) \approx \bar{F} + \delta_{TR}(n)(y^T_{t+1} - \bar{y}^T) + \delta_b(n)(b_t - \bar{b}) + \delta_Q(n)(\tilde{\lambda}_t - \bar{\lambda}),$$

where $\bar{F} = (\bar{y}^m + \bar{\lambda})\,\delta_Q(n)$. Substituting back and noting that $\bar{F} - \delta_{TR}(n)\bar{y}^T = \delta_Q(n)\big[\kappa^m(\omega^m_b) + \bar{\lambda}\big]$,

$$y^s_{t+1}(n) \approx \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_{TR}(n)\, y^T_{t+1} + \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_b(n)\, b_t + \delta_t(n), \tag{47}$$

with

$$\delta_t(n) = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\Big[\delta_Q(n)\,\kappa^m(\omega^m_b) - \delta_b(n)\,\bar{b}\Big] + \left[\frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_Q(n) - 1\right]\tilde{\lambda}_t. \tag{48}$$

The intercept $\delta_t(n)$ collects all pool-specific and time-varying terms that do not multiply y^T_{t+1} or b_t. In the empirical implementation, components of $\delta_t(n)$ that vary slowly across time are absorbed by pool and time fixed effects.

A.5 Proofs of Testable Predictions

Proof of Proposition 1. Differentiating (47) with respect to y^T_{t+1},

$$\frac{\partial y^s_{t+1}(n)}{\partial y^T_{t+1}} = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_{TR}(n) = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\omega^m_b\,[Q^n(\bar{b})]^{-1/\sigma}.$$

Since $\omega^m_b > 0$, $[Q^n(\bar{b})]^{-1/\sigma} > 0$, and $1 - \bar{\alpha}_t > 0$, the partial derivative is strictly positive if and only if $\alpha_t(n) > 0$, and equals zero when $\alpha_t(n) = 0$. ■

Proof of Corollary 1. By (41), the steady–state penetration ratio depends on the pool index only through $\varphi(n)$:

$$Q^n(\bar{b}) = \frac{\varphi(n)\,(\bar{b} - \omega_b^m)}{\omega_b^s}.$$

Consider two pools n and n' with $\varphi(n) = \varphi(n')$. Then $Q^n(\bar{b}) = Q^{n'}(\bar{b})$ and hence $\delta_{TR}(n) = \delta_{TR}(n')$. From the proof of Proposition 1, the Treasury-premium sensitivity of pool n is

$$\frac{\partial y_{t+1}^s(n)}{\partial y_{t+1}^T} = \frac{\alpha_t(n)}{1 - \bar{\alpha}_t}\,\delta_{TR}(n),$$

which is strictly increasing in $\alpha_t(n)$ (since $\delta_{TR}(n) > 0$ and $1 - \bar{\alpha}_t > 0$). Therefore, if $\alpha_t(n) > \alpha_t(n')$ with $\varphi(n) = \varphi(n')$,

$$\frac{\partial y_{t+1}^s(n)}{\partial y_{t+1}^T} > \frac{\partial y_{t+1}^s(n')}{\partial y_{t+1}^T}.$$

■

Proof of Corollary 2. By (41), the steady-state penetration ratio depends on $\varphi(n)$ through

$$Q^n(\bar{b}) = \frac{\varphi(n)\,(\bar{b} - \omega_b^m)}{\omega_b^s},$$

which is strictly increasing in $\varphi(n)$ since $\bar{b} > \omega_b^m$ in any equilibrium with positive stablecoin deposits (from (40) with $s_t/m_t > 0$). Consequently

$$[Q^n(\bar{b})]^{-1/\sigma} = \left(\frac{\bar{b} - \omega_b^m}{\omega_b^s}\right)^{-1/\sigma} \varphi(n)^{-1/\sigma},$$

which is strictly decreasing in $\varphi(n)$ for $\sigma > 0$. From the proof of Proposition 1, the Treasury-premium sensitivity of pool n is

$$\frac{\partial y_{t+1}^s(n)}{\partial y_{t+1}^T} = \frac{\alpha_t(n)}{1 - \bar{\alpha}_t}\,\omega_b^m\,[Q^n(\bar{b})]^{-1/\sigma}.$$

Consider two pools n and n' with $\alpha_t(n) = \alpha_t(n')$ but $\varphi(n) > \varphi(n')$. Holding the common factor $\alpha_t(n)\,\omega_b^m/(1 - \bar{\alpha}_t)$ fixed, the sensitivity is proportional to $\varphi(n)^{-1/\sigma}$, so

$$\frac{\partial y_{t+1}^s(n)}{\partial y_{t+1}^T} < \frac{\partial y_{t+1}^s(n')}{\partial y_{t+1}^T}.$$

By the same argument applied to $\delta_b(n) \propto \varphi(n)\,[Q^n(\bar{b})]^{-(1+\sigma)/\sigma} \propto \varphi(n)^{1-(1+\sigma)/\sigma} = \varphi(n)^{-1/\sigma}$ in absolute value, the loading on b_t inherits the same scaling in pool size. ■

Proof of Proposition 2. Differentiating (47) with respect to b_t,

$$\frac{\partial y^s_{t+1}(n)}{\partial b_t} = \frac{\alpha_t(n)}{1-\bar{\alpha}_t}\,\delta_b(n).$$

From the definition of $\delta_b(n)$,

$$\delta_b(n) = -\frac{1}{\sigma}\left(\bar{y}^m + \bar{\lambda}\right)[Q^n(\bar{b})]^{-(1+\sigma)/\sigma}\,\frac{\varphi(n)}{\omega^s_b}.$$

Each factor is positive in absolute value: $\sigma > 0$; $[Q^n(\bar{b})]^{-(1+\sigma)/\sigma} > 0$; $\phi(n)/\omega^s_b > 0$; and the shadow MMF spread $\bar{y}^m + \bar{\lambda} = \tilde{R}^m > 0$. The last sign follows from the investor's first-order condition for MMF holdings: the marginal liquidity value $\psi_t L_t^{1/\sigma}(1-\bar{\alpha}_t)m_t^{-1/\sigma}$ is strictly positive at any interior optimum with $m_t > 0$, and equals $\beta\,\mathbb{E}_t[\lambda^c_{t+1}]\,(y^m_{t+1} + \tilde{\lambda}_t)$, so $\tilde{R}^m_{t+1} = y^m_{t+1} + \tilde{\lambda}_t > 0$ regardless of the sign of y^m_{t+1} itself.

Therefore $\delta_b(n) < 0$, and with $\alpha_t(n)/(1-\bar{\alpha}_t) > 0$,

$$\frac{\partial y^s_{t+1}(n)}{\partial b_t} < 0,$$

so that a decline in b_t raises $y^s_{t+1}(n)$. Equivalently, $R^s_{t+1}(n)$ falls relative to R^a_{t+1}. ■

Proof of Proposition 3. The proposition is most cleanly established from the non-linear equation (43). Because pools form a continuum of measure one, a change in $\alpha_t(n)$ for a single pool does not affect the aggregate $\bar{\alpha}_t = \int_0^1 \alpha_t(n')\,dn'$. Holding $\bar{\alpha}_t$, y^T_{t+1}, b_t, and $\tilde{\lambda}_t$ constant, differentiating (43) with respect to $\alpha_t(n)$ yields

$$\frac{\partial y^s_{t+1}(n)}{\partial \alpha_t(n)} = \frac{1}{1-\bar{\alpha}_t}\left[\omega^m_b\, y^T_{t+1} + \kappa^m(\omega^m_b) + \tilde{\lambda}_t\right]\left[Q^n(b_t)\right]^{-1/\sigma} = \frac{1}{1-\bar{\alpha}_t}\,\tilde{R}^m_{t+1}\left[Q^n(b_t)\right]^{-1/\sigma}.$$

The factors $(1-\bar{\alpha}_t)^{-1} > 0$ and $[Q^n(b_t)]^{-1/\sigma} > 0$. The shadow MMF spread $\tilde{R}^m_{t+1} = y^m_{t+1} + \tilde{\lambda}_t > 0$ by the investor's first-order condition for MMF holdings, whose left-hand side $\psi_t L_t^{1/\sigma}(1-\bar{\alpha}_t)m_t^{-1/\sigma}$ is strictly positive at an interior optimum; this holds regardless of the sign of y^m_{t+1}, and in particular even when the Treasury premium y^T_{t+1} is negative.

Therefore $\partial y^s_{t+1}(n)/\partial \alpha_t(n) > 0$: a decrease in $\alpha_t(n)$ reduces $y^s_{t+1}(n)$. Equivalently, $R^s_{t+1}(n)$ must rise relative to R^a_{t+1} to clear the market. ■

B Data and Summary Statistics

In this section, we describe the dataset construction and the cleaning procedure to obtain the final weekly dataset used for the empirical analysis.

B.1 Data

We start from the universe of DeFi pools available through the DeFiLlama API[17] between February 2022 and December 2025, restricted to lending and non-lending pools.[18] For each pool-day observation, we retain the pool identifier, the chain, the project (the protocol that operates the pool), the symbol (the token denomination), the DeFiLlama `stablecoin` flag, the DeFi `category` (e.g., lending, liquid-staking, yield), the total APY, its two components `apyBase` and `apyReward`, and the total value locked in U.S. dollars (`tvlUsd`).[19] A single protocol can have multiple pools across different chains. The token denomination can be "single" (sometimes called single-token pools, e.g., USDT) or "multiple" (e.g., USDT–USDC). We complement this data with information about stablecoin peg type (e.g., `peggedUSD`) and the peg mechanism (e.g., `fiat-backed`).

Each date is assigned an ISO year-week identifier. Using the NYSE trading calendar, we flag weekends and U.S. holidays as non-trading days and identify, for each ISO week, the last NYSE trading day. The final weekly dataset is constructed by keeping only those last-trading-day observations.

Perpetual-futures funding rates for the BTCUSDT contracts (from Binance) are quoted per eight-hour funding interval, so we annualize them. BTC realized volatility is obtained from Bloomberg. The VIX is obtained from FRED (`VIXCLS`). The effective federal funds

[17]Pool-level yields and total value locked are obtained from DeFiLlama's public REST API. The set of pools and their metadata (project, chain, token, category) is pulled from the snapshot endpoint `https://yields.llama.fi/pools`; for each pool, the historical series is then queried from the chart endpoint `https://yields.llama.fi/chart/\{pool_id\}`, using the open-source `defillama2` Python wrapper (`https://github.com/coindataschool/defillama2`).

[18]In the extraction, we exclude categories that are structurally different from lending protocols or no longer economically relevant (e.g., NFT-related pools), as they do not provide a meaningful counterfactual for our analysis. Specifically, we exclude the following categories: dexs, dex-aggregator, cross-chain-bridge, derivatives, options, basis-trading, bridge, options-vault, nft lending, insurance, nft-marketplace, nft-lending, prediction-market, unknown, and managed token pools. The final sample includes the following categories: lending, yield, yield-aggregator, staking, liquid-staking, liquid-restaking, liquidity-manager, onchain-capital-allocator, leveraged-farming, rwa, rwa-lending, cdp, and dual-token-stablecoin indexes.

[19]For the total value locked, we follow DeFiLlama's convention. For lending pools, DeFiLlama's `tvlUsd` field is defined as `totalSupplyUsd` − `totalBorrowUsd`. As a robustness check, we used `totalSupplyUsd` instead of `tvlUsd`, obtained from DeFiLlama's Pro API (`/yields/poolsBorrow` snapshots and `/yields/chartLendBorrow/{pool_id}` histories), which exposes the supply and borrow components separately. While substituting `totalSupplyUsd` for `tvlUsd` modifies the cleaned sample, our insights and conclusions remain the same.

rate is from FRED (series `DFF`). Constant-maturity nominal Treasury yields are from FRED at the 1- and 3-month maturities (`DGS1MO` and `DGS3MO`). Overnight indexed swap rates at the same maturities are sourced from LSEG (Refinitiv).

Outstanding marketable Treasury debt held by the public, intragovernmental holdings, and the total are taken from the U.S. Treasury's *Debt to the Penny* dataset. We also obtain from FRED the following weekly series: U.S. Treasury securities held outright by the Federal Reserve (`TREAST`); Treasury and agency securities held by all commercial banks (`TASACBW027SBOG`); and the Treasury General Account balance (`WTREGEN`). Aggregate primary-dealer U.S. Treasury repos are constructed from the FRBNY API. As a robustness check, we also collect the monthly primary-dealer repo series published by SIFMA. Monthly money-market-fund total assets are taken from the SEC.

The set of crypto hacker attacks is from DeFiLlama's hacks dataset. Each record contains the date of the event, the U.S. dollar amount stolen, the target category (e.g., `DeFi Protocol`), the classification, and the technique.

B.2 Cleaning

The daily panel is collapsed to a weekly panel by retaining only the last NYSE trading day of each ISO week. Pool symbols on DeFiLlama occasionally include visually similar Unicode characters, zero-width characters, or emoji. We normalize the symbol field by replacing a small set of Unicode look-alikes or Cyrillic characters with their ASCII counterparts. We then drop pools with missing symbols or whose symbol contains at least one emoji.

For each pool, we compute case-insensitive fuzzy-match indicators that equal one whenever the symbol string contains the substring `USDC`, `USDT`, `BTC`, or `ETH`. We then retain only these pools to capture the two largest stablecoins, the two largest non-stablecoin crypto assets, and their wrapped, synthetic, and liquid-staking representations (e.g., WBTC, stETH, M.USDC).

We manually correct the following symbols `USDT-USDC`, `USDC-USDT0`, `USDE-USDT0`, `USDT`, `USDT0`, `DAI-USDT0`, `CRVUSD-USDT0`) as `stablecoin` pools. Conversely, any pool whose symbol fuzzy-matches BTC or ETH (and is therefore denominated in a volatile asset) is forced to `stablecoin` = 0. We further classify each stablecoin pool as USD-pegged fiat-backed using the DeFiLlama peg metadata. The set of USD-pegged fiat-backed tokens is defined as those with `pegType` = `peggedUSD` and `pegMechanism` = `fiat-backed`; A pool is then flagged `stablecoin_and_USD_fiat` = 1 if it is already classified as a stablecoin pool and its symbol contains at least one of these USD-pegged fiat-backed tokens.

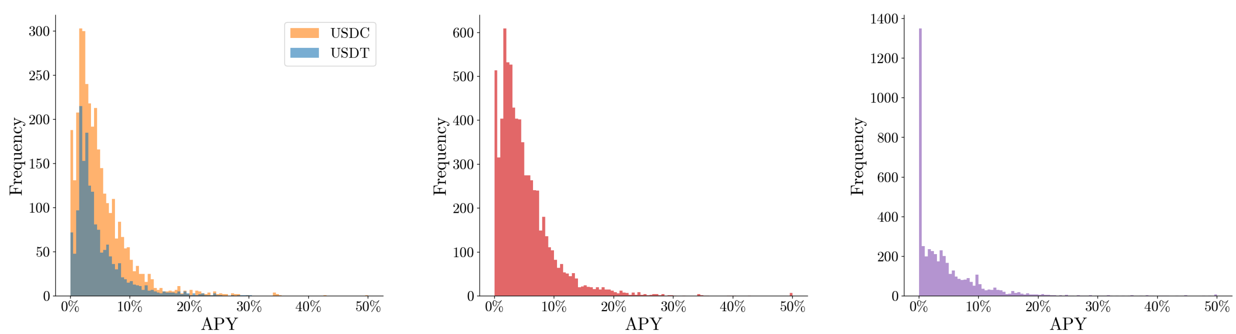
To limit the influence of extreme, unreliable pool-week observations, we drop pools whose

APY exceeds the 95th percentile (which corresponds to 96.78%) of the full APY distribution. Next, we partition the panel into three categories: stablecoin lending, non-stablecoin lending, and non-lending. Within each category, we retain only pools whose mean TVL falls in the top decile of that category's pool-mean TVL distribution. The combined filters retain roughly 90% of the initial TVL. Finally, we drop pools that have less than 52 weeks of data.

The cleaned weekly panel covers the period from February 2022 to December 2025 and contains more than 41'000 observations, 372 pools, 94 protocols/projects, 13 categories, and 145 symbols. Main summary statistics are reported in Section 4.

B.3 Additional Summary Statistics

Figure 2 reports the distribution of APYs across the main subsamples used in the empirical analysis. APY is reported as the annual percentage yield and expressed as a percentage of the value of the deposited token. APYs are generally concentrated at relatively low levels, with most observations lying below 10%. The distributions for USDC and USDT lending pools are very similar and largely overlapping, indicating comparable yield dynamics across the two major fiat stablecoins. The distribution for the broader set of USD fiat stablecoin lending pools exhibits a similar pattern but with a slightly wider dispersion of yields. By contrast, the distribution for stablecoin non-lending pools is more concentrated near zero, reflecting the lower yields typically associated with these pools. Overall, lending pools exhibit greater dispersion and a thicker right tail of APYs relative to non-lending pools.

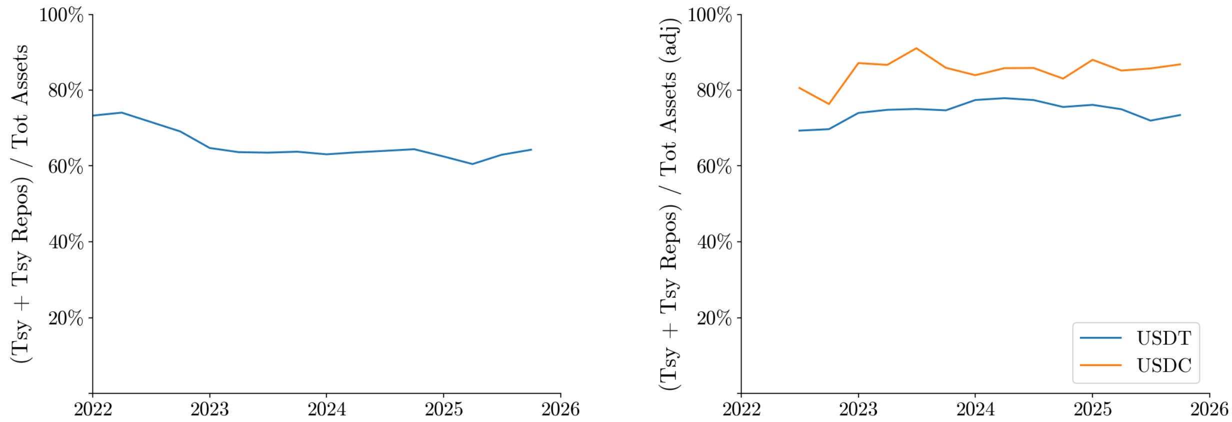


(A) USDT and USDC SCLPs (B) USD Fiat SCLPs (C) SC Non-Lending Pools

Figure 2: **Distributions of APY**. The figure reports histograms of annual percentage yields (APY) for different subsamples of DeFi pools. Panel A shows the distribution for USDC and USDT lending pools. Panel B reports the distribution for USD fiat stablecoin lending pools. Panel C shows the distribution for stablecoin non–lending pools. APY is measured as the annual percentage yield and expressed as a percentage of the value of the deposited token.

Figure 3 shows the shares of Treasuries and Treasury repos in the portfolios of MMFs and the two largest USD fiat stablecoins (USDT and USDC), based on their financial reports.

Our model assumes that these portfolio weights are stable across time (see Section 3). The figure supports this assumption, as the shares are stable over time, around 80% for MMFs and USDC and slightly lower, around 70%, for USDT.



(A) Money Market Funds

(B) USD Fiat Stablecoins (USDT and USDC)

Figure 3: **Share of Treasuries and Treasury repos over the Total.** The figure presents the shares of Treasury and Treasury repos in the portfolios of money market funds (Panel A) and of the two major stablecoins, USDT and USDC (Panel B). Money market fund data are from the SEC. Stablecoin data are from official financial reports published on the issuers' respective websites. For USDC, reports with asset breakdowns are available from 2022Q3, while for USDT they are available from 2023Q1; therefore, we backfill these two quarters with the data available for the first time they report this breakdown (2023Q1). USDC total assets account for settlement-timing adjustments.

C Additional Results and Robustness Tests

Table 14: **USD-Stablecoin supply growth and Treasury premium**. The table reports time-series estimates of the weekly growth in total USD-pegged stablecoin circulating supply. The dependent variable is weekly growth in total USD-pegged stablecoin circulating supply, Δ*log(SC Supply)*$_t$, where *SC Supply*$_t$ denotes the total circulating token supply of all USD-pegged stablecoins. All four Columns include the lagged *Treasury premium* as a covariate, defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. The reported coefficients are the lagged *Treasury premium*, the lagged dependent variable, and the lagged log level of supply. Controls include the federal funds rate (*FFR*), the 30-day *Bitcoin volatility*, the *BTC futures funding rate*, and the *Treasury supply.* Shock dummies include the Terra de-peg, the FTX collapse, and the SVB run. Standard errors are Newey–West with data-driven bandwidth. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Δ*log(SC Supply)*$_t$			
	(1)	(2)	(3)	(4)
Tsy Premium$_{t-1}$	–0.0192***	–0.0327***	–0.0201***	–0.0176***
	(–3.55)	(–5.72)	(–3.66)	(–2.97)
Δ*log(SC Supply)*$_{t-1}$			0.343***	0.247***
			(4.12)	(2.64)
log(SC Supply)$_{t-1}$				0.0093***
				(3.49)
Controls	No	Yes	Yes	Yes
Shock dummies	No	Yes	Yes	Yes
N	202	202	201	201

Table 15: **Stablecoin premium and demand for safety: APY Base and APY Reward**. The table reports OLS estimates of equation (28). The dependent variable is the *Stablecoin Premium*, defined as follows: in Columns (1) and (2), it is the difference between the OIS rate and the APY offered by DeFi pools (as in the baseline specification); in Columns (3) and (4), it is the difference between the OIS rate and the *APY Base* offered by DeFi pool; in Columns (5) and (6), it is the difference between the OIS rate and the *APY Reward* offered by DeFi pool. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Columns (1), (3) and (5) use a sample of single-token lending pools denominated in USDT or USDC (USDT/USDC Only). Columns (2), (4) and (6) use a broader sample of USD fiat stablecoin lending pools, including pools denominated in USD-backed stablecoins such as USDT and USDC (SC). Controls include the federal funds rate (*FFR*), th *BTC futures funding rates*, and the 30-day *Bitcoin volatility.* Fixed effects are included at the project, chain, token, and calendar quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Stablecoin Premium (*Total APY*)		*Stablecoin Premium* (*APY Base*)		*Stablecoin Premium* (*APY Reward*)	
Sample:	(1) USDT/USDC Lending	(2) SC Lending	(3) USDT/USDC Lending	(4) SC Lending	(5) USDT/USDC Lending	(6) SC Lending
Tsy Premium$_{t-1}$	4.796***	4.223***	5.299***	3.922**	–0.737**	0.151
	(3.16)	(2.83)	(3.44)	(2.62)	(–2.04)	(0.20)
Tsy Supply$_{t-1}$	–10.84***	–9.794***	–9.651***	–8.241***	–3.497***	–2.353
	(–5.34)	(–4.93)	(–4.66)	(–4.43)	(–5.67)	(–1.37)
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	5041	7187	4930	7039	2649	4163
R^2	0.405	0.399	0.252	0.282	0.493	0.570
Adj. R^2	0.401	0.394	0.247	0.276	0.488	0.565

Table 16: **Stablecoin premium and demand for safety: Aggregate regressions**. The table reports Newey–West estimates obtained by aggregating the sample at the weekly level. In Panel A, the dependent variable is the TVL-weighted *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools, where weights are given by the log of each pool's total value locked (TVL). In Panel B, the *Stablecoin Premium* is equally weighted. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Column (1) uses a sample of single-token lending pools denominated in USDT or USDC (USDT/USDC Lending). Column (2) uses a broader sample of USD fiat stablecoin lending pools, including pools denominated in USD-backed stablecoins such as USDT and USDC (SC). Column (3) uses the full sample of stablecoin pools classified by DeFiLlama in categories other than lending. Column (4) excludes from the sample in Column (3) pools classified in the "Yield" and "Yield aggregator" categories. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	(1)	(2)	(3)	(4)
Sample:	USDT/USDC Lending	SC Lending	SC Non-Lending	SC Non-Lending excl. "Yield"
Panel A: log(TVL)–Weighted				
Tsy Premium$_{t-1}$	7.833***	7.939***	5.188***	–0.484
	(4.48)	(4.56)	(5.11)	(–0.40)
Tsy Supply $_{t-1}$	–11.92***	–11.46***	–6.022***	–1.441
	(–3.10)	(–2.79)	(–2.66)	(–0.77)
N	202	202	202	189
F	11.85	12.03	13.18	4.513
Panel B: Equal-Weighted				
Tsy Premium$_{t-1}$	7.837***	7.793***	5.202***	–0.401
	(4.48)	(4.57)	(5.04)	(–0.32)
Tsy Supply$_{t-1}$	–11.95***	–11.18***	–6.203***	–1.984
	(–3.10)	(–2.68)	(–2.70)	(–0.95)
N	202	202	202	189
F	11.74	11.66	15.33	5.350

Table 17: **Stablecoin premium and demand for safety: IV Aggregate regressions.** The table reports Newey–West estimates obtained by aggregating the sample at the weekly level. In Panel A, the dependent variable is the TVL-weighted *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools, where weights are given by the log of each pool's total value locked (TVL). In Panel B, the *Stablecoin Premium* is equally weighted. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. This ratio is instrumented using variation in the Treasury General Account (TGA). Columns (1)–(4) use the sample of USD fiat stablecoin lending pools. Columns (1) and (2) report the baseline OLS estimates, while Columns (3) and (4) report the corresponding IV estimates. Column (5) reports IV estimates using the full sample of USD fiat stablecoin pools in categories other than lending. Column (6) reports IV estimates when additionally excluding from the sample in Column (5) pools classified in the "Yield" and "Yield aggregator" categories. Standard errors are Newey–West heteroskedasticity and autocorrelation consistent (HAC) with eight lags. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Sample:	SC Lending				SC Non-Lending	SC Non-Lending excl. "Yield"
	OLS		IV (2SLS)		IV (2SLS)	IV (2SLS)
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: log(TVL)-Weighted						
Tsy Supply$_{t-1}$	–10.66**	–11.46***	–29.75***	–27.67***	–10.73***	–0.923
	(–2.17)	(–2.79)	(–3.15)	(–3.62)	(–3.20)	(–0.57)
Tsy Premium$_{t-1}$		7.939***		8.616***	5.385***	–0.490
		(4.56)		(3.06)	(4.13)	(–0.45)
First Stage: *log(TGA)*$_{t-1}$ $\rightarrow$ *Tsy Supply*$_{t-1}$						
log(TGA)$_{t-1}$			0.087***	0.088***	0.088***	0.090***
N	202	202	202	202	202	189
First-stage F			30.35	35.91	37.36	37.25
Panel B: Equal-Weighted						
Tsy Supply$_{t-1}$	–10.40**	–11.18***	–29.33***	–27.28***	–10.55***	–1.452
	(–2.17)	(–2.68)	(–3.23)	(–3.65)	(–3.16)	(–0.77)
Tsy Premium$_{t-1}$		7.793***		8.436***	5.383***	–0.401
		(4.57)		(3.07)	(4.13)	(–0.35)
First Stage: *log(TGA)*$_{t-1}$ $\rightarrow$ *Tsy Supply*$_{t-1}$						
log(TGA)$_{t-1}$			0.087***	0.088***	0.088***	0.090***
N	202	202	202	202	202	189
First-stage F			31.52	35.91	37.36	37.25

Table 18: **Stablecoin premium and demand for safety during periods of higher uncertainty: Aggregate regressions**. The table reports Newey–West estimates obtained by aggregating the sample at the weekly level. The baseline model is augmented with interactions between the *Treasury premium* and dummies capturing periods of elevated uncertainty. In Panel A, the dependent variable is the TVL-weighted *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools, where weights are given by the log of each pool's total value locked (TVL). In Panel B, the *Stablecoin Premium* is equally weighted. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Shock* indicators are defined as dummies equal to one in the two weeks following a major uncertainty event. Columns (1)–(4) use crypto-market shock dummies: *All Crypto*, *SVB*, and *Terra*. The *All Crypto* dummy is an aggregate indicator that takes the value one in the two weeks following the SVB episode, the Terra collapse, or the FTX bankruptcy, and zero otherwise; the *SVB* and *Terra* dummies isolate each of these episodes individually. Columns (1)–(3) use the sample of stablecoin lending pools, and Column (4) reports a placebo specification on non-lending stablecoin pools using the *All Crypto* dummy. Columns (5)–(6) use the *VIX top 25%* dummy, which equals one when the VIX is in its top quartile of the sample distribution, on the lending and non-lending samples respectively. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, the 30-day *Bitcoin volatility*, and quarter dummies. Because event indicators are short-lived, covariates are standardized to make interaction coefficients comparable across specifications. Standard errors are Newey–West heteroskedasticity and autocorrelation consistent (HAC) with automatic bandwidth selection. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	Crypto Shocks				**Market Uncertainty**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Shock:	*All Crypto*	*SVB*	*Terra*	*All Crypto*	*VIX top 25%*	*VIX top 25%*
Pools:	SC Lending	SC Lending	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending
Panel A: log(TVL)-Weighted						
$Tsy\ Premium_{t-1} \times Shock$	–1.383***	–2.302***	–1.973***	–0.110	–0.505	–0.316
	(–3.67)	(–5.82)	(–3.80)	(–0.43)	(–1.17)	(–1.60)
$Tsy\ Premium_{t-1}$	1.229***	1.201***	1.231***	–0.0740	1.355***	0.0720
	(4.48)	(4.35)	(4.65)	(–0.40)	(3.05)	(0.36)
$Tsy\ Supply_{t-1}$	–0.822***	–0.856***	–0.836***	–0.108	–0.898***	–0.101
	(–2.63)	(–2.83)	(–2.68)	(–0.78)	(–2.73)	(–0.72)
Shock	1.624*	0.826	3.238***	–0.112	1.162**	0.0883
	(1.76)	(0.85)	(3.49)	(–0.39)	(2.17)	(0.41)
N	202	202	202	189	202	189
F	11.31	129.5	10.65	6.213	11.92	4.470
Panel B: Equal-Weighted						
$Tsy\ Premium_{t-1} \times Shock$	–1.319***	–5.493***	–1.968***	–0.0672	–0.545	–0.420*
	(–3.10)	(–14.14)	(–3.86)	(–0.25)	(–1.31)	(–1.94)
$Tsy\ Premium_{t-1}$	1.213***	1.194***	1.209***	–0.0624	1.361***	0.140
	(4.51)	(4.38)	(4.67)	(–0.33)	(3.13)	(0.73)
$Tsy\ Supply_{t-1}$	–0.804**	–0.852***	–0.814**	–0.151	–0.872***	–0.133
	(–2.55)	(–2.86)	(–2.58)	(–0.96)	(–2.60)	(–0.86)
Shock	1.304	1.468	3.194***	-0.288	1.098**	0.0238
	(1.24)	(1.54)	(3.51)	(-0.84)	(2.01)	(0.10)
N	202	202	202	189	202	189
F	9.846	516.5	10.40	7.438	11.30	5.423

Table 19: **Stablecoin premium and demand for safety during crypto hacks: Aggregate regressions**. The table reports Newey–West estimates obtained by aggregating the sample at the weekly level. In Panel A, the dependent variable is the TVL-weighted *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools, where weights are given by the log of each pool's total value locked (TVL). In Panel B, the *Stablecoin Premium* is equally weighted. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. The baseline model is augmented with interactions between the *Treasury premium* and indicator dummies capturing hack events. *Hack* indicators are defined as dummies equal to one in the week following a hack event. Columns (1) and (2) use a dummy covering all major DeFi hack events. Columns (3) and (4) focus on DeFi hacks affecting the Ethereum blockchain. Columns (5) and (6) use a dummy equal to one for all (DeFi and non-DeFi) hack events. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, the 30-day *Bitcoin volatility*, and quarter dummies. Standard errors are Newey–West heteroskedasticity and autocorrelation consistent (HAC) with eight lags. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	DeFi Hacks		Ethereum Hacks		All Hacks	
	(1)	(2)	(3)	(4)	(5)	(6)
Pools:	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending	SC Lending	SC Non-Lending
Panel A: log(TVL)-Weighted						
$Tsy\ Premium_{t-1} \times Hack$	–4.148**	–0.841	–3.798**	0.862	–2.791	–0.816
	(–2.30)	(–0.72)	(–2.36)	(0.83)	(–1.62)	(–0.80)
Hack	0.482	0.0969	–0.0716	–0.179	0.276	0.136
	(1.20)	(0.47)	(–0.15)	(–0.73)	(0.71)	(0.76)
$Tsy\ Premium_{t-1}$	8.998***	–0.227	8.616***	–0.626	8.799***	–0.250
	(4.61)	(–0.14)	(4.93)	(–0.45)	(4.37)	(–0.16)
$Tsy\ Supply_{t-1}$	–11.25***	–1.402	–11.87***	–1.495	–11.80***	–1.541
	(–2.74)	(–0.73)	(–2.95)	(–0.77)	(–2.88)	(–0.85)
N	202	189	202	189	202	189
F	13.55	4.310	13.72	4.529	12.48	4.361
Panel B: Equal-Weighted						
$Tsy\ Premium_{t-1} \times Hack$	–4.015**	–1.066	–3.539**	0.647	–2.744	–0.956
	(–2.23)	(–0.92)	(–2.19)	(0.59)	(–1.62)	(–0.93)
Hack	0.441	0.143	–0.148	–0.0990	0.264	0.163
	(1.08)	(0.67)	(–0.31)	(–0.36)	(0.69)	(0.87)
$Tsy\ Premium_{t-1}$	8.831***	–0.0919	8.440***	–0.518	8.640***	–0.130
	(4.85)	(–0.06)	(5.13)	(–0.36)	(4.59)	(–0.08)
$Tsy\ Supply_{t-1}$	–11.00***	–1.916	–11.61***	–1.994	–11.52***	–2.100
	(–2.79)	(–0.89)	(–3.02)	(–0.91)	(–2.93)	(–1.03)
N	202	189	202	189	202	189
F	13.12	4.876	13.31	4.701	12.25	5.022

Table 20: **Stablecoin premium and demand for safety: IV panel regressions (Instrument: TGA Surprises)**. This table reports OLS and IV estimates of the baseline panel specification. The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. In Columns (3)–(6), *Treasury Supply* is instrumented with the standardized lagged Treasury General Account (TGA) surprises cumulated over the previous 26 weeks. The weekly TGA forecast surprise is the realized TGA less the Wrightson ICAP's *Money Market Observer* projection. To match the stock structure of $\textit{Treasury Supply}_{t-1}$, we cumulate the weekly TGA forecast surprises over a 26-week trailing horizon, $\textit{TGA Surprise}^{K}_{t-1} \equiv \sum_{k=1}^{K} \textit{TGA Surprise}_{t-k}$, with $K = 26$ corresponding to two complete Quarterly Refunding cycles. First-stage coefficients and F-statistics are reported. Columns (1)–(4) use the sample of USD fiat stablecoin lending pools; Column (5) uses USD fiat stablecoin non-lending pools; Column (6) reports IV estimates when additionally excluding from the sample in Column (5) pools classified in the "Yield" and "Yield aggregator" categories. Columns (1) and (3) omit the *Treasury premium* control. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates*, and the 30-day *Bitcoin volatility.* Fixed effects are included at the project, chain, token, and quarter levels. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	OLS		IV			
	(1)	(2)	(3)	(4)	(5)	(6)
Sample:	SC Lending	SC Lending	SC Lending	SC Lending	SC Non-Lending	SC Non-Lending excl. "Yield"
$\textit{Tsy Supply}_{t-1}$	–9.551***	–9.794***	–26.53***	–25.08***	–10.32	5.928
	(–4.75)	(–4.93)	(–4.91)	(–4.91)	(–1.41)	(0.72)
$\textit{Tsy Premium}_{t-1}$		4.223***		4.720**	2.514	–3.877
		(2.83)		(2.63)	(1.25)	(–0.94)
First Stage: $\textit{TGA Surprise}^{K}_{t-1} \rightarrow \textit{Tsy Supply}_{t-1}$						
$\textit{TGA Surprise}^{K}_{t-1}$			0.039***	0.040***	0.041***	0.043***
First-stage F			84.92	90.32	95.34	98.70
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	7,187	7,187	7,187	7,187	4,643	2,095
R^2	0.394	0.399	0.021	0.039	0.051	0.015
Adj. R^2	0.390	0.394	0.013	0.031	0.042	0.004

Table 21: **Stablecoin premium and demand for safety: IV panel regressions (Instrument: Coupon Bond Settlements)**. The table reports OLS and IV estimates of the baseline panel specification. The dependent variable is the *Stablecoin Premium*, defined as the difference between the OIS rate and the APY offered by DeFi pools. The *Treasury premium* is defined as the difference between the 3-month OIS rate and the 3-month U.S. Treasury bill yield. *Treasury Supply* is the ratio of Treasuries held by private investors, including through repo transactions, to total money market fund assets. In Columns (3)–(6), *Treasury Supply* is instrumented with the lagged log issuance of Treasury coupon bonds over the previous 12 weeks; first-stage coefficients and F-statistics are reported. Columns (1)–(4) use the sample of USD fiat stablecoin lending pools; Column (5) uses USD fiat stablecoin non-lending pools; Column (6) reports IV estimates when additionally excluding from the sample in Column (5) pools classified in the "Yield" and "Yield aggregator" categories. Columns (1) and (3) omit the *Treasury premium* control. Controls include the federal funds rate (*FFR*), the *BTC futures funding rates* and the 30-day *Bitcoin volatility.* Fixed effects are included at the project, blockchain, token, and quarter levels. All specifications include project, blockchain, token, and calendar quarter fixed effects. Standard errors are two-way clustered at the pool and time levels. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	OLS		IV			
	(1)	(2)	(3)	(4)	(5)	(6)
Sample:	SC Lending	SC Lending	SC Lending	SC Lending	SC Non-Lending	SC Non-Lending excl. "Yield"
Tsy Supply$_{t-1}$	–9.833***	–9.993***	–24.54***	–21.60***	–2.521	18.62
	(–4.98)	(–5.08)	(–3.73)	(-3.64)	(–0.25)	(1.40)
Tsy Premium$_{t-1}$		3.444**		3.789**	1.176	–4.307
		(2.08)		(2.05)	(0.53)	(–0.96)
First Stage: *Coupon Treasuries*$^K_{t-1}$ → *Tsy Supply*$_{t-1}$						
Coupon Treasuries$^K_{t-1}$			0.086***	0.093***	0.094***	0.106***
First-stage F			34.66	39.79	36.00	41.80
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter	project, chain, token, quarter
N	7,107	7,107	7,107	7,107	4,579	2,084
R^2	0.398	0.400	0.039	0.060	0.045	–0.050
Adj. R^2	0.393	0.396	0.031	0.052	0.037	–0.062

D Construction of Treasury Supply Instruments

This appendix details the construction of the two additional instruments for $Tsy\ Supply_{t-1}$ used in Section 8: the TGA forecast surprise and the coupon-settlement schedule. We then discuss their validity and benchmark them against alternative instruments. The instruments are built from the same primary source: Wrightson ICAP's *Money Market Observer* (MMO), a subscription publication produced by Wrightson ICAP and widely tracked by money-market participants. Jones (2024) first uses the MMO archive to construct weekly surprises in 4-week T-bill auction sizes from Wrightson's projections as an instrument for short-term Treasury supply. We collect all available MMO issues over the period June 2021 through December 2025. Pre-2022 publications are collected only to provide trailing-window history for the rolling cumulation at the start of the regression sample.

D.1 TGA Forecast Surprise

Definition. We define the weekly TGA forecast surprises as the realization minus the Wrightson projection. Realized TGA comes from the U.S. Department of the Treasury's *Fiscal Data API* (Daily Treasury Statement, Operating Cash Balance).

$$TGA\ Surprise_t \ \equiv\ TGA_t\ -\ \widehat{TGA}_t^{W}. \tag{49}$$

The Wrightson projection $\widehat{TGA}_t^{W}$ is constructed from two distinct objects in the MMO depending on the period, reflecting a change in the MMO's publication format.

Beginning with the MMO of 17 October 2022, Wrightson publishes a daily TGA projection table (*Treasury Cash Balance*, Table 5 of the MMO). From this table we read Wrightson's projection of the TGA balance at $t + 7$ days as of the publication date. The weekly TGA forecast surprise for these weeks is the realized minus this 1-week-ahead projection.

Prior to October 2022, Wrightson's TGA projections appear only in the narrative text of the MMO and take the form of projections of *quarter-end* (March 31 / June 30 / September 30 / December 31) cash balance targets. We parse these prose projections from each Monday MMO between June 2021 and October 2022. Across 81 MMO issues over this period, the procedure extracts 14 distinct (MMO date, target quarter-end, projected balance) tuples. For each target quarter-end, the weekly surprise series is built from projection *revisions*, following the standard logic that unforecastable news is the change in the forecast plus the residual at realization. The first projection for a given target quarter-end is treated as the baseline forecast and therefore does not generate a forecast revision; each subsequent projection is recorded as a revision relative to the immediately preceding projection and assigned to the MMO publication week; at the target quarter-end, the residual (realized minus the last projection) is assigned to the realization week. By construction, the cumulative forecast revisions plus the terminal forecast error exactly equal the difference between the realized quarter-end balance and the initial forecast. To illustrate the construction of the forecast revision series, consider the June 30, 2022 quarter-end TGA balance. Wrightson's first projection, published on January 31, 2022, forecast a quarter-end balance of $700 billion and serves as the baseline forecast. Subsequent projections revised this forecast to $800 billion on April 18 (+$100 billion revision), $750 billion on May 2 (–$50 billion revision), and $800 billion on May 9 (+$50 billion revision). The realized quarter-end TGA balance was $782 billion, implying a terminal forecast error of –$18 billion relative to the final projection. The cumulative forecast revisions therefore equal +$100 billion. Adding the terminal forecast error of –$18 billion yields a total innovation of +$82 billion, exactly equal to the difference between the realized balance and the initial forecast ($782 billion – $700 billion).

The endogenous regressor, $\mathit{Tsy\ Supply}_{t-1}$, is a persistent stock variable. To align the instrument with the frequency of variation in Treasury supply, we cumulate weekly TGA surprises over a 26-week trailing window:

$$\mathit{TGA\ Surprise}^{K}_{t-1} \equiv \sum_{k=1}^{K} \mathit{TGA\ Surprise}_{t-k}, \qquad K = 26. \tag{50}$$

The choice of $K = 26$ corresponds approximately to two Quarterly Refunding cycles. This aggregation transforms a flow of weekly forecast innovations into a measure that more closely matches the stock nature of Treasury supply. Because each weekly surprise is defined as an innovation relative to contemporaneous professional forecasts, the cumulative measure captures the sequence of unanticipated changes in Treasury cash management over the preceding six months.

D.2 Coupon Settlement Schedule

As an alternative supply-side instrument, we use Wrightson's reported schedule of coupon-bearing Treasury settlements, $\mathit{Coupons}^{W}_{t}$, in the spirit of the maturity-driven Treasury-supply instruments in Greenwood et al. (2015). The series is read from the *Summary: Weekly Projected Cash Flow Totals* table of each MMO, *Coupons* Column, which reports the dollar volume of coupon-bearing securities (Treasury notes and bonds) scheduled to *settle* in each calendar week. This Column records a forward-looking compilation of the Treasury's announced auction calendar: once the Treasury announces a coupon auction, the settlement date is fixed by the auction schedule and the entire series is known to market participants at the time of publication. We deliberately use the settlement schedule rather than the announcement (auction) calendar: settlement is the date at which the Treasury actually receives cash and the supply of newly-issued debt enters investors' portfolios, and is therefore the relevant supply-side margin for the prediction in Section 3. Auction announcements precede settlement by several days to two weeks and are absorbed into expectations by the time the cash changes hands. The variable is available over the entire sample, June 2021 through December 2025. As with the TGA surprise, we cumulate the weekly schedule over a trailing horizon to obtain an instrument aligned with the slow- moving stock regressor $Tsy\ Supply_{t-1}$. We use the log of the 12-week cumulation:

$$log\ Coupons^K_{t-1} \equiv log\left(\sum_{k=1}^{12} Coupons^W_{t-k}\right), \qquad K = 12. \tag{51}$$

The 12–week horizon spans one Quarterly Refunding cycle, the natural window over which the Treasury's coupon-settlement plans are committed. Because $Coupons^W_{t-k}$ is determined by the announced auction calendar at $t - k$, its 12-week cumulation is predetermined with respect to contemporaneous shocks to crypto-market conditions or DeFi borrowing demand at t, supporting the exclusion restriction. On settlement day, the volume of coupon-bearing securities mechanically enters the stock of privately held Treasury debt, directly contributing to *Tsy Supply* and providing the instrument's first-stage power.

D.3 Comparison with the Jones (2024) T–bill issuance surprise

For comparison and as a robustness exercise, we replicate Jones (2024)'s 4-week T-bill issuance surprise from the same MMO archive, matched against the Treasury's realized auction offerings via TreasuryDirect. As suggested by Jones (2024), the 4-week T-bill issuance surprises turn out to be weak in our sample period (2022–2025): The 26-week cumulation yields a first-stage F-statistic of only 9.8, whereas the corresponding first-stage F-statistic for cumulative TGA surprises is about 90. This difference likely reflects the larger magnitude of TGA surprise innovations relative to T-bills, which provides more identifying variation for the instrument.