Demand for Safety in the Crypto Ecosystem*

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ABSTRACT

We study the demand for safety and liquidity in the crypto ecosystem. In an environment lacking frictionless access to traditional safe assets, we examine whether stablecoin lending pools provide liquidity services to investors. To do so, we develop a model in which a representative investor allocates liquidity between stablecoin lending pool deposits and traditional safe assets (e.g., MMF shares). The model delivers three predictions: (i) the stablecoin premium co-moves positively with the Treasury premium when investors value liquidity services of stablecoin pools, (ii) Treasury scarcity increases the stablecoin premium, and (iii) declines in the perceived liquidity of stablecoin pools — e.g., due to de-pegs or hacker attacks — reduce their premium. Our empirical results provide evidence consistent with these predictions. They suggest that investors treat stablecoin lending pools as money-like instruments and that shocks to traditional safe assets transmit to crypto markets. Our findings contribute to the literature on safe assets by showing how safety is intermediated in crypto markets. They also offer new insights into the segmentation and structure of decentralized finance (DeFi) as it evolves alongside traditional financial systems.

Keywords: Safe Assets, Demand for Safety, FinTech, Cryptocurrencies, Decentralized Finance, Institutional Demand.

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1 Introduction

Safe assets are key to any financial system. These are usually short-term assets issued by governments or systemically important financial institutions and serve as a store of value or collateral (Gorton, 2017). When the public supply of safe assets is insufficient to satisfy investors' demand, the private sector produces imperfect substitutes (Krishnamurthy and Vissing-Jorgensen, 2015). These substitutes are inherently riskier, as they lack the same level of liquidity, creditworthiness, and backing as their traditional counterparts. Their safe-asset status relies more heavily on investor confidence and market conditions (Nagel, 2016; Moreira and Savov, 2017; Cipriani and La Spada, 2021).

This paper investigates the demand for safety and liquidity in a new, largely unregulated, and highly volatile environment: digital asset (crypto) markets. Crypto assets lack the defining characteristics of traditional safe assets: they have highly risky payoffs and cannot rely on backing from a government or a regulated financial institution. Within this poorly-understood ecosystem, it is unclear which assets, if any, can cater to investors' demand for safety services. Critically, crypto investors cannot frictionlessly resort to traditional safe asset classes due to costs associated with exiting and re-entering the system — once capital is allocated within the ecosystem, investors may seek a safe equivalent inside it.[1] Moreover, many crypto-native funds operate under restrictive mandates that limit their deployment of capital to digital assets, often to satisfy specific regulatory requirements or to maintain a specialized investment focus.[2] Identifying and scrutinizing assets that provide safety and liquidity services to investors is a fundamental question for understanding the evolution of the crypto ecosystem. Understanding their dynamics may also shed light into the growing integration between crypto and traditional markets, particularly money markets.[3]

Specifically, we investigate whether decentralized (DeFi) lending pools can serve as safe assets within the crypto ecosystem. Stablecoin lending pools are often presented as low-risk investments in the crypto ecosystem. These assets have relatively low counterparty risk combined with a number of risk-mitigation features, while offering some safety services (e.g., safe cash flows, store of value).[4] In these pools, crypto investors deposit tokens (e.g., BTC, ETH,

[1]These high costs are acknowledged by investors (Fidelity Digital Assets, 2022) and include deposit and withdrawal fees, tax scrutiny on capital gains, and high regulatory uncertainty (De Simone et al., 2024; Cong et al., 2023; Campello et al., 2024; Gorton et al., 2022).

[2]Examples of these firms include Pantera Capital, Polychain Capital, and Paradigm.

[3]We use both the term safety and liquidity, acknowledging their close conceptual and empirical entanglement. The distinction between the two is known to be difficult in the context of traditional safe assets, and even more so in crypto markets, where instruments feature immediate on-chain redeemability but face structurally higher costs of conversion into fiat liquidity. For simplicity, we refer to crypto investor demand for "safety and liquidity services" in a manner analogous to investors' demand for money market funds' shares.

[4]Investors have increasingly preferred DeFi over centralized exchanges (CEXs). This shift is driven

stablecoins) and obtain a real-time rate called annualized percentage yield (APY) with the option to withdraw at any time. Pools are able to pay an APY as deposited tokens can be borrowed against over-collateralized loans (FSB, 2023; Cornelli et al., 2024). Differently from other DeFi products, lending pools incorporate specific features that resemble private safe assets, such as overcollateralization and pooling of collateral, that are meant to minimize liquidity and counterparty risk. Crucially, when investors deposit stablecoins, they not only benefit from these mechanisms but also from the price stability of stablecoins itself. Stablecoin value is supported by their collateral, primarily held in U.S. Treasuries (see Cornelli et al. (2024)).

To guide our analysis, we develop a simple model with a representative investor who allocates liquidity between traditional safe liquid assets (e.g., money market fund shares) and stablecoin lending pools — these two investable assets provide liquidity services. The model yields three main testable predictions. First, the premium on stablecoin lending pool deposits — defined as the spread between the stablecoin deposit return and a benchmark rate — moves positively with the Treasury premium, as long as investors value liquidity services of lending pools. Specifically, when Treasury securities become relatively more attractive, all assets valued for their liquidity (including stablecoin deposits) must offer higher returns to remain competitive. Second, an increase in Treasury scarcity increases the stablecoin premium. The reason is that a reduction in the supply of Treasuries available to private intermediaries impairs their ability to provide liquidity services. As a result, intermediaries like money market funds respond by offering lower returns, and, to clear the market, stablecoin deposits must also offer lower returns. Notably, this mechanism captures how Treasury scarcity transmits to crypto-native liquid instruments. Third, a decrease in the liquidity weight of stablecoin lending pool deposits lowers their premium — when liquidity weights fall, investors derive fewer liquidity benefits from holding these deposits. In practice, as we show below, such declines often result from adverse shocks to perceived liquidity, including stablecoin de-pegs, security breaches, or spikes in market-wide uncertainty.

We put together new, granular data to empirically investigate the predictions of our model. We start by collecting daily data on DeFi pools from the DefiLlama API from February 2022 through December 2024. These data cover all lending and non-lending pools that include the three key stablecoins (USDT, USDC, and DAI), the two main crypto assets (BTC and ETH), as well as their synthetic representations (e.g., WBTC, M.USDC), together with various asset class combinations (e.g, USDT-USDC). Beyond standard characteristics such as blockchain, protocol, and token denomination, we also have information

by DeFi's greater transparency, self-custody features, and lower counterparty risk. The collapse of the centralized exchange FTX further accelerated this trend, prompting investors to migrate toward self-custodial DeFi protocols, such as Uniswap.

regarding the category of the pool (i.e., lending *vs.* non-lending), and whether it is classified as a stablecoin pool. We complement our initial data by sourcing additional information from Refinitiv, CoinGecko API, FRED, the US Treasury, and the US Fiscal data, among others. Our final sample contains 91,811 weekly observations that encompass 1,359 pools, 194 protocols/projects, 44 blockchains, and 669 token denominations.

In our main empirical analysis, we test whether the stablecoin premium, measured as a difference between the 3-month overnight indexed swap (OIS) rate and the return on stablecoin lending-pool deposits (APY), moves with the Treasury premium, measured by the 3-month Treasury premium. This OIS–T-bill spread proxy follows Sunderam (2015), but our results are robust to other definitions of the Treasury premium. As the model suggests, we also include the total amount of Treasury held by private investors to assess the response of the stablecoin premium to Treasury scarcity. In all specifications, we employ a wide range of fixed effects at the protocol, blockchain, token denomination, and week levels to isolate the demand for safety and liquidity from variation coming from pools' differences over time.

Our empirical results confirm the model's predictions. First, consistent with the view that stablecoin lending pool deposits offer safety and liquidity services, we document a positive and significant co-movement between the stablecoin premium and the Treasury premium. This relationship is concentrated in lending-based stablecoin pools and is absent for BTC- and ETH-denominated pools, suggesting that the liquidity properties are specific to stablecoin-denominated claims.[5] For stablecoin lending pools, the effects are economically sizable as a one standard deviation increase in the Treasury premium (i.e., 0.13) leads to an increase in the stablecoin premium of 0.38; 25% of its unconditional mean of –1.4. Second, we find that a decline in the public float of Treasuries is associated with an increase in the stablecoin premium, consistent with the notion that Treasury scarcity raises the shadow price of liquid instruments. Finally, we show that the stablecoin premium is sensitive to shifts in liquidity preferences: during episodes of stress in the stablecoin market (e.g., SVB run, Terra collapse), elevated aggregate uncertainty (VIX), or protocol-specific hacker attacks, the positive co-movement between Treasury and stablecoin premia is attenuated.

Our baseline empirical strategy implicitly assumes that there are no omitted factors simultaneously driving both the Treasury premium and variations in DeFi market yields through channels unrelated to the demand for liquidity and safety services. To alleviate identification concerns, we instrument the Treasury premium with FED's short-term interventions in Treasury markets, mainly via its Reverse Repo facility. The relevance condition requires that the FED's Reverse Repo facility affects the Treasury premium (d'Avernas and

[5]This result is particularly revealing because BTC- and ETH-denominated pools are often used by speculators in the crypto ecosystem. We discuss how speculative motives could affect our results below.

Vandeweyer, 2024), which is verified in the data. The exclusion restriction assumes that weekly FED interventions influence the stablecoin premium only through their impact on Treasury markets. We argue that this is plausible given the segmentation between Treasury markets and lending-pool markets. Indeed, neither stablecoin issuers nor lending pools have access to the FED balance sheet. In practice, we use two main instruments for the Treasury premium: the first is the amount of FED's overnight repos; and the second is the cumulative net reverse repo amounts, calculated as the weekly cumulative sum of overnight reverse repos minus the weekly cumulative amount of FED repos. Both of these tests confirm our results.

We then exploit the rich cross-sectional variation in DeFi pools. The advantage of our cross-sectional tests is that they allow us to include time fixed effects, which control for any time-varying factors that affect all lending pools equally. Specifically, we examine how pool characteristics — including the underlying token, category (e.g., lending vs. staking), protocol size (e.g., large vs. small) and hosting blockchain — influence their sensitivity to the Treasury premium and supply. Our prediction is that pools providing greater liquidity services should exhibit stronger co-movement with the Treasury premium and be more affected by Treasury scarcity.

First, we look at token heterogeneity. The stablecoin market is dominated by a few key players (USDT, USDC, and DAI), each with unique characteristics regarding governance structures, redeemability and liquidity, transparency, regulatory alignment, and, importantly, backing from traditional financial institutions. For instance, USDC is issued by Circle, a US company that adheres to US regulatory standards and provides monthly attestations from a major accounting firm to verify its reserves. Circle also collaborates with traditional financial institutions like Blackrock.[6] In contrast, USDT was registered in the British Virgin Islands, and recently 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 USDT's reserves.[7] Notably, USDT's size is over three times that of USDC.

On the one hand, we might expect only pools whose deposits are denominated in stablecoins with greater transparency and backing from reputable financial institutions to respond to the Treasury premium. On the other hand, segmentation in the market might drive some investors to prefer USDT for additional benefits (e.g., lower KYC). In our empirical analysis, we find that the stablecoin premium of lending pools denominated in each of the three major tokens co-moves positively and significantly with the Treasury premium. The estimated co-

[6] Circle's reserves are managed by Blackrock "Circle Reserve Fund."

[7] These distinctions are evidenced by S&P Global Ratings, which evaluate the capacity of each stablecoin to maintain its peg to the US dollar. S&P Global assigns USDT a rating of 5 (weak), suggesting severe limitations in its stability relative to the peg, whereas USDC receives a rating of 2 (strong).

efficients are quantitatively similar across tokens, despite their institutional differences. This lack of differential pricing suggests that investors do not exhibit a strict preference for the most transparent stablecoins when seeking safety and liquidity services. Rather, the results are more likely consistent with a segmented market structure, in which distinct investor groups rely on different stablecoins features when seeking safety and liquidity investments.

Second, we explore heterogeneity across pool categories. Our model focuses on the DeFi category "lending," and we empirically show that lending pools have a significantly larger response to the Treasury premium, *vis-à-vis* non-lending pools. However, we cannot exclude that the yields on other types of DeFi investments co-move with the Treasury premium through alternative mechanisms not explicitly captured in our model. For this test, we focus on the largest DeFi category, "staking," which includes both traditional and liquid staking pools. We find no significant co-movement between staking yields and the Treasury premium, suggesting that staking protocols do not offer safety or liquidity services. Instead, staking yields increase with Treasury supply, consistent with investors reallocating toward riskier, higher-yielding opportunities as safe asset availability rises.

Next, we examine heterogeneity across protocols, using protocol size as a proxy for their ability to offer safety and liquidity services. Pools hosted by larger protocols are associated with deeper liquidity, broader user bases, and stronger integration with the DeFi system. We find that the co-movement between the stablecoin premium and the Treasury premium is concentrated among pools of the largest protocols, particularly Aave and Compound. However, when restricting the sample to stablecoin lending pools, these differences largely vanish, suggesting that within this more homogeneous category, protocol size plays a limited role. Notably, some large protocols, such as JustLend, exhibit a negative response to the Treasury premium. This is consistent with investors reallocating away from platforms perceived as riskier due to lower transparency, weaker governance, or more centralized design. These findings point to segmentation within DeFi lending markets along institutional and protocol-level dimensions. Finally, we also examine heterogeneity across blockchains. We find that the co-movement between the stablecoin premium and the Treasury premium is strongest for pools hosted on Ethereum, consistent with its central role in DeFi markets. In contrast, pools on Tron exhibit weaker or even negative responses, in line with the response of their main protocols (e.g., JustLend on Tron).

Our paper contributes to the literature on safe assets by shedding light on what assets provide safety and liquidity services in a new unregulated environment where assets are designed with different characteristics from traditional ones. This strand of literature started by focusing on government-issued safe assets (see, among others, 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. Some studies have focused on safe assets issued by traditional financial institutions, such as banks (Krishnamurthy and Vissing-Jorgensen, 2015), while others have examined those created by shadow banks (Sunderam, 2015). Kacperczyk et al. (2021) investigate the safety properties of French certificates of deposits and document that their supply responds positively to excess safety demand. More recently, Mota (2023) enlarged the scope of this literature by investigating the role of corporates in providing quasi-safe assets. Vuillemey (2024) provides evidence that the demand for safe stores of value underpins not only key characteristics of debt markets but also the institutional evolution of equity markets, notably the adoption of limited liability.

Our paper also relates to the burgeoning research work on decentralized finance and crypto assets.[8] A seminal contribution to this literature is by Liu et al. (2023), who document the economics of lending protocols and what led to the crash of the Terra-Luna ecosystem. Rivera et al. (2023) study how lending platforms set interest rates as a function of pool utilization rates, while Cornelli et al. (2024) document the main drivers of DeFi investors by using granular data from Aave-v2. Other studies have focused on the functions, leverage, and collateral liquidation of lending protocols (Chiu et al., 2022; Carapella et al., 2022; Lehar and Parlour, 2022; Saengchote, 2023; Heimbach and Huang, 2024). Another branch of literature focuses on the macro and trading aspects of these ecosystems (e.g., Chiu and Koeppl, 2019; Chiu and Monnet, 2024; Capponi et al., 2024; Copestake et al., 2024). On the features of stablecoins, Gorton et al. (2022) study banknotes from the free-banking era and stablecoins as private money to investigate whether the forces that generated positive convenience yield on banknotes also apply to stablecoins. Finally, Anadu et al. (2023) provide evidence that stablecoins exhibit flight-to-safety dynamics, akin to money market funds, particularly during periods of heightened Bitcoin volatility.

Our contribution is to provide a theoretical and empirical framework for understanding how stablecoin lending pools can respond to investors' demand for safety and liquidity in an environment that lacks traditional institutional guarantees. While existing research has focused on the technological and financial innovation of DeFi, we highlight its potential to replicate some of the functions of safe assets through endogenous yield adjustments and institutional design. Our model delivers clear predictions that we test using high-frequency data across a broad cross-section of DeFi protocols and pools. The evidence we bring to bear is novel in showing that the stablecoin premium co-moves with the Treasury premium, rises with Treasury scarcity, and responds to shifts in liquidity preferences, — behaviors consistent with safe asset characteristics. In documenting these dynamics, we advance the

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

understanding of how safety is intermediated in crypto markets and offer new insights into the segmentation and structure of DeFi as it matures alongside traditional financial systems.

2 DeFi Lending Pools

Let us discuss the institutional characteristics of the DeFi ecosystem, with a particular focus on DeFi lending. DeFi, short for decentralized finance, refers to a financial system built on blockchain technology that enables users to lend, borrow, and trade digital assets without intermediaries like banks. DeFi lending protocols, such as Aave, allow users to deposit cryptocurrencies into lending pools, where they can earn interest from borrowers who take out loans (Cornelli et al., 2024). A key feature of DeFi lending is the interest paid to depositors, often expressed as the Annual Percentage Yield (APY). APY reflects the real rate of return earned on an investment, taking into account compound interest over a year. In Aave, one of the largest lending protocols, users who deposit stablecoins like USDC or DAI may see an APY ranging from 0% to 62%, depending on the supply and demand within the pool. Crucially, the APY fluctuates based on how much capital is borrowed with respect to the amount available in the pool, which is called "utilization rate" (Rivera et al., 2023). When more investors deposit funds than borrow, this increases the total capital supply and thus the APY decreases. Conversely, when fewer funds are available, APY increases as borrowers compete for access to the limited capital, driving up interest rates.[9]

DeFi lending is typically characterized by the absence of fixed maturities for deposits and loans, unlike traditional financial systems. Depositors can withdraw their funds at any time, provided there is sufficient liquidity in the pool, which allows for flexible lending terms. Borrowers, similarly, can repay loans on-demand without strict repayment schedules, though they must maintain collateral above a certain threshold to avoid liquidation.

Another important metric in DeFi is Total Value Locked (TVL), which refers to the market value of all tokens deposited in a pool and serves as a measure of the protocol's scale and popularity. The TVL is commonly used to signal the size and attractiveness of a pool, often serving as a marketing tool for DeFi protocols. Nevertheless, the TVL is a noisy measure prone to double-counting (Saggese et al., 2025; Aquilina et al., 2023; FSB, 2023; ESMA and EBA, 2025). For this reason, we will use the APY for our main analysis.

To participate in DeFi lending, users typically deposit assets by connecting their crypto wallets to a DeFi protocol like Aave, selecting an asset to lend, and confirming the transaction on the blockchain. The deposited funds are pooled with others, and borrowers can take loans from this pool by providing collateral, which is often over-collateralized to mitigate

[9] See Cornelli et al. (2024) for a detailed explanation of the dynamic interest rate mechanisms in Aave.

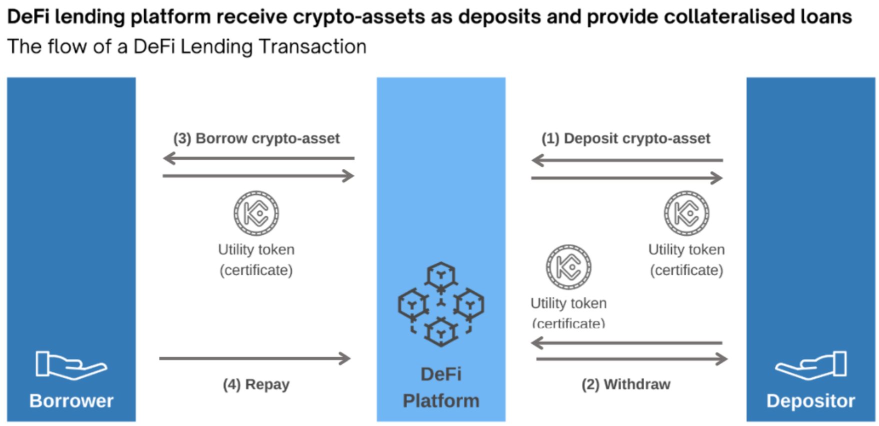

Figure 1: Source: Financial Stability Board (FSB, 2023) "The Financial Stability Risks of Decentralised Finance"

the risk of default. Additionally, protocols like Aave employ mechanisms such as automated liquidations and the "Safety Module" (a reserve fund) to reduce risk for depositors (such as smart contract risk, and liquidation risk) and ensure the safety of their assets in times of market stress or smart contract vulnerabilities.[10]

Figure 1 details the flow of a Defi lending transaction (FSB, 2023). For our research, it is essential to understand the sources of variation in the APY received by investors when depositing in DeFi protocols. In Aave, interest accrual for depositors is facilitated through aTokens, a form of interest-bearing tokens that are minted when users deposit assets into Aave's lending pools. These aTokens represent the depositor's claim on the underlying asset, plus any interest earned, and are key to tracking the accumulation of interest over time.[11]

When users deposit assets such as USDC or DAI, they receive an equivalent amount of aTokens (e.g., aUSDC or aDAI) in return. The value of aTokens remains constant relative to the deposited asset (1 aUSDC = 1 USDC), but the balance of aTokens in a depositor's wallet increases continuously as interest is earned. This increase reflects the APY, which is dynamically adjusted based on the supply and demand of the asset in the pool. The APY accrues in real-time, with the interest being continuously compounded and reflected in the growing balance of aTokens. Unlike traditional finance, where the interest might be credited periodically, in Aave, the compounding process is automated and is provided block by block, as each new Ethereum block is mined. This means that the interest earned is integrated into the balance of aTokens, and depositors can withdraw not only their principal but also any accrued interest at any time.[12] Moreover, aTokens can be transferred or used in other DeFi

[10]For further details, see `https://aave.com/docs/primitives/safety-module`.
[11]For further details, see `https://aave.com/docs/developers/smart-contracts/tokenization`.
[12]For example, if an investor deposits 1,000 USDC into Aave with an APY of 5%, they receive 1,000 aUSDC. As interest accrues, their aUSDC balance gradually increases over time. After one year, assuming

applications, so that the accrued interest is accessible at all times.

3 Model

We develop a simple model meant to describe a representative investor who optimizes liquidity holdings by investing in both traditional safe liquid assets (e.g., money market funds) and crypto assets. The model characterizes the co-movement between the Treasury premium and the stablecoin premium. We define the Treasury premium 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 analogous spread for stablecoin lending pool deposits.

The key mechanism we model is the substitutability of liquidity provision between traditional and crypto markets. Treasuries are special because financial intermediaries hold them to facilitate the issuance of liquid liabilities. This specialness determines the Treasury premium, which transmits to the prices of liquid liabilities issued against Treasury collateral. When stablecoins provide an alternative source of liquidity, their price will be influenced by the outstanding amount of Treasuries and the Treasury premium. Of course, other forces influence these asset prices; for simplicity, 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 lending pool deposits. We use MMF shares to represent traditional assets that provide safety services; other examples include bank deposits and direct holdings of Treasury securities. 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

the APY remains stable at 5%, the depositor's aUSDC balance will reflect a 5% increase, resulting in approximately 1,050 aUSDC. The depositor can redeem these aTokens for an equivalent amount of USDC at any time, with the accumulated interest already accounted for.

indexed by $i \in \{m, s\}$ and pay gross returns R^i_{t+1}. We also consider two additional assets in the economy: Treasury bills in exogenous supply with risk-free gross return R^T_{t+1}, and outside assets with return R^a_{t+1}. The returns of the outside asset can be interpreted as a risk-adjusted return of risky assets that do not provide liquidity services (e.g., corporate bonds).

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; therefore, they need to hold liquid assets. After experiencing adverse funding 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 help mitigate this liquidity 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 $B^L_t \equiv B_t - \bar{X}_t$. If b^m_t and b^s_t denote Treasury holdings of the MMF and the SCI, respectively. Market clearing is given by

$$b^m_t + b^s_t = B^L_t. \tag{1}$$

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: money market fund (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 gross return R^i_{t+1} 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:

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

At the beginning of period t, the investor holds total wealth 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

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

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

$$\max_{\{c_t, m_t, s_t(\cdot), a_t\}_{t\geq 0}} \mathbb{E}_0\left[\sum_{t=0}^{\infty} \beta^t U(c_t, L_t)\right] \tag{5}$$

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

$$a_t = w_t - c_t - m_t - \int_0^1 s_t(n)\, dn \geq 0. \tag{6}$$

Let λ^c_{t+1} denote the marginal utility of next-period 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:

$$\left(\frac{s_t(n)}{m_t}\right)^{1/\sigma} = \frac{\alpha_t(n)}{1-\alpha_t}\, \frac{y^m_t + \tilde{\lambda}_t}{y^s_t(n) + \tilde{\lambda}_t}, \tag{7}$$

where

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

We refer to y^m_t as the MMF premium and $y^s_t(n)$ as the crypto premium. The relative demand equation (7) 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 crypto premia. When the MMF premium (y^m_t) rises relative to the crypto premium ($y^s_t(n)$), investors substitute away from MMF shares toward stablecoin deposits, with the magnitude governed by the preference weight $\alpha_t(n)/(1-\alpha_t)$ 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 this constraint binds ($\tilde{\lambda}_t > 0$), investors face a tighter budget and cannot freely adjust their overall exposure to liquid assets, amplifying the co-movement between traditional and crypto premia. Investors' willingness to substitute between MMF and crypto assets in their provision of liquidity services is the key mechanism through which shocks to liquidity premia propagate across traditional and crypto markets.

3.3 MMFs

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

$$\omega_{bt}^m + \omega_{at}^m = 1. \tag{8}$$

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

$$c_t(\omega_{bt}^m), \qquad c_t \geq 0, \quad c_t'(\omega_{bt}^m) \leq 0, \tag{9}$$

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

$$\pi_m^{\text{unit}} = \omega_{bt}^m R_T + (1 - \omega_{bt}^m) R_a - c_t(\omega_{bt}^m) - R_m. \tag{10}$$

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

$$y_t^m = \omega_{bt}^m y_t^T + c_t(\omega_{bt}^m) \tag{11}$$

where $y_t^T \equiv R_{t+1}^a - R_{t+1}^T$ is the Treasury premium. We assume that ω_{bt}^m is exogenously set by regulation.

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. Therefore, Treasuries may command a liquidity and safety premium.

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 $k(s_t)$ per unit of coins issued. We assume that $k(.)$ is monotonic and convex.

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

$$\omega^s_{bt} + \omega^s_{at} = 1. \tag{12}$$

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

$$c^s_t(\omega^s_{bt}), \qquad c^s_t(\cdot) \geq 0, \quad (c^s_t)'(\cdot) \leq 0, \tag{13}$$

Net revenue per unit of assets combines portfolio returns, liquidity costs, and the cost of servicing stablecoin liabilities:

$$\pi^{\text{unit}}_{st} = \omega^s_{bt} R_{Tt} + (1 - \omega^s_{bt}) R_{at} - c^s_t(\omega^s_{bt}) - \kappa(s_t). \tag{14}$$

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

$$\omega^s_{bt}(R^T_t - R^a_t) - c^s_t(\omega^s_{bt}) + R^a_t - \kappa(s_t) = 0. \tag{15}$$

We assume that ω^s_{bt} is fixed 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 competitive monopolist 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 gross rates. First, the lending (borrower) inverse demand

$$R^\ell_t(n) = f_t\big(d_t(n)\big),$$

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:

$$d_t(n) = \kappa_t(n)\, s_t(n), \qquad \kappa_t(n) \in (0, 1] \text{ exogenous.} \tag{16}$$

The pool's per-period profit is therefore

$$\pi_t(n) = f_t\big(d_t(n)\big)\, d_t(n) - g_t\big(s_t(n)\big)\, s_t(n). \tag{17}$$

Substituting (16) gives profit as a function of deposit scale:

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

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

$$\max_{s_t(n)\geq 0}\ \pi_t(n). \tag{19}$$

We do not explicitly model the optimization problem of SCLPs, as doing so is not necessary to derive the propositions of interest in this paper. What matters for our purposes is that, when loan demand is sufficiently high, an SCLP may optimally set the deposit rate $R^s(n)$ at a level that exceeds the return on the outside asset, R^a. In this case, the stablecoin premium, $y^s(n)$, 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 $\int_0^1 s_t(n)\, dn \leq s_t$.

3.6 Equilibrium

An equilibrium is a sequence

$$\big(m_t,\ s_t(\cdot),\ R_t^m,\ R_t^s(\cdot),\ R_t^T\big)_{t\geq 0}$$

such that investor demands m_t and $s_t(n)$ satisfy the investor's first-order conditions and relative demand expressions, given the asset premium ($y_t^i = R_{t+1}^a - R_{t+1}^i$); the intermediary zero-profit conditions for the MMF and SCI hold; SCLP and the Treasury market clear.

Define the pool-n share of aggregate stablecoin deposits as

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

and $Q^n(B_t^L) = \varphi_t(n)\, \frac{1}{\omega_{bt}^s} \left(\frac{B_t^L}{m_t} - \omega_{bt}^m \right)$ and $\tilde{R}_t^i = y_t^i + \tilde{\lambda}_t$, for $i \in \{m, s\}$.

In equilibrium, we have

$$\frac{\alpha_t(n)}{1-\alpha_t} \frac{\tilde{R}_{t+1}^m}{\tilde{R}_{t+1}^s(n)} = \left[\, Q^n(B_t^L) \,\right]^{1/\sigma}. \tag{20}$$

We seek 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 (20). However, we recognize 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_{t+1}^a of an asset that is risk-free and provides zero safety services; and 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.

Let $b_t \equiv \log B_t$. For tractability, we assume time-invariant shares and portfolio weights: $\varphi_t(n) = \varphi(n)$, $\omega_{bt} = \omega_b$, $\omega_{st} = \omega_s$, and $m_t = m$. That is, the distribution of deposits across pools, the Treasury portfolio weights, and the MMF sector's aggregate size are fixed at their steady-state values.[13]

The linearized equilibrium condition gives the following expression connecting the stablecoin premium, Treasury premium, and Treasury supply:

$$y_t^s(n) \approx \frac{\alpha_t(n)}{1-\alpha_t}\, \delta_{TR}\ \ y_t^T - \frac{\alpha_t(n)}{1-\alpha_t}\, \delta_b\ \ b_t + \delta_t + \delta_{nt}. \tag{21}$$

[13] This simplifying assumption is supported by empirical evidence showing that both money market funds and major stablecoins (such as USDC and USDT) maintain relatively stable allocations to Treasuries or other liquid assets over time (see, for instance, BlackRock, 2025; U.S. Securities and Exchange Commission, 2025; S&P Global Ratings, 2025).

where the coefficients are defined as follows:

$$\delta_{TR} \equiv \omega_m \left(q^n(\bar{b})\right)^{-1/\sigma}, \tag{22}$$

$$\delta_b \equiv \frac{1}{\sigma}\bar{R}^m \left(q^n(\bar{b})\right)^{-(1+\sigma)/\sigma} \frac{\partial q^n}{\partial b_t}(\bar{b}), \tag{23}$$

$$\delta_t \equiv \tilde{\lambda}_{t+1}\left(\delta_m - 1\right) + c_t^m(\omega_m), \tag{24}$$

$$\delta_{nt} \equiv \frac{\alpha_t(n)}{1-\alpha_t}\delta_m \bar{R}^m + \frac{\alpha_t(n)}{1-\alpha_t}\delta_b \bar{b}. \tag{25}$$

3.7 Testable Predictions

Proposition 1 (Co-movement of Rates) *In equilibrium, the premium on stablecoin lending pool deposits, y_t^s, co-moves positively with the Treasury premium, y_t^T, as long as investors value the liquidity services provided by these deposits ($\alpha_t(n) > 0$).*

An increase in the Treasury premium, i.e., a decline in R^T relative to R^a, raises the opportunity cost of holding liquid claims. Money market funds are indifferent only if their offered rate R^m adjusts downward. Through investors' demand for liquidity services, this higher opportunity cost is transmitted to all money-like instruments, including stablecoin lending pool deposits. As a result, stablecoin lending pools also offer lower APYs in equilibrium, generating positive co-movement between stablecoin premium and Treasury premium. Notice that if the coin does not provide liquidity services, so that $\alpha_t(n) = 0$, there is no co-movement between the two rates.

Corollary 1 (Cross-Sectional Heterogeneity across SCLP) *For a given Treasury premium variation, the response of the stablecoin premium is increasing in $\alpha_t(n)$. That is, SCLP deposits providing higher liquidity services exhibit larger premium adjustments.*

The corollary follows directly from equation (21), where the sensitivity of the stablecoin premium $y_t^s(n)$ to the Treasury premium y_t^T is given by $\frac{\alpha_t(n)}{1-\alpha_t}\delta_{TR}$. This coefficient is increasing in $\alpha_t(n)$, which measures the liquidity services provided by SCLP deposit n. The economic mechanism is as follows: When the Treasury premium rises (Treasuries become more "special"), liquidity provision by intermediaries decreases. Therefore, investors seek alternative sources of liquidity and eventually hold assets that are closer substitute of liquid assets, namely those with larger $\alpha_t(n)$. Consequently, when liquidity becomes more expensive, investors bid up the prices of high-liquidity SCLP deposits more aggressively, driving their premia higher.

The cross-sectional dispersion in stablecoin premia thus reflects heterogeneity in liquidity provision: deposits offering superior liquidity services command larger premia precisely when traditional safe asset liquidity becomes scarce. This prediction allows us to test the substitutability mechanism empirically by examining whether high-liquidity SCLP deposits exhibit greater sensitivity to Treasury premium shocks than low-liquidity deposits.

Proposition 2 (Treasury Scarcity) *A decrease in the free float of Treasuries, B_t^L, increases the premium of stablecoin lending pool deposits. Equivalently, in equilibrium, the APY offered by stablecoin lending pools, R_{t+1}^s, must drop relative to the benchmark rate R_{t+1}^a.*

A reduction in the supply of Treasuries available to private intermediaries impairs their ability to provide liquidity services. As a result, intermediaries like money market funds respond by offering lower returns, R_t^m. To clear the market, stablecoin deposits must also offer lower returns, leading to lower equilibrium APYs. This mechanism captures how Treasury scarcity transmits to crypto-native liquid instruments.

Proposition 3 (Market Uncertainty and Liquidity Preferences) *Holding all else constant, a decrease in the liquidity weight of deposits in stablecoin lending pool n, $\alpha_t(n)$, reduces the premium of those deposits. That is, to clear the market, the APY offered by the pool, R_t^s, must increase relative to the return on the outside asset, R_{t+1}^a.*

In the model, $\alpha_t(n)$ captures the extent to which deposit n in a stablecoin lending pool provides liquidity services. When $\alpha_t(n)$ is low, investors derive fewer liquidity benefits from holding that deposit and therefore require a higher return as compensation. In equilibrium, this results in a higher APY relative to the return on the outside asset. In practice, episodes of market stress, such as crypto-specific shocks, security breaches, or spikes in market-wide uncertainty, can represent adverse shocks to the perceived liquidity of stablecoin lending pools, sharply reducing their ability to provide liquidity services and push APYs upward.

4 Data and Descriptive Statistics

4.1 Data

We collected daily data on all lending and non-lending pools from DefiLlama API for the longest time series available, namely from February 2022 to December 2024. We filtered pools that include at least one of the key stablecoins, USDT, USDC, and DAI, and the two largest cryptos, BTC and ETH, as well as their synthetic representations (e.g., WBTC, M.USDC). For each pool, we know the identity of the protocol that operates it — also called "project" — (e.g., Aave, Compound) and the blockchain hosting the pool (e.g., Ethereum). A single protocol can have multiple pools on different chains. Each pool has a certain token denomination that can be "single" (sometimes called single-name pools), so only one token can be deposited (e.g., USDT), or "multiple," when investors can deposit multiple tokens in the same pool (e.g., USDT-USDC). DeFiLlama also provides a variable that categorizes pools as either stablecoin pools or non-stablecoin pools. The dataset includes various pool characteristics, such as the DeFi category (e.g., lending, staking, dexes, etc.).

We cleaned the data by discarding pools for which the category is "cross-chain" (to avoid double counting), "unknown," or is related to NFTs. We drop pools whose APY is above the 95% percentile of the aggregate APY distribution (i.e., above 118.08), and retain only the top 25% largest pools that account for more than 98% of total value locked of the Defi ecosystem.

We complement the data on market capitalizations at the token level from CoinGecko API. Bitcoin volatility is from T3Index. Data regarding T-bill yields, federal fund rates, VIX, and reverse repo facilities is from FRED, OIS rates are from Eikon/Refinitiv, whereas the amount of Treasury outstanding held by private investors is from the US Fiscal Data. Hacker attacks are from DefiLlama. Finally, the dataset is collapsed from daily to weekly frequency by taking the last NYSE trading day of the week. The final sample at the weekly level encompasses 91,811 observations, 1,359 pools, 194 protocols, 44 blockchains, and 669 symbols.

4.2 Summary Statistics

Table 1 reports the summary statistics for the variables used in our empirical analysis. The frequency is weekly and the time ranges from February 2022 to December 2024. In the top panel, we show the figures for the entire sample, whereas in the two bottom ones, for added insight, we split the sample between stablecoin and non-stablecoin lending pools.

The sample is fairly evenly split between stablecoin and non-stablecoin pools. On average, the APY for non-stablecoin pools is about half the APY of stablecoin pools. This is most likely due to the volumes of both the pool (TVL) and of the cumulative total market capitalization of the tokens in these pools (e.g., BTC and ETH) being much higher, and this might bring down the APY since such tokens are not "scarce." Additionally, investors in non-stablecoin pools also obtain a yield when using their tokens for speculative purposes.

In Table 2, we report the unique values of pools, blockchains, and symbols/tokens for different subsamples as we use these dimensions both for our fixed effects and for our heterogeneity analysis. Notably, the distribution is relatively uniform across subsamples, which means that we do not have a concentration of unique characteristics (e.g., chains or protocols) in some specific subsamples.

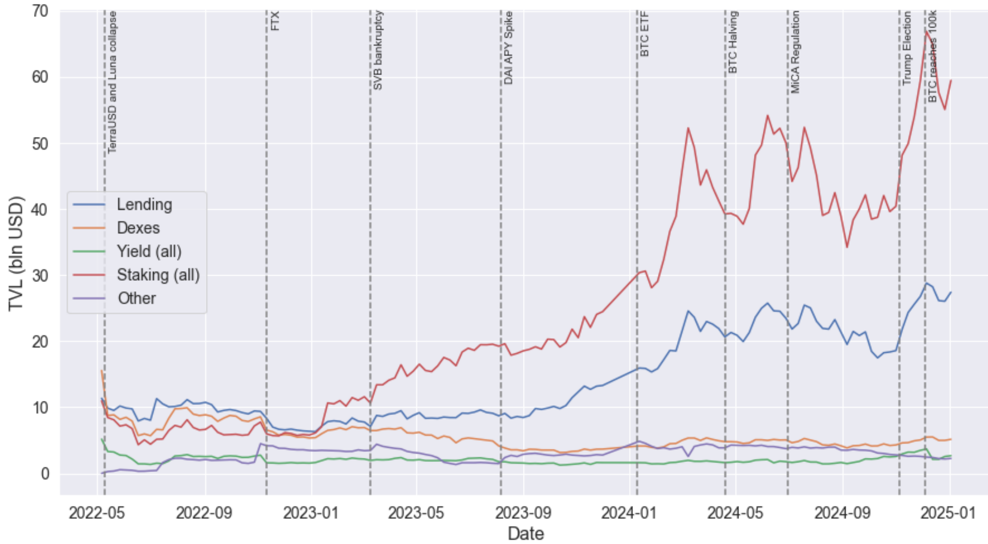

Figure 2: Total Value Locked (TVL) over time by category.

To convey the relative importance of the various categories, Figure 2 displays the time series evolution of TVL by category. Staking pools have the largest market share with roughly 60 bln USD at the end of 2024, followed by lending pools with almost 30 bln USD. TVL is measured as the total amount deposited in the pools, multiplied by the current price of the tokens. As a result, its value fluctuates with market prices, which is particularly relevant for non-stablecoin pools, such as ETH staking pools.

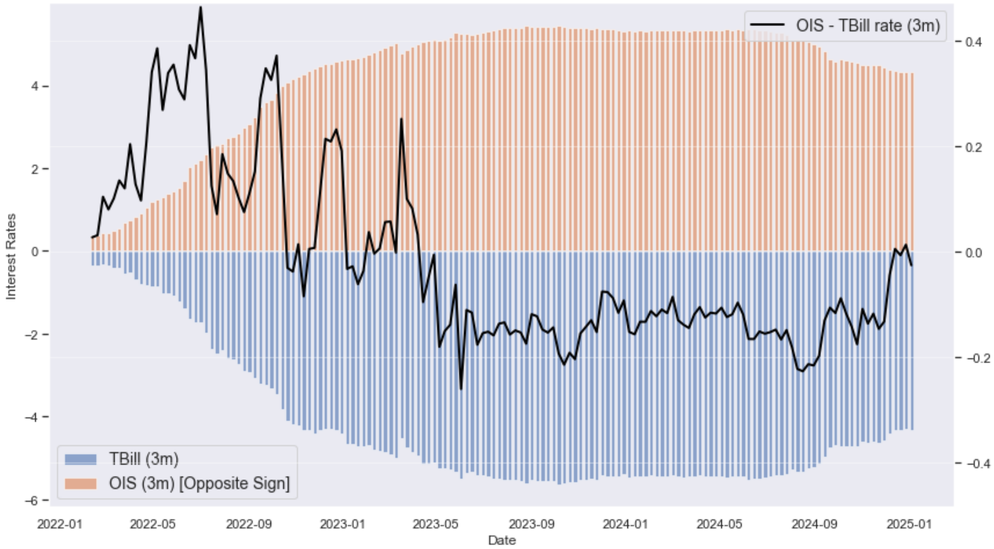

Figure 3: 3–month OIS rate and 3–month TBill rate [opposite sign] on the left axis and 3–month Treasury premium (OIS minus TBill rate) on the right axis.

Figure 3 shows the Treasury premium as well as its components, namely the 3–month T-bill yield and the 3-month OIS rate. The Treasury premium captures the return investors are willing to forgo in exchange for the safety and liquidity services provided by government securities. The OIS rate is a measure of the expected federal funds rate in a given period. Crucially, OIS contracts are highly liquid and have extremely low credit risk.[14] Hence, the subtraction of the OIS strips out of the T-Bill rate the variation due to the interest rate and singles out its idiosyncratic characteristics (Sunderam, 2015; Kacperczyk et al., 2021). From the start of the sample until mid-2023, the Treasury premium is characterized by large negative swings, whereas more recent periods appear relatively more stable. Indeed, the T-bill and the OIS increased with respect to the start of the sample to eventually stabilize.

Figure 4 displays the distributions of the APY for a selection of samples we use in our empirical analysis. Notably, the distributions of the APY are quite similar for the main stablecoin lending and non-lending pools, with a relatively fatter tail for the latter. Conversely, the distribution of the APY for stablecoin non–lending pools presents a thinner tail. Remarkably, the APY of the BTC and ETH lending pools is highly concentrated between 0 and 5%, with a relatively thinner tail.

[14]Notionals are never exchanged and there is no cash exchange upfront. For these reasons, OIS contracts are not used as collateral or a store of value.

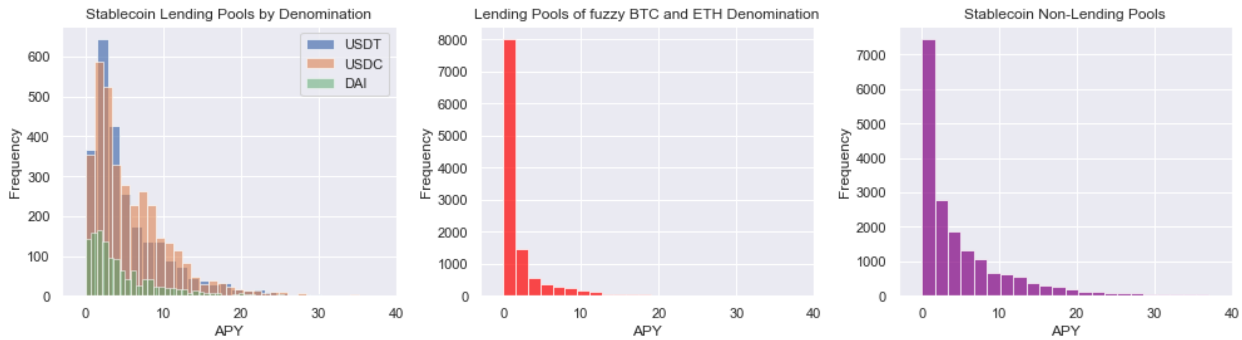

Figure 4: Histograms of APY for different sample splits. x-axes are truncated.

5 Main Empirical Results

To empirically investigate the propositions laid out in the model in Section 3, we estimate the following baseline regression specification:

$$(\text{OIS–APY})_{pckt} = \beta_1 \cdot (\text{OIS–TBIll rate})_{t-1} + \beta_2 \cdot \log(\text{Treasury})_{t-1} \\ + \text{Controls}_{t-1} + \alpha_p + \alpha_c + \alpha_k + \alpha_{woy} + \epsilon_{pckt} \tag{26}$$

The *OIS–APY* spread is the stablecoin premium, where the first term is the overnight-index swap (OIS) rate, while the second is the annualized percentage yield (APY). The subscripts are: p for protocol, c for blockchain, k symbol(s)/token(s) denomination, and t for year-week. The *OIS–TBill rate* is the Treasury premium, which is meant to capture the Treasury specialness. The log*(Treasury)* is the amount of Treasury outstanding held by private investors.

Based on equation (21), the main source of endogeneity in estimating β_1 and β_2 stems from our inability to include time fixed effects, as these would absorb the time-series variation in Treasury premium and supply. Theoretically, the model's time-series effects are captured by δ_t in Equation (21). A simple OLS regression then creates two primary sources of endogeneity from omitted variables: (i) the shadow price of shorting a stablecoin deposit, which is primarily driven by demand for speculation, and (ii) the expected liquidity costs faced by intermediaries. An additional source of potential bias arises from the time × pool effects captured by $\alpha_t(n)$, which represent changes in pool-specific liquidity weights. However, we expect these liquidity weights to be slow-moving preference parameters and remain relatively stable over time, making this a less significant concern for our analysis. To alleviate these endogeneity concerns, we pursue three strategies: (i) include relevant control variables, (ii) exploit cross-sectional variation across different pools, and (iii) employ an instrumental variable approach.

5.1 Time-Series Variation

In the baseline specification of equation (26), we explore only the time-series variation of the Treasury premium and supply. We then include two key controls: *Bitcoin Volatility* to capture crypto market conditions that might affect the demand for speculation and the stablecoin premium, and the *Federal Funds rate* to account for the monetary policy stance and potential residual variation in funding conditions. We also include a comprehensive set of fixed effects: protocol, blockchain, token denomination, and week-of-the-year fixed effects to control for seasonal patterns (e.g., end-of-month effects, tax-loss trading, tax deadlines, and protocol-specific incentives). Following standard practice in the literature (e.g., Kacperczyk et al., 2021; d'Avernas and Vandeweyer, 2024), we aggregate the data at weekly frequency. In all specifications, standard errors are clustered at the protocol level.

According to Propositions 1 and 2, we expect $\beta_1 > 0$ and $\beta_2 < 0$. A positive β_1 indicates that stablecoin lending pools providing liquidity services exhibit premia that comove with the Treasury premium. A negative β_2 suggests that a reduction in Treasury supply increases equilibrium premia for stablecoin lending pools, reflecting investors' increased valuation of liquidity services when aggregate liquidity supply becomes scarce.

Table 3 reports the estimates of the specification (26). In the first column, we consider the sample of lending pools, whose coin denomination is either USDT, USDC, or DAI, and find a highly significant and positive coefficient for β_1. This means that when the Treasury premium increases, so does the stablecoin premium, which implies that investors accept lower yields in exchange for safety and liquidity. In the second column, we expand the sample and consider all stablecoin lending pools. The coefficient is slightly smaller but still highly significant. The effects are economically sizable as a one standard deviation increase in the Treasury premium (i.e., 0.13) leads to an increase in the stablecoin premium of 0.38, more than 25% of its unconditional mean of –1.4.

In the third column of Table 3, we include all stablecoin-denominated pools, as in the second column, but restrict the sample to exclude the lending category. This exclusion allows us to test whether the observed response to the Treasury premium is driven by the token denomination (i.e., the deposit of a stablecoin), rather than by the lending function of the pool itself. In this case, the coefficient of interest is roughly half of the one in the first column, with a lower significance. In the fourth column, we discard from the sample not only lending pools but also the ones that are akin to lending, such as "Yield Aggregator" and "Yield."[15]

[15] Yield Aggregator and Yield protocols are akin to lending protocols, with the difference being in the yield generation. Yield protocols provide investors with automated optimization services to diversify their

The coefficient remains similar in magnitude but loses significance relative to the previous specification, suggesting that the response to the Treasury premium is primarily driven by lending pools, with non-lending pools displaying only a weaker sensitivity.

In the remaining columns (5–7) of Table 3, we consider different non-stable coin pools. Our sample includes BTC- and ETH-denominated pools for both lending and non-lending protocols. We find no evidence of co-movement between the APY premium and the Treasury premium. Overall, the baseline results suggest that the co-movement between the Treasury premium and the stablecoin premium is primarily driven by lending-based stablecoin pools, which suggests that only these pools offer liquidity services.

In line with Proposition 2, the same table reports a negative estimate for β_2, indicating that a lower supply of outstanding Treasuries available for private investors is associated with greater issuance of stablecoin lending pool deposits, consistent with their role in providing safety and liquidity, and their premium rises especially when Treasuries are scarce. Notably, the coefficient becomes statistically insignificant, or even flips sign, when the sample is restricted to BTC and ETH lending or non-lending pools, suggesting that this mechanism is specific to stablecoin-based protocols.

5.2 Cross-section Variation

We now focus on the cross-sectional variation in our data to test Corollary 1 of Proposition 1, which predicts that pools with higher liquidity characteristics will exhibit higher exposure to Treasury premium. Specifically, we use the entire sample, including both stablecoin and non-stablecoin pools, and interact the Treasury premium with a set of dummy variables that classify pools based on their liquidity provision: single stablecoin lending pools, non-single stablecoin lending pools, and lending pools with BTC or ETH tokens.

The main advantage of exploiting the rich cross-sectional variation in our data is that it allows us to include additional controls. In particular, we can add time fixed effects (weekly), which absorb important sources of endogeneity affecting all pools uniformly, such as the aggregate demand for speculation and intermediary costs discussed in the previous section. We can also include various combinations of protocol, blockchain, and token fixed effects to control for time-invariant pool characteristics. If liquidity weights are relatively stable in our data, these fixed effects should absorb the model-implied confounders captured by δ_{tn} in equation (21).

Results are reported in Table 4. In line with Table 3, we find positive and statistically significant coefficients for the interactions term between the Treasury premium and the dum-

investments. Their portfolios include different pools, such as lending pools, but also staking, and others. For these reasons, they have some overlap with the lending pools.

mies classifying single and multi stablecoin lending pools. We also find a negative coefficient for the amount outstanding of Treasuries available for private investors. In the stricter specification, we include protocol-chain-token and time fixed effects to absorb, respectively, persistent heterogeneity in yields across specific stablecoin markets (e.g., USDC on Aave on Ethereum) and time-varying shocks that are common across the ecosystem in a given week (e.g., macro news, risk sentiment, or funding conditions).

In all, our base empirical results support Propositions 1 and 2 of the model, where stablecoin-lending pools respond to the demand for safety and liquidity of investors. The rest of the analysis in this section is structured as follows. To assuage concerns about identification, in the next subsection, we instrument the Treasury premium with FED interventions in the Treasury markets. Next, we test Prediction 3 of the model by focusing on how the safety and liquidity provision of stablecoin lending pools respond to different sets of liquidity shocks. Subsequently, we exploit the granularity of our data to identify characteristics that matter the most for investors seeking safety and liquidity within crypto markets.

5.3 An Instrumental Variables Approach

In the empirical baseline specification (26) in Table 3, we assume that there are no omitted factors jointly influence the weekly changes in the Treasury premium and the stablecoin premium that are not captures by the included controls. Omitted variables affecting both premia could bias our estimated coefficient and undermine the causal interpretation of our results. Establishing that the Treasury premium causally affects the stablecoin premium is important for demonstrating that stablecoin deposits provide liquidity services and serve as partial substitutes for traditional liquid assets. In turn, we work on reducing concerns about endogeneity biases.

One potential source of endogeneity is a general increase in demand for leverage that affects both the Treasury and the stablecoin premia. Higher speculative demand increases borrowing from SCLPs, which incentivizes platforms to raise deposit rates (APY) to attract more capital. As described in Section 3, higher APYs reduce the stablecoin premium. If speculative demand correlates with the Treasury premium — for example, through its correlation with expected MMF liquidation costs — our coefficient estimate will be biased. Notably, the direction of this bias is ambiguous.

We estimate a set of instrumental variable regressions to strengthen the identification of our empirical tests. The main idea is to use the FED's short-term interventions in Treasury markets as an instrument for the Treasury premium. The relevance condition requires that the FED's Reverse Repo facility affects the Treasury premium (see also d'Avernas and

Vandeweyer, 2024). The exclusion restriction assumes that weekly FED interventions affect the stablecoin premium only through their impact on Treasury markets. This condition is plausible due to the segmentation between Treasury markets and lending-pool markets.

Specifically, we use two main instruments. The first is the logarithm of the amounts in the FED's overnight Reverse Repo facility (RRP). The second is the cumulative net reverse repo amount (cum-net-RRP), calculated as the weekly cumulative sum of overnight reverse repos minus the weekly cumulative amount of FED repos.[16]

Table 5 presents the results. We estimate the IV specification on three representative subsamples: the USDT, USDC, and DAI stablecoin lending pools, and, for comparison, the ETH/BTC lending pools. As expected, the instrument is strong in all cases, with first-stage F-statistics well above standard critical values. Columns (1–2) and (4–5) report the effect of the Treasury premium on the stablecoin premium using the proposed instruments. Across all specifications, the effect is positive and statistically significant, consistent with the baseline results (Table 3) and the model's predictions. The estimated coefficients are larger than those from the OLS specification, in line with Jiang (2017). Columns (3) and (6) show the corresponding results for BTC and ETH lending pools. In these cases, the instrumented premium is negative, consistent with the idea that these pools do not serve safety/liquidity demand. Finally, we report similar results when using money market funds' usage of the FED's Reverse Repo facility as an instrument (see Table B.14 in Appendix B).

6 Market Uncertainty and Liquidity Preferences

We now explore the implications of Proposition 3, which focuses on the response of the stablecoin premium to changes in liquidity preferences and to market uncertainty. In other words, we now test the resilience of the stablecoin lending pool in response to a different set of liquidity shocks. Our sample is well suited to examine the stability of the liquidity services provided by stablecoin lending pools, as it includes two major stablecoin shocks: (i) Terra, the first large-scale collapse of an algorithmic stablecoin, and (ii) SVB, the collapse of a traditional bank that triggered the de-pegging of one of the largest stablecoins (i.e., USDC), revealing the significance of crypto ecosystem's linkages with the traditional banking sector. Furthermore, we test the response to the failure of a major centralized exchange due to fraud (i.e., FTX) that spread panic in crypto markets. Finally, in addition to these systemic

[16] For FED reverse repos, we use "Overnight Reverse Repurchase Agreements: Treasury Securities Sold by the Federal Reserve in the Temporary Open Market Operations" (RRPONTSYD, `https://fred.stlouisfed.org/series/RRPONTSYD`). For FED repos, we use "Overnight Repurchase Agreements: Treasury Securities Purchased by the Federal Reserve in the Temporary Open Market Operations" (RPONTSYD, `https://fred.stlouisfed.org/series/RPONTSYD`); both from the St. Louis FED.

events, we use a novel dataset to study investors' responses to crypto hacks.

In Table 6, We present results for two types of crypto-specific shocks — namely, stablecoin-related events (e.g., Terra collapse and the SVB episode) and non-stablecoin-related shocks (e.g., FTX bankruptcy) — as well as for a broader measure of aggregate market stress, the VIX, which is not specific to crypto markets. We interact the Treasury premium with each *Shock* dummy, that is equal to one for one month after, on the stablecoin-lending pool sample and on the BTH and ETH one. In columns (7–8), we employ a similar specification using the VIX. Specifically, the variable *High VIX* is equal to one in the period in which it is in the top 15th percentile in our sample period. Our findings indicate that during periods of heightened uncertainty, investors treat stablecoin lending pools as less safe and liquid, consistent with the insights of Proposition 3. As expected, this dynamic does not apply to BTC- and ETH-denominated pools.

In Table 7, we extend our analysis of the stablecoin premium's response to liquidity shocks by incorporating granular data on large-scale crypto hacks. Specifically, we focus on incidents that resulted in losses exceeding USD 100 million, identifying 16 such event weeks. These high-impact episodes provide a test of how investors adjust their portfolio allocations in response to elevated uncertainty, particularly regarding the security and reliability of DeFi protocols. The detailed nature of the dataset allows us to examine attacks specifically targeting DeFi protocols (columns (3–4)).

Our findings indicate that during episodes of hacks, stablecoin lending pools experience significant disruptions and lose their ability to provide safety and liquidity services. In particular, the coefficient in column (3), which isolates hacks related to DeFi, shows a negative and significant effect on stablecoin pools during DeFi-related attacks. Notably, we find no comparable response in non-stablecoin lending pools, suggesting they serve investors who have factored in the higher risk of their investments. Our results stress that hacker attacks undermine the benefits of holding stablecoin-lending pools.

7 Heterogeneous Effects

In this section, we exploit the granularity of our dataset to examine whether investors differentiate among tokens within the same category. We explore four dimensions of heterogeneity: token denomination, pool type (lending vs. non-lending), protocol size, and platform. Although our model abstracts from these specific features, it predicts that premium sensitivity 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 serve as effective providers of liquidity services.

An important advantage of our cross-sectional analysis is that we can refine our baseline specification (??) by incorporating protocol × time fixed effects. These fixed effects alleviate concerns about time-varying omitted variables that might jointly drive both the Treasury premium and the demand for DeFi deposits.

7.1 Heterogeneity across Tokens

Table 8 reports the results on token heterogeneity. We focus on the subsample of single-name USDT, USDC, and DAI lending pools. The interaction terms between the Treasury premium and aggregate stablecoin pool indicator (column 1) and pool-level indicators for USDC, USDT, and DAI (columns 2, 3, and 4, respectively) are positive and statistically significant throughout. We find the same results in column (6), where we switch back to our baseline set of fixed effects. These results suggest that all the pools denominated in the three major stablecoins exhibit co-movement with the Treasury premium. Notably, the estimates are of comparable magnitude across tokens, despite differences in transparency, collateral structures and ties with the financial institutions, suggesting potential segmentation within the stablecoin market with investors valuing either full transparency (e.g., USDC) and or full opaqueness (e.g., USDT).

7.2 Heterogeneity across Lending and non-Lending

Our model centers on the DeFi category of lending as it is the one with the largest pools of stablecoin deposits (see Figure 2). However, it is possible that yields in non-lending pools also co-move with the Treasury premium through alternative mechanisms not explicitly captured in the model. To explore this possibility, we extend our empirical analysis to the largest non-lending category ("staking"), assessing whether staking pools respond to the Treasury premium.

Crypto 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. For instance in ETH staking pools, investors generate yield by delegating their tokens, which validators use to support network operations. While this category shares certain features with lending pools, its design inherently exposes investors to the volatility of the staked asset, primarily ETH price fluctuations. In contrast, this price volatility is largely mitigated in stablecoin lending pools. Additionally, the deposited value in stablecoin lending pools is backed by the pooling of the assets and the over-collateralization design.

In Table 9, we present results for the category "Staking," which includes both "Liquid

Staking" and "Staking" pools. For comparison, column (1) repeats our baseline results for stablecoin lending pools. Columns (2–3) show that, for staking pools, the coefficient on the Treasury premium is negative and statistically insignificant, suggesting no meaningful co-movement. Columns (4–5) restrict the sample to staking pools on the Ethereum blockchain and yield similar results. By contrast, the coefficient on Treasury supply is positive and significant across all staking specifications, indicating that yields in these pools respond in the opposite direction to Treasury scarcity compared to stablecoin lending pools. Taken together, these findings suggest that staking yields do not reflect a safety or liquidity premium in the same way as stablecoin lending pools. Instead, the positive association between Treasury supply and staking yields may indicate that staking activity is more sensitive to broader risk appetite and investor search-for-yield behavior. As the availability of safe assets like Treasuries expands, investors may rebalance portfolios toward higher-yielding, riskier DeFi opportunities such as staking consistent with demand for yield-enhancing strategies when liquidity constraints are relaxed.

7.3 Heterogeneity across Size

In an additional test, we investigate whether the observed co-movement between stablecoin lending pool yields and the Treasury premium is concentrated among the largest protocols. In the context of our model, where stablecoin deposits earn a premium due to their perceived safety and liquidity, larger protocols are more likely to serve as focal points for such demand. Their size may proxy for deeper liquidity and stronger integration with the broader DeFi ecosystem, and these features might enhance their ability to provide safety and liquidity services. Examining size heterogeneity allows us to test whether the mechanism emphasized in the model is primarily operative among the most systemically relevant protocols.

In Table 10, we interact the Treasury premium with indicators classifying pools by protocol identity and total value locked (TVL). We distinguish between Aave, Compound, and other platforms. The results in column (1) indicate that yields from pools associated with the largest lending protocols co-move with the Treasury premium. However, this relationship appears to be primarily driven by the subset of stablecoin-denominated pools. In column (2) we find that the co-movement between the stablecoin premium and the Treasury premium is stronger for pools associated with Aave, particularly its V3 implementation, the largest protocol in the market, followed by Compound (column 2). These findings are consistent with the interpretation that larger and more established protocols with deeper liquidity, greater user participation, and more consistent integration with the broader DeFi ecosystem are more likely to provide liquidity and safety services. However, when restricting the sample to stablecoin lending pools (column (3)), we find no statistically significant differences in the response to the Treasury premium across protocols, indicating that within this more homogeneous dimension, protocol-level characteristics play a smaller role. One exception is JustLend, a protocol native to the Tron blockchain, for which we observe a negative and significant interaction. This result implies that yields on JustLend move in the opposite direction compared to the broader lending category. A possible interpretation is that JustLend, which is perceived as less transparent and operates within a more centralized ecosystem, attracts less capital during periods of heightened demand for safety. These findings point to segmentation within the DeFi lending landscape, with investors reallocating away from riskier or less trusted protocols when the demand for safe assets increases.

7.4 Heterogeneity across Hosting

Finally, we examine heterogeneity across blockchains to assess whether the co-movement between stablecoin lending yields and the Treasury premium varies by hosting environment. While the model abstracts from blockchain-level characteristics, this dimension is empirically relevant: blockchains differ in decentralization, governance, institutional integration, regulatory exposure, and user base composition. Ethereum and its associated layer-2 solutions (e.g., Arbitrum, Optimism) host the most established and institutionally connected lending protocols, such as Aave. By contrast, Tron primarily hosts JustLend, a protocol with high total value locked (TVL) but widely viewed as more centralized and opaque, as discussed before. Exploring blockchain heterogeneity allows us to test whether the mechanism emphasized in the model operates more strongly in environments where institutional trust and transparency are higher.

In Table 11, we interact the Treasury premium with indicators for Ethereum, Tron, and Avalanche to assess blockchain-level heterogeneity. In columns (1–3), the interaction with Ethereum is positive and statistically significant, indicating that the co-movement between stablecoin lending yields and the Treasury premium is particularly strong for pools hosted on Ethereum. In contrast, the interaction with Tron is negative and significant in several specifications, consistent with the dominance of JustLend on Tron and with our earlier findings on protocol heterogeneity. Importantly, column (5) shows that when we restrict the sample to stablecoin lending pools hosted outside Ethereum, the Treasury premium remains positive and statistically significant. This result indicates that while Ethereum plays a central role, the mechanism is not exclusive to pools on Ethereum.

8 Robustness Tests

We conclude our analysis by presenting a series of robustness checks and complementary tests that confirm the validity of our baseline results. All supporting tables are reported in in Appendix B.

We begin by verifying the robustness of our baseline specification to alternative methods of inference. Specifically, we re-estimate the main tests using a battery of standard error clustering approaches, including clustering by protocol, blockchain, token, and combinations thereof. Across virtually all specifications, the coefficient on the Treasury premium remains positive and statistically significant, confirming the robustness of the co-movement with the stablecoin premium. Next, we test whether the observed relationship is sensitive to the maturity used in constructing the Treasury premium. While our baseline specification uses the 3–month Tbill–OIS spread, we replicate the analysis using alternative maturities (e.g., 1–month, 6–month, 1–year, and 2–year). We find that the effect is concentrated in the shortest maturities (1–month and 3–month), with no statistically significant relationship observed for longer maturities. This result suggests that stablecoin lending pools primarily respond to short-term safety and liquidity conditions.

As an additional test of our identification strategy, we implement an alternative instrumental variable (IV) approach. Specifically, we instrument the Treasury premium using the log of repo amounts conducted by money market funds with the Federal Reserve's Reverse Repo Facility.[17] When applying this instrument to the baseline sample of single-token pools denominated in USDT, USDC, or DAI, we continue to find a positive and significant relationship between the stablecoin premium and the Treasury premium.

We also address concerns that our findings might be driven by noise from smaller protocols or less liquid blockchains. To this end, we re-estimate the baseline specification restricting the sample to Ethereum-hosted pools only, the largest and most liquid blockchain in the DeFi ecosystem. The estimated relationship between the Treasury premium and the stablecoin premium remains positive and statistically significant, indicating that our results are not driven by idiosyncratic variation among smaller chains or protocols.

Finally, we test whether the co-movement between stablecoin and Treasury premia is more pronounced among institutionally dominated pools. We proxy for institutional versus retail investor activity using the median average change in total value locked (TVL), and split the sample into pools with the top 5%, 10%, and 15% of TVL change (institutional) and bottom 5%, 10%, and 15% (retail). We find that the relationship is driven by pools

[17]Data obtained from the Federal Reserve Economic Data (FRED): Money Market Funds; Security Repurchase Agreements (Federal Reserve Reverse Repurchase Agreement Operations); Asset, Level (Series ID: BOGZ1FL632051103Q), available at `https://fred.stlouisfed.org/series/BOGZ1FL632051103Q`.

with greater institutional activity and is weaker or absent among those dominated by retail investors. This pattern is consistent with the idea that institutional investors may be more responsive to changes in the relative attractiveness of liquid instruments and adjust their portfolios more quickly in response to shifts in market conditions.

Taken together, these robustness checks confirm that our core findings are not sensitive to specification choices, measurement of the Treasury premium, sample composition, or estimation strategy.

9 Conclusions

This paper investigates how the demand for safety and liquidity manifests in crypto markets by focusing on the role of stablecoin lending pools in the decentralized finance (DeFi) ecosystem. We develop a simple model in which stablecoin deposits, much like traditional safe assets, provide liquidity services and adjust their yields in response to fluctuations in the Treasury premium and the availability of safe collateral. Using granular data covering thousands of DeFi pools across protocols, tokens, and blockchains, we test the model's predictions and provide robust evidence that the stablecoin premium co-moves positively with the Treasury premium, responds to Treasury scarcity, and is sensitive to shifts in perceived liquidity.

Our findings indicate that this behavior is specific to lending pools and to deposits denominated in stablecoins, with no comparable dynamics for pools based on BTC or ETH. The co-movement is most pronounced on Ethereum and among large protocols like Aave and Compound, consistent with these platforms' centrality, liquidity depth, and institutional credibility. Importantly, we show that this relationship holds across major stablecoins, despite meaningful differences in transparency, reserve backing, and regulatory alignment — suggesting a segmented investor base, where different tokens serve similar safety functions for distinct market participants. By contrast, non-lending categories such as staking do not exhibit comparable co-movement, reinforcing the view that safety and liquidity services are tightly linked to the institutional structure of lending protocols.

Our contribution lies at the intersection of the literature on safe assets and the rapidly growing field of DeFi. We show that in an unregulated, high-volatility environment where traditional guarantees are absent, private crypto-native instruments can replicate some of the features of safe assets through design and market dynamics. While these substitutes remain imperfect and subject to fragility, their responsiveness to shifts in Treasury conditions reveals the growing integration between crypto and traditional liquidity markets. In doing so, our paper highlights the role of DeFi as an emerging site of safe asset intermediation, with implications for how risk, liquidity, and investor segmentation evolve in the future of digital finance.

References

Anadu, Kenechukwu, Pablo D. Azar, Marco Cipriani, Thomas M. Eisenbach, Catherine Huang, Mattia Landoni, Gabriele La Spada, Marco Macchiavelli, Antoine Malfroy-Camine, and J. Christina Wang, 2023, Runs and Flights to Safety: Are Stablecoins the New Money Market Funds?, Staff Report 1073, Federal Reserve Bank of New York, Revised April 2024.

Aquilina, Matteo, Jon Frost, and Andreas Schrimpf, 2023, Addressing the risks in crypto: laying out the options, *BIS Bulletin* .

BlackRock, 2025, Circle Reserve Fund, `https://www.blackrock.com/cash/en-us/products/329365/`, Institutional money market fund product page and prospectus materials.

Campello, Murillo, William Cong, and Diemo Dietrich, 2024, Regulatory Uncertainty and FinTech Innovation, *FEB-RN Research Paper No. 15/2024* .

Capponi, Agostino, Ruizhe Jia, and Shihao Yu, 2024, Price Discovery on Decentralized Exchanges, *SSRN Electronic Journal* Available at SSRN: https://ssrn.com/abstract=4236993 or http://dx.doi.org/10.2139/ssrn.4236993.

Carapella, Francesca, Edward Dumas, Jacob Gerszten, Nathan Swem, and Larry Wall, 2022, Decentralized Finance (DeFi): Transformative Potential & Associated Risks Finance and Economics Discussion Series (FEDS).

Chiu, Jonathan, Charles Kahn, and Thorsten V. Koeppl, 2022, Grasping decentralized finance through the lens of economic theory, *Canadian Journal of Economics/Revue canadienne d'économique* 55, 1702–1728.

Chiu, Jonathan, and Thorsten Koeppl, 2019, Blockchain-Based Settlement for Asset Trading, *The Review of Financial Studies* 32, 1716–1753.

Chiu, Jonathan, and Cyril Monnet, 2024, Public and Private Money Creation for Distributed Ledgers: Stablecoins, Tokenized Deposits, or Central Bank Digital Currencies?, *Bank of Canada* University of Bern, Study Center Gerzensee.

Cipriani, Marco, and Gabriele La Spada, 2021, Investors' appetite for money-like assets: The MMF industry after the 2014 regulatory reform, *Journal of Financial Economics* 140, 250–269.

Cong, Lin William, Wayne Landsman, Edward Maydew, and Daniel Rabetti, 2023, Tax-loss harvesting with cryptocurrencies, *Journal of Accounting and Economics* 76, 101607.

Copestake, Alexander, Davide Furceri, and Tammaro Terracciano, 2024, The Crypto Cycle and Institutional Investors, Working paper.

Cornelli, Giulio, Leonardo Gambacorta, Rodney Garratt, and Alessio Reghezza, 2024, Why DeFi lending? Evidence from Aave V2, BIS Working Papers 1183, Bank for International Settlements.

d'Avernas, Adrien, and Quentin Vandeweyer, 2024, Treasury Bill Shortages and the Pricing of Short-Term Assets, *The Journal of Finance* 79, 4083–4141.

De Simone, Lisa, Peiyi Jin, and Daniel Rabetti, 2024, Tax Avoidance with DeFi Lending, *SSRN Electronic Journal* .

ESMA, and EBA, 2025, Joint Report: Recent developments in crypto-assets (Article 142 of MiCAR).

Fidelity Digital Assets, 2022, Exploring Institutional Interest in Blockchain Applications and Digital Asset Uses: Additional Insights from the Fidelity Digital Assets 2022 Institutional Investor Digital Assets Study, Accessed: YYYY-MM-DD.

FSB, Financial Stability Board, 2023, The Financial Stability Risks of Decentralised Finance, Reports to the g20.

Gorton, Gary, 2017, The History and Economics of Safe Assets, *Annual Review of Economics* 9, 547–586.

Gorton, Gary, Stefan Lewellen, and Andrew Metrick, 2012, The Safe-Asset Share, *American Economic Review* 102, 101–06.

Gorton, Gary B., Chase P. Ross, and Sharon Y. Ross, 2022, Making Money, NBER Working Papers 29710, National Bureau of Economic Research, Inc.

Greenwood, Robin, Samuel Hanson, and Jeremy C. Stein, 2015, A Comparative-Advantage Approach to Government Debt Maturity, *Journal of Finance* 70, 1683–1722.

Greenwood, Robin, Samuel Hanson, and Jeremy C. Stein, 2018, The Federal Reserve's Balance Sheet as a Financial-Stability Tool, in *Innovative Federal Reserve Policies During the Great Financial Crisis*, chapter 3, 63–124 (World Scientific Publishing Co. Pte. Ltd.).

Harvey, Campbell R., Ashwin Ramachandran, and Joseph Santoro, 2021, DeFi and the Future of Finance, *SSRN Electronic Journal* Available at SSRN: https://ssrn.com/abstract=3711777 or http://dx.doi.org/10.2139/ssrn.3711777.

Heimbach, Lioba, and Wenqian Huang, 2024, DeFi leverage, BIS Working Papers 1171, Bank for International Settlements.

Jiang, Wei, 2017, Have Instrumental Variables Brought Us Closer to the Truth, *The Review of Corporate Finance Studies* 6, 127–140.

Kacperczyk, Marcin, Christophe Perignon, and Guillaume Vuillemey, 2021, The Private Production of Safe Assets, *Journal of Finance* 76, 495–535.

Krishnamurthy, Arvind, and Annette Vissing-Jorgensen, 2012, The Aggregate Demand for Treasury Debt, *Journal of Political Economy* 120, 233 – 267.

Krishnamurthy, Arvind, and Annette Vissing-Jorgensen, 2015, The impact of Treasury supply on financial sector lending and stability, *Journal of Financial Economics* 118, 571–600.

Lehar, Alfred, and Christine A Parlour, 2022, Systemic fragility in decentralised markets, BIS Working Papers 1062, Bank for International Settlements.

Liu, Jiageng, Igor Makarov, and Antoinette Schoar, 2023, Anatomy of a Run: The Terra Luna Crash, NBER Working Papers 31160, National Bureau of Economic Research, Inc.

Makarov, Igor, and Antoinette Schoar, 2022, Cryptocurrencies and Decentralized Finance (DeFi), *SSRN Electronic Journal* Available at SSRN: https://ssrn.com/abstract=4104550 or http://dx.doi.org/10.2139/ssrn.4104550.

Moreira, Alan, and Alexi Savov, 2017, The Macroeconomics of Shadow Banking, *The Journal of Finance* 72, 2381–2432.

Mota, Lira, 2023, The Corporate Supply of (Quasi) Safe Assets, Available at SSRN: `https://ssrn.com/abstract=3732444` or `http://dx.doi.org/10.2139/ssrn.3732444`.

Nagel, Stefan, 2016, The Liquidity Premium of Near-Money Assets, *The Quarterly Journal of Economics* 131, 1927–1971.

Rivera, Thomas, Fahad Saleh, and Quentin Vandeweyer, 2023, Equilibrium in a DeFi Lending Market, *SSRN Electronic Journal* .

Saengchote, Kanis, 2023, Decentralized lending and its users: Insights from compound, *Journal of International Financial Markets, Institutions and Money* 87.

Saggese, Pietro, Michael Fröwis, Stefan Kitzler, Bernhard Haslhofer, and Raphael Auer, 2025, Towards Verifiability of Total Value Locked (TVL) in Decentralized Finance, BIS Working Papers 1268, Bank for International Settlements.

S&P Global Ratings, 2025, Stablecoin Stability Assessment: Tether (USDT), Technical report, Standard & Poor's Financial Services LLC, Not a credit rating; assessment dated November 26, 2025.

Sunderam, Adi, 2015, Money Creation and the Shadow Banking System, *The Review of Financial Studies* 28, 939–977.

U.S. Securities and Exchange Commission, 2025, Money Market Fund Statistics: Form N-MFP Data, Period Ending December 2024, Technical report, Division of Investment Management, Analytics Office, Filings received through January 17, 2025.

Vuillemey, Guillaume, 2024, The Origins of Limited Liability: Catering to Safety Demand with Investors' Irresponsibility, HEC Paris Research Paper EEH-24-00137, HEC Paris, Forthcoming in *Explorations in Economic History*.

Table 1: **Summary Statistics**. Data is from February 2022 to December 2024. The frequency is weekly.

	Obs.	Mean	STD	25%	50%	75%
Full Sample						
OIS - TBill rate	91 811	-0.078	0.130	–0.152	–0.119	–0.045
VIX	90 536	17.14	4.55	13.51	16.03	19.85
BTC Volatility	91 227	59.35	10.26	53.75	58.27	63.96
Number of unique pools	1 359					
APY	91 811	6.354	9.986	0.739	3.110	7.676
TVL (mln USD)	91 811	78.9	832.5	1.7	4.2	14.8
Stablecoin Lending Pools						
Number of unique pools	125					
APY	9 767	5.993	6.953	1.840	3.782	8.123
APY (Base)	9 635	4.650	5.283	1.432	3.139	6.208
APY (Reward)	5 242	2.553	5.758	0.000	0.453	2.477
TVL (mln USD)	9 767	48.4	178.0	1.9	5.7	27.1
Non Stablecoin Lending Pools						
Number of unique pools	215					
APY	11 627	2.225	4.954	0.029	0.410	2.112
APY (Base)	11 222	1.302	2.865	0.026	0.263	1.496
APY (Reward)	5 595	2.001	5.205	0.000	0.093	1.716
TVL (mln USD)	11 627	146.2	543.1	2.3	7.9	42.4

Table 2: **Unique Values**. The samples are defined as follows: The *Full Sample* includes everything. The *Lending Pools* sample only the pools whose category is "Lending". The *USDT, USDC, DAI Lending Pools* only single name lending pools whose denomination is either in USDT, USDC or DAI. *Stablecoin Lending Pools* includes all lending pools classified as stablecoin pools. *BTC ETH Lending Pools* encompasses all the lending pools whose token denomination (symbol) contains either BTC, ETH or any of their representations (e.g., W.BTC).

	Pools	**Chains**	**Projects/Protocols**	**Symbols/Tokens**
Full Sample	1359	44	194	668
Lending Pools	340	31	58	102
USDT, USDC, DAI Lending Pools	83	17	31	3
Stablecoin Lending Pools	125	21	35	34
BTC ETH Lending Pools	214	27	54	67

Table 3: **Stablecoin premium and Treasury premium.** The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The"SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT", "USDT-USDC–DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. Defi Category specifies which pools are included in the regression (e.g., Lending). Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	Single	All	All	All	All	All	All
	USDT;USDC;DAI	SC Pools	SC Pools	SC Pools	BTC;ETH	BTC;ETH	BTC;ETH
OIS–TBill rate$_{t-1}$	3.529***	2.975***	1.848**	1.825*	0.971	-0.772	-0.398
	(3.29)	(3.22)	(2.23)	(1.82)	(1.53)	(-0.69)	(-0.41)
log(Treasury)$_{t-1}$	-34.49***	-33.27***	-10.36***	-2.083	-0.957	13.63**	10.74**
	(-5.84)	(-4.89)	(-2.67)	(-0.45)	(-0.22)	(2.45)	(2.48)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	7225	9596	18051	13230	11345	44161	55506
R^2	0.480	0.514	0.512	0.532	0.551	0.447	0.476
DeFi Category	Lending	Lending	No Lending	No Lending No Yield Agg.	Lending	No Lending	All

Table 4: **Stablecoin premium and Treasury premium. Full Sample.** For these tests, we include all lending and non-lending pools in our sample. In each column, we interact the Treasury premium with the sub-samples used in our baseline specifications (Table 3). *SC Lending* includes all lending pools denominated in stablecoins (USDT, USDC, DAI, or a combination of them); All pools denominated in stablecoins that are not classified as lending are included in *SC Non-Lending*. *BTC;ETH Lending* include lending pools denominated in ETH and BTC. The pools denominated in ETH and BTC for which the category of the pools is different from lending, are included in *BTC;ETH Non-Lending*. *Single-Token SC lending* include lending pools denominated in only one stablecoin. Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1) OIS–APY	(2) OIS–APY	(3) OIS–APY	(4) OIS–APY	(5) OIS–APY	(6) OIS–APY	(7) OIS–APY	(8) OIS–APY
OIS–TBill rate$_{t-1}$· Single SC Lending	6.391***	6.359***	6.276***	6.318***				
	(3.22)	(3.10)	(3.20)	(3.08)				
OIS–TBill rate$_{t-1}$· SC Lending					5.563**	5.845**	5.670**	5.825**
					(2.43)	(2.47)	(2.47)	(2.46)
Single SC Lending	-2.323***		-2.218***					
	(-2.92)		(-2.79)					
SC Lending					-2.395***		-2.272***	
					(-2.96)		(-2.81)	
OIS–TBill rate$_{t-1}$· SC Non-Lending	-0.590	0.525	-0.322	0.471	-0.391	0.863	-0.0386	0.817
	(-0.26)	(0.23)	(-0.14)	(0.20)	(-0.16)	(0.35)	(-0.02)	(0.33)
SC Non-Lending	-0.304		0.140		-0.292		0.156	
	(-0.41)		(0.15)		(-0.39)		(0.17)	
OIS–TBill rate$_{t-1}$· BTC; ETH Lending	-1.659	0.0498	-1.493	0.0169	-1.472	0.402	-1.217	0.378
	(-0.84)	(0.03)	(-0.77)	(0.01)	(-0.70)	(0.19)	(-0.59)	(0.18)
OIS–TBill rate$_{t-1}$· BTC; ETH Non-Lending	-9.457***	-8.563***	-9.333***	-8.547***	-9.254***	-8.222***	-9.046***	-8.199***
	(-3.68)	(-3.32)	(-3.62)	(-3.33)	(-3.49)	(-3.07)	(-3.40)	(-3.07)
FEs: protocol (p), chain (c), token (t), year-week (yw)	p c t yw	p×t c yw	p×c t yw	p×c×t yw	p c t yw	p×t c yw	p×c t yw	p×c×t yw
N	89654	89653	89654	89653	89654	89653	89654	89653
R^2	0.478	0.510	0.485	0.513	0.478	0.510	0.485	0.513

Table 5: **Instrumental Variable Regressions.** The instrument in columns (1–3) is the amount of the FED's Reverse Repo facility (RRP). The instrument in columns (4–6) is the net weekly sum of FED's Reverse Repos minus FED's Repos (cum-net-RRP). The instrument amounts are in logs. The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT-USDC-DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. Defi Category specifies which pools are included in the regression (e.g., lending). *** p<0.01, ** p<0.05, * p<0.10. Standard errors are clustered at the protocol level.

	(1)	(2)	(3)	(4)	(5)	(6)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	Single	All	All	Single	All	All
	USDT;USDC;DAI	SC Pools	BTC;ETH	USDT;USDC;DAI	SC Pools	BTC;ETH
OIS–TBill rate$_{t-1}$	27.79***	26.96***	-1.698*	30.64***	29.81***	-4.191**
	(26.69)	(26.09)	(-1.94)	(16.72)	(15.94)	(-2.30)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	7228	9601	11345	6233	8357	10321
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending
F-stat, first stage	2290.28	2916.08	2298.67	870.80	1087.33	713.44
Instrument:	RRP	RRP	RRP	cum–net–RRP	cum–net–RRP	cum–net–RRP

Table 6: **Stablecoin premium response to uncertainty shocks**. The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT-USDC-DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. *Controls (incl. levels and interactions)* indicates that some control variables and their interaction terms are omitted for brevity. High VIX indicates the top 15% of the VIX index distribution. Crypto Shocks are dummies equal to one for the two weeks after the event. Defi Category specifies which pools are included in the regression (e.g., lending). *** p<0.01, ** p<0.05, * p<0.10. Standard errors are clustered at the protocol level.

	(1)	(2)	(3)	(4)	(5)	(6)
	OIS-APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All	All	All	All	All	All
	SC Pools	BTC;ETH	SC Pools	BTC;ETH	SC Pools	BTC;ETH
OIS–TBill rate$_{t-1}$	2.365***	0.946	3.307***	1.013	5.364***	1.473
	(2.77)	(1.50)	(3.09)	(1.43)	(3.28)	(1.61)
log(Treasury)$_{t-1}$	-32.59***	-0.946	-32.66***	-0.889	-32.39***	-0.936
	(-4.79)	(-0.22)	(-4.87)	(-0.21)	(-4.68)	(-0.21)
OIS–TBill rate$_{t-1}\times$ Shock	-17.80***	-0.169	-30.37***	-7.888		
	(-3.72)	(-0.07)	(-4.22)	(-1.31)		
Shock	5.162***	0.153	-0.894	-0.357		
	(4.16)	(0.22)	(-1.00)	(-1.05)		
OIS–TBill rate$_{t-1}\times$ High Vix					-4.896**	-0.783
					(-2.31)	(-0.70)
High Vix					-0.971**	-0.450
					(-2.08)	(-1.39)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FEs: project chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	9596	11345	9596	11345	9596	11345
R^2	0.517	0.551	0.514	0.551	0.516	0.551
Category	Lending	Lending	Lending	Lending	Lending	Lending
Diff	-15.438	0.777	-27.068	-6.876	0.468	0.69
p-value	0.001	0.743	0.001	0.226	0.606	0.301
Shock type	Stablecoin Shocks	Stablecoin Shocks	FTX	FTX	VIX	VIX
	Terra and SVB	Terra and SVB			Top 15th	Top 15th

Table 7: **Stablecoin premium response to hacker attacks**. The "USDT;USDC;DAI" sample includes single pools denominated either in USDT, USDC, or DAI. The "BTC;ETH" sample consists of pools containing BTC and ETH. Columns (1–2) assess the impact of "All" hacks, Columns (3–4) only DeFi-specific hacks, and columns (5–6) on non-DeFi-related security breaches. DeFi Category specifies which pools are included in the regression (e.g., Lending). Hacks data are from DefiLlama. We select hacks with losses exceeding USD 100 million. Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	Single	All	Single	All	Single	All
	USDT;USDC;DAI	BTC;ETH	USDT;USDC;DAI	BTC;ETH	USDT;USDC;DAI	BTC;ETH
OIS–TBill rate$_{t-1}$	4.438***	1.255*	4.799***	1.341*	3.581***	0.966
	(3.75)	(1.71)	(3.72)	(1.88)	(3.41)	(1.49)
OIS–TBill rate$_{t-1}\times$ Hacks (All)	-3.330***	-1.191				
	(-2.84)	(-1.59)				
Hacks (All)	-0.439	-0.0608				
	(-1.18)	(-0.48)				
OIS–TBill rate$_{t-1}\times$ Hacks (DeFi)			-8.757***	-2.191*		
			(-5.13)	(-1.71)		
Hacks (DeFi)			1.129***	0.100		
			(3.18)	(0.47)		
OIS–TBill rate$_{t-1}\times$ Hacks (Non-DeFi)					-0.943	0.116
					(-0.63)	(0.18)
Hacks (Non–DeFi)					-1.170*	0.0159
					(-2.01)	(0.10)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	7225	11345	7225	11345	7225	11345
R^2	0.481	0.551	0.482	0.551	0.481	0.551
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending

Table 8: **Stablecoin Premium and Treasury Premium: Token Heterogeneity**. The sample includes all stablecoin and non-stablecoin lending pools. The dummy variable SC Pool is equal to 1 for all stablecoin lending pools. USDC/USDT/DAI Pool are dummies equal to 1 for single-name lending pools denominated in specific stablecoins. Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All	All	All	All	All	All
OIS–TBill rate$_{t-1}$						-0.590
						(-0.87)
log(Treasury)$_{t-1}$						-17.07***
						(4.23)
OIS–TBill rate$_{t-1}\times$ SC Pool	7.539***					
	(6.43)					
OIS–TBill rate$_{t-1}\times$ USDC Pool		5.108***			7.671***	6.840***
		(7.15)			(9.10)	(8.13)
OIS–TBill rate$_{t-1}\times$ USDT Pool			3.746***		6.715***	5.694***
			(4.82)		(6.20)	(4.86)
OIS–TBill rate$_{t-1}\times$ DAI Pool				4.141***	7.314***	7.722***
				(3.28)	(4.56)	(4.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: token chain protocol–year–week	Yes	Yes	Yes	Yes	Yes	p, c, t, yw
N	20080	20080	20080	20080	20080	20956
R^2	0.713	0.710	0.710	0.709	0.713	0.538
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending

Table 9: **Staking Yields and Treasury Premium.**. "All Staking" includes the pools in the categories "Staking Pools" and "Liquid Staking". Column (1) reports the baseline results for comparison purposes. Columns (2) includes pools both in "Staking Pools" and "Liquid Staking", while Column (3) only the latter. Columns (4–5) only include pools hosted on the Ethereum blockchain. Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All SC	All	All	Ethereum	Ethereum
OIS–TBill rate$_{t-1}$	2.975***	-0.144	-0.332	-0.0966	-0.287
	(3.22)	(-0.06)	(-0.14)	(-0.04)	(-0.12)
log(Treasury)$_{t-1}$	-33.27***	13.92***	14.16***	13.98***	14.21***
	(4.89)	(-4.36)	(-4.40)	(-4.30)	(-4.35)
Controls	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes
N	9596	1768	1599	1642	1473
R^2	0.514	0.500	0.505	0.441	0.445
Category	Lending	All Staking	Liquid Staking	All Staking	Liquid Staking

Table 10: **Stablecoin Premium and Treasury Premium. Protocol Heterogeneity**. We consider the largest lending protocols: Aave (v2 and v3), Compound (v2), JustLend and Morpho-blue. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT", "USDT–USDC–DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. Defi Category specifies which pools are included in the regression (e.g., All, Lending). Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All	All	Single	All	All
		SC pools	USDT;USDC;DAI	SC pools	BTC;ETH
OIS–TBill rate$_{t-1}$	0.149	1.573**	4.127***	3.441**	1.386
	(0.16)	(2.33)	(2.96)	(2.45)	(1.44)
log(Treasury)$_{t-1}$	-2.915	-20.08***	-35.80***	-34.00***	-1.691
	(-0.95)	(-5.36)	(-6.40)	(-5.19)	(-0.41)
OIS–TBill rate$_{t-1}\times$ Aave v2	7.111***	1.482	-2.479	-2.439	-0.235
	(4.23)	(1.60)	(-1.38)	(-1.26)	(-0.19)
OIS–TBill rate$_{t-1}\times$ Aave v3	9.830***	7.177***	1.893	2.954	0.517
	(6.66)	(6.56)	(1.22)	(1.55)	(0.40)
OIS–TBill rate$_{t-1}\times$ Compound v2	8.419***	4.552***	-0.0639	0.630	-0.461
	(5.01)	(4.92)	(-0.04)	(0.33)	(-0.36)
OIS-TBill rate$_{t-1}\times$ JustLend	3.199**	-3.075***	-12.11***	-7.171***	-0.999
	(2.12)	(-3.27)	(-6.97)	(-3.66)	(-0.82)
OIS–TBill rate$_{t-1}\times$ Morpho-blue	-3.153***	-10.05***		-6.560*	2.756
	(-2.67)	(-5.54)		(-2.03)	(1.26)
FE: top–protocol chain token week	Yes	Yes	Yes	Yes	Yes
N	89654	27648	7226	9597	11345
R^2	0.403	0.414	0.396	0.466	0.472
DeFi Category	All	All	Lending	Lending	Lending

Table 11: **Stablecoin Premium and Treasury premium: Blockchain Heterogeneity**. We include the following blockchains based on their relevance in the DeFi ecosystem: Ethereum, Avalanche, Tron. The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT–USDC–DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. DeFi Category specifies which pools are included in the regression (e.g., All, Lending). Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	Single USDT;USDC;DAI	All SC pools	All SC pools	All SC and on Ethereum	All SC No Ethereum	All BTC;ETH	All BTC;ETH on Ethereum	All BTC;ETH no Ethereum
OIS–TBill rate$_{t-1}$	0.561	0.595	1.146	3.515***	2.995**	0.971	0.730	1.173
	(0.28)	(0.52)	(0.55)	(4.01)	(2.58)	(1.53)	(0.56)	(1.47)
OIS–TBill rate$_{t-1}\times$ Avalanche	8.161***	1.866	3.806					
	(4.28)	(0.47)	(0.92)					
OIS–TBill rate$_{t-1}\times$ Ethereum	4.371**	3.177*	4.513**					
	(2.15)	(1.86)	(2.07)					
OIS–TBill rate$_{t-1}\times$ Tron	-6.399**	-0.610	-4.409**					
	(-2.20)	(-0.38)	(-2.21)					
log(Treasury)$_{t-1}$	-26.57***	-18.94***	-33.58***	-45.51***	-28.07***	-0.957	-13.05	4.960
	(-5.60)	(-5.02)	(-4.95)	(-4.96)	(-3.25)	(-0.22)	(-1.29)	(1.46)
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	12076	27647	9596	3105	6491	11345	3670	7675
R^2	0.458	0.506	0.516	0.574	0.516	0.551	0.588	0.535
DeFi Category	All	All	Lending	Lending	Lending	Lending	Lending	Lending

A Model Additional Calculations

A.1 Investor's First Order Conditions

At the end of the period, wealth evolves according to

$$w_{t+1} = R^a_{t+1}\, a_t + R^m_{t+1}\, m_t + \int_0^1 R^s_{t+1}(n)\, s_t(n)\, dn. \tag{27}$$

Combining (4) and (27) gives the intertemporal budget constraint

$$w_{t+1} = R^a_{t+1}(w_t - c_t) - (R^a_{t+1} - R^m_{t+1})\, m_t - \int_0^1 (R^a_{t+1} - R^s_{t+1}(n))\, s_t(n)\, dn. \tag{28}$$

The first-order conditions are straightforward:

$$u'(c_t) = \beta\, \mathbb{E}_t[\lambda^c_{t+1}\, R^a_{t+1}] + \lambda^a_t, \tag{29}$$

$$\psi\, \frac{\partial L_t}{\partial m_t} = \beta\, \mathbb{E}_t[\lambda^c_{t+1}\, (R^a_{t+1} - R^m_{t+1})] + \lambda^a_t, \tag{30}$$

$$\psi\, \frac{\partial L_t}{\partial s_t(n)} = \beta\, \mathbb{E}_t[\lambda^c_{t+1}\, (R^a_{t+1} - R^s_{t+1}(n))] + \lambda^a_t, \qquad \forall n \in [0,1]. \tag{31}$$

From the CES liquidity aggregator,

$$\frac{\partial L_t}{\partial m_t} = L_t^{1/\sigma}\, (1 - \alpha_t)\, m_t^{-1/\sigma}, \tag{32}$$

$$\frac{\partial L_t}{\partial s_t(n)} = L_t^{1/\sigma}\, \alpha_t(n)\, s_t(n)^{-1/\sigma}. \tag{33}$$

Substituting into (30)–(31) yields

$$\psi\, L_t^{1/\sigma}\, (1 - \alpha_t)\, m_t^{-1/\sigma} = \beta\, \mathbb{E}_t[\lambda^c_{t+1}(R^a_{t+1} - R^m_{t+1})] + \lambda^a_t, \tag{34}$$

$$\psi\, L_t^{1/\sigma}\, \alpha_t(n)\, s_t(n)^{-1/\sigma} = \beta\, \mathbb{E}_t[\lambda^c_{t+1}(R^a_{t+1} - R^s_{t+1}(n))] + \lambda^a_t. \tag{35}$$

Assuming R^i_{t+1} are known at time t, these two conditions imply the relative demand:

$$\left(\frac{s_t(n)}{m_t}\right)^{1/\sigma} = \frac{\alpha_t(n)}{1 - \alpha_t}\, \frac{y^m_t + \tilde{\lambda}_t}{y^s_t(n) + \tilde{\lambda}_t}, \tag{36}$$

where

$$y^m_t \equiv R^a_{t+1} - R^m_{t+1}, \quad y^s_t \equiv R^a_{t+1} - R^s_{t+1}(n), \text{ and } \tilde{\lambda}_t \equiv \frac{\lambda^a_t}{\mathbb{E}_t[\lambda^c_{t+1}]}. \tag{37}$$

Aggregation. The first-order conditions imply

$$\psi\, L_t^{1/\sigma}(1-\alpha_t)m_t^{-1/\sigma} = \mathbb{E}_t[\lambda_{t+1}^c]\left(R_{t+1}^a - R_{t+1}^m + \tilde{\lambda}_t\right),$$

$$\psi\, L_t^{1/\sigma}\alpha_t(n)s_t(n)^{-1/\sigma} = \mathbb{E}_t[\lambda_{t+1}^c]\left(R_{t+1}^a - R_{t+1}^s(n) + \tilde{\lambda}_t\right).$$

Solving for optimal holdings gives

$$m_t = \left(\frac{\psi\, L_t^{1/\sigma}(1-\alpha_t)}{\mathbb{E}_t[\lambda_{t+1}^c]}\right)^{\sigma}\left(R_{t+1}^a - R_{t+1}^m + \tilde{\lambda}_t\right)^{-\sigma},$$

$$s_t(n) = \left(\frac{\psi\, L_t^{1/\sigma}\alpha_t(n)}{\mathbb{E}_t[\lambda_{t+1}^c]}\right)^{\sigma}\left(R_{t+1}^a - R_{t+1}^s(n) + \tilde{\lambda}_t\right)^{-\sigma}.$$

The aggregate demand for SCLP balances is therefore

$$s_t = \int_0^1 s_t(n)\, dn = \left(\frac{\psi\, L_t^{1/\sigma}}{\mathbb{E}_t[\lambda_{t+1}^c]}\right)^{\sigma}\int_0^1 \alpha_t(n)^{\sigma}\left[R_{t+1}^a - R_{t+1}^s(n) + \tilde{\lambda}_t\right]^{-\sigma} dn.$$

Dividing by m_t yields

$$\frac{s_t}{m_t} = \left(\frac{1}{1-\alpha_t}\right)^{\sigma}\int_0^1 \alpha_t(n)^{\sigma}\left(\frac{R_{t+1}^a - R_{t+1}^m + \tilde{\lambda}_t}{R_{t+1}^a - R_{t+1}^s(n) + \tilde{\lambda}_t}\right)^{\sigma} dn.$$

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

$$\frac{s_t}{m_t} = \left[\frac{\alpha_t}{1-\alpha_t}\,\frac{R_{t+1}^a - R_{t+1}^m + \tilde{\lambda}_t}{R_{t+1}^a - R_{t+1}^s + \tilde{\lambda}_t}\right]^{\sigma}. \tag{38}$$

A.2 Equilibrium

Because $s_t = \int_0^1 s_t(n)\, dn$ is equal to the total coins outstanding, we may now combine investor demand for stablecoin balances with market clearing for SCLPs. Starting from the Treasury-clearing condition

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

we solve for the aggregate stablecoin supply:

$$s_t = \frac{B_t^L - m_t\,\omega_{bt}^m}{\omega_{bt}^s}.$$

Dividing by m_t yields

$$\frac{s_t}{m_t} = \frac{1}{\omega^s_{bt}} \left(\frac{B^L_t}{m_t} - \omega^m_{bt} \right). \tag{39}$$

Define the pool-n share of aggregate stablecoin deposits as

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

Since $s_t(n) = \varphi_t(n)\, s_t$, combining with (39) gives

$$\frac{s_t(n)}{m_t} = \varphi_t(n)\, \frac{1}{\omega^s_{bt}} \left(\frac{B^L_t}{m_t} - \omega^m_{bt} \right). \tag{40}$$

Define $Q^n(B^L_t) = \varphi_t(n)\, \frac{1}{\omega^s_{bt}} \left(\frac{B^L_t}{m_t} - \omega^m_{bt} \right)$ and $\tilde{R}^i_t = R^a_t - R^i_t + \tilde{\lambda}_t$, for $i \in \{m, s\}$. We can substitute investor's demand and get

$$\frac{\alpha_t(n)}{1-\alpha_t}\, \frac{\tilde{R}^m_{t+1}}{\tilde{R}^s_{t+1}(n)} = \left[\, Q^n(B^L_t)\, \right]^{1/\sigma}. \tag{41}$$

A.3 Linearization

For each SCLP, the equilibrium adjusted returns follows

$$\tilde{R}^s_{t+1}(n) = \frac{\alpha_t(n)}{1-\alpha_t}\, \tilde{R}^m_{t+1} \left[Q^n_t \left(B^L_t \right) \right]^{-1/\sigma}, \tag{42}$$

Let's rewrite as function of $b_t \equiv \log B_t$

$$Q^n(b_t) = \varphi_t(n) \frac{1}{\omega^s_{bt} m_t} \exp(b_t) - \varphi_t(n) \omega^m_{bt} \tag{43}$$

For tractability, we assume time-invariant shares and portfolio weights: $\varphi_t(n) = \varphi(n)$, $\omega_{bt} = \omega_b$, $\omega_{st} = \omega_s$, and $m_t = m$. That is, the distribution of deposits across pools, the Treasury portfolio weights, and the MMF sector's aggregate size are fixed at their steady-state values.

Denote steady-state values of $\tilde{R}^m_{t+1}$ and b_t by bars. A first-order Taylor expansion around $\bar{R}^m$ and $\bar{b}$ yields

$$\tilde{R}^s_{t+1}(n) \approx \frac{\alpha_t(n)}{1-\alpha_t} q^n_t(\bar{b})^{-1/\sigma} \left(\tilde{R}^m_{t+1} - \bar{R}^m\right) - \frac{1}{\sigma}\frac{\alpha_t(n)}{1-\alpha_t}\bar{R}^m \left(q^n_t(\bar{b})\right)^{-(1+\sigma)/\sigma} \frac{\partial q^n_t}{\partial b_t}(\bar{b})\left(b_t - \bar{b}\right) \tag{44}$$

Substituting back and rearranging gives the linearized excess-return relation

$$y^s_t \approx \frac{\alpha_t(n)}{1-\alpha_t}\,\delta_m\, y^m_t - \frac{\alpha_t(n)}{1-\alpha_t}\,\delta_b\, b_t + \delta^m_t. \tag{45}$$

The coefficients are defined as follows:

$$\delta_m \equiv \left(q^n_t(\bar{b})\right)^{-1/\sigma}, \tag{46}$$

$$\delta_b \equiv \frac{1}{\sigma}\bar{R}^m_{t+1}\left(q^n_t(\bar{b})\right)^{-(1+\sigma)/\sigma}\frac{\partial q^n_t}{\partial b_t}(\bar{b}), \tag{47}$$

$$\delta^m_t \equiv \tilde{\lambda}_{t+1}\left(\delta_m - 1\right) - \frac{\alpha_t(n)}{1-\alpha_t}\delta_m\,\bar{R}^m_{t+1} + \frac{\alpha_t(n)}{1-\alpha_t}\delta_b\,\bar{b}, \tag{48}$$

where δ^m_t collects constant terms.

Finally, our model implies a direct mapping between MMF rates and the Treasury money premium. This premium should be interpreted as arising from the MMF's liquidity transformation problem. In our framework, the relationship is particularly simple and is summarized by equation (11). Hence, we can rewrite the equilibrium equation as

$$y^s_t(n) \approx \frac{\alpha_t(n)}{1-\alpha_t}\,\delta_{TR}\;\; y^T_t - \frac{\alpha_t(n)}{1-\alpha_t}\,\delta_b\;\; b_t + \delta_t. \tag{49}$$

where

$$\delta_{TR} \equiv \delta_m \times \omega_m \tag{50}$$

$$\delta_t \equiv \delta^m_t + c^m_t(\omega_m) \tag{51}$$

A.4 Predictions

Proposition 4 (Co-movement of Rates) *In equilibrium, the crypto premium on stablecoin lending pool deposits, y^s_t, comoves positively with the Treasury convenience yield, y^T_t, as long as investors value the liquidity services provided by these deposits ($\alpha_t(n) > 0$).*

Proof.

$$\frac{\partial y_t^s}{y_t^T} = \frac{\alpha_t(n)}{1-\alpha_t}\delta_{TR} > 0, \quad \forall \alpha_t(n) > 0 \tag{52}$$

■

B Robustness Tests

Table B.12: **Stablecoin Premium and Treasury Premium. Robustness Checks Using Alternative Standard Error Clustering**. The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT–USDC–DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. DeFi Category specifies which pools are included in the regression (e.g., lending). *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	USDT;USDC;DAI	All SC	USDT;USDC;DAI	All SC	USDT;USDC;DAI	All SC	USDT;USDC;DAI
OIS–TBill rate$_{t-1}$	3.529***	2.975***	3.529***	2.975***	3.529**	2.975*	3.529***
	(5.87)	(5.02)	(3.29)	(3.22)	(2.12)	(2.02)	(4.70)
log(Treasury)$_{t-1}$	-34.49***	-33.27***	-34.49***	-33.27***	-34.49***	-33.27***	-34.49***
	(-26.71)	(-25.47)	(-5.84)	(-4.89)	(-5.79)	(-4.92)	(-5.34)
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SE,	robust	robust	protocol	protocol	protocol year–week	protocol year–week	chain
N	7225	9596	7225	9596	7225	9596	7225
R^2	0.480	0.514	0.480	0.514	0.480	0.514	0.480
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending	Lending

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All SC	USDT;USDC;DAI	All SC	USDT;USDC;DAI	All SC	USDT;USDC;DAI	All SC
OIS–TBill rate$_{t-1}$	2.975***	3.529**	2.975**	3.529**	2.975***	3.529	2.975**
	(4.68)	(2.50)	(2.32)	(7.71)	(5.77)	(2.32)	(2.35)
log(Treasury)$_{t-1}$	-33.27***	-34.49***	-33.27***	-34.49***	-33.27***	-34.49***	-33.27***
	(-5.88)	(-5.32)	(-5.90)	(-15.64)	(-10.73)	(-12.65)	(-10.30)
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SE, Cluster	chain	chain year–week	chain year–week	token	token	token year–week	token year–week
N	9596	7225	9596	7225	9596	7225	9596
R^2	0.514	0.480	0.514	0.480	0.514	0.480	0.514
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending	Lending

Table B.13: **Stablecoin Premium and Treasury Premium. Testing for different maturities.**. The sample includes all stablecoin and non-stablecoin lending pools. The dummy variable Stablecoin is equal to 1 for all stablecoin pools. USDC/USDT/DAI are dummies equal to 1 for single-name pools denominated in specific stablecoins. Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)
	OIS–APY (1M)	OIS–APY (3M)	OIS–APY (6M)	OIS–APY (1Y)	OIS–APY (2Y)
Pools:	Single USDT;USDC;DAI	Single USDT;USDC;DAI	Single USDT;USDC;DAI	Single USDT;USDC;DAI	Single USDT;USDC;DAI
OIS–T-bill rate (1M)$_{t-1}$	1.423***				
	(3.83)				
OIS–T-bill rate$_{t-1}$		3.529***			
		(3.29)			
OIS–T-bill rate (6M)$_{t-1}$			-0.919		
			(-0.68)		
OIS–T-bill rate (1Y)$_{t-1}$				-0.718	
				(-0.49)	
OIS–T-bill rate (2Y)$_{t-1}$					-0.910
					(-0.32)
Controls	Yes	Yes	Yes	Yes	Yes
FE: week token protocol chain	Yes	Yes	Yes	Yes	Yes
N	7225	7225	7225	7225	7225
R^2	0.471	0.480	0.491	0.502	0.499
Category	Lending	Lending	Lending	Lending	Lending

Table B.14: **Alternative Instrumental Variable Regressions.** The instrument is the (log) repo amounts of money market funds with the FED's Reverse Repo facility (i.e., "Money Market Funds; Security Repurchase Agreements (Federal Reserve Reverse Repurchase Agreement Operations); Asset, Level" [BOGZ1FL632051103Q] from FRED). The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT-USDC-DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. Defi Category specifies which pools are included in the regression (e.g., lending). *** p<0.01, ** p<0.05, * p<0.10. Standard errors are clustered at the protocol level.

	(1)	(2)	(3)
	OIS-APY	OIS-APY	OIS-APY
Pools	USDT;USDC;DAI	All SC	BTC;ETH
OIS - TBill rate$_{t-1}$	17.73***	16.55***	-4.058***
	(26.92)	(25.09)	(-7.32)
Controls	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes
N	7228	9601	11345
Category	Lending	Lending	Lending
F_first	6943.1	9093.4	8151.4

Table B.15: **Stablecoin Premium on Ethereum blockchain and Treasury Premium.** The "USDT;USDC;DAI" sample includes *single* pools denominated either in USDT, USDC, or DAI. The "SC pools" sample consists of all pools that include either versions of USDT, USDC, or DAI individually, or any combination of these tokens with each other or another token (e.g., "M.USDT" or "USDT–USDC–DAI"). The "BTC;ETH" sample is defined equivalently for pools containing BTC and ETH. DeFi Category specifies which pools are included in the regression (e.g., lending). Standard errors are clustered at the protocol level.*** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)
	APY–OIS	APY–OIS	APY–OIS	APY–OIS	APY–OIS	APY–OIS
Pools:	Single	All	All	All	All	All
	USDT;USDC;DAI	SC Pools	SC Pools	SC Pools	BTC;ETH	BTC;ETH
OIS–TBill rate$_{t-1}$	3.188***	3.515***	0.595	-0.122	0.730	-1.300
	(3.63)	(4.01)	(0.47)	(-0.08)	(0.56)	(-1.02)
log(Treasury)$_{t-1}$	-47.91***	-45.51***	-21.92***	-10.51*	-13.05	10.03*
	(-4.80)	(-4.96)	(-4.68)	(-2.06)	(-1.29)	(-1.70)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	2524	3105	9145	5957	3670	31253
R^2	0.548	0.574	0.458	0.468	0.588	0.377
DeFi Category	Lending	Lending	No Lending	No Lending	Lending	No Lending
				No Yield Agg.		

Table B.16: **Stablecoin Premium and Treasury Premium. Evidence on Institutional vs. Retail Pools.** We consider pools with greater institutional activity (top 5%, 10% and 15%) and pools with greater retail activity (bottom 5%, 10% and 15%). The distinction is made based on the median average change of total value locked. Panel A includes all stablecoin lending pools containing USDC, USDCT, and DAI. Panel B includes consists of all lending pools containing BTC and ETH. DeFi Category specifies which pools are included in the regression (e.g., lending). Standard errors are clustered at the protocol level. *** p<0.01, ** p<0.05, * p<0.10.

	(1)	(2)	(3)	(4)	(5)	(6)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	All SC	All SC	All SC	All SC	All SC	All SC
OIS–TBill rate$_{t-1}$	1.624	2.952**	3.071**	1.957	1.329	1.219
	(0.61)	(3.11)	(2.88)	(0.88)	(0.41)	(0.58)
log(Treasury)$_{t-1}$	-22.65**	-30.12***	-28.22***	-35.33**	-35.38	10.34
	(-3.19)	(-5.78)	(-5.11)	(-2.70)	(-1.67)	(0.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	639	1378	1814	1789	1210	600
R^2	0.608	0.578	0.677	0.484	0.502	0.583
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending
Pool size	top 5	top 10	top 15	bottom 15	bottom 10	bottom 5
Pools number	8	14	20	19	13	7
	(7)	(8)	(9)	(10)	(11)	(12)
	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY	OIS–APY
Pools:	BTC;ETH	BTC;ETH	BTC;ETH	BTC;ETH	BTC;ETH	BTC;ETH
OIS–TBill rate$_{t-1}$	0.286	0.523**	0.356*	-0.0357	2.570	2.383
	(1.20)	(2.69)	(1.86)	(-0.01)	(0.67)	(0.52)
log(Treasury)$_{t-1}$	0.642	0.728	2.706	-7.172	-8.884	-14.01
	(0.38)	(0.54)	(1.29)	(-0.76)	(-1.06)	(-1.23)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
FE: protocol chain token week	Yes	Yes	Yes	Yes	Yes	Yes
N	1004	1788	2311	1905	1480	865
R^2	0.912	0.875	0.784	0.600	0.619	0.623
DeFi Category	Lending	Lending	Lending	Lending	Lending	Lending
Pool size	top 5	top 10	top 15	bottom 15	bottom 10	bottom 5
Pools number	11	22	33	33	23	11